Discourses of positive welfare by UK sheep farmers and industrial actors.

By

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ABSTRACT

Discourses of positive welfare by UK sheep and industrial actors.

Farm animal welfare science promotes positive welfare to facilitate positive experiences for animals instead of focusing solely on minimising negative experiences that can only achieve the concept is still in its infancy, it is communicated and interpreted differently by the scientific community, farmers, other industry actors (veterinarians, farming organisations, and advisors), and the public. There are growing numbers of studies exploring the impact of this development in the veterinary and critical social science literature, which explore the framing and perceptions of positive welfare. Previous studies have focused more on content-based analyses and have not unravelled the complexity of the discourses, and the meanings of positive welfare. Furthermore, there is less focus on what positive welfare means for extensively reared outdoor livestock such as sheep. This study explores the views, meanings and understanding of positive welfare by sheep industry actors in the United Kingdom (UK) using a participatory research methodology. Taking a close look at how farmers and other industry actors view, understand and articulate positive welfare, the study found a series of counter-narratives regarding the concept of positive welfare. The study also highlights evidence that shows the adoption of positive welfare in practice, even though the practices are not necessarily narrated as being positive welfare by those actors. This study is of value to policy makers and industry actors in how they frame and facilitate positive welfare in extensively reared livestock systems. It demonstrates the importance of a participatory, co-design approach mobilising those affected by a societal issue in order to empower farmers and industry in implementing social change.

Keywords: positive welfare, good husbandry, good welfare, higher welfare, industry actors, sheep farmers, language, discourse.

Word count; ~ **65,000**

DECLARATION

I declare that this dissertation is the result of independent research conducted at Royal Agricultural University, Cirencester, under the supervision of Dr Jessica Stokes and Professor Louise Manning. I certify that the research is my work, except as indicated by appropriate citations in the text. The author is responsible for the original ideas, data collection, interpretation of results and the conclusion reached within this thesis. I acknowledge the assistance and advice provided by my colleagues.

Mukhtar Muhammad

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Acknowledgement

To begin with, I would like to express my gratitude to Almighty God for granting me the opportunity to pursue this PhD doctoral programme. Thank you, God, for keeping me well and healthy, for keeping me in good faith, for keeping me in good well-being, and for all the wonderful things I do not have the strength to observe for the last three years that I have been doing this (PhD), and throughout my life as well.

This PhD research was not conducted in a conventional approach, i.e., where the researcher, from the onset, has an idea of where they want to go with their research. Instead, the PhD study here represents exploratory research, where both the research and the researcher grow simultaneously. For the study, it developed mainly as a result of data-driven focus i.e., where the data is allowed to tell the research *story*. For the researcher, they too evolved similarly in knowledge, skills, and techniques - all of which will be discussed throughout the research process.

The exploratory idea was born when I, Dr Karen Rial-Lovera and Dr Allan Butler began our working relationship. However, both left the University after just one semester of working together on my PhD proposal. I remember meeting Professor David Main for the first time in the coffee shop close to Emrys Jones Building. We had a candid and lively conversation and discussed what I wanted to get out of my PhD, what contributions I was willing to make to academia, and what skills I was looking to gain from it (PhD). I am very grateful for that discussion, for it was one of the most significant turning moments on this PhD journey.

At this point, I would like to express special thanks to Professor Louise and Dr Jessica Stokes for their patience, support, guidance, valuable advice, comments, important feedback, and suggestions. Thank you for the support towards publishing my first pieces of review articles, which are both related to this PhD research. Certainly, this PhD work would not have been completed without you both. I am also very thankful to Dr Iona Huang, who, despite differences in Alma Mata, provided me with the right guidance and support to learn a unique approach to problem-solving in Nvivo and IT skills. Special thanks to Dr Lisa Morgans, my mentor and personal tutor, for her thought-provoking questions. I also want to thank

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Publications

Publications related to this thesis:

Muhammad, M., Stokes, J. E., Morgans, L., & Manning, L. (2022). The Social Construction of Narratives and Arguments in Animal Welfare Discourse and Debate. Animals, 12(19), 2582.

Muhammad, M., Stokes, J. E., & Manning, L. (2022). Positive Aspects of Welfare in Sheep: Current Debates and Future Opportunities. Animals, 12(23), 3265.

This PhD incorporates relevant information and reviews from these published articles in mostly chapter one and two of this study. For instance, Muhammad et al (2022a) presents a review article that specifically examines the social construction of discourse and debates among industry stakeholders regarding animal welfare. The information from this review contribute to the overall comprehension and awareness of the PhD topic, enriching the research and enhancing the scholarly discourse in the field.

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Acronyms

Black live matters	BLM
Department of Environment Food and Rural affairs	DEFRA
Discourse explanatory framework	DEF
Farm animal welfare committee	FAWC
Non-governmental organisations	NGO
United Kingdom	UK
United States	US
Participatory online workshop	POW
Participatory extension method	PEM
People of Colour	PoC
Doctor of Philosophy	PhD
Quality of life	QoL
Human-animal relationship	HAR
Veterinarian	Vet

Chapter 1 – Introduction

"Excellence is not a destination; it is a continuous journey that never ends."

- Brian Tracy

This chapter introduces the scientific and societal background to the conceptions of animal welfare and the emergent positioning of positive welfare. The chapter then presents the problem statement, the aims and objectives of the study, its importance and originality, and the thesis outline. Research questions are then raised in the methodology section, which is presented later in the study.

1.1 Animal welfare: scientific and societal viewpoints

Farm animal welfare is a dynamic, evolving concept as new research continues to provide more significant insights into the capabilities and preferences of animals and the suitability or inappropriateness of their management within a wider environment. There have been several meanings proposed for animal welfare by various scientists. In the scientific realm, several researchers have presented critical and balanced arguments for defining animal welfare. Scholars such as Carenzi and Verga (2009), Fraser (1995), Haynes (2011), and Lerner (2008) have not only described but also examined and critiqued these interpretations. They highlight the evolutionary nature of these definitions, which have predominantly developed based on scientific understanding and assessments of animal welfare.

To understand animal welfare from a scientific perspective, researchers have categorised it into six key domains. These categories, outlined in Table 1, provide a framework for comprehensively describing and assessing animal welfare. The categories include affective states, which refer to the emotional well-being of animals; coping mechanisms and biological

functioning, which involve the animal's ability to adapt and maintain physiological balance; natural living, which encompasses preserving the animal's innate behaviours and preferences; harmony and suitable environment, which focuses on creating conditions that align with the animal's needs; care, which involves providing appropriate care and management practices for the animal's well-being; and adaptation, which considers the animal's capacity to adjust to various contexts and situations.

Criteria lists and frameworks are also commonly used to define and measure animal welfare. The Five Freedoms, a widely recognised criteria list, has been criticised for focusing predominantly on negative welfare aspects (Yeates & Main, 2008). As a result, there has been a shift towards considering positive experiences in defining animal welfare. Alternative frameworks such as the Five Domains, the Good Life, and the Opportunities to Thrive frameworks have emerged to incorporate positive welfare considerations.

Fraser et al (1997) propose three complementary operational definitions of animal welfare: affective states, health and diseases, and natural behaviour in outdoor environments. These definitions can be practically applied and assessed. Affective states and biological functioning are seen as complementary in welfare assessments, taking a physiological approach while considering the subjective feelings of the animals. The concept of naturalness captures animals' approval or disapproval of the environmental resources around them and their expression of common behaviours. However, there is debate among researchers about the usefulness of naturalness in practical applications and scientific welfare assessments.

Table 1 Scientific definitions of animal welfare

Category	**Definition**	**Source**
Affective states	Absence of suffering	(Dawkins, 1983)
	Feelings	(Duncan, 1993, 1996)
	Wants	(Duncan & Petherick, 1991)
	Consists of positive and negative experiences.	(Simonsen, 1996)
	What the animal prefers at a given point in time.	(Sandøe, 1996)
Coping mechanisms/biological functioning	The individual's state as regards their attempts to cope with their environment.	(Broom, 1986)
	The welfare of a farm animal depends on its ability to sustain fitness and avoid suffering.	(Webster, 2001)
Natural living	Behaviour that animals tend to perform under natural conditions because it is pleasurable and promotes biological functioning.	(Bracke & Hopster, 2006)
	The behaviour for which the animal is strongly motivated and which, when carried out, gives functional feedback to the animal (lowers its motivation).	(Lidfors et al, 2005)
Harmony	A complete mental and physical health state, where the animal is in harmony with its environment.	(Hughes, 1976)
Suitable environment and care	The avoidance of exploitation of animals by humans by maintaining appropriate standards of accommodation, feeding and general care, the prevention and treatment of disease and the assurance of freedom from harassment and unnecessary discomfort and pain.	(Blood & Studdert, 1988)
Adaptation	The welfare of managed animals relates to the degree to which they can adapt without suffering to the environments designated by humans.	(Party & Carpenter, 1980)

Naturalists emphasise the importance of animals having natural lives and engaging in natural behaviours, which they consider fundamental to welfare. This teleological view of welfare focuses on the purpose and function of behaviours in relation to an animal's natural state (Browning, 2020). On the other hand, proponents of subjective feelings view welfare in terms of an animal's subjective experience and emotional state (Browning, 2020). This perspective considers the feelings and emotions of animals as central to their welfare (Browning, 2019). The debate between these two views reflects a deeper conceptual disagreement about the nature of welfare itself (Browning, 2019). Understanding and measuring welfare require considering both the objective aspects of natural behaviours and the subjective experiences of animals (Browning, 2019; Dawkins, 2023; Yeates, 2018).

In the societal realm, animal welfare is a matter of public concern and holds significant importance for multiple stakeholders. Stakeholders can concur or hold divergent values and perspectives regarding the definition of animal welfare and how to achieve good welfare in practice. Different stakeholder groups often highlight distinct problems and propose alternative solutions based on their specific frames of reference (Duijvesteijn et al, 2014; Te Valde et al, 2002, Verbeke, 2009). These frames of reference, which are often reductionist in nature, help stakeholders comprehend the complexities surrounding animal welfare and guide their knowledge, experiences, judgments, and responses (Duijvesteijn et al, 2014; Schön & Rein, 1994).

In the process of framing animal welfare, various groups compete to shape the primary discourse and gain public recognition and support (Schulze & Deimel, 2012), through articulating a range of argumentative positions with the given discourse (Buddle et al, 2021).

The adoption of specific animal welfare frames or perceptions by individuals depends on their roles and affiliations, as well as the specific context and audience they are addressing, or the organisation they represent, and as a result, their framing may vary over time and place, i.e, the situation and the environment (Boyd & Schwartz, 2021). For instance, a farmer may have different perceptions of acceptable welfare standards for their livestock compared to their pets at home. Consequently, recurring aspects of animal welfare, such as the definition and implementation of good welfare practices, remain contested due to the diverse frames and understandings held by different stakeholders.

Many studies examine stakeholders' views and perceptions of animal welfare (Buddle et al, 2021; Doughty et al, 2017; Vanhonacker et al, 2012). In their multi-stakeholder research, Duijvesteijn et al (2014) found that pig farmers prefer a biological functioning approach to framing animal welfare, emphasising animals' health, fertility, and productivity. In contrast, animal scientists and urban citizens see pigs as natural living beings, emphasising the need for good mental well-being and for them to live in environments where they can behave naturally. Similarly, surveys in the United States (US) and the United Kingdom (UK) found that consumers view better living conditions for farm animals as very important for good animal welfare (Alonso et al, 2020). The referenced studies demonstrate the diverse perspectives and ongoing discussions surrounding farm animal welfare. They highlight the complexity of assessing animal welfare and the need to consider subjective feelings, natural behaviours, and the overall holistic well-being of animals. By understanding the evolving perceptions of stakeholders and the strategies they employ, efforts can be made to enhance animal welfare practices and policies.

In summary, animal welfare is characterised by ongoing research and debate as scientists and society seek to define and assess welfare more comprehensively. Different frameworks and concepts are being explored from scientific and societal perspectives to develop practical approaches for understanding, measuring, and promoting animal welfare. The field's dynamic and evolving nature reflects the topic's complexity and the diverse range of factors that contribute to animal welfare.

1.2 Problem statement

The evolving definitions and assessments of animal welfare are shifting to consideration of subjective experiences from initially protecting animals' basic needs to give a more holistic understanding of what constitutes the quality of life of farm animals. These also include understanding and assessing farm animals' positive emotions and feelings (Farm Animal Welfare Committee, 2009, Mellor, 2016a, 2016b; Yeates & Main, 2008). Positive welfare is the term for this holistic approach. It represents an expansion of the traditional animal welfare understanding that animal welfare is defined by minimising negative experiences such as stress, pain, suffering, and disease, to intentionally providing animals with increased opportunities to improve their overall positive welfare states (Rault et al, 2020; Vigors, 2019). The concept is in its infancy in terms of developing ways of assessing positive welfare on farms. The infancy level can be associated with two interconnected issues.

Firstly, there is a lack of consensus regarding the terminology used to describe approaches aimed at providing positive experiences to animals (Rault et al, 2020). Terms such as good husbandry, good welfare, a life worth living, high welfare, good life, and positive welfare are commonly employed, but their usage, comparison, and practical application have not been extensively examined in existing literature. This lack of clarity and consistency in

terminology poses a potential obstacle to the effective implementation of positive practices. Inconsistent use of these terms may hinder the knowledge and understanding of farmers and other stakeholders, impeding their ability to grasp and apply the concept of positive welfare. To overcome this barrier, further research is needed to explore and establish a standardised and universally accepted set of terminologies that accurately reflect the principles and goals of positive welfare. Such clarity in language would facilitate effective communication, knowledge dissemination, and the successful adoption of positive welfare practices in the agricultural industry.

The use of positive connotations in scientific discussions and assessments has been criticised for its potential to perpetuate exploitative practices in animal agriculture. This criticism arises from the argument that when the focus is solely on highlighting the positive aspects of animal agriculture, ethical concerns may be overlooked or downplayed. This can result in the continuation of practices that exploit animals without adequate scrutiny or consideration of their ethical implications. Scholars, including Cole (2011), have raised concerns about this issue and emphasised the need to address and confront the ethical concerns associated with animal agriculture. By acknowledging and addressing these concerns, it becomes possible to foster a more comprehensive and balanced approach to animal agriculture that considers both the positive and negative aspects (Vigors et al, 2021a). This can ultimately lead to the development of more ethical and sustainable practices in the industry.

Farmers and industry actors (defined herein as farm advisors, veterinarians, supply chain, industry personnel) can hold conflicting values and viewpoints on animal welfare, how a life worth living is achieved, and, crucially, when a good life is experienced by the animals (Stokes et al, 2022). Therefore, actors' understanding, and knowledge of the positive welfare

concept can play a significant role in its acceptance and, thus, in its long-term application. Consequently, it is imperative to gain a more in-depth understanding of what positive welfare means to livestock farmers and industry actors and how it can be (or currently is) implemented and imagined.

1.3 Study objectives

The objective of this research is to make a meaningful contribution to the existing body of knowledge by investigating stakeholders' understanding and knowledge of the positive welfare concept. By gaining insights into stakeholders' views and perspectives, this research seeks to bridge the gap between theory and practice. It recognises that the successful implementation of positive welfare practices relies on the engagement and acceptance of stakeholders, including farmers, industry actors, advisors, veterinarians, and supply chains (Stoke et al, 2022). Their understanding and knowledge of positive welfare play a pivotal role in shaping its adoption and integration into real-world contexts. It will also allow for a more holistic understanding of animal welfare and the role of the farmer in providing positive welfare for their animals. Therefore, this research seeks to contribute to the advancement and application of positive welfare principles, promoting the well-being of farm animals and fostering sustainable and ethical practices in the industry. Thus, the main aim of this study is to:

"Explore how UK sheep farmers and industrial actors view and understand positive welfare."

Specific study objectives are to: -

i. Explore, and analyse farmers' and industry actors' awareness of the concept of positive welfare.

ii. Evaluate and analyse if UK sheep farmers and industry actors articulate positive welfare, how they articulate the concept.

iii. Evaluate and critique assess the differences in awareness, understanding and articulation of positive welfare among UK sheep farming participants and industry actors in the study.

iv. Evaluate and assess differences in the level of adoption of positive welfare practices on a hierarchical level.

v. Evaluate and assess the influence of welfare language (message framing) on the decision-making of the U.K sheep farmers; and

vi. Identify and critique ways of fostering welfare language (*positive* welfare vs *negative* welfare) between the farming community and the public.

1.4 Importance and originality of the research

The exploratory work presented here is one of the first studies to explore the complexity of (positive) animal welfare – how it is viewed, expressed and discussed. By comprehending the various perspectives and interpretations of this concept, it becomes possible to gain a deeper understanding and the deeper implications associated with its adoption. Additionally, exploring the viewpoints and understandings of stakeholders regarding positive welfare aids in identifying any institutional barriers to accessing resources related to this concept or preventing its implementation at the farm level. This research contributes to the broader understanding of positive animal welfare and provides valuable insights for developing strategies to promote its effective application in animal agriculture.

This is among the first studies to use a participatory method to add to the existing positive animal welfare literature. By adopting a participatory method, the research contributes to existing literature with new articulations and understanding of positive welfare among UK sheep farmers and groups of industry actors. The discourses on the positive welfare concept involved identifying, assessing and prioritising potential issues that stakeholders have with it (positive welfare as a concept). This helped to build an in-depth understanding of different viewpoints on the given topic, providing researchers with valuable insights into how their work can best address those competing interests. Additionally, stakeholder discourses allow researchers to identify which areas require further exploration and encourages collective planning when deciding what direction research should take or what goals the research hopes to achieve. By undertaking stakeholder discourses analysis as part of a research project, its findings become more holistic and can offer long-term solutions for better outcomes. Ultimately, such analysis represents an important starting point that can be refined over time through additional scholarly insights on the topic.

It is critical to note that this research is being conducted concurrently with the introduction of the Animal Welfare (Sentience) Bill as part of the Government's Action Plan for Animal Welfare in the UK Parliament. As part of the initiatives to adopt this Sentience Bill, Defra has launched a joint research project with farmers on all the major livestock species to understand how they apply welfare enhancements from the farmers' perspectives and lived experiences. In accomplishing its stated goals, this PhD adds fresh perspectives from key actors to the ongoing scientific and policy discussions such as the Sentience Bill and other animal welfare legislation/standards that generally apply to farmers. In addition, the findings of this work can help researchers and policy makers design interventions tailor-made for farmers (in specific

farming systems), as well as prioritise and support the development of the welfare enhancement scheme to facilitate continuous improvement in sheep welfare. Overall, this type of participatory research is critical since it provides a basis for further collaboration between the academic community and the industry on positive animal welfare.

1.5 Thesis overview and development

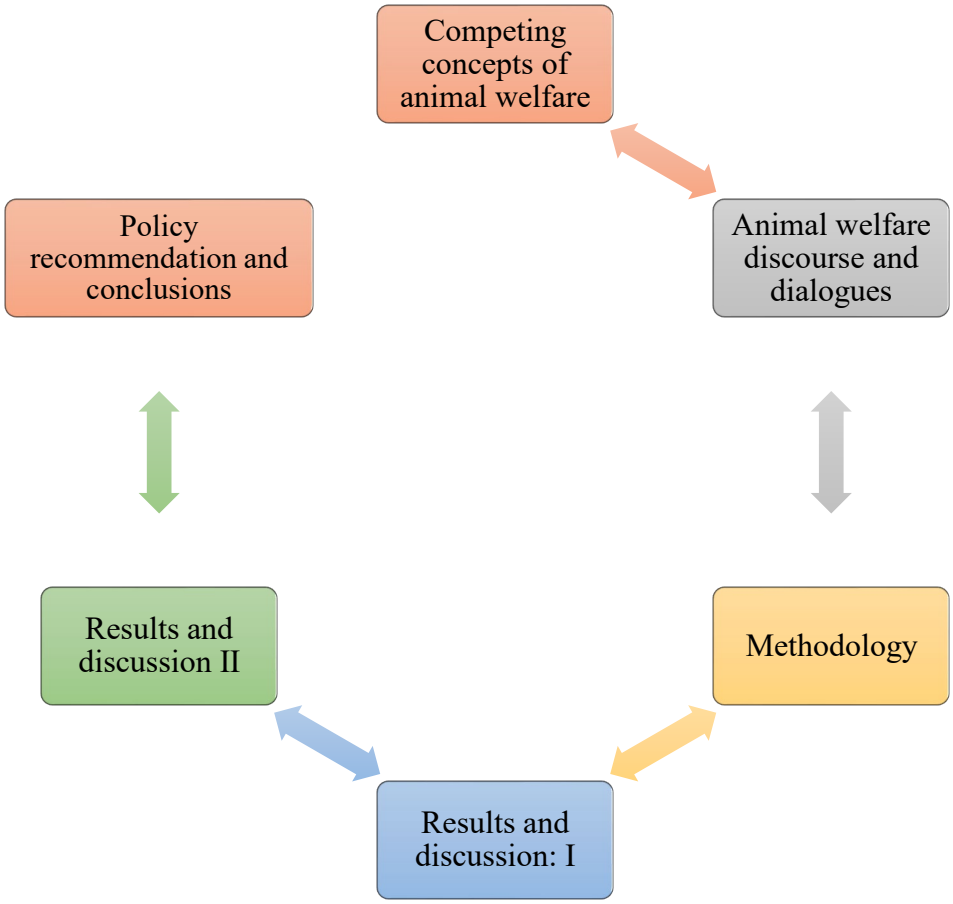
Since this PhD research is an explanatory study, it has an iterative (cyclical) nature. A systematic literature review was conducted to build a basic understanding of animal welfare, its indicators and assessment. Relevant articles were systematically studied and identified as sources for further information regarding the subject matter. The literature review conducted here forms an essential part of a research publication authored by the researcher (Muhammad et al, 2022a). It provides a comprehensive overview of the literature, establishes theoretical framework of this study, and helps situate this research within the broader scholarly context.

The next iterative step in the PhD journey focused on conducting a wider literature review on animal welfare, to familiarise the researcher with meanings, indicators and assessments related to traditional animal welfare issues from the lens of industry actors. The researcher consulted various grey articles published online and other peer-reviewed journals and policy documents from relevant organisations. Compiling these resources allowed the researcher to build a comprehensive picture of current scholarship concerning the topic while exploring alternative discourse and improvement strategies by and between industry actors through a website content analytical approach. The findings from the analysis of the grey literature were the foundational basis for the publication of animal welfare stakeholder debates and discourses (Chapter two).

These iterative processes led to the first reported part of the thesis (chapter one and two), which focused on the established meanings of (positive) animal welfare. The chapter started with broader conceptions and definitions of animal welfare, narrowing down and presenting a critical analysis of the scientific literature on positive welfare. The chapter also looked at societal perspectives, as well as market definitions of these terms. The literature review concludes by positioning the research enquiry.

Subsequently, the third chapter, the methodology section, discusses the materials and methods used during this research. The methodology chapter also explores the research philosophy and approach employed and reflects on how these elements then informed the data collected and the research analytical process. Chapters four and five present the results and discussion of the findings from the multi-method qualitative approach. The sixth chapter presents a summary of findings that can be used to inform future policy formulation and scientific research. While writing these elements (chapters three, four and five) of the thesis, it was necessary to constantly return and forth to ensure that the research questions and the research findings were clear and coherent and were being comprehensively addressed. The double arrow in the iterative flow chart (Figure 1) shows points of *reversible actions* while developing the thesis and resultant findings and recommendations.

Figure 1 Thesis outline



The next chapter presents the literature review section.

Chapter 2 – Literature review

The literature review has two aims. First, it begins by examining and evaluating various terminologies and concepts related to (positive) animal welfare. This analysis includes a discussion of these terminologies' definitions, underlying principles, and practical applications. The review specifically focuses on differentiating these terminologies based on scientific, societal, and other relevant factors. Articles from scientific databases (ScienceDirect) were synthesised iteratively and purposefully (methodology described in Chapter 3) to compile this review and to create a coherent narrative. This approach ensures that the literature review comprehensively analyses the chosen terminologies and their implications in the given context.

The second aim is to explore the varied contributions from different stakeholders to the socially constructed narratives and discourses about animal welfare and its implications to provide wider understanding about communication around animal welfare across the food production related discourse. This critical review considers how different stakeholders construct their perceptions of animal welfare based upon these contested narratives and arguments and how this informs the defining of good animal welfare and a good life in the wider discourse. In this context, the narrative discourse refers to the application of a discursive perspective to a narrative, treating narrative as a mode of discourse rather than simply a specific type of text or structure associated with literary genres (Bamberg, 2011; Fludernik, 2000). Narrative is here seen as a means of communication and expression that goes beyond its traditional association with storytelling. Instead, narrative is understood as a discursive tool through which individuals or groups construct and convey their perspectives, beliefs, and values (Bamberg, 2011; Fludernik, 2000).

2.1 Defining good husbandry, good welfare, high welfare, and positive welfare.

2.2 Good husbandry

"Good animal husbandry" is widely related to the responsible, ethical care and management of farm animals to ensure their welfare, productivity, and sustainability (Stafford, 2017; Wang & Tan, 2022; Webster, 2011). Webster (2011) described good husbandry as managing an animal's life and the land through science and economic production principles. This implies that the life (or animals in this sense) being managed is viewed strictly as a unit of production. Good animal husbandry has also been defined as encompassing all measures carried out on a farm, from purchasing, moving and rearing healthy animals to final slaughter or milking within the herd (Bhilegaonkar et al, 2014).

The current scientific literature on good husbandry reviewed here focuses on aspects of the health and productivity of the animal. For example, Vass-Bognár et al (2022) study found that using individual calf pens and milk replacer feeding was associated with a lower prevalence of paratuberculosis infection than group housing and dam-rearing. The article highlights calf management as a good animal husbandry practice in preventing the spread of diseases and ensuring the welfare of animals. Similarly, it has been determined that husbandry practices such as proper hygiene, biosecurity, dry-period management and vaccination programme are important to maintaining flock health (Bessell et al, 2020; Krattley-Roodenburg et al, 2021; Zhu et al, 2023). Husbandry practices include appropriate udder health treatment, stocking densities, breed selection, feeding, and health management, grassland management, and management of pregnant and lactating animals (Arsenos et al, 2004; Bessell et al, 2020; Garforth et al, 2013). This evidence is significant, as it shows that the current definition of good husbandry includes a focus on health but not animal welfare. This finding is important because it highlights a potential gap in the understanding and

implementation of husbandry practices. By prioritising health, there is a risk of neglecting other important factors that contribute to the overall well-being of animals and, therefore, suggest a lack of agreement on what good husbandry entails. This has implications for the welfare of animals, and further research is needed to bridge the gap between productivity and welfare.

Good husbandry is essential for animal welfare. Party and Carpenter (1980) defined animal welfare as the degree to which managed animals can adapt without suffering to human-provided environments. This definition highlights the importance of creating environments and management practices that allow animals to thrive and minimise their potential for distress or harm. By practicing good husbandry, which encompasses various aspects such as proper nutrition, housing, health care, and handling, animal welfare can be safeguarded. This understanding emphasises the responsibility of humans in providing suitable conditions and care for animals under their management, promoting their well-being and minimising any negative impacts on their physical and psychological states.

It is important to note that the different practices in these systems significantly impact farmers' understanding of animal welfare and whether they can improve welfare outcomes. For instance, Van Staaveren et al (2018) reported that daily flock inspections and vaccination schemes were the main practices used to maintain flock health in poultry husbandry, whereas veterinarian involvement on-farm and in the development and implementation of a flock health plan was less common. Similarly, in sheep husbandry, practices such as tail docking are used to manage ectoparasite infestation, but these routine husbandry and surgical practices can cause pain, necessitating proper pain management (Larrondo et al, 2018; Lizarraga & Chambers, 2012; Morris, 2017). Analgesics are still not widely used in these

practices among farmers, veterinarians and even animal scientists (Canozzi et al, 2020; Larrondo et al, 2018). This lack of consideration for the need to provide pain relief to maintain animal welfare is due to prioritising productivity over welfare (Hötzel et al, 2014).

An ethical foundation for careful animal husbandry in all systems for farmers integrates the Five Freedom principles to formulate a general ethical position for animal husbandry (Jochemsen, 2013). Despite scientific research suggesting that the five freedoms do not contribute to the holistic welfare of animals, the freedoms continue to be widely practiced, as they are seen as a necessity rather than an optional (Stafford, 2017). In any case, scientific evidence should always inform husbandry practices, with the animals' welfare being the primary consideration.

In summary, existing definitions of good animal husbandry often prioritise productivity and economic factors over animal welfare considerations. This gap in the definition of good animal husbandry hinders the development and implementation of effective welfare practices. To address this issue, it is crucial to revise and update the definitions of good animal husbandry to include a stronger focus on animal welfare, ensuring that the well-being of animals is given the attention it deserves.

2.3 Good welfare

Good welfare, as a term, is used interchangeably by researchers with positive welfare (van Weeghel et al, 2021). However, the distinction between these two was not explored until more recent academic work. There are many proposed definitions for good welfare in the literature. For example, the OIE (2019, p4) stated that an animal experiences good welfare if it is healthy, comfortable, well-nourished, safe, not suffering from unpleasant states such as

pain, fear and distress, and can express behaviours important for its physical and mental state. Dawkins (2023) emphasises that "good animal welfare" should include the animal's health, what they want, and providing opportunities for animals to perform behaviours that are important to them. Dawkins clearly goes beyond the physical aspect of welfare and emphasises the importance of understanding what animals want. Animals have their own preferences, desires, and needs, which may vary across species. Recognising and respecting these individual differences is crucial for promoting their welfare. Webster (2001, 2005) mentioned good welfare as the state of an animal being fit (healthy) and feeling good (emotional state). Broom (2000) argues that welfare varies from good to poor and includes the health and feelings of an animal as well as aspects of its behaviour and physiology. Therefore, if an animal is healthy, experiences good feelings, and demonstrates positive behaviours, then it can be said to be in a state of good welfare. The definitions of good welfare suggest that the concept is designed to reduce pain and stress experienced by animals (whether for food, research, or other purposes), while also considering their mental and physical needs.

The concept of good welfare in animal care goes beyond the actions of humans towards animals and encompasses how animals respond and experience their environment. When evaluating animal welfare, it is crucial to consider both aspects. Research by Zhu et al (2023) revealed that large dairy herds with poor biosecurity measures had higher disease prevalence compared to smaller herds. Similarly, Mondragón-Ancelmo et al (2019) found that larger sheep flocks were more prone to welfare issues such as mutilations, injuries, and transmissible diseases. However, Lindena & Hess (2022) presented contrasting results, suggesting that larger farms had better animal welfare scores. This discrepancy could be attributed to two emerging issues. Firstly, farm size alone is not a reliable predictor of animal

welfare. While larger farms may have more resources and infrastructure, it does not guarantee better welfare outcomes. Smaller farms can also prioritise animal welfare and implement practices that promote good welfare standard. Finally, animal welfare is a complex and multifaceted concept that cannot be simplified into a binary classification (good versus bad). These studies emphasize the complexity of evaluating animal welfare and the importance of comprehensive and context-specific assessments. Understanding the relationship between resource provisions and animal welfare requires consideration of both the resources provided by humans and how animals respond and experience their environment.

The current review suggests that effective definitions of good welfare are centred around understanding and addressing the needs and preferences of the animals themselves. In other words, the focus is on identifying and prioritising the factors that are important for the well-being and quality of life of the animals in question. For example, Wagner et al (2021) compared the welfare of dairy cows in organic and conventional farming systems using the Welfare Quality assessment protocol. The results showed significant differences between the two systems, with organic farms scoring higher in all four Welfare Quality principles: “Good Feeding,” “Good Housing,” “Good Health,” and “Appropriate Behaviour.” Organic farms demonstrated better resting comfort, lower rates of diseases, and implemented less painful husbandry methods or avoided it altogether. They also provided access to pasture and outdoor exercise.

On “Good housing”, Adler et al’s (2020) case-control study compared the effects of a partially perforated flooring system with a littered flooring system on the welfare indicators and production performance of fast-growing broiler chickens. The study found that broilers

housed on the partially perforated flooring system exhibited less fearfulness during the avoidance distance test on days 21 and 28 compared to those in the control barn. Altogether, these studies reveal that it is possible to develop comprehensive and meaningful definitions of good welfare by considering the animals' physical health, behavioural needs, social interactions, and emotional states. This approach moves away from solely human-centric perspectives and considers the intrinsic value and interests of the animals.

In conclusion, the good welfare definitions also show that animals can have negative emotions, such as pain and suffering, which should be avoided to improve productivity. Similarly, positive emotions such as comfort are important and should be considered when making animal welfare-related decisions. Comparatively, most definitions have focused on eradicating negative emotions, experiences, and feelings to achieve good welfare. Good animal welfare, therefore, remains one of the most important components of good animal husbandry, as it ensures the treatment of animals from the animal's own point of view. Therefore, researchers need to integrate scientific and ethical perspectives on what good welfare means to create a truly holistic understanding of good welfare. This integration is essential to ensure that scientific findings are considered in a moral context and vice versa, allowing for the making of effective and ethical decisions.

2.4 Higher animal welfare

Scientifically higher welfare involves the acknowledgement that animals have cognitive capacities, and so recognising and considering that ability is essential to achieving higher welfare goals (Nawroth et al, 2019; Nawroth & Rørvang, 2022). This requires more than simply providing physical comfort and basic needs. It necessitates a deeper understanding of the animal's natural behaviours, needs and motivations and how they fit into the environment

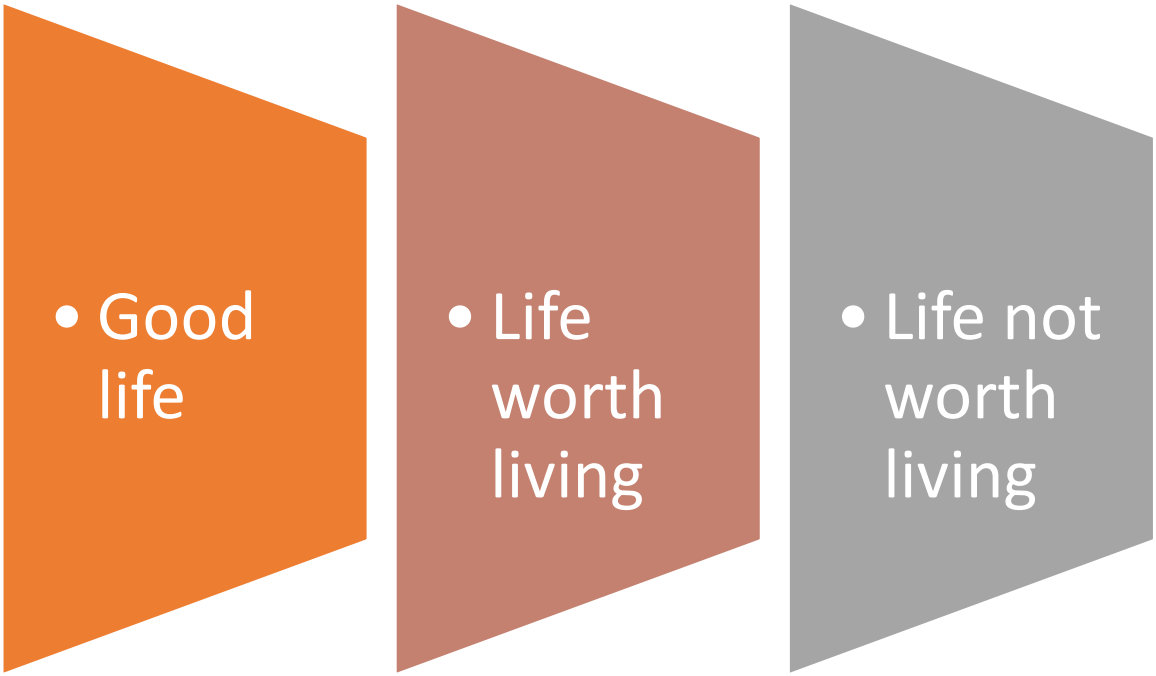
in which they live. For example, higher welfare production can reflect “allocating more space and infrastructure per animal and greater care and stock person time” (Cornish et al, 2019). Other researchers described it as management and improved housing conditions (Alonso et al, 2020), management attention and vigilance (Grandin, 1996). Higher welfare practices strive to provide the best quality of life for animals.

The current literature indicates that higher animal welfare definitions are linked to the implementation of standards from assurance schemes (Rowe et al, 2021; Vanhonacker et al, 2010). These schemes, usually supported by science, can encompass various aspects such as housing conditions, access to food and water, health care, and humane handling practices. By adhering to these standards, it is possible to improve the well-being and quality of life for animals. The association between higher animal welfare definitions and standards underscores the importance of establishing and enforcing guidelines that promote the ethical treatment of animals. This can be beneficial not only for the animals themselves but also for the reputation and credibility of industries involved in animal production and care. However, it is important to note that while general quality assurance schemes may include animal welfare standards, the level of welfare assurance provided may vary. The specific requirements and criteria for animal welfare within these schemes may differ, leading to potential discrepancies in the level of welfare achieved (Rowe et al, 2021). Establishing standardised higher welfare schemes that would enable food businesses to source authentic higher welfare products with scientific support has the potential to mitigate such challenges, as well as offer consumers information required to make informed choices about higher welfare food products (Rowe et al, 2021). Section 2.8.4 for discussions on consumers concerns for higher welfare and their willingness to pay for higher welfare products.

2.5 Quality of Life (QoL)

The FAWC (2009) report discusses topic of mental states in animals and proposes the idea of achieving a balance where positive experiences outweigh negative ones. This concept aligns with the "Quality of Life" (QoL) approach introduced by FAWC in 2009, as referenced in Serra et al (2018). The concept of the Quality of Life (QoL) is based upon three principles: The first being that animals should have a life worth living, indicating that their overall well-being and welfare should be ensured. The second principle emphasises the importance of avoiding a life not worth living, which means preventing conditions that would cause significant suffering or compromise the animal's welfare. Lastly, the third principle aspires to provide animals with a good life, which entails promoting positive experiences and enabling animals to thrive. These three principles (Figure 2) laid the foundation for the development of the Five Domains framework by Green and Mellor in (2011).

Figure 2 Quality of life framework



Green and Mellor's work on the Quality of Life (QoL) spectrum is regarded as one of the most practical applications of this concept throughout the lives of animals. Their research focused on developing a framework that allows for a comprehensive assessment of an animal's well-being across different stages of life. By considering various factors such as nutrition, environment, health, behaviour, and mental state, the QoL spectrum provides a holistic approach to evaluating animal welfare.

In relation to the QoL concept, Webster (2016) contributes significantly to the discourse by offering constructive criticism. Webster questioned whether it was possible to be certain of the affective states of animals, given that these states are entirely subjective. As illustrated by Webster, it remains difficult for welfare assessors to determine at what point positives outweigh negatives, such as the provision of positive experiences versus the chronic pain of lameness in a dairy cow within a herd. Consequently, QoL remains abstract, however the concept of QoL has primarily been applied in the context of veterinary practice when determining when to euthanise a companion animal whose life is judged to be not worth living (Sandøe & Christiansen, 2007; Yeates & Main, 2009).

2.5.1 Life worth living

A life worth living is achieved when the animal has more pleasure than pain or its existence is better than an empty life (Espinosa & Treich, 2021; Farm animal welfare committee, 2009). A life worth living has also been associated with animals in the wild or outdoor settings capable of demonstrating their natural behaviours (Browning & Veit, 2021). A life worth living is also viewed as a socially constructed quality of life that an animal should have (Farm Animal Welfare Committee, 2009; Rault et al, 2020). This means that, for example, where the living conditions cannot be improved through husbandry practices, or chronic pain

cannot be relieved through husbandry practice, the animal is culled on humanitarian grounds, death being better off for the animal than living in suffering, therefore a life not worth living (Wathes, 2010). Consequently, the concept of a life worth living involves providing cognitive opportunities to improve their mental state, which distinguishes it from good husbandry.

Yeates (2011) describes two ways to ensure that an animal lives a life worth living. Firstly, livestock keepers should ensure that resources provided to the animal should be *important to the animal* and meaningful because they matter to them daily (i.e, their intrinsic, innate values). Secondly, the resources should relate to the *interest(s) of the animal* as in whether a life is worth living for them, and to the interests of farmers and consumers. In this sense, the market (what the consumer or the society wants) may drive the adoption of good practices for welfare at the production level.

However, the life worth living approach relies heavily on subjective criteria, making it difficult to measure or to create consensus on the quality of life for animals (Espinosa & Treich 2021; Webster, 2016). It is hard too to objectively assess the conditions of extensive livestock in external environments, making it difficult to use this approach to improve their quality of life. Besides, there is still a knowledge and practice gap at the husbandry level that limits providing extensive livestock with a life worth living, particularly sheep (Small et al, 2021). This is largely because there is a limited understanding of the specific needs of sheep, the lack of training and resources available to farmers, and the inability to access the latest and most efficient technologies. Therefore, the sheep industry further emphasises the importance of creating and enforcing high(er) animal welfare standards that prioritise the reduction of animal pain and suffering.

2.5.2 Positive welfare (good life)

Positive welfare is an enhanced definition of animal welfare, focusing on the quality of life (QoL) for farm animals. It is a dimension of high welfare that emphasizes animal thriving instead of only minimising negative experiences. Positive welfare also includes environmental enrichments such as toys or objects to explore with different smells and textures. Researchers have developed differing criteria for positive welfare; Lawrence et al's (2019) review proposed four developing components; positive affective states, positive emotions, QoL, and happiness. Positive affective states describe individuals' contentment, engagement, and energy, while positive emotions relate to pleasure and joy with QoL referring to an overall sense of satisfaction. Happiness is the level of contentment and joy an individual feel. Research indicates that these evolving concepts are grounded in subjective feelings and emotions. Positive welfare balance is the degree to which a positive experience outweighs a negative one throughout an animal's life, while positive hedonic welfare arises from a positive affective state characterised by the absence of negative emotions.

Recently, eudaimonia (the state of being in *good spirit* across a lifetime) was defined within animal welfare science and positive welfare (Colditz, 2022a; Rault et al, 2020; Williams, 2021). Eudemonic concepts demonstrate a progression towards measuring an animal's accumulative QoL across its lifespan, above and beyond focusing on individual states or conditions of an animal's wellbeing at specific times. The outcome of eudaimonia is mainly happiness and well-being, making it similar with the concept of hedonism. Nevertheless, applying the concept of applying eudaimonia to farm animals has remained difficult, as most of its aspects (for example, happiness) are covered in the animal welfare framework (Colditz, 2022a), or and are difficult to objectively measure (as it involves cumulative evaluation of QoL across an animal's lifespan). Therefore, the challenges remain as to what indicators

specifically measure eudaimonia exclusively rather than welfare, or how to assess it over the lives of the animals. So far, little progress has been made in animal literature compared to humans. Even though this is at an early stage, eudemonic concepts do appear exciting for assessing farm animals' quality of life, who have a high level of coping mechanisms within their environment because of their natural ability to adapt.

As scientists continue to explore good life strategies for animals, the current market differentiation strategies (labels, certification) do not exclusively capture positive welfare practices and interventions for those who practice it (e.g., carers and stock keepers). There remains a gap in financial incentives provided to these stock keepers who are not properly compensated for their going above and beyond their husbandry practices. Given this reality, measures must be taken both at policy level, by designing adequate market systems, and through initiatives in which citizens themselves can participate to foster more inclusive markets that recognise people's work while providing them financial sustainability. Rowe and Mullan (2022) has taken the initiative in this regard by developing a vetted resource tier framework for on-farm assessment of positive welfare for beef cattle, broiler chicken, and pigs. They propose that increased opportunities for animals to experience a "good life" could be used to structure resource tiers, which would lead to positive welfare that goes beyond legal minimum standards.

Future research should explore the feasibility of incorporating positive animal welfare indicators into assurance schemes and certification processes to provide incentives for entities attaining high standards of welfare.

2.6 Animal welfare, animal consciousness and sentience.

Animal consciousness and sentience are important underlying concepts to understanding the capacities of animals and therefore the welfare provision required to meet a quality of life in farm animals. The reason for this is that both sentience and consciousness serve as the validity on which humans can ethically justify their treatment of animals (Birch et al, 2020; DeGrazia, 2020). This means that the level of care and concerns given to (farm) animals is dependent on how much their keepers and carers understand the capacities of their conscious awareness (Kirkwood & Hubrecht, 2001). Therefore, the more the understanding and recognition of these concepts increases, the aspiration is that farmers and care givers will provide increasing levels of resources, provision and animal centred care.

The concept of animal consciousness is a multifaceted and contentious topic. Although it is difficult to precisely define, researchers commonly characterise animal consciousness as the subjective or phenomenological experiences of an individual, encompassing their sensory perception, awareness, and cognition of the world and their own body (Bekoff & Sherman, 2004; Birch et al, 2020; Brown, 2015; Chandroo et al, 2004). Within consciousness, there are various abilities that contribute to one's cognitive experience. These abilities include self-recognition, which involves the recognition of oneself as a distinct entity; episodic memory, which allows for the recollection of specific past events; metacognition, which involves the awareness and monitoring of one's own cognitive processes; and mindreading, which refers to the ability to attribute mental states to others and understand their perspectives (Ahmed & Corradi, 2022; Birch et al, 2020). These aspects collectively contribute to the complex and multifaceted nature of consciousness, shaping an individual's subjective experience and their understanding of themselves and the world around them.

Most of the research on farm animal consciousness has indeed been primarily focused on social cognition (Kendrick, 2008; Nawroth et al, 2019). Marino & Merskin (2019) review specifically focuses on sheep and reveals that they are complex, individualistic, and social animals. They exhibit a diverse range of behaviours and possess cognitive abilities that demonstrate their intelligence and adaptability. For instance, sheep display adaptive intelligence by learning rules that connect stimuli and rewards and adjusting their responses as these rules change (Ahmed & Corradi, 2022; Morton & Avanzo, 2011). Sheep also possess remarkable memory skills, being able to remember and recognise up to fifty other sheep even after a two-year period (Ahmed & Corradi, 2022; Kendrick, 2008). Additionally, they have spatial memory, enabling them to excel in maze navigation tasks (Lee et al, 2006). Clearly, the understanding of animal consciousness has evolved, recognising that animals have their own unique forms of consciousness and subjective experiences. Research in fields such as cognitive ethology, comparative psychology, and neuroscience has provided evidence of animals' cognitive abilities, emotional experiences, and social interactions as discussed by Ahmed and Corradi (2022). This growing body of knowledge highlights the need to appreciate and respect the unique consciousness and experiences of animals, rather than solely relying on human-centric perspectives as discussed by (Ahmed & Corradi, 2022).

Despite the growth in evidence-based research on animal consciousness, studies such as Nawroth et al (2019) and Gutfreund (2017) highlight a significant gap in knowledge regarding certain aspects of farm animals' cognitive abilities, particularly their physical cognitive capacities. This indicates the need for further research to better understand how farm animals perceive and interact with their physical environment, and how this influences their cognitive processes. By addressing these knowledge gaps, researchers can develop effective strategies and practices to enhance the welfare of farm animals on farms.

Animal sentience, like animal consciousness, is a concept that continues to be debated. It refers to the capacity of animals to have subjective experiences, including both positive and negative emotions. Scholars such as Browning & Birch (2022), DeGrazia (2020), Mellor (2010), and Webster (2005) have explored this concept in their research. Animal sentience encompasses the awareness that animals have of their subjective experiences, whether they are perceived as good, bad, or neutral. It requires emotional and cognitive abilities to make such distinctions, with the brain playing a crucial role in facilitating sentience (Broom, 2016; Mellor, 2010). In essence, sentience encompasses both consciousness and the ability of animals to evaluate what matters to them. This understanding highlights the complex nature of animals' subjective experiences and their capacity to perceive and respond to their environment.

The recognition of animal sentience in law is a significant development that acknowledges the capacity of animals to experience emotions and sensations. This recognition has been observed in various countries and regions, including the European Union, the United Kingdom, New Zealand, parts of Australia, and Scotland (Browning & Veit, 2022; Loeb, 2021). In the Netherlands, for instance, the Council on Animal Affairs (2022) recently provided some guidelines for ensuring the humane treatment of animals in the industry. The first principle acknowledges that animals are sentient beings capable of experiencing pain and pleasure. It emphasises the need to respect their inherent value and avoid physical interventions such as tail docking and beak-trimming.

The second, third, and fourth principles focus on meeting the animal's basic needs, including good feeding, good housing, and good health. The fifth principle emphasises the importance of allowing animals to express their instincts and behaviours, promoting their overall welfare.

The final principle highlights the importance of creating an environment that promotes positive experiences and mental well-being for the animals. These principles demonstrate the aim of animal sentience laws to promote humane livestock farming practices that prioritise the well-being and welfare of animals. The legal recognition of animal sentience has implications for animal protection and welfare, as it establishes a basis for ensuring their well-being and ethical treatment (Blattner, 2019). They also reflect a growing understanding of the importance of considering animal interests and experiences in legal frameworks (Coleman et al, 2021). Including animal sentience in legislation signifies a shift towards a more comprehensive and compassionate approach to animal rights and welfare (Kotzmann, 2023).

However, challenges remain with the legal recognition of animal sentience presenting several challenges and limitations. Kotzmann (2023) discusses the typology of animal sentience recognition provisions in Australian jurisdictions, highlighting that the legal consequences of these provisions may vary depending on the legislative context. Similarly, Blattner (2019) also points out legal shortcomings of recognising sentience in policy, such as some states' refusal to commit to animal sentience and remaining prejudices in society and science. Loeb (2021) also reported similar concerns, citing the need for consistent implementation across different jurisdictions and the potential impact of devolution on the application of animal sentience laws. Yeates (2022) explores the ethical and evidential considerations in ascribing sentience to animals, emphasising that policymakers must be conscious of the process's ethical assumptions. Furthermore, Browning & Birch (2022) analyse the shift towards recognising animal sentience in laboratory animal research and its effects on animal welfare and use. Clearly, overcoming cognitive biases, ensuring consistent recognition across

jurisdictions, and effectively implementing and enforcing animal welfare laws are crucial for promoting the well-being and protection of animals.

In summary, animal sentience refers to the capacity of animals to experience various emotions and sensations, including joy, pain, fear, and hunger. This understanding of animal sentience has led to the establishment of animal welfare laws and regulations aimed at protecting animals from unnecessary suffering. On the other hand, animal consciousness refers to the ability of an organism or system to process information, plan behaviour, and make decisions based on these processes. The study of animal consciousness has the potential to enhance our understanding of animal behaviour, cognition, and inform ethical debates surrounding the use of animals in research and other contexts. The knowledge gained from studying animal sentience and consciousness is being used to develop evidence-based guidelines and best practices for promoting the "good life" for farm animals. While farmers often rely on traditional farming symbols such as good feed, housing, and health as guidance, there is an opportunity for further development of the concept by considering farmers' direct engagement with animals as sentient beings (Wemelsfelder et al, 2022). This deeper understanding of animals' subjective experiences can inform farming practices that prioritise their well-being and contribute to improved animal welfare outcomes (Wemelsfelder et al, 2022).

2.7 Discourses, dialogues, and animal welfare

A discourse is simply, communication in either the written or spoken word about a specific topic i.e., the word as a single unit lies at the heart of the discourse and how the words are arranged or structured in each sequence forms language. A discourse is developed from a constructed arrangement of language, and can include a monologue i.e., a one-way, report,

statement or commentary and dialogues which are multiple-way communication or conversations. Discourse can be considered for its linguistic content, the subject matter, and its linguistic form, namely its cohesion and structuring, as well as the socially framed meanings. These are often positioned in the discourse through rhetoric devices in the argumentative organisation of the text (Potter & Wetherell, 1987).

The term dialogue" derives from two words in classical Greek, "dia" meaning "through" and "logos" meaning "word" (Howe & Abedin, 2013). The direct interpretation of the term implies that engaging in dialogue creates communication, harmony and understanding. Dialogues are "key to our inspiration and to our capacities to sort out ethical dilemmas and the multiple meanings that confront us as we continue our inquiries into human experience" (Gilgun & Abrams, 2002 p.51). Dialogues between stakeholders in this context have been described alternatively as intensified (Blokhuis et al, 2003); institutionalised (Karlsen & Villadsen, 2008); collaborative, cogenerated, consensus driven (Blaha, 2020; Innes et al, 2010; Innes & Booher, 2003); mutually beneficial (Johansen & Nielsen, 2011); constructive (Blaha, 2020); pluralistic (Starke, 2006); persuasive (Amhag & Jakobsson, 2009); synchronous or asynchronous (Amhag & Jakobsson, 2009); internal or external (Haney, 2000); and surface or deep (Robertson, 2001). These descriptions of dialogue demonstrate the multifaceted aspects of engaging in dialogue.

Dialogue may take many forms, such as persuasion, deliberation, eristic, negotiation, inquiry (scientific), and inquiry (philosophical). Indeed, based on the extant literature, citizens' and consumers' dialogue can be classified from a philosophical and ethical stance (Stafford, 2014; Verbeke, 2009); and driven by cognitive appraisal of what individuals believe is right

or wrong, which may, or may not be scientifically supported. Persuasion uses rhetoric strategies to influence others and is an element of overall communication with both analytical approaches (focusing on logic), and dialectic (debating a point or issue) elements (Manning, 2018).

Dialogue can be classified into primary and secondary dialogue (Manning, 2018). Primary or direct dialogue is the visible argument or communication in external corporate documents like annual reports and websites. Secondary dialogue, on the other hand, represents the internalised discourses that may not be visible but are embedded or inferred in primary dialogues. Secondary dialogues can be implicit, e.g., non-verbal cues or explicit, such as underlying assumptions or hidden meanings. These dialogues can have a powerful impact on how a conversation unfolds. For example, a statement about a sheep flock having a high level of lameness could be taken as an unfair judgment on the care giver. It is necessary to consider all the factors like genetics, environment, nutrition, and management when evaluating the health of a flock of animals.

In the debate surrounding “good animal welfare” practices, there is a significant interplay between the narrative discourses employed by various stakeholders. For instance, consumers and citizens can view the improvement of animal welfare as a collective responsibility shared by all stakeholders. This notion of collective responsibility encompasses both causal responsibility and blameworthiness, attributing moral responsibility to the collective actions taken by these groups. As a result, consumers and citizens may utilise “prescriptive statements” (e.g., advocating for responsibly sourced meat) or “culpability language” (e.g., condemning intensive farming or shearing practices) to hold stakeholders accountable based

on established standards. Through such dialogues, consumers and citizens can hold farmers accountable for their perceived right and wrong practices in animal production, influencing the adoption and implementation of specific practices on their behalf. This dynamic interaction between stakeholders and their use of discourse plays a crucial role in shaping the standards and practices related to animal welfare.

2.8 Narrative discourses in support of good animal welfare

The animal welfare concept has historically been driven by the concept of values (de Greef et al, 2006), leading to potential conflicts in discourses and dialogues. These conflicts arise not because one value is considered right or wrong, but rather due to the differing priorities assigned to a set of values (de Greef et al, 2006; Duijvesteijn et al, 2014). Value-laden approaches to animal welfare can be categorised into ethical (moral) or utility perspectives (Bracke et al, 2005; Sandøe et al, 2003; Verbeke, 2009). The ethical perspective asserts that humans have a moral responsibility to care for animals, particularly in preventing their suffering. Within this moral framework, animal welfare is considered intrinsically important, and the goal is to minimise or eliminate negative experiences such as suffering, fear, pain, or stress for animals (Garner, 2013). Ethical discourses can establish binary classifications of good and bad welfare, using positive and negative language. However, the influence of this language choice on farmers' decision-making and actions regarding animal welfare has been rarely explored.

In contrast, the utility perspective, known as anthropocentric welfarism, argues that ill-treating animals does not violate any morally significant interests of the animals themselves but rather infringes on the interests of humans (Garner, 2013; Johansson-Stenman, 2018). This viewpoint disregards notions of animal sentience and suggests that the care and

protection of animals depend solely on human interests. One argument supporting anthropocentric welfarism is the difficulty of quantifying the economic value of pleasure, happiness, or comfort in animals (Garner, 2013). Therefore, anthropocentric welfarism posits that only human welfare holds intrinsic value, as opposed to moral considerations. Some principles within the utility perspective are useful for understanding the discourses and narratives of key industry stakeholders.

To demonstrate how different values are manifested in the discourses of stakeholders concerning animal welfare, and to gain a deeper understanding of the interactions and conflicts between these discourses, five discursive strategies are reviewed within this context. These discourses being referred to has undergone a rigorous peer-review process and has been deemed suitable for publication in a scholarly journal (Muhammad et al, 2022a). These include the farming as a business narrative, the religion-based narrative, the research, legislative, and political-based narrative, the higher welfare narrative, and the 'animal rights/power-based' narrative. Each of these strategies represents a distinct perspective and set of values that shape stakeholders' discussions and actions related to animal welfare.

2.8.1 Farming as a business narrative

The farming as a business narrative emphasises economic considerations and views animal welfare through the lens of profitability and efficiency (Albernaz-Gonçalves et al, 2021; Buddle et al, 2021). This perspective prioritises practices that maximise productivity and minimise costs, often at the expense of animal welfare. Therefore, statements such as producing more with fewer resources is common dialogue at the farm level, derived from discussions centred around farm efficiency and sustainability (economic, environmental, and social aspects). Such established discourses and dialogues may focus on intensifying animal

and food production, with animals perceived in terms of utility as a *production unit* to deliver broader socio-economic outcomes.

2.8.2 Religious-based narrative discourses

The religion-based narrative draws on religious beliefs and teachings to guide attitudes and behaviours towards animal welfare. This narrative may vary depending on different religious traditions and interpretations, but it often emphasizes compassion and stewardship towards animals (Caruana, 2020; Farouk et al, 2016; Kleczkowska, 2014; ; Rahman, 2017; Szűcs et al, 2012). Judeo-Christian perspectives incline towards the notion that humans have dominion over animals, and this view remains one of the most populous beliefs among many (Caruana, 2020; Szűcs et al, 2012). According to biblical sources, man's superiority over animals comes with a moral obligation to the animal (Caruana, 2020; Szűcs et al, 2012). These moral obligations interface with the Five Freedoms' principle (for example, freedom from hunger and thirst) as well as underpinning an ethics focused argument.

In Islam, there is a strong emphasis placed on the importance of balancing the narratives of utility, ethics, and power. From the Islamic perspective, animals were created for humankind's benefit and use. Humans are prohibited from using farm animals in ways that are not prescribed. Quranic textual evidence (Quran 16: verse 5 - 8) shows that naturalness plays a key part in the perception of farm animals' lives in the Quran. This aligns with the naturalness definition of animal welfare, which plays an essential role in facilitating the behaviour of farmed animals, such as sheep, as they graze in open environments, i.e., the freedom to express normal behaviour, as well as the importance of protection and shelter at night. Existing research in the literature links the Quran to animal welfare (Farouk et al, 2017; Rahman, 2017). However, practice may not always reflect the religious narrative, and

research advocates for the sensitisation of religious followers to the teachings of animal welfare in the Quran and the Hadiths (Rahman, 2017).

In summary, religion-based narratives influence how animals are socially, culturally, and politically viewed and ideally treated in human society. Currently, there is a focus on research to establish dialogue between science, society and religion especially on religious slaughter (Miele et al, 2020). This means that scholars now recognise the importance of understanding and addressing the perspectives and beliefs of different stakeholders to foster meaningful discussions and collaborations. In other countries, such dialogues have been formalised into industry standards and codes, for example, the halal certification standards implemented by the Malaysian organisation Jabatan Kemajuan Islam Malaysia (JAKIM) (Jalil et al, 2018).

2.8.3 Research, legislative and political based discourses

The research, legislative, and political based narrative is driven by scientific research, legal frameworks, and political agendas. These narrative discourses focuses on evidence-based approaches, regulatory measures, and policy interventions to improve animal welfare Scholars such as (Bock & Buller, 2013; Farm Animal Welfare Committee, 2009; Fraser et al, 1997; Mellor, 2015, 2016; Woods, 2012; Yeates, 2022) have contributed to the discourse through their research and publications.

Scientific research plays a crucial role in providing empirical evidence on the impact of different practices on animal welfare. This evidence is used to inform the development of legislative frameworks and regulations that aim to protect and enhance animal welfare. Legal frameworks provide the basis for establishing standards and guidelines for animal welfare, ensuring that appropriate measures are in place to safeguard animals from unnecessary

suffering. The political dimension of this narrative involves the formulation and implementation of policies and interventions that address animal welfare concerns. Political agendas and public opinion influence the prioritisation of animal welfare issues and the allocation of resources to support initiatives aimed at improving animal welfare. Overall, the research, legislative, and political based narrative recognises the importance of evidence, legal frameworks, and political action in driving positive change for animal welfare. It highlights the need for collaboration between researchers, policymakers, and stakeholders to develop effective strategies and policies that promote the well-being of animals.

2.8.4 Higher welfare narratives

The higher welfare narrative places a strong emphasis on providing animals with a good quality of life. It advocates for practices that go beyond basic welfare standards and aim to enhance the overall well-being and happiness of animals, through commodification of higher welfare products (Almond, 2000; Clipsham & Fulfer, 2016). Studies have explored increased intention to purchase higher welfare rather than conventional welfare products (Cornish et al, 2016; Heinola et al, 2023; Napolitano et al, 2010; Xue et al, 2010). While consumers increasingly show their willingness to pay for higher welfare products across these studies, their intentions do not always correspond to purchasing and consumption patterns, with sales of higher welfare products reported to be far lower than levels of reported concern (Clark et al, 2016). This has widely been associated with cognitive dissonance, where an individual's actions contradict their beliefs or values, and as a result discrepancies occur between an individual's perceived role as a citizen and their actions as a consumer (Alonso et al, 2020; Boogaard et al, 2011; Grunert, 2006).

Consumers are affected by what they can afford, and their income can inform their preferences (Bansback, 1995; Gorton et al, 2023; Hughes, 1995). Bansback (1995 p.6) argues that:

"*Price factors are still the most important determinants of meat consumption … the ability of the industry to reduce its costs relative to other competitors is getting more limited. Income effects … are also of less importance in influencing demand (however) consumer attitude/preference issues are growing in importance.*"

Therefore, not all consumers may consider, or be able to financially consider, animal welfare at the point of purchase. Considering this apparent disconnect, and "unwillingness to pay" mediating between citizens' concerns, preferences, and consumers' consumption, it becomes imperative to understand the unresolved issues emanating from often contested, even undisclosed animal welfare related discourses. It is our understanding that there have been less studies examining the influence of expressive or descriptive language (whether positive or negative) within the dissemination of information about animal welfare. It is possible that further exploration of this topic will contribute to a better understanding of the dynamics of consumer choices, and the impact that discourse, language, and the monologue/dialogue within a specific narrative may have on those choices.

2.8.5 Animal-based/Power-based narratives

The "animal rights/power-based" narrative centres around the belief that animals have inherent rights and should be treated as equals to humans. These narrative discourses challenge the use of animals for human purposes and advocates for the abolition of practices that exploit animals. Animal rights groups raise concerns with specific farm practices and

systems, detailing the consequences for the animals' welfare (Norwood & Lusk, 2009; Rollin, 2011). These stakeholders focus on inducing negative emotions using words like pain, fear or stress, to describe outcomes which can be caused by certain husbandry practices, justifying ethical claims against these practices. Animal rights groups focus on animals as sentient beings and will contest any practice that would subject farm animals to negative experiences. Thus, through their narrative animal rights groups challenge and reject the commodification of animals in society, condemning animal products such as meat, wool or fur because the animal may experience pain and other negative experiences during the production process.

The negative narrative of cruelty, abuse, trauma, or torture is powerful in terms of the descriptiveness or expressiveness of the language, leading to feelings of disbelief, sympathy, concern and even condemnation in the people (recipients) who interact with it. Thus, the language can be considered as powerful in terms of either its expressiveness (words used) and/or the narrative can express notions of being empowered (the human) versus unempowered (the animal) and as a result imply a power imbalance and notions of abuse of that power within the human-animal relationship (Alexander, 1988). Jennings et al (2018) describe this as "the power of talk" i.e., the power of communication, or "the power in talk" i.e., the power/powerlessness dynamics embodied in the language used in communication. Deetz and Mumby (1990, p.32) position the power of talk:

"*We conceive of power neither as simply a possession of individuals nor a relationship between individuals, but rather as a structural quality of institutional life, which is chronically reproduced by the day to day communicative practices of its members*".

and the power in talk,

"*Power is conceived as involving a relationship of autonomy and dependence between social actors or groups, then power is exercised in the context of a struggle between domination and resistance……. is conceived as the process through which competing interests exist interdependently, simultaneously vying for a privileged status in the whole constellation of interests that characterise institutional life*".

These explanatory passages demonstrate how stakeholders compete for control and content of conflicts adopted and based on power. Thus, societal processing of the narrative discourses depends on the situational aspect (what it is about) and the level of cognitive engagement with the discourse (deriving what it means) (Boyd & Schwartz, 2021). These two elements are influenced by the properties of the communication and the contextual cognitive assessment by the recipient. Media culture "helps shape everyday life, influencing how people think and behave, how they see themselves and other people, and how they construct their identities" (Kellner, 2003 p.2). There are many public spaces where images of animal cruelty are placed, debated, and reproduced. In these spaces, the media coverage typically describes cruel, animal-related food production, or "factory farming", using the utility narrative describing animals as economically exploitable production units and commodities (Schwartz, 2020). Power-based media narratives typically focus on ethical issues in agricultural production, particularly farm animal welfare (Buddle & Bray, 2019). Constructed discourses were used to question the activities and motives of the wool industry in countries like Australia, especially practices such as Mulesing, leading to a decrease in sales of lamb and wool due to activism driving lower consumer demand (Schwartz, 2020). Media representations of farm animal welfare issues are important because the media is a significant

source of information for consumers/citizens, and the way that issues are represented, or framed suggests causes, solutions, or provides moral evaluations (Buddle & Bray, 2019).

In summary, the typology of five narratives discourses on "good" farm animal welfare presented in this review reflects the social construction of diverse perspectives on the purpose and treatment of animals in society. The social construction process is influenced by stakeholders' experiences, background knowledge, and cultural values (Bracke et al, 2005; Haynes, 2011; Verbeke, 2009). These discourses range from viewing animals as production commodities (farming as a business narrative) to recognising humans' moral obligation to protect animals and prevent cruelty (religious-based narratives). The higher welfare narrative focuses on optimising welfare within new farming systems, while the research, legislative, and political narrative acknowledges animals as sentient beings capable of positive welfare experiences. The animal rights/power narrative rejects the utility-based concept of animals as units of food production and emphasises achieving a good life for animals. These differing articulations of animal welfare stem from varied ideological positioning, which can hinder effective communication and conflict resolution, especially as livestock producers face increasing scrutiny. Therefore, it is crucial to bring stakeholders – scientists, farmers, retailers, consumers, legislators and media together across the ideological spectrum to foster mutual understanding and collaboration based on common ground (Appleby, 2004). The next section explores how dialogue can be utilised to address these contested positions on (positive) animal welfare.

2.9 Dialogue as a method of resolving contested discourses on good animal welfare.

Welp et al (2006) define stakeholder dialogue in scientific research as structured communication processes that link scientists with stakeholders (earlier defined). A key aspect of this definition is the linkages between scientific knowledge and local, tacit or indigenous knowledge. The intent of these collaborations is to generate new ideas and co-create new solutions to contentious issues. Thus, the main objectives of science-based stakeholder dialogues are to deepen the collective understanding of contentious issues, combine scientific knowledge with other indigenous sources, and to check the social relevance of concepts (Welp et al, 2006).

The evidence of collaborative dialogue between science and society in animal welfare can be clearly seen in the case of welfare assessment protocols (Bock & Swagemakers, 2010; Miele et al, 2011); religious slaughter (Miele et al, 2020); and animal behaviour (Benard & de Cock Buning, 2013). By way of illustration, Miele et al (2011) describes the methods for establishing successful science and societal dialogue for the Welfare Quality® assessment protocol. To design the framework, there were numerous interactions between animal scientists, social scientists, and members of the public. The social construction process was achieved through multi-actor interactions included meetings, conferences, workshops, websites, newsletters, interviews, focus groups, and citizen and farmers juries. Through these series of collaborations, the stakeholders developed twelve welfare criteria, which were vetted by citizen juries. Animal scientists therefore took account of societal opinion when developing the farm animal welfare assessment tools which can increase the likelihood of palatability of use and outcomes for societal expectations and animal welfare standards on farm.

Dialogue between scientists and farmers can be complex to facilitate and can have repercussions for the scientific-societal relationship (Benard et al, 2014). This study found that farmers were only moderately open to scientific knowledge on animal behaviour relating to reducing tail biting in pigs, and found scientific solutions proposed to be too uncertain, not well understood or not applicable in their context. The authors did however find that dialogues between scientists and farmers did lead to improved mutual trust and understanding of each other's framing and context. Both groups appeared to react and argue from their praxis, including their local environment and situation, especially their way of living and understanding their environment. Therefore, stepping into each other's praxis through social learning might provide the concrete and fusing insights, required to facilitate joint co-constructed learning processes (Benard et al, 2014; Benard & de Cock Buning, 2013).

Research has reveal three communication strategies used in corporate communications reflect how corporate or organisational values are established via embedded strategy and the integration of stakeholder expectations (Monfort, 2019; Morsing & Schultz, 2006). This is important when considering a values-laden narrative.

Firstly, the information strategy, where corporate strategy is developed in isolation, priorities set and then communicated as a monologue through corporate communications. This communication is one-way e.g. press releases, or information statements (Hughes, 1995). In this form of communication, the expectations of interest groups or end users are not always overtly integrated into the corporate vision. An example of this form of dialogue includes the Animal Health and Welfare Statement by UK retailer Sainsburys.

Alternatively, stakeholders such as farmers, food companies and retail businesses can often use a monologue response strategy to deliver to stakeholder or consumer demands i.e., a reactive rather than proactive unidirectional communication approach. Examples of response strategy communications are corporate social responsibility (CSR) reports or company annual reports (Monfort, 2019). These can be prompted internally or externally to the business and are crafted in terms of words, language and discourse especially with regard to the target audience(s).

Finally, involvement strategy is where a dialogue takes place between stakeholders e.g., via social media, online forms or meetings with interest groups, with implications for the definition/redefinition of normative standards or corporate values and associated CSR activities (Monfort, 2019). Involvement strategy is normally used by mediating bodies that aim to promote dialogue and understanding in the animal welfare debate seeking to protect consumer interests, whilst also listening to farmers and others to achieve a common objective. Advisors, certification bodies, standards owners, and service providers engaged with involvement strategies may work with a broader stakeholder base such as farmers, manufacturers, animal welfare groups and retailers and mediate to protect consumers interest in animal welfare. An example of an international involvement strategy addressing animal welfare is the Better Chicken Commitment where over 200 food companies have now publicly committed in organisational statements to meet specific welfare standards within given timeframes.

Mullan et al (2011) proposes four solutions to difficulties that may arise when developing a collective and co-owned stakeholders' dialogue. These include allowing sufficient time for key stakeholders' dialogues to form, ensuring involvement of all interested parties in the

creation and maintenance of shared dialogue, using facilitation techniques to engage and include, and distinguishing clearly between experimental and applied science when developing science-based discourse. Using a multi-actor approach to explore values, preferences, expectations and risk perceptions of multiple stakeholders such as farmers, food companies and retail businesses can facilitate engagement to co-create knowledge and achieve mutual goals (Feo et al, 2022).

Summarising, this section defines discourses and dialogues in the context of animal welfare and highlights the importance of accounting for animal preferences in addition to natural behaviour to measure animal welfare rigorously. The section also explores different forms of animal welfare dialogue, such as persuasion, deliberation, and negotiation, and their impact on stakeholder perceptions of animal welfare, which can vary based on gender, culture, and profession. The section emphasises the need to analyse socio-constructive mechanisms that inform these perceptions and to use non-market strategies, such as discourses and dialogues and debates, to drive collective improvement in farm animal welfare. It calls on scientists to consult stakeholders within the food industry, as they are often a crucial source of insights into animal welfare outcomes. Furthermore, stakeholders should be included in the design and implementation of welfare assessment protocols, in order to ensure that the results are applicable in real-life solutions.

2.10 Research gap and introduction to study

The concept of positive welfare is of interest to science and society, particularly farmers and the public, who have been found to consider both enhancing positive and reducing negative aspects of welfare when assessing livestock production systems (Sweeney et al, 2022; Vigors & Lawrence, 2019; Vigors, 2019; Vigors et al, 2021a). Industry actors view the concept with

different prioritises depending on their given context or situation, and this needs to be considered when developing positive welfare measures. In participatory research, Stokes et al (2022) found that dairy farmers support all the good life opportunities developed from the available scientific evidence base for cattle in principle but cannot see change in practice towards more innovative opportunities due to their lack of feasibility without significant market or government incentivises. Similarly, the few studies that have qualitatively explored this area of research have shown variations in framings and discourses among producers and the public (Sweeney et al, 2022; Vigors & Lawrence, 2019; Vigors, 2019).

In any case, one's own ethical beliefs affects how they view positive welfare (Rault et al, 2020), and this means that multiple perceptions of good welfare through to a good life can exist without necessarily conflicting with one another based on value-based judgments of what positive welfare is (Vigors et al, 2021a). Positive welfare acknowledges sentience and positive welfare states, such as comfort and pleasure, which demonstrate advancement in the animal welfare research domain. Therefore, gaining insights into what stakeholders think about positive welfare, their (stakeholder) beliefs as well as attitude towards them is important to create policies and programmes related to the topic. It also allows for dynamic progression of research and translating this to farmer led innovation is necessary for extant science to make a meaningful contribution to society (Rault et al, 2020).

2.11 Next steps

The purpose of this research is to study the discourses and dialogues of UK sheep farmers and industry actors on positive animal welfare. The study was conducted through a participatory social learning approach with livestock farmers in the UK and selected industry actors. The inclusion of industry actors in this research is of significance, as their input to

agricultural knowledge flows is mainly determined by “off-farm” interests (Stone, 2016), thus expanding the scope of behavioural processes that influence discourses, accepted dialogues and decisions. There are also few publications on the positive welfare concept involving industry actors, as those available are mostly aimed at livestock farmers and members of the public (citizens and consumers). As a result, this research seeks to fill a contemporary knowledge gap within the literature. The next chapter presents the aims and objectives of the study, the reflective aspects of the design of the research approach and the methodology employed.

Chapter Three: The Methodology

3.1 Philosophical approaches to research

Philosophies are important to research because they express views, assumptions, and values about how reality or the world is formed, or should be formed (Newby, 2010). Epistemology and ontology are two different branches of philosophy that focus on the study of knowledge, reality, and how they relate to each other. Epistemology is concerned with questions about what can be known, while ontology focuses on understanding the nature of reality (Al-Saadi, 2014; Cohen et al, 2007; Moon & Blackman, 2014). The philosophical implications behind epistemological and ontological theory remain highly relevant due to their application for unlocking a deeper understanding of the universe. As Al-Saadi (2014) explains, researchers who view knowledge as a tangible object, likely adopt a philosophy that deals with physical, actual objects to unravel new knowledge. In contrast, researchers who view knowledge as subjective, unique, and personal, will adhere to the philosophy that supports these beliefs.

Epistemological theories generally fall into three categories: objectivism, empiricism, and constructivism (Al-Saadi, 2014; Moon & Blackman, 2014). Objectivism focuses on tangible reality as a source for knowledge acquisition while empiricists focus more on experience gained through sensory observation as a source for knowledge. Constructionists acquire knowledge about their environment based upon past experiences combined with ongoing analysis which may create new ideas or understanding about the said environment over time (Al-Saadi, 2014; Moon & Blackman, 2014; Newby, 2010).

Ontological research is focused on examining theories about the absolute existence and nature of “reality”, such as critical or structured realism (one reality exists) or relativism (multiple realities exist) (Al-Saadi, 2014; Goertz & Mahon, 2010; Moon & Blackman, 2014).

It (ontology) places an emphasis on understanding how language shapes our perceptions of reality by exploring a variety of possible ontologies (or descriptive systems), such as philosophical positions that focus on social constructionism or other naturalistic views on knowledge (positivism and post-positivism).

These two areas (epistemology and ontology) have been extensively studied in academic literature since their modern definition was established based Ancient Greek philosophies by figures like Plato and Aristotle (Goertz and Mahon, 2010). In more recent times these areas have also come under heavy consideration within research disciplines as diverse as computer science, cognitive science, anthropology etc. Therefore, this research does not delve deeply into historical accounts, comparisons, and contrast of these philosophical approaches, as these have been well captured in the literature. Instead, accounts of why and how the approach used fits in this study are presented.

3.2 Social constructionism

Social constructionism theory is a sociologist theory which states that knowledge and understanding is not fixed, but rather can be interpreted in different ways (Amineh & Asl, 2015; Burr & Dick, 2017). This theory holds that meaning and truth are created by people through their interactions with the world around them and through engaging in dialogue with others. This means that human beings are constantly constructing reality as they interact with each other based on shared beliefs, values, culture, language and ideas (Amineh & Asl, 2015; Bruffee, 1986; Burr & Dick, 2017; Schwandt, 1994).

The main components of social constructionism include the role of language, cultural mediation (how individuals interpret external events), power relations between groups or

individuals (dominant worldviews) and negotiation of meanings among various participants in any given situation (Bruffee, 1986; Burr & Dick, 2017; Nickerson, 2021). The idea behind this theory is to acknowledge the social nature of learning; it suggests that we all make sense of our experiences both within specific contexts such as family units or work environments, as well as more broadly at large-scale levels relating to global trends such societal norms or value systems across cultures (Amineh & Asl, 2015; Schwandt, 1994).

One of the main criticisms of social constructionist is that they are not clear on what the *absolute* truth should be. In other words, social constructionism denies objective reality and reduces knowledge to social constructs. This criticism is premised on two main points, as outlined by several researchers (Andrews, 2012; Burningham & Cooper, 1998; Schwandt, 1994; Stam, 2001). The first point is that social constructionism is not "realist" because it does not attempt to search for the true essence of reality. Instead, it seeks to understand how people interact with and construct their own reality. This means that people's interpretations of the world are seen as equally valid, with no single interpretation being objectively "correct". This concern allows for multiple interpretations of the same event, creating an opportunity for more diverse perspectives to be heard. In response, social constructionists resign themselves from the aspirations of the singular objective truth. The philosophers justify their approach as *naturalistic* because the conclusions are drawn from real-life situations in which the participants exercised their own volition to provide a narrative based on their lived experiences.

The second point is that social constructionism ignores the material reality of the world and the impact of natural forces on social phenomena (Andrews, 2012; Burningham & Cooper, 1998; Schwandt, 1994; Stam, 2001). This means that social constructionism can be seen as a

form of idealism, where instead of focusing on material reality, it focuses on the idea of a social reality that is created and maintained by people (Burningham & Cooper, 1998). This social reality is not necessarily limited to the physical world, but rather reflects the values, beliefs, and perspectives of the people. Social constructionists themselves agree that material reality can exist, but it is still subject to human construction. Through this process, the material world is given meaning and shaped by people's experiences. This means that social reality is constantly changing and evolving based on the values, beliefs, and perspectives of the people.

This PhD research is guided by social constructionist thinking and seeks to explore the meanings and viewpoints of positive welfare concepts. This involves looking at how different groups within societies construct ideas about what constitutes a good life for farm animals. Animal welfare scientists are concerned with the viewpoint and experience of animals and therefore what constitutes a good life for farm animals. The purpose of this study is to observe what the farmers think constitutes a good life in this way, we can gain insight into how the farmers view animal welfare, and how it affects their decision-making. We can also learn how the farmers interact with their animals and how this interaction shapes their relationship. Similar studies exploring the meanings of traditional animal welfare have adopted this approach (Buddle et al, 2021). The authors describe how individual perceptions of these issues are formed through social interactions within a social context. Social constructionism is now reflected upon within this positionality of the researcher.

3.3 Epistemology, ontology, and researcher's positionality

In essence, the researcher's positionality affects what they choose to investigate and the angle of investigation (the how). It can also influence the interpretation of the observations based

on the individual's position (Croyle et al, 2019). There are suggestions that the researcher's positionality is beyond crucial factors such as race, gender, and age, but is also intertwined with their personality and emotions which remain the subject of academic debate (Wilkinson, 2016). When discussing positionality, personality must be taken into consideration so it may be difficult to avoid using first-person words such as I, me, my or second persons such as we or us. Therefore, where this research uses these terms, they refer to the researcher unless otherwise stated.

Two pieces of work have helped me understand more clearly research paradigms and the concept of positionality: the works of Al-Saadi (2014) and Bourke (2014). Their frame of reference mainly influenced this authors' positionality through *religion* (Al-Saadi) and *race* (appearance) (Bourke). These frames of reference are significant in influencing the thinking of many billions of people, subconsciously influencing their paradigmatic thoughts. I will now discuss how religion and race influenced my paradigmatic thoughts.

Al-Saadi methodologically discussed his epistemological and ontological thinking constructively from a religious frame of reference. The philosophy of Islam is built on absolute truth, which emphasise the role of divine revelation and the teachings of both the Quran and hadiths (sayings attributed to the Prophet Mohammad, peace be upon him) in shaping our understanding of the truth and knowledge. In other words, it emphasises that Muslims should prioritise seeking out knowledge from God's revelation, while at the same time being open to discovering new truths through human reasoning and thought. The Quran even commands Muslims to "ask those who are knowledgeable" if they do not understand a particular verse or passage. Similarly, Prophet Muhammad stated: "*Seeking knowledge is an obligation upon every Muslim*."

This idea is reflected in everyday Muslim life as well through interfaith dialogue with people of different religious backgrounds and philosophical study regarding topics such as sciences, social sciences, geography, biology, metaphysics, epistemology, and ethics which aim towards understanding reality better. While Islamic principles remain static with regards to faith beliefs related directly to religion; personal interpretations within its realm encourage openness for learning about others experiences outside what has been written in scripture bringing the enlightenment necessary for spiritual growth on a journey towards excellent character development. Therefore, as a Muslim, the researcher's preconceived idea of knowledge and reality relates to multiple truths (constructivism) rather than singular objective truth (positivism), as this already exists (Holy Quran) and cannot be altered.

While social constructionism and Islamic perspectives differ in their underlying assumptions and values, there are some similarities between them. Both emphasise the importance of language and discourse in shaping our understanding of reality. Islamic perspectives also recognise the importance of social interactions and the role of culture and history in shaping our understanding of truth and knowledge. In other words, it also considers the subjective nature of knowledge and truth and the importance of dialogue and debate in uncovering them. Furthermore, both social constructionism and Islamic viewpoints prioritise the significance of engaging in critical reflection and challenging prevailing narratives. Based upon these similarities, the researcher was able to develop an understanding of knowledge and truth that combined both perspectives. This understanding was based on the idea that knowledge and truth are necessarily constructed through dialogue and debate through social relations, and that critical thinking is essential for uncovering them.

Similarly, Bourke (2014) critically reflected on his *race* and *appearance* as a white Caucasian male studying *black race* and *gender* in the United States of America (US). That meant he had to observe and collect data from people of colour (POC) whose grievances are well documented and have given rise to movements such as Black Lives Matter (BLM). If we swap places, topics, and locations with Bourke, then it is the researcher, of African descent studying welfare through studying UK livestock farmers. However, the UK livestock farmers are not (as) socio-politically *aggrieved* participants compared to the BLM movement, although some of them may feel aggrieved by the dialogue associated with animal rights activism, animal welfare scientists, and policy makers.

The positionality of the researcher here is that of an outsider, one of black African descent who approaches the topic of positive welfare through the lens of UK industry professionals whose knowledge is considered the dominant perspective. Thus, the researcher approached the study from an *intellectual* position that is grounded in the critical assessment of the animal welfare literature. Understanding how animal welfare narratives have evolved from negative to positive, the researcher looks for alternative sources of information about the topic being studied (positive welfare). Thus, the primary objective of the research is to acquire authentic voices and understandings that might otherwise be lost or silenced due to the predominant power structures in academia and wider society, determining what should be prioritised in the dialogue and what should remain unsaid.

3.4 Specifying research questions or hypotheses:

Many studies have examined industry actors' (mostly consumers' and farmers') views and perceptions of animal welfare and its social construction, and the trend is now growing within academia and policy to promote positive welfare. To the best of the researcher's knowledge,

none of the previous studies undertaken have captured voices and provided a deep understanding of how UK sheep farmers and industry actors' construct meanings and narratives (Rose et al, 2022a). In addition, none of the previous studies has explored how welfare language, the vocabulary itself and the position (positive or negative) influences decision-making processes for improving animal welfare, especially at farm level. There is a need to fill these critical knowledge gaps, as they shape how individuals behave and act, how they provide options for improving welfare, reflect on language use as a barrier to change, and provide a more nuanced focus on how adoption of change can be operationalised (Rose et al, 2022a).

Accordingly, the primary research question was positioned to consider the role language plays in industry actors' discourses, which can hinder science-practice collaboration and the implementation of scientifically supported initiatives to improve animal welfare. This thesis is guided by the following overarching research question to address the research enquiry:

How do UK sheep industry actors' view and understand positive welfare?

The sub-questions below were developed to guide the analysis of the data:

a. How well are UK sheep farmers and industry actors aware of positive welfare terminology? Does positive welfare feature prominently in industry actors' discourses? If not, what other terms do they use?

b. How do industry actors interpret and define the concept of positive animal welfare? How is it (positive welfare) approached from industry actors' perspectives?

c. What are the differences in the level of awareness, how established meanings of positive welfare are viewed, and what are the new meanings of positive welfare among different industry actor groups?

d. In what capacity are farmers currently applying positive welfare practices? Are there any links between interpretations of meanings and practical considerations? How does this link (if any) influence the widespread uptake of more positive welfare practices? What are the benefits of positive welfare as perceived by different industry actors?

e. What effect does the framing of welfare language have on sheep farmers' decision-making? Are they (farmers) affected by the language at all?

f. How can a common understanding on positive welfare be developed between farmers and society? What animal welfare benefit could this bring?

The research focuses on two key propositions related to the role of discourse and language in promoting the understanding adoption of welfare improvement strategies in the context of positive animal welfare. Proposition 1 suggests that the use of positive welfare language does not have a significant effect on the adoption of welfare improvement strategies. In other words, simply using positive language to communicate the importance of animal welfare may not be sufficient to drive farmers to actively implement welfare improvement measures. This proposition implies that other factors, such as economic considerations, practicality, and feasibility, may play a more influential role in farmers' decision-making process. While positive language may create awareness and understanding of positive animal welfare, it may not directly translate into behavioural change among farmers.

Proposition 2 highlights the potential influence of negative language in association with animal welfare on farmers. This proposition suggests that the use of negative language, which

conveys blame, guilt, or criticism towards farmers regarding their treatment of animals, can have an impact on their attitudes and behaviours. Negative language may evoke defensive reactions or resistance among farmers, leading to a reluctance to adopt welfare improvement strategies. It is important to note that the influence of negative language may vary depending on individual farmers' attitudes, beliefs, and values.

3.5 Research methods

Qualitative research has been defined in various ways, with applications in multiple fields. A key aspect of qualitative research is the iterative process of gaining a deeper understanding of a phenomenon by making new significant distinctions and studying it closer (Aspers & Corte, 2019; Flick et al, 2004). In simpler terms, a qualitative study presents its results in words rather than numbers, in contrast to quantitative studies in which the results are presented as numbers. Nevertheless, descriptive numbers are typically used in qualitative studies to indicate the range of opinions and views expressed by the participants and the level of agreement, or disagreement within the research population.

Several qualitative data collection methods have been proposed and applied in the literature, including participant observations (ethnography), grounded theory, and participatory research methods (Vaughn & Jacquez, 2020). Ethnography primarily deals with cultural, norms, or societal comparison studies. An ethnographic approach to this topic (of PhD) would mean that the researcher visits farms to observe how positive sheep welfare is practised. This would require considerable preparation and time. This method was incompatible with the overall objectives of this PhD research, and furthermore, could not be undertaken during the Covid-19 pandemic.

Therefore, the researcher adopted the participatory extension method (PEM) based on peer-to-peer facilitated learning to explore the views, meanings and discourses of UK sheep farmers and industry actors on the researched topic (Knook et al, 2022; Prager & Creaney, 2017). This methodology differs from the other participatory methodologies in its emphasis on addressing multidisciplinary objectives through participatory, learning based method. Thus, learning among participants can occur through social interactions between individuals within a social context, with fewer formalities to permit as much flexibility as possible regarding achieving genuine outcomes.

In discussing the meanings and views of positive welfare, people may express different views of what it is (or should be) in private and when together in groups, especially if the groups involve a range of stakeholders. This means that in the group scenario, individual voice "could be lost". Therefore, after the literature review stage of the study, it was logical to use a two-stage qualitative method approach (individual semi-structured interviews and a facilitated workshop) for the participatory research for this study. Facilitated workshops (or focus groups) as a research method and semi-structured interviews were used to understand discourse, views, and ideas through informal approaches (Beazley & Ennew, 2006; Hennink, 2013; Longhurst, 2003), aligning closely with the inquiry focus of this PhD research. Semi-structured interviews as a co-research method helped to address potential complexities associated with conducting focus groups since these are often time-consuming. The major difference between semi-structured interviews and focus groups is the interaction that occurs in the latter between the participants. In the former, interaction focuses typically on the interaction between the interviewer and interviewee, while the latter is moderated by a facilitator who helps the group achieve specific objectives (Hennink, 2013; Longhurst, 2003).

The semi-structured questions were informed mainly by the literature review, especially from prior studies investigating positive welfare meanings among industry actors (Vigors & Lawrence, 2019; Vigors, 2019). As the study involved various industry actors, it was necessary to prepare two questionnaires to fit in with their situational and social contexts (see Appendix B and C). The data collection phase was conducted between April 2021 – January 2022 for the semi-structured interviews and the workshop was held in March 2022. The design and conduct of the semi-structured interviews and focus group discussions are discussed in detail in subsequent sections.

3.6 Research design

3.6.1 Ethical approval

Ethics approval for this study was obtained from the Royal Agricultural University ethics committee. The Royal Agricultural University Ethics Review reference number for this project is: 20213216-Muhammad, and the study also follows the University of Gloucestershire's Handbook of Research Ethics.

3.6.2 Literature review methodology

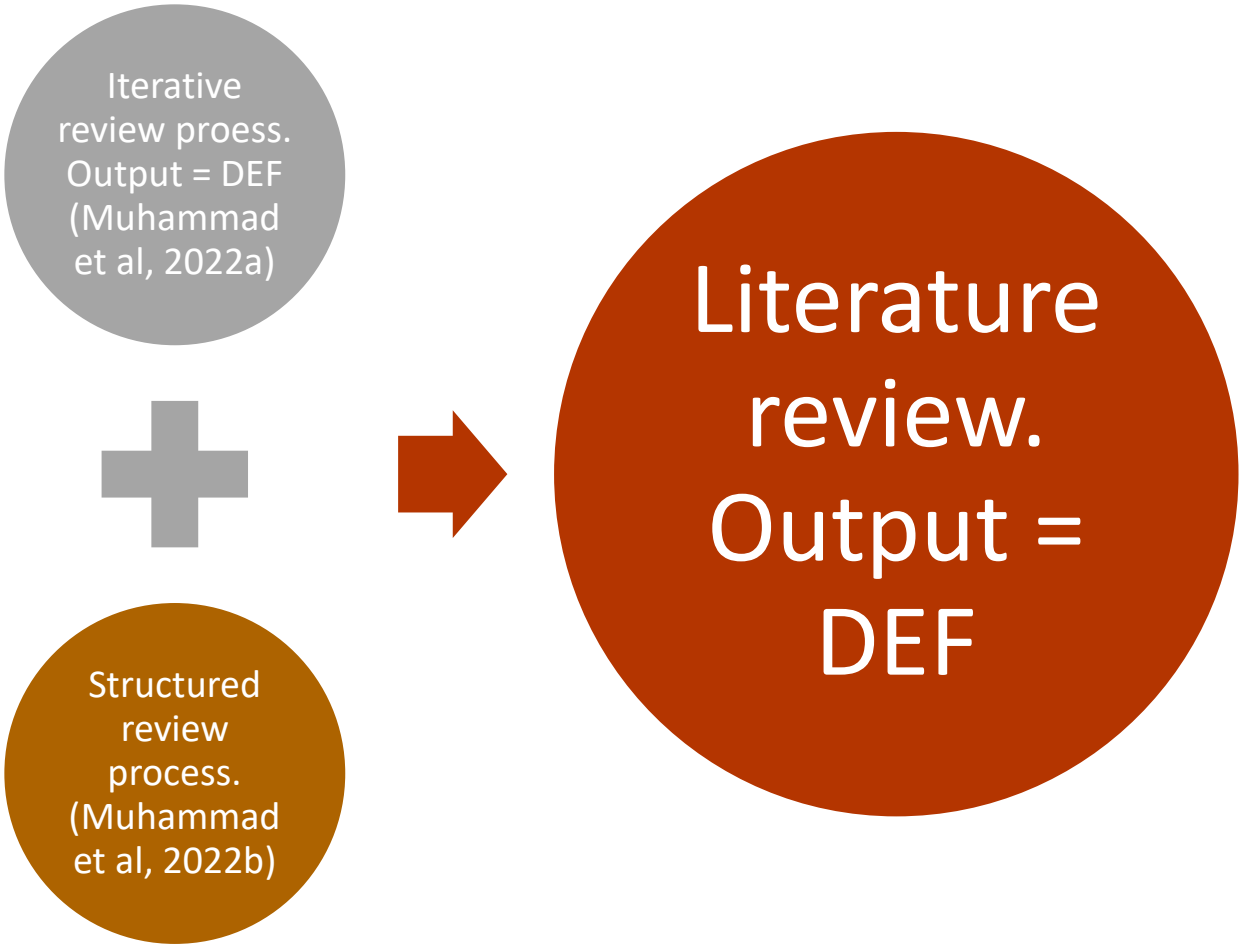
As stated at the beginning of chapter 2, the literature review for the thesis is part of a wider structured, iterative, review process (Figure 3). This multi-method review process involved searching for relevant research and review papers, as well as grey studies in an organised manner using keywords related to the topic of interest (good husbandry, good welfare, high welfare, positive welfare, etc). It also included assessing each item found from the search to determine relevance before adding it into consideration or discarding it completely, thereby cultivating knowledge on relevant matters throughout this peer-reviewed content selection approach. Following these steps during this focused investigation enabled collection and

analysis of known information, as well as providing ways to build up ideas necessary for formulation of arguments that supported the main findings (welfare hierarchy) and conclusions associated with the review process.

The literature review process also led to the development of a theoretical frameworks. The first framework focuses on how language and communication are influenced by interaction among people in different social contexts has been published in peer-reviewed journal (Muhammad et al, 2022a). The advantages and disadvantages of this framework (herein referred to as DEF) has been explained in the previous section. The second theoretical framework, the welfare hierarchy is based more directly on research into terminologies relating to animal welfare. It looks at some key concepts and terms such as good husbandry, good welfare, high welfare and good life (positive welfare) and the blurred boundaries between these terminologies, as well as places where these terms can be used.

The use of a theoretical framework (or theoretical triangulation) is not new in the literature. It basically entails the use of multiple theoretical frameworks in data interpretation order to gain a fuller understanding of complex phenomena (Bazeley, 2017; Carter et al, 2014; Johnson et al, 2007). It helps researchers identify patterns that may not be evident from a single source – it allows them to draw more complete conclusions about their topic than if they used only one framework. Not all aspects related to the subject matter are best explained by one theory alone; thus, other models may be needed to explain certain complexities that exist within this particular field of study. Theory triangulation can also reduce researcher bias by providing different interpretations and points-of-view which account for nuances that might have been ignored using just one perspective. Therefore, it was essential to consider multiple theoretical frameworks in this research which focus on a complex topic like animal welfare.

Figure 3 Literature review process adopted for this research.



3.6.3 Sampling frame and recruitment of participants

The sampling frame was restricted to UK sheep farmers industry actors (academics, farming organisations, advisors, and supply chain), consistent with the literature review on positive sheep welfare (presented in the previous chapter 2). A mixture of snowballing and convenience sampling was adopted to select participants within this sample frame across the country. The method started with convenience sampling with direct requests to farmers when

meeting at another knowledge exchange event for a *positive welfare of the wool* project. The contacts who volunteered to participate were asked to spread the word and asked for interested farmers to get involved in the study, thus setting in the *snowballing approach*. The researcher was also introduced to UK sheep industry actors by the supervisors and others, where a direct more purposive request for participation was made. The fourth approach was convenience sampling involving direct requests from social media (Twitter) for potential interviewees by the researcher.

The farmers (n=25) were representative of the three geographical regions in the UK, namely Scotland, England, and Wales. The majority of participants in the study were engaged in multiple forms of livestock farming, including poultry, pigs, and cattle, in addition to sheep. However, it was observed that sheep farming constituted their primary farming activity. As a result, these participants were categorised as "sheep farmers" due to the significant focus and reliance on sheep-related activities within their farming operations. This categorisation acknowledges that while participants may have other livestock species present on their farms, sheep farming holds a central role in their overall farming practices. By categorising participants in this way, the study recognises the specific expertise, knowledge, and resources required for successful sheep farming and aims to capture the unique perspectives and experiences of individuals primarily involved in this sector of livestock agriculture.

Among the industry actors participating were a veterinarian, two individuals engaged in certification schemes, two agricultural advisors (one specialising in sheep, one more general) and one academic researcher. In addition, four other organisations from the supply chain were also engaged (wool n=3 and meat n=1). As part of their involvement in the interview process, participants were encouraged to engage in discourse and dialogue with the

researcher as they responded to questions and constructed their interpretations of positive welfare. The variation of voices satisfied the need for rich, detailed data from various contexts, in line with the quality criteria for qualitative research (Palcyznski et al, 2022). These participants were asked to reflect on their own experiences and perspectives, as well as the collective experiences and perspectives of the organisations they represented.

3.6.4 Impact of COVID-19 on the qualitative data collection

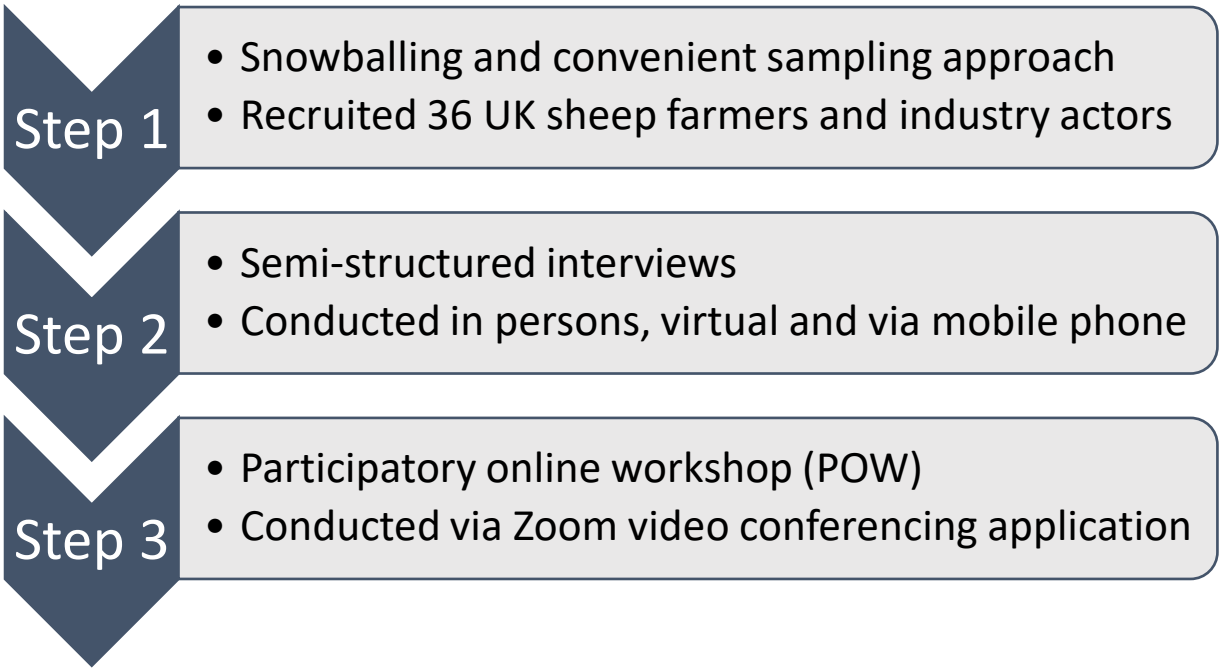
During this research in 2020/2021, the UK and other countries went into a state of national lockdown due to COVID-19. It resulted in the closure of institutions and other public organisations, with many employees being advised to work from home. Amid the international lockdown, students returned home as their campuses were closed; due to the pandemic, the new normal became online interaction and learning. Although online methods of communication (Skype, Zoom, Teams) existed before COVID-19, they were limited to important business meetings and the technology was not widely used by farmers. In response to daily escalating cases of COVID, the PhD Studies Director at the Royal Agricultural University suggested that research students consider switching from paper-based data collection methods to online methods since it was impossible to predict when the lockdown would be lifted.

COVID-19 presents two main challenges to researchers: time constraints and social/physical distancing (Tremblay et al, 2021). Both challenges impacted the initial approach to contemporary participatory research. The first few interviews were conducted face-to-face. COVID-19 restrictions meant, however, that face-to-face data collection could not be facilitated physically in person. Furthermore, the timeframe associated with this PhD made it difficult to implement this method due to its time-consuming preparation and execution and

the challenges of farmers with livestock physically leaving their farms and travelling from distant locations to a central meeting point.

Alternatively, an innovative virtual approach was considered to conduct the PEM interviews and discussions (Falter et al, 2022; Hall et al, 2021). The virtual approach, henceforth referred to as participatory online workshop (POW) offers several benefits. Firstly, they can provide ease of use and simplicity of operation (Azadegan & Macaulay, 2011; Gray et al, 2020). There may be few technical details in the planning and execution processes. It is also possible to obtain qualitative data online cost-effectively and reach various populations (Boland et al, 2021; Gray et al, 2020). Conducting these online methods requires no travel costs and time spent with journeys, which means that both the participants and the organisers can more efficiently use their time (Boland et al, 2021; Gray et al, 2020). In addition, POW can enhance the personal interface to discuss issues with deeper meanings and provide greater accessibility to a wider group of participants via mobile devices, iPad and laptops (Azadegan & Macaulay, 2011; Gray et al, 2020). Moreover, its successful applications have been conducted in the past, indicating that if properly designed, it can meet the desired research objectives (Archibald et al, 2019). Due to these advantages, this study also employed a participatory online workshop (POW) in March 2022 (Figure 4).

Figure 4 Steps involved in the research design process.



Virtual POW as a research method has raised concerns among many researchers. Based on a closer examination of the literature, four primary concerns have been raised. The main weaknesses of virtual POW are 1) the lack of high-quality facilitation, 2) conflicts in group collaborations, 3) problems with internet connectivity, and 4) security and privacy (Archibald et al, 2019; Azadegan & Macaulay, 2011; Lobe et al, 2020; Salmons, 2022). Many of these concerns were already addressed at the ethical committee meeting and seeking consent from participants wishing to contribute to the research. To overcome the interaction issues associated with virtual discussions, i.e., that many of the participants could come into the workshop with little preparation time, the researcher adopted an innovative *design fiction approach* to set the scene and focus for the POW participants (See section 3.6.5).

3.6.5 Operationalising the semi-structured interviews.

The interviews were conducted in three formats: in a seated setting on the farm (before the COVID lockdown), in a demonstration setting on the farm, and on virtual platforms via

videos calls and on mobile phones. Interviews generally lasted between 20 to 60 minutes (recommended times for interviews) and included audio-visual recording to allow transcription. The duration of mobile phone interviews in this study varied from 20 to 30 minutes. To ensure the accuracy of transcription, an additional recording device was used to enhance the clarity of the audio. This approach aimed to facilitate the transcription process and maintain the integrity of the data collected during the interviews. Table 2 provides details for the twenty-five farmer interviews and the eleven industry participants.

The semi-structured interview was conducted following the four stages of qualitative data collection as described by Adam and Cox (2008). The formal participation procedures, including designing participation and consent forms, followed by sending these to participants which were completed via email exchanges. Nevertheless, at the start of each interview, participants were reminded of their option of terminating the interview at any point without having to provide a reason, where if desired. All participants participated of their free will and choice. The first three interviews were planned as pilot phases, which were also included in the outcome. These were designed to familiarise the researcher with qualitative interviews and test the "strength" of the questionnaire, ensuring that the "right" questions were asked. To put the interviewee at ease, discussions typically started with background questions such as tell me about your farm? This was followed by narrative-inducing questions designed to capture participants' views, familiarity, and awareness of positive welfare.

Table 2 Medium for data collection for the semi-structured interviews

S/N	Participants	Industry actor group	Gender	Age	Main output	Medium of data collection
1	Participant 1	Sheep Farmer	M	unassigned	Meat, breeding sheep	Mobile phone
2	Participant 2	Sheep Farmer	M	59	Wool	One-on-one agricultural event
3	Participant 3	Sheep Farmer	F	63	Meat and wool	Virtual
4	Participant 4	Sheep Farmer	F	unassigned	Wool	Online
5	Participant 5	Sheep Farmer	F	65	Wool	One-on-one at farm
6	Participant 6	Sheep Farmer	F	58	Meat	Virtual
7	Participant 7	Sheep Farmer	M	29	Meat	Virtual
8	Participant 8	Sheep Farmer	F	47	Meat and wool	Virtual
9	Participant 9	Sheep Farmer	F	63	Meat	Mobile phone
10	Participant 10	Sheep Farmer	F	24	Meat	Virtual
11	Participant 11	Sheep Farmer	F	32	Wool	Virtual
12	Participant 12	Sheep Farmer	F	35	Meat	Virtual
13	Participant 13	Sheep Farmer	M	61	Meat and Wool	Mobile phone
14	Participant 14	Sheep Farmer	M	70	Meat and wool	Mobile phone
15	Participant 15	Sheep farmer	F		Meat	Mobile phone
16	Participant 16	Sheep farmer	M	57	Meat	Virtual
17	Participant 17	Farmer	M	unassigned	Wool	Mobile phone
18	Participant 18	Sheep Farmer	F	70	Meat and wool	One-on-one at an agricultural event
19	Participant 19	Sheep Farmer	M	31	Meat	Mobile phone
20	Participant 20	Sheep Farmer	M	30	Meat	Virtual
21	Participant 21	Sheep Farmer	M	Null	Meat	Virtual
22	Participant 22	Sheep Farmer	M	Null	Meat and wool	Mobile phone
23	Participant 23	Sheep Farmer	M	59	Wool	Mobile phone
24	Participant 24	Sheep Farmer	F		Meat,	Virtual

					breeding stock	
25	Participant 25	Farmer	M	41	Meat and wool	Mobile phone
	Industry participants					
26	Actor 1	Industry actor – trade association representation	-	Not applicable (NA)	NA	Virtual
27	Actor 2	Industry actor – advisory	-	NA	NA	Virtual
28	Certification scheme 1	Industry actor – certification scheme	-	NA	NA	Virtual
29	Actor 3	Industry actor – advisory	-	NA	NA	Virtual
30	Supply chain 4	Industry actor – meat supply chain	-	NA	NA	Virtual
31	Supply chain 3	Industry actor – wool supply chain	-	NA	NA	Virtual
32	Supply chain 1	Industry actor – wool supply chain	-	NA	NA	Virtual
33	Supply chain 2	Industry actor – wool supply chain	-	NA	NA	Virtual
34	Actor 4	Industry actor – advisory	-	NA	NA	Virtual
35	Researcher 1	Industry actor – research	-	NA	NA	Virtual
36	Veterinarian	Industry actor – veterinarian		NA	NA	Virtual

Some of the learning outcomes from this "piloting phase" are summarised: firstly, the interviews were too formal, even though semi-structured interviews are intended to be informal conversations. The formality stems largely from the inexperience of the researcher, and he(me) learned to loosen up as the discussions progressed.

The interviews after the pilot stages were much improved in that they were less formal and more conducive. This allowed for a more comfortable setting and helped to create a better understanding between the researcher and the participants, resulting in more accurate and

reliable data. Consequently, this allowed for more efficient decision-making and improved results, and overall, the experience was positive. The industry actors were interviewed using a similar approach. The PhD scope did not require the sampling frame to include consumers, although it is recognised are vital to driving and accepting change in the industry. The main reason is that the research primarily targets sheep producers, advisors and other farming organisations, as these are the primary adoptees or enablers of welfare at the grassroots level. The outcomes of this study can inform future research on how to communicate with consumers about positive welfare, however. Working with consumers can therefore be addressed by future studies that build on this novel work to capture farmers experiences and interpretations. For example, further empirical work can develop ways to explore consumer views on positive welfare as a concept, over and above good husbandry, good welfare, or higher welfare and how this relates to the findings of this study.

3.6.6 Operationalising the POW discussion.

The purpose of the POW discussion was to address questions that were formulated after the initial coding of semi-structured interviews to identify emerging questions to explore further within the studied topic. This approach allowed the researcher (me) to explore topics that may have not been initially discussed in the interviews. The other purpose of the POW was to *sense check* the initial findings of the study with the interview participants and to build the richness of these initial individual findings. Therefore, it was significant to approach the virtual group discussions with creative data collection methods to ensure the success of the research. Examples of creative ways that have been developed for virtual participatory extension approaches include photovoice and digital diaries (Hall et al, 2021).

As alluded to earlier, the creative method for the POW was the *design fiction* model. In simple terms, *design fiction* is a cross-disciplinary method that allows illustrations and demonstrations of a particular object of interest (in this case, positive welfare) to be envisioned, allowing humans to narrate their meanings and accounts when considering the object in question (Rosello, 2017). In simple terms, it enables participants to express their opinions about particular illustrated things through narrations. Coulton et al (2017) suggested that design fictions are more than just stories—they tell "worlds". This means the results of participants' observations and interpretations when they observe *an object's illustrations* are not simply narratives, but instead their (people) individual perspectives on what they see. Consequently, a design fiction can be used to gain insight into how users construct meaningful discourses through acts of creative imagining. Previous studies on design fiction relating to animal welfare show that the approach is not prescriptive, with some respondents able to speculate on the importance of housing and technology in improving the quality of lives of horses (North, 2017). Also design fiction has been used effectively in empirical research by members of the supervisory team in other research (Jacobs et al, 2021; Craigon et al, 2023).

Designing a prototype for *positive welfare* scenarios in this POW was based on a pre-recorded video and situation-related *illustrative designs*. These are now discussed.

3. Pre-recorded video

The first step was to play a pre-recorded video of one of the farming participants describing their narrated account of what positive welfare is in the context of their farm. The pre-recorded video was considered more advantageous than an icebreaker exercise because the purpose of the pre-recorded video was to get the participants' attention and to stimulate their thinking on the topic of positive welfare, to facilitate communication in line with social

constructivism. The pre-recorded video appears to have served its purpose of sparking conversations. For example, once participants were in their breakout rooms, some started providing opposing views of the version of positive welfare that was presented in the video. In other words, participants began to tell their worlds as per the aims of *design fiction*. The video drew participants together around the topic of positive welfare but did not bias their thinking nor impact on their ability to think and to imagine freely.

B. Illustrations of positive welfare scenarios

The second step in the design fiction stage is to illustrate imagined futures of positive welfare in practice and then ask participants about their perceptions of the imagined futures. These illustrated scenarios are described in appendix A. They were presented to the participants to interact with, so they could explain how they would define the term *positive welfare*. By introducing an illustrative visual of sheep in for example a comfortable state, it was expected that the cognitive processes of the participants and their inner world would be stimulated in how they view positive welfare and to what extent this visual was consistent with their view.

Similarly, the second to fifth illustrative picture in appendix A shows combinations of scenarios for each of the pre-defined positive welfare-related questions. Participants were asked to describe what terms they used (instead of positive welfare) to describe welfare and draw out a systematic typology of welfare terms they use in their communications, which could then be cross-referenced with other data or terms used. Picture 3 in appendix A explored the cognitive impacts of the tone of welfare language (positive vs negative) on the behaviour of participants regarding their daily interactions with their farm animals and for industry stakeholders. Picture 4 in the figure explored participants' perceived solutions to issues surrounding welfare language and framings. In contrast, picture 5 revolved around an

imagined future of labelling meat products as positive welfare to determine any perceived benefits, or challenges for them and for consumers.

c. Facilitating the POW

To address the challenges of poor facilitation and engagement suggested by some in the literature (Hall et al, 2021), in the virtual group discussion, the researcher, a novice facilitator, adopted the widely recognised facilitation techniques promoted by Ben (2017). A detailed facilitation plan was drawn up based on the aims of objectives of the research, which included recruiting experienced facilitators to lead the breakout group discussions. The researcher then prepared and organised the group discussion by setting the team schedule and managing invitations. All communications seeking consent, privacy and information were handled securely via encrypted emails.

In terms of the POW attendance, from the original group of participants, nine farmers and two other industry actors were not able to attend the virtual workshop. However, three new working colleagues of participants who initially interviewed attended, alongside an academic guest from Harper Adams University who is part of the research team and validator of this research's analysis. Therefore, twenty-four people ended up attending in total. Five breakout rooms were created during the POW (Table 3). These breakout rooms each had a facilitator, defined as a *learning guide* within the context of this research. The facilitators include the researcher and four other facilitators who are a part of the supervisory team. Strict adherence was given to time as the whole POW was schedule to last one hour and thirty minutes. This meant that another co-facilitator was assigned to the team to monitor the workshop schedule, so that each discrete discussion around each question was kept to time. Also, this same co-facilitator was responsible for moving people virtually in and out of the breakout rooms, supporting all users and optimising the function of the virtual space.

As a novice facilitator, the researcher has previously assisted with a virtual discussion and observed how participation is conducted in the positive welfare and wool project. However, facilitation during the POW represents the first "proper" facilitation they conducted. Therefore, it was essential to assume an open-minded *learning guide* position during the participatory virtual workshop. Discussions and consolidations of findings in the plenary suggested that all breakout groups achieved the basic objectives of the virtual group discussion.

Table 3 Breakout rooms for group discussions in the participatory workshop.

Facilitators	Groups	Members
Researcher/ novice facilitator	Farmer group 3	Sheep farmer 7_grp Sheep farmer 10_grp Sheep farmer 12_grp Sheep farmer 4_grp Sheep farmer 20_grp
Co-facilitator 1	Farmer group 2	Sheep farmer 15_grp Sheep farmer 14_grp Sheep farmer 16_grp Sheep farmer 22_grp
Co-facilitator 2	Farmer group 1	Sheep farmer 8_grp Sheep farmer 1_grp Sheep farmer 13_grp Guest farmer 26_grp Sheep farmer 23_grp Guest participant
Co-facilitator 3	Industry actor group 2	Actor4_grp Actor1_grp Researcher1_grp Supply chain 1*_grp
Co-facilitator 4	Industry actor group 1	Actor3_grp Veterinarian_grp Actor1*_grp Supply chain 1_grp Certification scheme 1_grp

While operationalising the discussion in the breakout rooms, each facilitator delegated a volunteer to take summary notes and the facilitator recorded the session for later transcription. Nonetheless, it is important to acknowledge that when undertaking content and thematic analysis, the researcher may have been influenced by the outcomes of not only their breakout group and the plenary discussion, so here there is the potential for some form of

bias. However, to counterbalance this experience, rigorous cross-checking was conducted of the quality of coding within NVivo, as explained later under reflections on the methodological steps at the end of this chapter. At the end of the breakout session, a volunteer from each breakout group provided feedback during a plenary session to reflect on the content of their group's discussions.

The aim of this was for discourses to be synthesised, and for each group to hear the discussions of other groups. However, due to time constraints, this only partially happened through brief feedback in the form of summary presentations, and where there was little time for facilitating interaction between different breakout groups in the form of a plenary discussion. All discussions were recorded for transcription by the researcher after the POW.

The team of researchers met after the POW to reflect on the virtual meeting, concluding that it was successful in engaging participants and achieving objectives (see section 3.6.7). Logistically, there were no issues from hosts or connectivity problems except for one farmer joining by audio instead of video.

3.6.7 The strengths and weaknesses of the virtual group discussion

The idea of gathering all key industry actors around the concept of positive welfare was considered worthwhile. Strengths of the workshop included the creative method *design fiction* (pre-recorded videos and illustrations) shown to the participants. This helped centre the interaction on *positive welfare* because most of the responses captured (as will be presented in the result sections) demonstrated that farmers not only disagreed with scientific conceptions of positive welfare but also criticised aspects of it and the general phrasing. In other words, the voice of the participants was well captured in the POW. Figure 5 indicates

that the participants were largely satisfied with their experience, as they rated it just below the maximum rating. This could mean they were impressed by the quality of facilitation and *design fictions pieces* (Figure 5).

Planning the agenda and pre-assigning participants to groups also contributed to the smooth operation of the virtual group discussion. The co-facilitator, who was responsible for facilitating breakout rooms as well as managing time, was also a major contributor to the success of virtual group discussion. Similarly, the division of the large group of industry actors into smaller homogenous groups enabled in-depth and nuanced discussions, as it made it easier for all participants to express their thoughts and ideas and not be concerned to express views in front of a large group of stakeholders (Fay et al, 2016).

Figure 5 Ratings of the POW by participants

Regarding weaknesses of the research methodologies, a major limitation was the challenge between overusing participants time and there being insufficient time allocated for each question to enable a deep dive. However, this element of the study was a sense check as previously explained rather than a deep dive. The impact of this limitation was reduced

through the creation of small breakout groups to ensure all participants were able to contribute to the discussion. Nevertheless, it was realised that adequate time for data collection, given how busy participants are in their work roles, was the most challenging factor in the research. This can also be seen as a success given the fact that the content matter was perceived as engaging and could have been discussed further. Many participants asked for a follow-up presentation to share findings, as this initial focus group meeting did not allow for reflection. Some respondents (n=3) did reflect and send follow-up emails which also contributed to the data set and their responses were analysed within the study.

The lack of funding for this research (the PhD being self-funded) also prevented farmers from receiving funding for their time and valuable input. However, one important positive impact of the current study was that all farmers from the previous semi-structured interviews attended the online sessions, demonstrating they were highly engaged in this subject and want to input into positive welfare research and policy development. Not all the attendees felt confident to participate in the group discussion from the beginning, which may have resulted from the environmental challenge and/or individual differences for some participants, who may have needed more time to reflect on the questions posed or are not confident to express their views in online participatory discussions with people they do not know. Indeed, farmers may be more acquainted with farm walks or action group events as a form of knowledge exchange. Therefore, in future workshops, variable engagement should be adopted to address individual cognitive processing speeds, learning and communication styles. Power and trust dynamics between participants will inevitably play a part in how much and what participants are happy to share in a virtual space where they are being recorded.

Most participants were actively engaging in the discussion, but a minority (n=3) remained passive. Two of these later provided their insights to the researcher after taking time to reflect on the concept discussed. They affirmed that they had been given ample opportunity and felt no discontent with how it (POW) was handled. These passive participants believe they better express themselves individually rather than in groups, suggesting that some individuals may need more time for cognitive processing, but also further individual reflection and critique. This is an important aspect for refining such methodology so that future studies can explore the voices of all farmers and other stakeholder groups in a group setting. The reason for explaining the methodological approach in such detail here is that it is potentially novel, as the researcher is unaware of design fiction being used in previous animal welfare studies, and the findings in its implementation and iterative refinement are of value to future research. In the next section, the tools of analysis are discussed.

3.7 Analytical tools and methods of analysis

Audio recordings of the semi-structured interviews and participatory workshop discussions were manually transcribed using Otter.ai (Version 3.5.0 - 121bc514, Los Altos, California, USA), providing an integrated speech interface to text transcription and translation applications using artificial intelligence and machine learning. The interview and online workshop transcripts were then first level coded for content and then reread and then thematically coded in NVivo for Windows (Version 12 Plus, QSR International Pty Ltd., Victoria, Australia) to group common extracts into themes (Beazley & Ennew, 2006; Braun & Clarke, 2006).

3.7.1 Thematic discourse analysis

Thematic analysis is a common social constructionist analytical tool used in qualitative research to identify themes recurring in a predictable pattern (Nowell et al, 2017). The thematic analysis involves the generation of meaning based on the deduced themes from qualitative data. It is widely used by researchers in the field of qualitative research where words are their data due to its user-friendly approach. This is because it is very flexible (to move between epistemologies and ontologies), which is of significant advantage, particularly in qualitative research (Braun & Clarke, 2006; Maguire & Delahunt, 2017). However, the meanings generated are limited to interpreting words and content without necessarily investigating "silent" deeper meanings associated with language and discourse (Khan & MacEachen, 2021). This can be achieved by adopting the thematic discourse analysis to explain in-depth themes generated from the thematic analysis stage.

Thematic discourse analysis is a research methodology that combines thematic analysis and discourse analysis approaches to examine patterns and meanings within qualitative data. It has been applied in many areas of research including medical studies, philosophy, and sociology to analyse the language, structure, and content of texts. For example, (Singer & Hunter, 1999) used a thematic discourse analysis to explore women's experiences of menopause. Porta et al (2022) combines thematic analysis and discourse analysis methods to study the self-efficacy and attitudes of Australian senior secondary teachers toward the implementation of differentiated instruction. Korostenskiene (2022) incorporates thematic analysis, case study triangulation method, and elements of discourse analysis to explore the humanistic paradigm in education. Such evidence demonstrates the application of thematic discourse analysis in various research contexts, reflecting its adaptability and significance in exploring patterns, meanings, and power dynamics within discursive practices.

The PhD research used a thematic discourse analysis approach, inspired by Potter and Wetherell (1987), to examine the nuances in meanings, views, and discourses of positive welfare. The principal tenet of discourse analysis, as explained by Potter and Wetherell, revolves around the construction of versions of the social world through language use. The term "construction" is particularly relevant for three reasons, as argued by Potter and Wetherell. Firstly, discourse analysis highlights that meanings and interpretations are not fixed or inherent but are actively constructed through language. Secondly, it recognises that language is not a mere reflection of pre-existing reality but contributes to the shaping of social interactions and perceptions. Finally, the term "construction" underscores the notion that language plays a fundamental role in constructing and giving meaning to social realities.

This understanding of discourse analysis is consistent across multiple studies (Anderson, 2017; Malterud et al, 2015; Potter et al, 1993; Schindel & Hicks, 2019). Researchers employing discourse analysis view language as an essential tool for ordering perceptions, constructing social interaction, and making reality meaningful. Discourse analysis is seen to examine social practices, actions, and the interpretive repertoires that inform and shape them. It aims to address concerns regarding how cognitivism relates to what people say and mean (Potter & Wetherell, 1987). This approach, then, is suitable for examining not only how people say things, but also the how they say them and the reasoning behind their discourses.

In summary, discourse analysis adopts a constructionist perspective, emphasising the role of language in constructing versions of the social world and shaping social interactions. It is a flexible and widely used methodology that sheds light on the complexities of social practices and actions embedded in language use.

3.7.2 Language use and analysis in this research

Boyd and Schwartz (2021) have highlighted a crucial limitation in contemporary models of language - the failure to consider situational contextual factors in discourse production. The authors emphasise the role of contextual and situational influences in shaping these discourses. This PhD study extends their framework by incorporating language's contextual and situational influences on discourse, thereby enhancing the framework's applicability and explanatory power (Figure 6). In this proposed framework, language and discourse dynamically interact, with language both shaping and being shaped by the broader discursive frameworks. The recognition of situational and contextual factors, and the integration of language provide valuable insights into the intricacies of language use and the social construction of meaning within different discursive contexts.

For example, when considering animal welfare as a socially constructed concept, words such as welfare, husbandry, and farming intertwine with the psychology of the speakers involved. These words are not employed in isolation but rather become intertwined with the speakers' intentions and beliefs. Adjectives play a significant role in positioning the language used to discuss welfare. This positioning can range from describing welfare as good or bad, positive, or negative, and may be influenced by the speaker's perspective and underlying values. Similarly, the word "farming" encompasses various connotations and has been extended to include phrases such as welfare-friendly farming, sustainable farming, factory farming, intensive farming, or extensive farming. These linguistic extensions give depth and specificity to the concept of farming, highlighting different agricultural practices.

The language used in these discourses plays a crucial role in shaping and structuring the discourse itself. Furthermore, the individuals involved in the discourse bring their own positionality, role, or identity, which further influence the language used. For instance, regulators, veterinarians, farmers, and consumers may each contribute to the discourse with their unique perspectives, values, and interests. These different roles can implicitly or explicitly impact the words and language employed by the actors, reflecting their positionality within the discourse.

This interplay between language and discourse is dynamic, with the language used both reflecting and shaping the broader discourse. The words chosen and the language employed by individuals contribute to the construction and negotiation of meanings and understandings within the discourse. These linguistic dynamics, captured within the scope of this PhD study, highlight the intricate relationship between language and discourse, where linguistic choices and framing reflect and reinforce discourses and the interests, perspectives, and identities of the individuals involved. By exploring the language and discourse surrounding positive animal welfare, this study delves into the complex interplay of language, discourses, and actors' positions, unravelling the discursive dynamics that shape understandings, practices, and actions related to concept studied.

Figure 6 Animal welfare discourse explanatory framework (Muhammad et al, 2022a adapted from Boyd and Schwartz, 2021)

3.8 Coding and themes generation

The researcher was an inexperienced qualitative researcher at the start of a PhD study. In their undergraduate and postgraduate studies, they mostly used quantitative approaches to study causal-relationships between variables. Even though research methods (including qualitative methods) are taught in classes as part modules, the researcher has not accomplished in qualitative data analysis due to a lack of experience. Therefore, to ensure that they developed their skill set and analysed the qualitatively generated data to a high level, the first steps taken was to attend some extra modules teaching the basics of Nvivo analysis (Jackson & Bazeley, 2019). The researcher was also supported within the supervisory team and with their advisors in how to undertake qualitative research to the level and depth required.

The researcher rewatched all recorded interviews several times in the first research stage. Similarly, the researcher and supervisory team members read the semi-structured interviews. There were intermittent discussions with the three supervisory team members regarding the transcripts' interpretation. During these discussions, preliminary assessments of the semi-structured interviews were *peer-brainstormed* with supervisory team members. All these phases are essential to establish transparency and trustworthiness during the process of themes generation (Braun & Clarke, 2013; Jackson & Bazeley, 2019; Nowell et al, 2017). It was also at these points that the emerging questions asked in the POW were iteratively generated, as alluded earlier in section 3.6.5

After these initial steps, and collection and familiarisation with all the datasets (POW included), the researcher's key question was *what do these data say and what do they mean and how do they relate to the research questions*. The first step of the coding structure was to adopt an *inductive coding method*, a more flexible approach that allows the data to tell its *story*, in contrast to thematic coding (Braun and Clark, 2006). Consequently, the first open coding was conducted based on the main patterns and associations of the discourses and their relationship with the research questions. Open coding refers to generating initial concepts from data by looking for connections and patterns in the dataset (Strauss & Corbin, 1998). Therefore, themes developed at this stage did not necessarily correspond to the open-ended questions in the semi-structured interviews and the virtual group discussions. Thirteen main nodes (first level codes) were identified at this first stage of coding (Table 4), and they have been defined in the context of this study.

Table 4 First level open coding (Source: Nvivo)

Node name	Description
Awareness of positive welfare term	What is the participants' familiarity and knowledge of the term?
Characteristics of the human-animal relationship	How do farmers feel about the *welfare* state of their animal(s)?
Continuous improvement practices	How are farmers applying improvement strategies in their daily lives to improve animal welfare or wider farming practices?
Decision making factors	What factors make farmers want to make positive changes on their farm?
Developing issues and challenges	What challenges have farmers had which are barriers to making a positive change?
Information source and participation	Where and how does knowledge construction and flow occur?
Perceived usefulness in discourse	Does the concept of *positive welfare* have any benefit?
Perceptions and applications of good welfare for sheep	How do farmers describe what *positive welfare* looks like on a sheep farm?
Sheep farm output	Meat, wool, or any other product
Understanding of positive animal welfare	What are the farmers' understanding of positive welfare and how does it vary from the articulation in the literature conception?
Veterinarians	What are farmers' perceptions of veterinarians (positive/negative)? (Emerging node)
Welfare indicators	What are the welfare indicators that farmers highlight in their narrative? (Emerging node)

There were many themes identified in the first level of coding. Still, as the research aims to analyse not only the views but also the views problems of the positive welfare concept, more open coding was conducted based on the depth and breadth of the open-coded categories. The extrapolation was limited to the salient points relevant to the study's objectives and aims This ensured that the results obtained were accurate and relevant to the research. Furthermore, it made the analysis easier and more efficient.

As part of the axial step, the next stage in the coding process, the researcher referred to the literature sources identified in the literature review to compare the open-coded themes with

what had already been established. Even though the researcher initially acknowledged that the coding process would be based on inductive coding, it was critical to cross-check and compare with existing theories on this subject and to see how other academic, industry and policy stakeholders, and previous research defined positive welfare. It is appropriate and valid to combine inductive and thematic coding to create a coding hierarchy. As Adam and Fox (2008) pointed out, researchers may still have theoretical interests that influence the original research question design and how existing knowledge is positioned and critiqued.

As a result of the comparison of participants' responses, patterns were observed adding more rigour and validity to open coding themes initially. Moreover, it allowed the differentiation of existing interpretations on positive welfare and those that can be considered new or emergent. Between the open coding and axial, there were eight separate review meetings, as well as deeper analysis of the coding structure (see later), between the researcher and the supervisory team to ensure rigour, consistency, reliability, and repeatability of the coding process. In previous studies (for example, Vigors, 2019), the approach to reporting participants' perceptions of positive welfare was less flexible and less comprehensive.

In the last stage of the process, selective coding was employed to refine and redefine the themes derived from open and axial coding to answer the research questions associated with this study, and in particular how positive welfare is problematised. One of the supervisory team members with expertise in animal welfare reviewed the contents of the selected codes and themes to ensure they were within the scope of positive welfare. A second validation check was conducted by the researcher and the second supervisor, who had qualitative expertise, to ensure alignment with the purpose of the study. In addition, a third supervisor double-coded one full interview transcript and one full focus group discussion transcript. The

percentage of agreement was between 97% - 99% for all the coded items, further indicating the reliability, repeatability and robustness involved in the coding process (Table 5).

Table 5 Final selected codes and associated descriptions

Name	Description
Level of awareness	High awareness, medium awareness, low awareness
Differences in levels of understanding and awareness	Emerging themes, comparing the differences in views and opinions expressed
Positive welfare awareness, understanding and narratives	Positive welfare knowledge, understanding and the problematisation of the concept
Evidence of an understanding of established meanings	Definitions and meanings related to or supporting literature-based definitions
How established meanings are scrutinised	Negative review, feedback or perception of the established meanings and definitions
New meanings of positive welfare	Discourses on new understandings not covered in the literature in this context
Influence of message framing on farmer behaviour	Language as a means of exploring farmer behaviour (transporting to positive welfare)
Welfare language effect on farmer behaviour	Welfare discourses and their effect on farmer behaviour
Fostering common welfare language	How to overcome welfare communications barrier
Perceived benefits of positive welfare	Perceived usefulness of positive welfare
Level of adoption of positive welfare practice	Evidence of positive welfare from continuous welfare improvement strategies
Factors driving decision for positive change on farm	Factors driving decision making
Other factors influencing the level of adoption of positive change on farm	Emerging factors

3.9 Key take away and methodological contributions.

One of the notable contributions of this methodology is its ability to highlight the advantages of the socio-constructionism approach as a pragmatic framework. It recognises the social and cultural context of knowledge construction, promotes collaboration and participation, acknowledges the dynamic nature of knowledge, and encourages reflexivity among researchers. These advantages contribute to a more comprehensive and robust research process, ultimately enhancing the quality and relevance of the study's findings.

The participatory methodology adopted in this study makes a significant contribution to social science research through the adaptation of creative methods to improve interaction between researchers, participants, and data collection. By adopting *design fiction* pieces, the approach helped to provide a deeper insight into the positive welfare topic by allowing UK sheep farmers and industry actors to raise their concerns with the concept, and without interfering with their natural thinking. The discourse on the concept enabled the researcher to gain perspectives that would not be available with traditional techniques such as surveys or interviews alone.

The POW also provided an opportunity for participants to engage with each other, make sense of their responses together and hearing each other's positive welfare discussions, and express themselves creatively, going beyond predetermined questions. POW significantly helped in refining and improving the coding system and qualitative data, making it a valuable part of the methodology. As such, the application of these types of methodological strategies is contributing significantly towards advancing knowledge within social sciences today.

Chapter 4.0 Knowledge and understanding of positive welfare as a concept.

This chapter aims to explore awareness and understanding of positive welfare as a concept among farmers. The research addresses the following areas:

a. How well are the UK sheep farmers and industry actors aware of positive welfare terminology? Does positive welfare feature prominently in industry actor discourses? If not, what other terms do they use?
b. How do U.K. sheep industry actors interpret, define, and view the concept of positive animal welfare? How is it (positive welfare) approached from industry actor perspectives?
c. What are the differences in the level of awareness, what established meanings of positive welfare are being presented, and what are the new meanings among different industry actor groups?

Herein, these objectives are considered according to the themes that emerged from the analysis and interpretation of both datasets. Six major themes are considered in this chapter. These themes are:

- Level of awareness of the term “positive welfare”.
- Understanding(s) of established meanings of positive welfare.
- Scrutiny and issues with established meanings of positive welfare and why this has arisen.
- Differences between industry actors in their level of awareness, understanding of established meanings of positive welfare.
- Emergent meanings and perceptions in the discourse of positive welfare.

These themes are now discussed in turn.

4.1 Level of awareness of the *positive welfare* concept.

The measure of awareness used here is the degree to which the interviewee was aware of "positive welfare" in terms of its scientific conceptualisation. In other words, the participants' familiarity was used to evaluate their awareness of positive welfare terminology. Prior studies such as Vigors and Lawrence (2019) also interviewed livestock producers and determined them as being potentially unexposed to the positive welfare concept; however, their study did not explicitly explore and describe the differential awareness levels among their respondents. However, other studies have found a difference between sectors. Stokes et al (2022) showed that dairy farmers had high awareness and interest in positive welfare, while Sweeney et al (2022) showed a significant difference in sectoral understanding of positive welfare, with the beef and dairy farmers viewing higher welfare more positively compared to the poultry and pig sectors. This difference suggests that dairy and beef farmers have more awareness of positive animal welfare than other sectors due to the discourse and dialogues with other key actors, or due to regulations and standards in the sector, which both could lead to a higher visibility, awareness and understanding of positive welfare.

Participants in this study were asked if they knew of or had previously heard of the term positive welfare. For industry actors, n= 7 (out of 11) responded to the question, while for farmers, n=15 (out of 25) responded positively. Table 6 presents a summary of the surrounding respondents' familiarity with the welfare term categorised in terms of low, medium, and high awareness.

Table 6 Participants level of awareness on the concept of positive welfare

Level of awareness of established meanings of positive welfare	Exemplary quotes	Categories of respondents	Frequency (n = 25
High awareness	"I think I understand the context – that is, welfare enables an animal to lead a good life rather than just avoid negative experiences."	Main industry actors	7
Some awareness	"Animal Welfare, yes. But no (not heard of positive welfare)."	Mainly farmers who previously to a positive welfare group	8
No awareness	"(Positive welfare) is not a term I heard of over here."	Mainly farmers	9

Seven of the participants (7/9) who said they had no awareness were farmers. These farmers stated that they had never heard of the term before and were unaware of its meanings or presence in contemporary farming vocabulary. This could be because the term is relatively new and not widely known, farmers have not been exposed to the latest industry research and literature or engaged with a knowledge exchange provider who focuses on advancing animal welfare. It could also be because the term has not been widely used in the daily farming vocabulary, or in agricultural media, or other forms of communication channels about farming.

Interestingly, however, among those previously exposed to the positive welfare concept, farmers (n=5/8) stated they still had limited understanding of the positive welfare concept. This was related mostly to a lack of understanding of discourse and language around how positive experiences fit within the overall animal welfare concept. As an example, Farmer 12, despite having been a member of a welfare group not associated with this research, did not

notice any significant differences between the welfare concepts. They believed that the concepts were largely the same, and that the only difference was the terminology used. This showed that Farmer 12 lacked an understanding of how the concepts were related to each other and had difficulty interpreting the complex language used to describe them. The quotes by Farmer 12 below narrates these struggles:

"So, we are trying to focus on the positive side; I feel like increasingly it has become gone towards preventing of negative if you like, so I do not know, I find it hard to differentiate."

This discourse therefore suggests that despite being exposed to the idea of positive welfare, farmers with limited access to reliable information do not recognise or implement these intervention strategies. This lack of recognition may stem from various factors, including a lack of awareness, limited resources, or competing priorities. These results further highlight the complexity of positive welfare concept, and therefore, would suggest the need for improved dissemination of information and education among farmers to bridge this knowledge gap.

The farmers' awareness of positive welfare concept did not appear to differ based on gender, as both male (n = 8/25) and female (n= 6/25) participants reported poor knowledge or limited understanding of the studied topic. Interestingly however, it could still be possible that there are disparities in their levels of knowledge or their overall comfort discussing the topic. For instance, more women from the farming participants (farmers) discussed about this positive welfare concept when critically evaluating it (section 4.4). Similarly, other studies have found women to be more sensitive in animal welfare issues, and place greater trust in those responsible for certifying animal welfare standards in traditional animal welfare literature

than men (Blanc et al, 2020). These findings indicate that women are more likely to be proactive in engaging, developing, and implementing animal welfare policies. The reason for this may be that animal welfare is a social issue highly valued by women, who tend to have greater compassion for animals and are more likely to advocate for this issue. The role of gender and its influence on attitudes towards positive animal welfare may therefore be worth investigating in the future.

In the study, it was found that a subset of farmers acknowledged age as a potential factor influencing their awareness and understanding of positive welfare. Specifically, approximately five out of twenty-five farmers (5/25) mentioned age-related factors as a potential barrier to their awareness and understanding of positive welfare concepts. Farmer 8, for instance, highlighted that older individuals may not necessarily possess the interest, awareness, or knowledge regarding positive welfare:

"I do not think it [positive welfare] would be a priority in their [older people] business plan. So maybe the younger generation is more connected to positive welfare than the older generation, which would be interesting to see."

The older generation is more likely to prioritise health and productivity that can bring in more profit for their businesses. They may not be as aware of the benefits that positive welfare can offer, such as improved quality of life and mental health. Lending credence to the previous statement, Farmer 11 added that the older generation may not use the term positive welfare in their vocabulary. Instead, they would prefer "good condition", perhaps suggesting for them that the physical state of an animal equals a good state of welfare:

"I think the older generation would say that the sheep were in good condition. Good condition is what my granddad would say. That is how we would talk about it, or he would say they look well."

Similarly, Farmer 9, with experience in providing farm help on older people's farms describes the challenges she encountered with some of her hosts to accept innovation is required to keep farming practices relevant:

"I used to go out. And in particularly one instance, I came away smiling because it was a farm that had got resistance to worms, and I was trying to explain what type of wormer [to use] .... oh, well, we have the cheapest one. And it was xxxxx. It was just like the white drench. It is one of the oldest ones, which is good for only one that will do tapeworm, but not the others. And I think you should try one or the other drenches, a different type, because, you know, you have got resistance. And if you have a faecal egg count, take it, and it will improve it. Well, it was good enough for my granddad, so it is good enough for me [how older people reacted]. There is that element out there. Education is difficult in some of the older farmers."

This idea that older people are reluctant to changing their management practices to animal-friendly practices is somewhat supported by the literature. Balzini and Hanlon (2020) discuss the finding that older farmers often exhibit greater sympathy towards animals facing health challenges. The study implies that older farmers, due to their own life experiences and accumulated wisdom, may have a heightened awareness of the importance of health in animals. They may recognise the impact that health issues can have on the overall quality of life for animals under their care. This heightened sensitivity towards animal health may

motivate older farmers to prioritise and invest in the well-being of their animals, ensuring that they receive appropriate care and attention. Nevertheless, one of the leaders in the adoption of positive farming practices in sheep (assuming awareness leads to practices) interviewed here is over the age of fifty:

"I think I understand the context (positive welfare). We have a specific farm related Positive Welfare Framework based on the work of [anonymised], round the 5 Opportunities [good life principles] which I do quarterly with my vet. I've worked hard to develop that. It's individualised as all these initiatives must be as every farm is different" (Farmer 5).

A future survey could be beneficial to determine the prevalence of positive farm awareness and practices across all age groups. This can help to gain a better understanding of the types of farms that are likely to adopt and implement more positive farming practices, as well as develop strategies for targeting all farmers wherever they are on the journey towards positive welfare awareness and on farm practice.

At the industry level, only a fraction (n=2/8) of the industry actors admitted having limited understanding of the positive welfare concept. Of these two, one was from a certification body background, who have their own specific animal welfare standards and associated vocabulary. Private standards such as these are mainly based on outcome-based assessments and delivering market-preferred products (see discussion around high welfare in chapter two). The other industry actor was a field veterinarian who mainly works with sheep health and welfare concerns. For veterinarians working directly with farmers, unless they actively engage with the research field and/or continuous professional development associated with animal welfare, this will likely result in their awareness and framing of animal welfare

around eliminating health problems and current negative welfare concerns on farm. Therefore, a vet's discourse may well focus on husbandry synonymous with farmer discourses (de Greef, 2006).

Another industry actor with prior exposure to positive welfare, echoes the concerns of farmers that there is a lack of understanding when it comes to positive terms and how they relate to behaviour. This can be seen in the way that people tend to focus more on avoiding pain instead of pursuing pleasure, which gives them less motivation to act positively or try something new:

"I think the positive terms are not well understood and I think that they are much more nebulous than the negative ones. I think the avoidance of pain is and avoidance of stress is better understood than the positive actions" (Advisor 3).

This suggests that positive animal welfare people do not have a clear idea of what they should strive to achieve happiness. Positive states such as like joy, optimism, and contentment can be hard to define and understand in animal terms, making it difficult to advocate for positive emotions and leads to a focus on avoiding negative feelings.

Farmers are the primary adopters of higher husbandry and welfare practices and need to lead actions for improving the animal's quality of life. Therefore, the lack of awareness and exposure with the positive welfare concept and terminology highlights a lack of knowledge sharing between academia, science and practice, and a lack of effectiveness in sharing knowledge from industry stakeholders to farmers or between knowledgeable farmers and other farmers. Often even applied research projects which actively engage with farmers and

consult them in the development of or practices associated with positive welfare (Stokes et al, 2022), have not had the remit or funding to upscale potential policies in practice. It is suggested that the role of researchers, industry actors and government bodies are to come together and collaborate at a national level to develop a strategy for working with farmers on positive welfare. Integrating positive animal welfare into everyday discussions and knowledge exchange activities by extension providers and particularly vets who provide one to one support, could help to shift the focus towards positive welfare. The Animal Health and Welfare Pathway, introduced by the UK Department for Environment, Food and Rural Affairs (Defra) could be one mechanism (DEFRA, 2022a). This programme aims to improve engagement with sheep farmers and enhance proactive flock health vet/farmer partnerships. Through this engagement, knowledge exchange activities regarding positive welfare indicators be shared between vets and farmers. This will help to improve understanding of positive animal welfare, including its adoption and implementation. This will also help to create a better relationship between vets and farmers, fostering trust and collaboration.

4.2 Evidence of an understanding of established meanings of positive welfare

Participants were asked to construct the meanings of positive welfare according to their lived experiences and understanding. The meanings broadly aligned with the themes relating to interpretations already found in the extant literature. Specifically, the following meanings, as defined, reflected the established understanding of the hierarchy drawn from the literature (see Figure 7):

- **good husbandry skills and practices** defined as good care, productivity and promoting animal health and minimising stress, and seeking to minimise negative welfare outcomes such as disease (Vigors & Lawrence, 2019);

- **good welfare** is the provision when animal resource needs are met, and potential issues have been negated (Vigors & Lawrence 2019)], i.e., a life worth living as opposed to a life not worth living (Mellor et al, 2020);
- **Living conditions** where are animals have outdoor access, or having space (Sweeney et al, 2022), to display their natural behaviours.
- **higher welfare** describing an animal's quality of life as substantially higher than the legal minimum animal welfare requirements describe as at least a life worth living (Edgar et al, 2013; Farm Animal Welfare Committee, 2009), i.e., a life of high quality (Boissy et al, 2007); towards a good life (FAWC, 2009).
- **Positive welfare** raises the husbandry bar higher regarding providing extra resources that promote positive experiences while minimising negative experiences, achieving a good life (FAWC, 2009). As discussed earlier in the literature (chapter two), positive welfare has been approached through aspects such as positive emotions, positive affective states, quality of life and happiness.

Table 7 summarises what the interviewees had to say about their views and discourses on positive welfare during the interview and the online POW. Therefore, it is worth noting that the number n in the table is higher than the total number of participants, as some participants gave varying descriptions in their interviews in the online participatory group. This implies that the POW was an effective platform that invited more in-depth discussions and allowed for greater exploration into the nuances of the issue which may have been overlooked during the interview. It also showed that the participant's understanding of the issue has grown deeper during the POW. By categorising the responses, it also allowed for a better understanding of the various perspectives on the issue. The understanding of positive welfare from the participants' perceptions is now discussed:

Table 7 Participants' views and discourses associated with the positive welfare concept as identified through NVivo analysis.

Definition	Inclusion criteria	Exemplary quote	Frequency (n) during interview	Frequency during POW
Good husbandry practices/Baseline definitions	Positive welfare as defined by the overall animal care and management	"What is good animal welfare: they are free from free from pain and discomfort or. free from disease free from, you know (they are) performing well."	7	1
Proactive welfare improvement	Positive welfare is defined by skills and abilities to "detect" and "correct" issues early-on	"I like to think that you notice an animal is ill before it has got to have an awful lot of antibiotics or an awful lot of medication."	4	1
Good welfare	Positive welfare as framed by reducing negative experiences especially through Five Freedoms	"So well, sheep that's not in pain and like not experiencing discomfort? And I guess Yeah, like the five freedoms I probably use that as a basis really."	5	4
Expressing natural behaviours	Positive welfare as defined from the perspectives of expressing natural behaviours in a natural environment	"I would say (positive welfare is) like where the animals are comfortable and have everything that meets their needs. And where they can express positive behaviours, like play behaviour, things like that."	4	2
Happy, healthy definition	Positive welfare as defined by the "happiness" and "productivity" concept	"Positive welfare for me is happy sheep, which results in good fibre (wool), which results in a good end product".	6	1
Higher welfare	Positive welfare as defined from the perspectives of the "going over and beyond baseline standards" concept	"Positive welfare would be promoting, you know, not just the minimum standards, not just accepting animal [welfare]. It sorts of above and beyond that."	4	4
Positive welfare	Positive welfare is defined by the "positive experience" outweighing the negative experience.	"So, for me, it would be a greater balance of positive experiences, pleasure, comfort, relaxation, excitement, positive social interactions, those kinds of things, and less of the negatives."	2	1

4.2.1 Good husbandry/Baseline definitions

Like Vigors and Lawrence (2019), the most frequently expressed definition (n=11/35) of positive welfare stems from good husbandry frames. In the previous study, good husbandry was defined based on providing the best possible care for the animal and was mainly echoed by the farmers. The perspectives of the participants in the present study align closely with the findings of previous studies conducted by Vigors and Lawrence. In the interviews and workshop, the farmers refer to their roles and responsibilities in improving the productivity of their animals when exploring the meaning of positive welfare for them. For example,

"Well, you have obviously got to make sure your animals are getting or getting everything, they need to grow. And they must perform they have to grow to get you a return. So, you must look after them you must make sure everything you know that they are that everything is right for them basically".

This statement emphasises the importance of providing animals with everything they need to grow and perform, as it directly impacts the farmer's return on investment. The farmer acknowledges the necessity of taking care of the animals and ensuring that all their needs are met to optimise their growth and productivity. The phrase "getting everything they need in order to grow" implies that animals require proper nutrition, suitable living conditions, and appropriate care to support their growth and development. This also includes providing them with a balanced diet, access to clean water, and a comfortable environment that meets their physiological and behavioural needs. Therefore, good animal husbandry in this context underscores the importance of meeting the animals' needs to facilitate their growth and performance. It highlights the farmer's role in ensuring that the animals receive proper care, nutrition, and suitable conditions to optimise their growth and productivity. By fulfilling this

responsibility, the farmer can not only promote the health of the animals but also achieve a favourable return on investment. These perspectives were also shared by another farmer in the breakout group:

"For me, positive welfare is ensuring you have done everything you can to help solve that issue. So, it is probably accepting that there will be issues but knowing that you have done everything you can, as they are in your care to sort of try and combat that issue, rather than, you know, just have had the black and white of healthy or unhealthy, it is also making sure you have done everything you can for them" (Farmer 26_grp).

For sheep to be in a good husbandry system, farmers highlighted not overstocking, good stockperson-ship, lack of stress and low veterinary bills as essential. Good stocking levels can reduce stress on animals, resulting in improved growth rates and overall health. The health of the animals ensures that stock keepers have a low expenditure on veterinary care This in turn maintains a steady and consistent income for the business. Healthy animals also produce more, providing higher yields of milk, meat, eggs, and wool. This results in higher profits for the business. Farmer 13 narrates:

"I think it (positive welfare approach for sheep) is a combination of lots of things and mainly, if you have got everything else right, you don't want to be overstocking. You know the old saying is that the worst thing for a sheep is another sheep (competing for resources)"

Being a good stockperson is important to the farmers. It enables farmers to understand the behaviour of their animals, anticipate their needs, and provide them with the best possible

care. By understanding the animals and their needs, farmers feel they are making decisions to ensure their health and welfare:

"(Positive welfare approach for sheep) means knowing when the sheep need moving on, from one pasture to the next when they are getting short of feed. Keeping an eye on the on the worm on the worm burden, you know, regular testing of the faeces to make sure there is no worms present. A major one always used to be them foot rot. If you got any lame ewes, that was usually a bad sign. So, you must take measures to keep on top of that. And just knowing the general health of you ewes: (body) condition scoring on a regular basis certainly before tupping and before lambing to seek to see what sort of fat cover they have got, and probably anything that is struggling anything that is not right, a taking it out and culling it."

It is clear from the narratives here that farmers' view their husbandry practices and operations as related to the health and productivity of their sheep. The discourses here suggest that farmers who define positive welfare based on the concept of "good husbandry" may not necessarily consider the intrinsic feelings and emotions of the animals. Instead, their focus is primarily on productivity, viewing positive animal welfare as a measure of the animals' ability to produce and perform rather than prioritising the well-being of the animals themselves. This perspective aligns with the concept of "good husbandry," which emphasises the practices and interventions necessary to promote animal productivity (as discussed widely in Chapter two). Farmers who adopt this frame of reference prioritize factors such as nutrition, housing, disease prevention, and other management practices that are believed to enhance the animals' growth and performance. Their primary concern is ensuring that the animals receive everything they need to thrive and generate a return on investment.

4.2.2 Proactive welfare improvement

In previous studies on animal welfare, proactive welfare improvement had been associated with standards, and farmers defined it as "going beyond the legal standards" (Vigors & Lawrence, 2019). There is no doubt that these descriptions are valuable contributions, but they appear as stipulative definitions associated with prescribed standards to which farmers will be required to conform. In contrast, farmers here associated proactive welfare improvement with a *pre-emptive approach* to health management. Pre-emptive measures allow for improved monitoring and earlier diagnoses of diseases before they become chronic or advanced illnesses, reducing the extent of illness conditions, and allowing for greater physical welfare of the animals. Therefore, by taking a proactive approach to animal welfare, adverse effects can be eliminated, and the burden on caregivers or stock persons is reduced when managing negative effects before they escalate. Some examples of meanings associated with this framing are for instance:

"Positive welfare is seeing a problem before it arises" (Farmer 14_grp).

"I like to think that you notice an animal is ill before it is got to have an awful lot of antibiotics or an awful lot of modification. If you can catch it early obviously, you can make sure that they are made better more quickly before they become ill and must be treated for something you know, with strong antibiotics and everything" (Farmer 9).

In some responses in the interviews and POW, the primary proactive initiative discussed by respondents (n = 5/35) was reflected in their discussing of using breeding techniques to eliminate certain health-related and disease-prone traits in the flock. Farmer 1 proposed genetic ewe longevity as an indicator for determining proactive welfare improvement:

"It will have a family line within the flock that you keep. It will probably have its parents in the flock and its offspring within the flock. It will contribute to the genetic makeup of your whole flock. It will survive healthily within your farming system because it is adapted to that environment. It will need little intervention from the shepherd. The shepherd will act as someone who protects it from outside, detrimental outside influences."

The participants' perspective underscores the belief that sheep living a healthy life, free from the need for interventions, is a natural and positive experience. The statement highlights the significance of maintaining a family line within the flock. Maintaining a flock that consists of both the parents and offspring of the sheep has several advantages. This practice ensures a continuity of genetic traits and characteristics that can be passed down through generations. It therefore contributes to the overall genetic makeup and diversity of the flock, potentially leading to improved traits and performance. This viewpoint also highlights the importance of providing the necessary conditions and care to support the sheep's health and overall welfare without the necessity for constant human intervention.

While the participants may have discussed the advantages of sheep longevity, it appears that their conversations did not specifically revolve around the positive impact on productivity and carbon emissions reduction (Browne et al, 2014). This indicates that the participants may have prioritized other aspects or benefits of ewe/ram longevity during their discussions. The absence of a specific focus on improved productivity and carbon emissions reduction does not necessarily imply that the participants were unaware of or disregarded these benefits. It simply suggests that these benefits were not the central topic of their conversations or the primary focus of their discussions.

4.2.3 Good welfare

In the context of positive welfare framed as good welfare, participants (n=9/35) such as farmers, a veterinarians and representatives from certifications schemes viewed the five freedoms as crucial for operating a successful and ethical farming business. These five freedoms are considered essential principles in animal welfare, representing the mini0mum standards that must be met to protect animals from harm and suffering, and ensure that proper standards are followed. By implementing these practices, which encompass freedom from hunger and thirst, freedom from discomfort, freedom from pain, injury, or disease, freedom to express natural behaviour, and freedom from fear and distress, farmers can promote healthier animals that experience reduced stress and achieve better overall outcomes:

"Also, it Is like referring to like the RSPCA for five freedoms. So, I suppose like if you if you take something like that as a structure and then come the animal in front of you, does it have these five freedoms?" (Veterinarian).

Two key principles of the five freedoms emphasised in discourses of the participants are the expression of natural behaviours and the freedom from discomfort. For example, Advisor Na stressed in their framing of positive welfare as indicate:

"I think good welfare conditions would again be the environment with which within which animals are kept. And I guess it would also include their reaction to that environment as well. So, it would be we when we talk about good welfare conditions we would talk about the condition of the housing if sheep were being house or the condition of the pasture for the range of the stocking levels. And again, the animals in response or reaction to those

conditions in terms of an indication of how comfortable, happy and to what extent those conditions led to a good state of health in the animals."

Others (n = 6) emphasise on the need for animals to be expressing their natural behaviours as a means for them to be considered in a positive experience state. The idea is that sheep, when given the opportunity, prefer to exist in a setting that is similar to their natural habitat where they can graze, establish social hierarchies, and form natural behaviours with minimal human intervention.

"I think that probably, it is about sheep, being able to express their innate desire to live and behave in the way that they would do in what was an unmanaged situation" (Actor3_grp)

Sweeney et al (2022) recently provided evidence that members of the public overwhelmingly defined positive welfare in terms of an animal's living condition. Similarly, Vigors et al's (2021b) findings suggest that UK farmers considered animal welfare as more "positive" when both health issues are minimised, and natural behaviours are promoted. Robbins et al (2018) reported that zoological animals living in a more natural state were rated by members of the public as happier than those living in unnatural (confined) situations. However, the study by Robbins did not clarify if the animals were also assessed to determine if they were healthier.

The definitions of the natural behaviours for the sheep considers the provision of an environment that acts as a stimulant for natural behaviour in sheep. In other words, creating an environment that mimics the natural habitat and conditions of sheep is essential for facilitating their natural behaviours. Therefore, to ensure that sheep can engage in these natural behaviours, it is crucial to provide them with an environment that supports and

stimulates these activities. This means creating conditions that allow for grazing on natural vegetation, providing opportunities for social interaction with other sheep, and offering space for exploration and movement. By providing an environment that acts as a stimulant for natural behaviour, farmers and animal caretakers can promote the physical and mental well-being of the sheep. When sheep can engage in their natural behaviours, it can contribute to their overall satisfaction, reduce stress, and enhance their overall welfare.

In summary, positive welfare was defined by the farmers and actors from the perspective of good welfare as providing minimum standards that improve the animal's quality of life with a particular emphasis on comfort and expression of natural behaviour.

4.3.4 Higher welfare

The findings here on the framing of positive welfare as "high welfare" is from the perspectives of industry stakeholders (n=8). This is unsurprising considering the industry and markets focus on delivering products which society demand:

"So, I guess from my perspective it (positive welfare) would mean looking at the aspects of comfort. I guess your kind of then look at going down the route of higher schemes as well so things like grass fed beef and things like that you probably looking at organic sheep production your kind of be looking probably over and above. So, we have a framework within xxxxx but then you probably looking at additional standard above that you can potentially look at so say for example organic. Grass fed that sort of thing. Which is providing the animal with the extra comfort the grass-fed natural nutrition. You've been looking at I guess you would probably be looking at minimal housing for sheep as well I mean that doesn't naturally come to them have been housed so you will be looking at potentially being out

more. I guess it would be over and above the additional standards looking to see what the consumer would want" (Certification scheme 1).

"Positive welfare would be promoting, you know, not just the minimum standards, not just accepting animal [welfare]. It sorts of above and beyond that" (Supply chain 1).

In private farm assurance schemes, industry stakeholders set the agenda for animal welfare requirements on farm according to a differentiated set of higher animal welfare standards. Examples of higher welfare standards include the New Zealand Society for the Prevention of Cruelty to Animals (SPCA) certified standards derived from the Five Domains of Animal Welfare and from France, the Label Rouge standards, as well as the Global Animal Partnership which is a five-stage animal welfare certification. These schemes allow for the active engagement with farmers in higher welfare schemes to demonstrate how higher welfare is being achieved in practice can facilitate continuous improvement amongst other farmers.

4.2.5 Happy, healthy definitions

The "happy, healthy animal" definitions are a proposed integrated approach to animal welfare in the positive welfare literature (Vigors, 2019; Vigors et al, 2021a). This approach not only evaluates the lack of negatives but also considers the presence of positives, creating a comprehensive outlook. This is referred to as the prioritisation approach (Vigors et al, 2021a) where members of the public (farmers included) prioritise or value aspects of positive and negative welfare in their approach to welfare improvement (positive welfare).

This research also found that this definition emanates mostly from the farmers (n = 7). For example, Farmer 18 narrates:

"Positive welfare to me is a happy healthy sheep that produces to its top potential, that it produces hopefully a profitable end product."

This definition means that a happy and healthy sheep should be able to reach its top potential in terms of productivity, with a product ideally being profitability. Happy healthy definitions, therefore, has a utility value associated with it.

Happy healthy definitions centre around making sure each animal receives care and resources such as adequate nutrition, freedom of movement, and health, while needing to minimise experiences with physical or psychological discomfort such as pain, discomfort, or stress. As one farmer said:

"a happy sheep It would have plenty of Yeah. Grass... grass primarily. We don't use a lot of concentrates. So, plenty of grazing (grass). running around? Yeah, yeah, yeah, the things we talked about here, you know, healthy sheep are active, alert, and free moving. So, skipping to playthings like that" (Farmer 18).

Overall, the discussion highlights the importance of a natural and varied diet for sheep, emphasising grazing and limited use of concentrates. It also emphasises the significance of providing sheep with opportunities for physical activity and mental stimulation through play activities. These factors contribute to sheep's overall health and happiness, ensuring that they are active, alert, and free moving.

4.2.6 Positive welfare interpretations

Compared to previous definitions, the participants who interpreted positive welfare here is mainly from two distinct views: positive experiences outweighing negative experiences (Yeates & Main, 2008), and the good life definition (Edgar et al, 2013; Green & Mellor, 2011) .

Researcher1_grp, who is an animal welfare scientist, asserted the positive experience (outcomes) view:

"Positive animal welfare is about what the animal experiences……. a greater balance of positive experiences, pleasure, comfort, relaxation, excitement, positive social interactions, those kinds of things, and less of the negatives."

Participants who frame positive welfare according to the research literature discuss the most important elements of positive welfare. For example, autonomy and agency allow animals to make their own decisions about how they want to live (FAWC, 2011). Play behaviour is beneficial for both physical and mental development as it helps develop problem-solving skills, understanding of interactions between others, and for example memory recall abilities (Ahloy-Dallaire et al, 2018; Anderson et al, 2015; Augustsson & Augustsson, 2014). And importantly, the ewe lamb bond which help strengthen the social connections between mother sheep (ewes) and baby lambs which is an important source of comfort within the flock. This helps grow stronger ties within herds/groups (Dwyer et al, 2003; Dwyer & Lawrence, 2005; Freitas-de-Melo et al, 2021; Mora-Medina et al, 2016).

"Well for sheep is, was, it was a tricky one, because it typically in the UK, sort of quite extensive systems. So, some of these, some of these freedoms and positive experiences are, are better in sheep, I would say than for the more intensive species. You know, they, they are typically allowed, you know, to be reared and raised by their, by their mums. So, we've got that positive experience. They experience nurturing, and they (have) opportunities to play for pleasure. And now they are their reason reasonably extensive groups" (Actor 2).

4.3 Differences in participants' understanding of positive welfare.

There was a diversity of interpretations among the farmers and industry actors in their understanding of positive welfare. Academic researchers, veterinarians, advisors, and supply chain actors all provided different definitions for the same positive welfare term. The differences could be attributed to their unique backgrounds, interaction (or not) with different research disciplines and job focus. For instance, the ethologist argued:

"And for me, as an animal welfare scientist, positive animal welfare is about what the animal experiences. Because scientifically, I can measure the animal's behaviour and physiology and try to infer how the animal is experiencing things" (Researcher1_grp).

The differences in personal background and knowledge contribute to the conflicts and contestation around discourses:

"If we use the same term to mean two different things, then conversations can get quite complicated because we are not talking about the same thing" (Researcher1_grp).

Researcher1_grp further distinguished between providing the animal with positive experiences with the higher welfare definitions offered by actor2_grp:

"I like your explanation (above and beyond minimum standards). But I think it is different from the one I gave (positive affective states) because you are talking about the farmers thinking positively and acting positively, which is brilliant. Nevertheless, then you are using the same term that I would then use and apply (it) to what the animal experiences, which is (different)" (Researcher1_grp).

Researcher 1 highlights that the other definitions given by other participants centres around the farmers' positive thinking and positive actions. This suggests that the other stakeholders lay emphasis on the importance of farmers having a positive mindset and taking positive actions towards animal welfare. However, Researcher 1 points out that their own explanation diverges from this perspective. They indicate that their explanation, focusing on positive affective states, pertains to what the animal experiences. In other words, Researcher 1's explanation centres around the emotional well-being and positive experiences of the animals themselves.

Actor4_grp highlights that the good life and positive welfare concept are different definitions and there is a need for distinction:

"I would value both concepts (good life and positive experiences). But I think they are both different. And they should have two different names."

Actor4_grp statement. Actor4_grp's statement implies that although the terminology may create an initial impression of similarity or overlap, the specific ways in which the term is

understood and applied in each explanation result in different interpretations and considerations. This indicates that the speakers are approaching the term from different angles or perspectives, leading to distinct understandings and implications. This highlights the divergence in interpretation and focus, despite the initial appearance of similarity in the shared terminology.

Despite the difficulty in constructing a collective discourse among the industry actors, there is still evidence of recurring trends. Most actors tend to hold views which support higher welfare standards that go beyond what may already be prescribed by law or other regulations. This is evidenced by the fact that the definitions were suggested four times during the interviews, and similarly during the POW (see Table 7), indicating that their views on the matter remained the same. Also, it was apparent that the farmer held the same views regarding the good welfare framing as evidenced by their statements in both the interviews (n=5) and the POW (n=4). The consistency between the farmer's statements in the interviews and the POW further supports the idea that the farmer had a consistent opinion on the good welfare framing, as they were able to articulate the same views in both contexts. These findings are really important because they highlight that in order to engage all farmers on a journey towards positive welfare, regardless of where they start in practice, continuous improvement is key (Mullan et al, 2021).

In summary, farmers largely focused on "good husbandry" although their knowledge grew to "good welfare" definitions when discoursing what positive welfare is. For industry actors, it tends to be centred more around higher welfare considerations such as respecting animals' needs for humane treatment and minimising distress. There are some shared similarities

between these two groups that focus on the broader living conditions of the farm animals which include things like comfortable, healthy housing facilities for the animals.

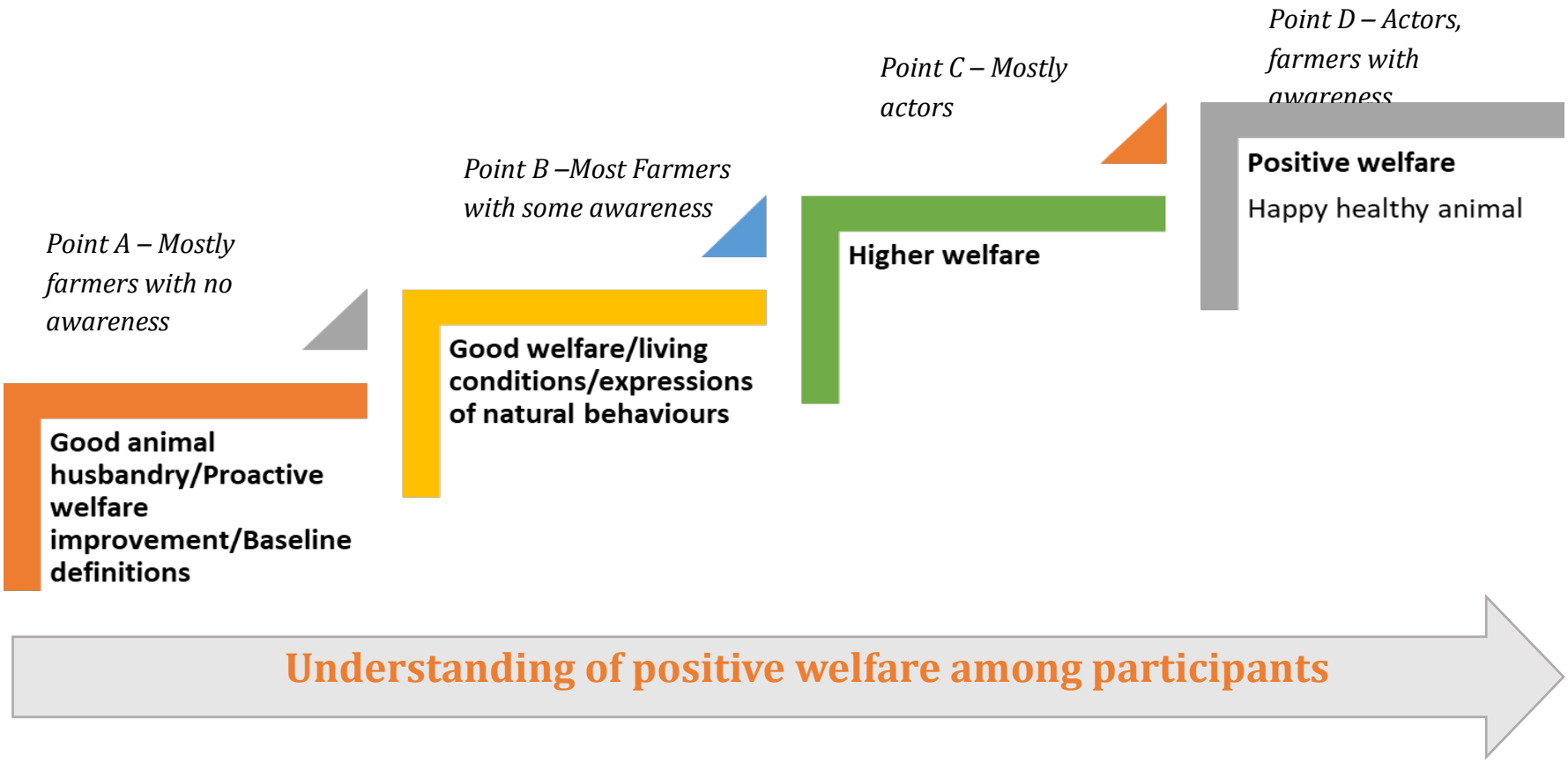
The concept of positive welfare, as understood by the participants, reveals a lack of common understanding among them. The varying interpretations and perspectives on what constitute positive welfare highlight the complexity and subjectivity of the concept. This lack of consensus can be attributed to several factors, including differences in personal values, cultural backgrounds, and professional experiences.

The participants' diverse understandings of positive welfare may stem from their unique roles and responsibilities within the context of animal welfare. Farmers, industry actors, veterinarians, and other stakeholders may have distinct perspectives shaped by their specific involvement in animal agriculture. Additionally, the lack of a standardised definition or framework for positive welfare may contribute to the divergence in understanding among the participants.

The absence of a common understanding of positive welfare poses challenges in implementing and promoting consistent practices across the industry. It underscores the need for further dialogue, collaboration, and research to establish a shared understanding and framework for positive welfare. By fostering open discussions and knowledge exchange, stakeholders can work towards developing a more unified and comprehensive understanding of what is positive welfare, ultimately leading to improved animal well-being and sustainable agricultural practices.

Figure 7 illustrates the variations in the positive welfare framings, including notions such as good husbandry, good welfare, higher welfare, and positive welfare, as expressed by the farmers and industry stakeholders involved in the study. The figure provides a visual representation of the diverse perspectives and understandings regarding positive welfare within the agricultural community.

Figure 7: Level of understanding of established positive welfare meanings in a hierarchical structure



4.4 Scrutiny and critical revaluation of established meanings of positive welfare and why this has arisen.

Evidence from the previous section has demonstrated that there lacks a uniform interpretation of the positive welfare terms. Nevertheless, a noteworthy pattern that emerges from the data is the expression of concerns about positive welfare, both as a concept and as a terminology. These concerns, from some sections of the farmers and industry actors, reveal the complexity of achieving positive welfare outcomes and underline the importance of all stakeholders' involvement in this process of animal welfare improvement. These are now discussed:

4.4.1 Issues with the concept and terminology

The word cloud (Figure 8) provides a semi-quantitative visual which illustrates the negative views associated with positive welfare and some more positive language.

Figure 8 Word cloud for analysis of participants' concerns around the positive welfare term.

Firstly, the female farmers (n=7) suggested that positive welfare is a *nebulous* and difficult term. They highlighted the term was still vague and therefore they struggled to understand it.

These farmers also discussed the cognitive impact of the word "positive", which causes them to make comparisons and construct associations in their minds with negative connotations, i.e., it created a binary narrative:

"So, it to me, it (positive welfare) makes me question, should we have negative welfare? I mean, that so to me when I think about positive and negative welfare, it makes me think about intensive agriculture, which we do not practice. It is just the way my mind is drawn to in terms of what negative welfare is acceptable. That makes me then think of intensification of agriculture" (Farmer 8).

One female agricultural advisor indicated that positive welfare is not well understood because negative welfare and language are more definable and understandable:

"I think the positive terms are not well understood and are much more nebulous than the negative ones. I think the avoidance of pain and stress is better understood than the positive actions" (Actor3).

This point link well with another farmer's (Farmer 8) concerns and, therefore, reluctance to go above and beyond the baseline standards because they consider *positive welfare* to be achieved if their flocks perform well within their extensive system. Similarly, Farmer 12, with prior knowledge of positive welfare, highlighted that she struggles to understand the difference between positive and negative welfare terms:

"So, we are trying to focus on the positive side; I feel like increasingly it has become gone towards, I think, the preventing of negative if you like, so I do not know, I find it hard to differentiate."

Another farmer with prior awareness of positive welfare also disagrees with its phrasing and articulation, suggesting that positive welfare cannot be positioned without articulating aspects of negative welfare. In other words, they explained that negative aspects and positive aspects are an interdependent part of the welfare discourse:

"I think you are not going to get to positive welfare without eliminating all those negatives. And then you must take another step to go to positive welfare. I would think" (Farmer 11).

Furthermore, farmer 24 and farmer 8 viewed positive welfare as an academic and judgemental term. These farmers criticise the term positive welfare as belonging to the field of research, and they feel that farmers (and advisors) do not have ownership of the term:

"It seems to be a very academic phrase" (Farmer 8)

Farmer 7 cautiously warned against using language that divides farmers into categories:

"You can promote high welfare, positive welfare. But you've also got to be careful that, you know, one of the easiest ways to do that is to point out bad welfare. You know, you can say my sheep don't have this, or my cows don't have this. And I think we've all got to be a bit careful at times when it comes to the sort of, you know, showing ourselves to the public that we don't throw each other under the bus."

Farmer 4 agreeing with the previous narratives, also added the importance of public engagement in the avoidance of using binary terms to classify farming practices:

"I mean, the last thing we want to be doing is, is running down other farmers and pointing out everything they might be doing wrong. I think it is just important to engage with the public and try and point out, you know, what we are doing, why we are doing it and what we are hoping to achieve by doing it rather than, you know, running down the guy next door who maybe hasn't got such high standards, that's not helping anybody in the day.

These accounts also suggest that farmers consider positive welfare has stigma associated with it, with the term being preconceived to having a silent dialogue that can (potentially) cause farmers harm by impacting self-ability or self-worth, and potentially (having the opposition effect of its intention and) discouraging dialogue around farm welfare improvement.

Furthermore, Farmer 24 suggested that the phrase, positive welfare, can be loosely applied, potentially opening the door to unsubstantiated claims without scientific evidence or verification:

"I think it is a very high-level term rather than one that, so it is like anything. Now, regenerative farming is very popular, but it means various things.

The same farmer called for the need to redefine positive welfare; otherwise, the aims of the term are unclear and thus difficult to achieve. This sentiment is shared by another (meat) producer who suggested positive welfare needed clearly defining but also highlights they agree with the phrase:

"Yeah, positive animal welfare is a good word. It is a good phrase to use. [however] it is not the most descriptive, is it? It does not tell you exactly what it means. But I am not sure I can think of a better way of explaining it" (Farmer 11).

Farmer 22 perceives that positive welfare seems just theoretical as a terminology, as it did not *sound* achievable, especially at the flock level. This farmer believes that the word "positive" implies a lack of progress in improving animal husbandry and, thereby, a lack of standardization to gauge progress:

"Positive almost seems like you are trying as opposed to good welfare, which means that you are achieving."

Farmer 8 associated the term as a reference for agricultural *catchphrases*, suggesting that it is being hyped with no trace of origin or development:

"You know, and to me, it is up there with regenerative agriculture because I do not understand where it comes from."

Another interviewee went further and alleged that the positive welfare term (and other visionary terms) is a potentially dangerous narrative and more focus on food security was required:

"I think there seems to be much research going down more the empathetic route, you know, vision agriculture, which is a bit new, nuanced, and dangerous. I think at the end of the day. We are producing food, which is essential."

The judgemental aspect is taken further in some respondents' narratives. Farmer 3 and Farmer 8 couched the term with scepticism and mistrust, associating it with a vague reference to existing frameworks such as the Five Freedoms, and questioned whether it would be determined in practice by a tick box exercise, citing Red Tractor assurance as an example. It was also questioned whether positive welfare fits with non-prescriptive systems (e.g., natural environment), arguing that only industrial farming (confined, intensive-based) needs to provide evidence of such welfare enrichments. One outdoor-based farmer with a small holding declared:

"I will be brutally honest. It is a bit like the Red Tractor mark, which I view with scepticism because it is what is done by industrial-level farming. They have the tick box exercise, and its standards are way below what is acceptable to me. So, positive welfare. I kind of think it might end up like a Red Tractor mark" (Farmer 3).

Farmer 4 questioned why welfare language should be of any use or importance than just ordinarily the "welfare" term. She argued that the definition of welfare is comprehensive and sufficient without the need for binary terms:

"I have an issue with positive and negative because the definition of welfare is health, happiness and well-being. So, I think welfare sums up what we should be doing rather than positive and negative."

Farmer 10_grp, supporting previous narratives, and argued that binary classifications could potentially be a judgemental tool to classify farmers into positive or negative groups. These can result in risks of defamation, i.e., the terms are value-laden:

"I agree that the positive [welfare] term is a difficult one [to comprehend]. And it can imply that farmers who are careful about their welfare but do not do positive welfare are poor, even though I do not think that is the case."

Farmer 20, also within the same group, agreed with the judgemental nature of positive welfare, added:

"Positive or negative, it should be (just) (be known) as welfare (at the) end of the day. Put this positive word, and say it is a great word. Same as sustainable; everybody is joking around. If the animal is happy and healthy, then the welfare is good; rather than I am better, my welfare is better than yours because I am positive, I got positive welfare, and you have acquired negative welfare. It does not stack up, does it?"

In contrast to all that has been discoursed by the sheep farmers, Researcher1_grp, a key research actor, defended the use of the term positive welfare, arguing that the term encompasses anthropomorphic languages that were otherwise deemed immeasurable in animal welfare:

"If we go to the language of QBA (qualitative behavioural assessment), a lot of that is about using subjective terms, that I think we are [becoming] more comfortable using the words like happy and relaxed, pleasure, joyous or something like that - words we are happier with using. But I suppose there has been this fear of introducing non-scientific and anthropomorphic terms because we have all been slammed over the past [for using those

terms]. So, using positive welfare is the sort of catch-all for something that sounds perhaps a bit more scientific, but less subjective."

In summary, the respondents (mostly female) who had problems with the positive welfare term appear to believe that positive welfare is at present merely a misleading term that may eventually become another normative industry standard without valid evidence behind its point of distinction. These respondents did not present any distinguishing factors between current welfare frameworks and positive welfare frameworks, and furthermore appeared to believe that academics are promoting the term without clear scientific informed definitions. Furthermore, this highlights the need for existing positive welfare scientists and associated actors such as extension providers, policy makers and key support actors such as vets, to actively engage with the farming community to develop a co-generated understanding and evidence base.

4.4.2 Issues with assessing and measuring (positive) welfare: *It is a tacit ability*.

Issues with assessing and measuring welfare are not new problems and have been reported in the past literature on animal welfare (Buddle et al, 2021). However, in the case of positive welfare, it is more of a farmer issue, as here in this PhD study, sheep farmers (n=4) did not entertain the idea of having a tick box or checklist-based assessment scheme for monitoring or verifying positive welfare. The concerns raised in this context exhibit notable differences when compared to the findings of previous studies concerning the assessment of positive welfare. For example. dairy cattle farmers justified positive welfare assessment as a means of recognition and reward for higher welfare practices (stokes et al, 2022). In contrast, here, only some industry actors (n=3), recognised the need for a positive welfare framework to

ensuring its practical implementation, as well as to substantiate claims of "going above and beyond" minimum standards.

"So, I suspect positive welfare has got to be put in boxes, so people know what they have got to deliver. And if you look at a system, you can see whether it ticks the box. And whether that is, and I think there are behavioural issues, and I suppose positive experiences may well stray outside those boxes, but I think it will be workable. You have got it; you have got a box up" (Actor4_grp).

In addition, two farming respondents expressed negative attitudes towards some of the positive welfare principles (particularly *pleasure* principle in the good life framework) suggesting that it (pleasure) to be a human-oriented phrase. Therefore, it was rejected on this basis of the perceived anthropomorphic nature as well as being unsuitable as a business indicator:

"If I can't measure that, it's not a valuable lever for me to use. So, it may seem, it may seem a bit flippant and a bit arrogant. But if it's something I can't measure as a business tool, I can't put it against an outcome. I think it becomes insignificant, which sounds awful, but I do not. I mean, I barely measure whether I thought my dog's walk was, you know, pleasurable. But I don't think I consider pleasure with sheep" (Farmer 8).

Like other animal welfare studies (Buddle et al, 2021), most of the farmers deemed positive welfare assessment inherent in farmers' mindsets. In other words, measuring welfare requires the tacit knowledge of the livestock farmer gained over time with the experience of managing farm animals. It was discussed that such knowledge is difficult to describe to someone

unfamiliar with sheep and other farm animals. Buttressing this hypothesis, Farmer 1 in the group asserted:

"If you need a measure (positive) animal welfare (such as happiness), you will have to speak to the shepherd. He could score that fill the sheet; how happy are they. But you would have to rely upon that shepherd."

Therefore, it was suggested that (positive) welfare assessments involve subjective elements culturally transmitted from generation to generation:

"That measurement (of happiness) is in me. Is it important for me to pass that on to a layperson, so they can measure it? The answer is no. But it is important to pass it on to a new generation of the shepherd (the answer is yes), and I am sure they would grasp it very quickly" (Farmers 1_grp).

Even though it has been made clear that assessing welfare is a matter of experience, farmers nevertheless remain concerned that their tacit knowledge and abilities are rarely recognised if they do not interface with the requirements of the market and legal standards:

"We, as farmers, know our animals. We know what is right…we know in 10 seconds, as we just said. But outsiders can be hypercritical and put more pressure and tension on us as practical farmers; we know what is going on. And in effect, undo the good we are doing by increasing the pressure. We must watch this danger, so this does not go in the wrong direction. It is the right ethos. We got to be careful what we are doing" (Farmer 23_grp).

In addition, sheep farmers and industry actors (n = 7) argued further that measuring welfare (and positive welfare) will vary among farms as there is *no one-size-fits-all* to welfare assessments:

"I think that would completely depend on the type of farm and sheep as well. It depends on the environment you are in. One example was somebody who had sheared early or late that sheep had in weather that for them was good. But by me, you could not shear that [time]. I think it was November. So, I do not think there are set measurable actions for set farms. It is completely related to what is best for your sheep in your system, on your farm" (Farmer 10_grp).

Farmers' have different thresholds for welfare (*what is good for my farm*, or *what I want to improve on*) based on their objectives and geographical location, and these features will influence what the farmers will want to assess to score themselves "good" or "bad". Further examples were given to illustrate the previous point. A meat-producing sheep farmer expressed a preference for the absence of disease and good biological functioning as their preferred approach for welfare assessment:

"I think the sort of easiest way in my mind to look at that this is rates of lameness, death, you know, nutritional sort of metabolic issues, things like that because I think you can actually put a number to things like that…you know, a good way to measure for me is how many lame ewes, with different times a year have been sort of different risk factors for lameness. And, you know, it is quite interesting to count in each group; how many were lame, and how many were treated this time compared to last year? And I think, from a sort of measuring point of

view, you can put a number on which, you know, it is quite interesting and useful now" (Farmer 7_grp).

In contrast, a wool-producing farmer focused on the absence of negative affective states as what is perceived as good for the welfare of their sheep:

"If you have got hands way up and down harassing the sheep and the pens, they are getting really stressed. You might have hardly any lame sheep. And you write that quite high under welfare standards, but the sheep are highly stressed, which is poor welfare. So how, you know, how do you go about measuring that? I think it is a really difficult thing to put a number [to]" (Farmer 4_grp).

These two divergent views suggest that what participants consider as "positive" or "good" welfare is highly subjective, or on a continuum.

In summary, some farmers expressed displeasure with the idea of (positive) welfare assessments by vets/assessors through tick box/checklist framework schemes. Assessors/vet practitioners should, it was suggested, rely on farmers' subjective judgements of the welfare states of their flocks. This provides a challenge for communicating (positive) welfare to society. In contrast, an industry actor said that such subjective matters must be treated cautiously to avoid bias. Most of the industry actors, however, in contrast to the farmers, believe that a positive welfare framework offers a sense of direction and a tool for claim substantiation in the event the market (or government) pays for positive welfare.

4.4.3 Lack of attention is paid to the discourse on improving health.

Interestingly, Rault et al (2022) propose expanding positive welfare to include eradicating diseases while promoting positive welfare states. Similarly, one participating veterinarian suggested here that the definition of positive welfare should comprehensively include ensuring good health and productivity:

"Positive welfare, presumably does that include disease prevention, though? Does it? Because obviously, that is very (important economically)" (Veterinarian_grp).

The process of treating pain and discomfort caused by disease experience was discussed as improving not only the liveability of the animal but also from an economic viewpoint. Veterinarian_grp added:

"If I can prevent the lambs from getting watery mouths, that is a huge positive welfare and a huge economic benefit as well. Joint ill, anything like that."

Farmers 4, 7 and 20 in POW further argued that medicine (e.g., responsible use of antibiotics) plays a crucial role in eradicating health challenges and, should therefore be an approach to achieving positive health in flocks. Farmer 4_grp, for instance, stated:

"I think it is all relative; if you have got a sick ewe and you have got antibiotics at hand, and you do not give those antibiotics to cure that sick ewe, how can you say that is a high welfare standard? You know, you are neglecting your duties to animals by not treating [them]."

Similarly, using medicine to treat diseased animals was discussed to have multiple benefits, including improving the mental health of the farmers (potentially knowing that the animal was going to recover):

"That is multifactorial (positive health), isn't it? You know, it is the economic benefit of antibiotic use. And, you know, farmer health, stress, and everything else" (Certification scheme_grp).

Industry actor1_Grp added that health is not the absence of disease as it incorporates other aspects, such as mental health for the animals, which has received less attention in the discussion among industry actors. Specifically, however, the narrative herein is one of cost-utility and cost-effectiveness, especially around managing diseases, which impact both animal and public health.

4.4.4 Positive natural systems are good but have many trade-offs.

Farmers and industry actors highlighted there are trade-offs, and welfare issues associated with specific time points, such as handling, disease spotting and treatment, sheltering from harsh climatic conditions, and the continuous supply of pasture all year round. Therefore, participants discussed the need for particularly more human intervention in extensive natural systems, and this concern is well documented in the literature on animal welfare (Dwyer, 2009). It was also highlighted that it was difficult to ensure welfare standards in the natural environment as it is difficult to uphold/enforce even all five freedoms when intervention strategies are needed.

The positive welfare literature seeks to replace the use of sheepdogs when handling sheep to enhance the quality of life of sheep (Stokes et al, 2017). However, it was argued that the

handling issue requires some trade-off considering their (farmers) perceived usefulness of dogs in the handling and yarding process. Industry actor Actor1_grp argued:

"There is always a playoff as well, between, you know, I am just thinking about the sheep-dogs issue. I guess you would have a bet whether we should use sheep dogs or not. But, you know, there is no doubt that when you gather sheep with a sheepdog, they are being herded through a level of stress, aren't they? But I could certainly justify that in my mind because I need to gather to improve health [of my sheep]."

Researcher1_grp, backing this previous point, added:

"And it is this trade-off, isn't it? Between [positive and negative experiences]. None of us always live a life of unrelieved joy all the time. You know, there are positives and negatives. And I think you know. [suppose] you allow them to express positive social behaviour. Shall we call it, or, you know, the comfort and pleasure of interacting positively with each other and feeling comfortable about their environment? That also means that you might experience short-term periods when you are cold or wet or do not have shelter. So, it is about a balance, I suppose, between those different things and the trade-offs that we and it is, as I suppose, making those trade-offs, the animals might be making some as well, but we make some too."

These trade-offs involving human-animal relationship have been extensively covered in the literature of traditional animal welfare (Dwyer et al, 2004; Dwyer, 2009; Terloew et al, 2007). The narratives suggest that the trade-offs can be broadly categorised into two categories: ethical considerations and practical considerations. Ethical considerations involve questions such as whether it is right to use dogs to herd sheep as the sheep are stressed.

Practical considerations relate to realistic impacts of herding sheep without dogs. The trade-offs associated with these issues are interesting because they highlight different values held by communities, and society over what the role of animals in the production system is. Clearly, further research on how cultural norms influence the practice of positive welfare, particularly with regards to using sheep dogs, needs more enquiry and engagement with the farming community.

4.4.5 Farmer welfare is not included in the positive discourse.

In the wider animal literature and positive welfare studies, the relationship between the welfare of the farmers and that of the animals has been subject to recent inquiry (Hansen & Østerås, 2019; Rose et al, 2022b). Similarly, participants reemphasised the association between the farmer's own welfare and the animal's welfare. They questioned why the welfare of the farmer is not discussed or considered alongside the positive animal welfare:

"The thing that's overlooked, I think, is the human welfare aspect on farms. So, you know, if you have got people who are not overworked and exhausted and do not in many hours, the animals get better attention" (Veterinarian_grp).

This is a really important point given the fact that humans are the gatekeepers to farm animal welfare, and if human welfare is not considered front and centre in that process, then it is unlikely to have the desired outcome.

4.5 Emerging meanings and narratives in the discourse of positive welfare

The section presents the new meanings associated with positive welfare by the respondents. Participants attributed other meanings not expressed in the current positive welfare literature in the interviews and discussion. These meanings and narratives within discourses we term

"emerging meanings" with three iteratively created themes that contribute to knowledge and understanding of positive welfare. These are: motivating welfare terminologies, environment as the sixth principle of the good life concept and *petification* of sheep.

4.5.1 New welfare terminologies

Given the farmers rejected the positive welfare term, and expressed a lack of ownership over it, the participants were then asked both in the interviews and in the POW if there were other languages or terms, they used to describe their sheep's welfare and increasing welfare states. Interestingly, all respondents suggested differing welfare terminologies to articulate their farm animals' welfare states more meaningfully (for them). These words appear to be an attempt to reclaim the welfare language and range across the use and application of preferred phrasings, such as animal welfare, positive well-being, high welfare, good welfare, happy, healthy sheep, and *stockperson(ship)*. Figure 9 shows the word cloud of the positive terminologies' participants used to describe increasing welfare (in contrast to using the term positive welfare itself). Interestingly, not all participants rejected using the word positive as you can see from the word cloud below, although good was the most common word expressed.

Figure 9 Wordcloud for motivating welfare terminologies

The prominence of the word “good” in the word cloud can be attributed to the fact that four of the reported terminologies included this word. As a result, its frequency was higher compared to other words, leading to its larger size in the word cloud visualisation. This observation is not surprising, considering that “good” is a commonly used adjective in everyday language and discourse. Its frequent usage in various contexts contributes to its prominence in the word cloud. The four terms are “good welfare” (n=6), “awareness of good practice” (n=1), “good condition” (n=1) and “good life” (n=2). These phrases, although not equivalent make use of an adjective form of the term to indicate some kind of effect or outcome associated with whatever action has been taken. For example, farmers that refer to “good condition” might be supporting the narrative that high productivity equals good welfare. Thus, this could explain why these terms include the world “good" so frequently and therefore cause it to be much larger than other words within a given phrase or sentence structure related to acting or assessing progress towards positive outcomes.

Both groups of farmers groups (meat and wool) (n= 9), especially those from the meat-producing sector, said they preferred *high welfare* term, and were happy to associate the term with their current practices. One possible reason the meat farmers may prefer to use the term "high welfare" instead of “positive welfare” is because in the context of animal welfare, these groups consider it an absolute term refers to a term that does not imply a relative or comparative judgment. Instead, it signifies a specific and fixed standard or level of welfare that is considered superior or elevated. By using the term “high welfare”, these groups are referring to a specific threshold or standard of welfare that they aim to achieve or maintain for their animals. This term does not imply a comparison to other levels of welfare or suggest a range of possible welfare states. It represents a definitive and non-negotiable standard that

farmers strive to meet. Therefore, the high welfare phrase appears to remove the silent or *shadow language* of positive must mean negative exists and the implied culpability, implying that if someone is good, then someone else, somewhere else, is bad:

"I would describe it as high welfare. Well, that is what we try to do anyway" (Farmer 21).

Psychologically, some of the sheep meat farmers without prior awareness of positive welfare assumed it to be the same thing as higher welfare:

"You know, I had never thought about it. In fact, it probably.... to me means the same thing (with high welfare)" (Farmer 7_grp).

Another meat producer, attempting to resolve psychological conflicts of the terms (positive and high welfare), mirrored them in one phrase:

"I would say we are very highly positive welfare" (Farmer 16).

Others, however, clearly differentiated high welfare from positive welfare, the latter which was considered in this comment as extraneous and meaningless:

"Yeah, high is better because just positive is just a word. It is just like. It has just been chucked around, isn't it? If you say about high, high welfare standards, then really you can measure that. You cannot measure [what a] positive [is]. Positive [is] just an idea. I could be or say I am a positive farmer. Anybody can chuck it around. If you have something you can measure, this is easier than…." (Farmer 20_group).

It was added that the high welfare term is used widely, already has an inherent market value, and is considered a benchmark standard for national and international levels:

"I mean, we are very fortunate in the UK that we have such high standards on animal welfare, like New Zealand. And all the sort of reduction of antibiotic use and things like that. So, we are at a good level anyway" (Supply chain 1).

A couple of opposing themes emerged regarding using high welfare in farmers' language in the interviews and workshops. One meat-producing sheep farmer suggested that although high welfare is commonly used, it may not indicate all welfare states. Aspects of welfare may not be included in the assessments, resulting in an incomplete picture of the overall welfare of the sheep.

There were thoughts about whether "positive well-being" terminology is a panacea. The phrase "positive well-being" was proposed by wool supply chain industry actors used by Supply chain 1, both in the one-to-one interviews and in groups at the POW. The industry actor described that positive well-being as a concept elucidates the experiences of the animals and, therefore, is less implicit compared to welfare. In their argument, industry actor Supply chain 1 cited anecdotal evidence suggesting that the term positive well-being is commercially appealing and could provide grounds for developing a common vocabulary between science and society. Thus, the suggestion is that positive well-being can be a more practical and effective communication tool for the supply chain as well:

"We have been focusing on or discussing that we have been tangling with this word welfare versus well-being. And I think if you were trying to reframe this, then well-being is the (right word). welfare is implied already that it is human-impacted, whereas ... (well-being is animal-focused). And it is relative to the experiences (of the) animal."

However, well-being has been interpreted with multiple definitions, leading to some research to conclude that a universally acceptable definition may not be feasible due to personal values, views, and experiences (Lerner, 2008). Besides, the issue of switching language from welfare to well-being has been debated in both animal welfare literature (Lerner, 2008) and (associated) positive welfare literature (Williams, 2021), and so far, the terms are best used as complementary synonyms to one another (Carernzi & Verga, 2009; Fraser et al, 1998).

Indeed, most of the well-being literature is mainly associated with human well-being. In agreement with this, the industry actor supply chain 1 suggested that positive well-being appeals well to consumers because it evokes human characteristics and feelings:

"My perception is that I think consumers or brands associate health and well-being, mental well-being, and human well-being. I think they see that similarity moving over to animal well-being, but perhaps [we] do not have that background in animal welfare and the five animal freedoms and the other aspects at farm level to make sense of that difference" (Supply chain 1).

However, Farmer 8, during the interviews and workshop, displayed scepticism over switching language from (positive) welfare to (positive) well-being terminology. Her concerns were the lack of verbal communication in animals, which is required to express one's feelings and emotions, meaning well-being was potentially an inappropriate term:

"I think I associate well-being with people. I never get to question my sheep on a one-to-one basis of whether I have said well-being. So, it must be a general observation and not, you know, an individual sort of conversation."

The same respondent felt using a well-being term intended to improve the experience of animals would be *counter-productive* if it resulted in humans having a poorer understanding of animals' intrinsic characteristics:

"I think well-being is very much a human term. And, you know, we can communicate well-being, (but) I am not sure animals can communicate that on the same level."

Positive well-being is a term being proposed by wool industry actors as an alternative to positive welfare terminology. It is perceived as *less implied* and embodies the characteristics of improving the lives of farm animals from the *animal's point of view*.

"One of the things that we have been focusing on or discussing is that we been tangling with this word welfare versus wellbeing. And I think if you were trying to reframe this, then well-being.... welfare is implied already, that it is human impacted, where whereas wellbeing is animal focused. And it is relative to the experience's animal. And, we have worked we are trying to sort of reshape or rebrand this in a communication tool, out to the marketplace for the wool was based on animal wellbeing versus animal welfare and moving to wellbeing versus welfare. I don't really want to sort of debate the semantics, because the thing is, I am sure I have got it wrong, but it's just a feeling of, of where we are now, versus where we probably need to be" (Supply chain1*_grp).

However, the term has raised concerns with other participating farmers, who do not find anthropocentric terminologies particularly useful for sheep.

Among the terms mentioned as substitutes for positive welfare were happy (healthy) sheep (n=5), animal welfare (3), and thriving (n=1). Happiness (happy sheep) as a term was heavily criticized by Farmer 5, who argued that the use of "happy" is unscientific, unprofessional, contaminated with extensive use and associated with "smallholder" agriculture. In contrast, the term "contentment" was described as an animal that is unafraid, curious, not worried, not seeking food or shelter, has had enough to eat and is not actively seeking food, not actively seeking warmth and comfort as it already has those basic needs met (Farmer 5). In the literature, contentment is understood to be an indicator for assessing affective states and like Vigors (2019), we find that most farmers mentioned it in their narratives.

There are those with a minority view (n=2) who agree that all the concepts and terminologies presented of welfare are valuable but emphasise that the wording around the stockperson, who provides care, handles the animals' affairs, and influences their lives, should be central to the research. According to this new finding, welfare language associated with caregiving should not be entangled with the application of social policy seeking to improve the lives of farm animals. Farmer 23_grp opined that:

"You know, the welfare (of) the sheep and all that word is nice, but I am quite big in stock person or a stockperson. Yeah, that is the person that knows about livestock and looks after livestock."

These emerging positive terminologies stimulate the need to rethink and reshape current positive welfare terminology to gain wider farmer acceptance. This is especially true since context vocabulary may be used with multiple associated meanings, and preferred language may support and characterise their meaning.

4.5.2 Environment as the sixth principle of a good life concept?

Industry actors explain that sheep live in the environment and derive positive benefits from it; therefore, the relationship should be more mutual and symbiotic (a relationship mutually beneficial for the environment and the animal). It was, therefore, suggested that positive welfare must embrace environmental care and considerations along with the welfare of the sheep. Participants highlighted that incorporating environmental indicators in positive welfare can make positive welfare more valuable and embed more meaning, preventing the term then becoming a more relevant concept:

"I think if the positive welfare sort of definition is to be of any value, you would have to bolt it down to certain standards in the environment and management, which you felt allowed sheep to be relaxed and have a reasonable lifestyle…. it makes it almost impossible for the industry to deliver on [without environment]" (Actor3_grp).

Participants also highlighted that there are trade-offs between providing positive welfare and environmental sustainability. For example, Actor4_grp added:

"You cannot promote a high welfare system. If it is environmentally damaging, you know, there is just it is just, it is not going to work."

It was further argued that the environmental element could send a positive and pertinent uniting message to consumers and farmers, even when consumers and farmers do not well understand the concept of positive welfare:

"We used to have discussions about the fact that people did not understand what organic was and what it really meant. And most people just felt that organic was good. They did not know why; they did not want to know why; it just had this rosy glow. And it was probably good for the environment. It was probably pretty good for animal welfare. And that was enough, to be honest; they did not need more. And I am slightly concerned about trying to get market gain from high welfare products. Then again, we want to think more holistically. You know, I want to buy food from a farm that has good environmental conditions. I would not want to buy a high-welfare product without thinking that it might damage the environment and that they might all go together. But putting things in silos, I think it just concerns me a little bit (industry actor 1).

The main environmental descriptor suggested by the industry actors was holistic management through regenerative agriculture:

"And at some point, in the next 10 to 20 years, we hope that well-being and regenerative merge because they are both continuous improvements. They are both very much farmer-led and quite big changes in verification, certification, and standards. It is a whole other world. Holistic science, isn't it?" (Supply chain 1).

Clearly, industry actors unsurprisingly have suggested here that positive welfare focusing on the animal's good life may not receive the widespread attention it deserves if it does not

incorporate environmental care and management. This is due to several factors. For example, environmental policies are becoming increasingly important in today's society to tackle both climate change and biodiversity degradation (Llonch et al, 2017) and this has led to increased demand from consumers and society. In addition, the increase in public concern about climate change means that there is now more focus than ever before on finding ways to reduce emissions and conserve resources through policy initiatives. Therefore, positive welfare frameworks and associated practices that do not take into account their impact on the environment are irrelevant (Bourque, 2017).

These finding adds weight to previous studies (Stokes et al, 2022), who reported that policy initiatives in isolation may not support the uptake of positive welfare changes in farms.

4.5.3 *Petification'* of sheep

Farmers explained that domesticating and *institutionalising* sheep with no novel experiences (outside their natural environment) is not positive for sheep welfare.

"They are not dealing with novel experiences. They are dealing with the routine stuff only. Yeah. I mean, the routine might not be quite fun, but it is still routine" (Actor3_grp).

This same industry actor and another farmer strongly objected to *petification,* an interactive term developed by the researcher to describe the interaction that constitutes scratching, brushing and gently stroking sheep to elicit a pleasurable experience for the animals. Firstly, participants suggested that interacting with sheep to a point where they approach you for stimulation, was beyond the cultural norms of human-animal farm relationship for these farmers and industry actors:

"And actually, that is a really good point, because when I saw in the film that sheep coming up to the person, my immediate thought was that sheep was having quite a lot of hand feeding" (Farmer 15_grp).

They also highlighted their concerns with encouraging this behaviour:

"And if I were to do that with my sheep, the next thing would be a bump up the backside, for me, you know, so I think this kind of felt like almost a step beyond a normal sheep" (Actor3_grp).

Farmer 15_postgrp supporting earlier narratives against the *petification* of sheep, also added:

"I am not sure you want to hear this either, but I found the film made me uncomfortable. For me, it is incorrect on several levels, those sheep appeared to be "pets" rather than a commercial flock, and quite clearly, there were not very many either."

The concept of *petification* among the participants seems to raise concerns about the potential negative impact it could have on the public perception of sheep farming and the consumption of sheep products. Specifically, there is a worry that if sheep are increasingly regarded as pets rather than livestock, it may contribute to a shift in public sentiment that could affect the sheep farming industry. Farmers and industry actors' express apprehension that this perception shift may further embolden the anti-meat movement, such as veganism and vegetarianism. They argue that because many individuals do not typically consume the same individual animals that are commonly kept as pets, the distinction between pet animals and

animals raised for meat consumption could strengthen the ideologies of the anti-meat movement. This concern reflects a broader recognition of the potential influence that perceptions and attitudes surrounding animals can have on dietary choices and consumer behaviour:

"I think you must be a bit careful (in making consumers choose positive welfare) because if people think they are all pets and got toys to play with, it might turn them off eating lamb chops. I am also concerned that if the public sees images in the (petting, brushing, striking) film [video], it could turn them off eating lamb! No one would want to eat their dog" (Farmer 15_grp).

These discourses suggests that for these participants, *petification* may, in the long run, create a negative public perception of sheep farming and consuming sheep products where sheep start to be considered a pet.

The discourses provided by the respondents highlight a belief that keeping sheep in domesticated and institutionalised conditions without exposure to novel experiences may negatively impact their welfare. The lack of novelty in their lives can lead to boredom and frustration, which can have a negative impact on their mental and physical health. Furthermore, the lack of novel experiences can lead to a decrease in their cognitive abilities, as they don't have the opportunity to learn new tasks or behaviours. This can lead to a decrease in their quality of life, as they are unable to engage in stimulating activities that could potentially enrich their lives. Prior research on farm animals, while not specifically focusing on sheep, has indicated that institutionalisation can lead to the development of

stereotypic behaviours (Latham & Mason, 2008). However, there is a lack of up-to-date information specifically addressing sheep in this regard.

Extreme human-animal relationships can manifest in various ways, including expressions of affection or even extreme anthropomorphism. These relationships involve the excessive projection of human characteristics onto animals, blurring the boundaries between human and animal behaviour. Scholars such as Shaw (2012) who support these human-animal relationships (HARs) contend that the current academic discourse used in reference to non-human animals contribute to and perpetuate societal and cultural inequalities between humans and other animals. The recognition of animal sentience and consciousness plays a significant role here, with scholars like Wallach et al (2020) advocating for the need to recognise the "personhood" of animals. Recognising animal personhood involves acknowledging the moral status and inherent value of animals as individuals. These scholars call for a critical reflection on the ways in which language shapes our understanding and interactions with animals, and the potential implications for their well-being and rights.

In summary, farmers here are concerned with the ethical implications and consequences of anthropomorphising animals to an extreme degree. These concerns highlight the complex intersection of societal attitudes, the role of social movements, and the potential influence on consumer behaviour related to the *petification* of animals typically used for meat production. It underscores the need for further exploration and understanding of the dynamics between *petification*, public perception, and attitudes towards meat consumption.

4.6 Summary

The chapter sets out to answer the following research questions:

a. How well are the UK sheep farmers and industry actors aware of positive welfare terminology? Does positive welfare feature prominently in industry actor discourses? If not, what other terms do they use?
b. How do U.K. sheep industry actors interpret, define, and view the concept of positive animal welfare? How is it (positive welfare) approached from industry actor perspectives?
c. What are the differences in the level of awareness, what different interpretations of established meanings are there, and what are the new meanings among different industry actor groups?

The findings presented in this chapter revealed that most of the respondents who were farmers in the study were not aware or familiar with the term positive welfare compared with the industry actors. Respondents indicated that the term positive welfare was not language the farming community themselves felt they *owned*; the term did not originate from them. Their proposed terms for increasing welfare arise mainly due to their (farming community) sensitivity to the use of binary judgement-based language, such as positive versus negative or good versus bad, which they believe can be used by other industry actors to apportion blame or guilt for the negative impact of husbandry practices. Alternatively, most respondents preferred to use terms such as higher welfare to avoid any moral connotations.

The findings from the chapter shows that awareness of positive welfare practices was not always improved by prior experience. Prior experience may shape expectations rather than directly increase knowledge or awareness; this means while experiences can encourage

people to pay more attention to new welfare terminology those same experiences do not always actively change beliefs about animal welfare in practice.

Sheep farmers and industry actors proffered various interpretations of positive welfare based on their lived experiences. Gender appears to influence views and awareness of positive welfare; women were more critical of the terminology. Most of the knowledge constructed at farm levels or discoursed via industry support actors is health-related, and a major aspect of positive welfare dialogue is missing. Industry actors raised concerns with the assessment measures approach to positive welfare, further revealing their knowledge of the concept and its difficulty in practical settings and assessments. New meanings were associated with positive welfare, and focusing on these emerging themes in future research could be instrumental to forge collaboration between farmers and research to develop a collective understanding and action for continuous improvement of "positive welfare".

The research questions, a, b, and c were addressed through the analysis of data obtained from individual interviews and online participatory discussions. The results of the study indicate that industry actors possess a greater level of understanding and awareness regarding the concept of positive welfare compared to farmers. The findings also reveal that farmers primarily prioritise good husbandry practices and do not actively consider enhancing the animals' quality of life from a positive perspective unless there are direct benefits or alignment with other prioritised principles such as environmental concerns. Future research could investigate the motivating factors that encourage farmers to adopt positive welfare practices. Additionally, it would be valuable to examine the specific positive welfare practices implemented by sheep farmers and explore the differences in awareness and understanding of positive welfare among key industry actors. Furthermore, future studies

could delve into the broader and more comprehensive meanings associated with positive welfare.

The next chapter explores the findings of this research in terms of the role of language in implementing positive welfare as a concept, with particular emphasis on addressing research questions d, e and f.

Chapter 5.0. Discourses and dialogues in response to positive welfare wording: the role of language in influencing farmer behaviour.

Participants were asked whether the way welfare language is *worded* and *framed* by the literature (i.e., positive vs negative framings) influences how farmers implement welfare improvements on farms. Factors beyond the person, such as the situation and the socio-economic and socio-political environment, were considered as to how they influence language, discourse, and the meanings derived.

5.1.1 Positive welfare - *We are doing it anyway.*

The most popular view from the respondents (n=8/25), mostly from the farmers, is that welfare language, as a word function, is merely descriptive and does not significantly influence or describe farmers' decisions to implement welfare improvement strategies.

"I do not know, necessarily, that the word is important to the farmer because we are doing it anyway." (Farmer 11).

"I think like what everyone else has said, how it is framed, what it is, what it is called, does not affect how I care for my sheep. I look after the flock the best I can, regardless of what it has called." (Farmer 10_grp)

Farmers (15/25) reported that positive welfare is not a term they use in their daily discourses, as these tends to be based on good husbandry, i.e., an absence of illness and diseases, or ensuring food availability. One participant described the difference between everyday language and a global concept such as positive welfare:

"You start a conversation by saying, are the animals, OK? So, it would be more about, are they looking, OK? are they happy and have they got food? So, you break it down into its components rather than talking about it in that global way. So, it is more nuanced; it is a bit more granular. As a farmer, you are more interested in the detail of it rather than the overall concept." (Farmer 24)

In contrast, some industry actors (n= 5/8) responded that positive welfare is a part of their day-to-day vocabulary. The industry actors who stated they use the term positive welfare in daily discourse were primarily influenced by their organisational values and ethics. For example, the wool industry actors explained they seek to add value at the farm level and through the supply chain to fibre products and have considered whether positive welfare is one of the ways to achieve this. In this sense, the wool supply chain's relationship with positive welfare, as a term, is evidenced by the interviews, is rooted in their business values, seeking to *internalise* the term within their supply chain:

"So, the [anonymised], as you know, is our sourcing platform, how we connect the growers to the end consumer in outdoor apparel. Wool keepers have many different value propositions. Fair price, direct working with the farmer, farmer, mental health, regenerative, and one of the core pillars is positive animal welfare. So that is when we talk about it specifically relating to our business and offering." (Supply chain 2)

The use of the positive welfare term in this context originates from the wool industry actors' belief that consumers prefer this terminology (and presumably practice) in their discourse. Therefore, the wool industry actors are interested in it because it has *positive* connotations that can be used for commercial purposes:

"In the apparel industry, there are lots of positive, like the word positive used a lot. So, we came across it and sort of marrying the tool up in the consumer world." (Supply chain 1_grp).

Two other industry actors, one with a research background and the other with advisory experience, offered different reasons to internalise positive welfare dialogue in their organisations. These advisors clarify that positive welfare is perceived as a new science, and there is not enough data available to back it up, so, therefore, the concept is yet to be widely communicated to farmers via knowledge exchange activities:

"I think you know the positive welfare aspects are certainly new and are probably... I am not [sure] they are within any of our communication material. Nevertheless, it is evolving. So, I expect it will become an increasingly important part of how our organisation considers animal welfare." (Actor2)

A perceived lack of evidence bases by Actor_2 can be addressed by actively conducting more research on positive welfare to generate a robust body of evidence that can support and inform decision-making processes. This evidence base can contribute to the development of effective policies, interventions, and practices aimed at promoting positive welfare in various contexts. Additionally, conducting more research can help address any scepticism or doubts surrounding the concept of positive welfare, providing a solid empirical basis for its implementation and evaluation.

For the participating veterinarians and certification scheme personnel, the lack of use of the term was associated with a wider focus on improving the quality of lives of animals through

husbandry issues. Priority in discourse and action still revolved around eradicating negative affective experiences and feelings such as pain, stress, discomfort, and distress.

"It [positive welfare] is used [internally]. However, our emphasis is more on conventional welfare. And, over the last year. So, we have been interested in pain management and relief around routine interventions like castration or tail docking, and methodology but also looking at pain, pain relief." (Actor4).

"From a stakeholder perspective within the industry, there is probably looking at animal health and welfare… also, the five freedoms….to be honest, the five freedoms are probably the main term regarding within the [anonymised] "(Certification scheme 1).

In any case, these findings indicate that there may be an association between the lack of explicit use of the language of positive welfare and the potential underutilisation of practices associated with it. While this does not definitively prove that farmers are not practicing positive welfare, it raises questions about the extent to which these practices are being implemented. The absence of explicit language may reflect a lack of awareness or understanding of the concept of positive welfare among farmers. It is possible that farmers are engaging in practices that promote positive experiences and well-being for animals, but without recognising or labelling them as such. However, the lack of explicit language can also be indicative of a broader gap in knowledge or a lack of emphasis on the importance of positive welfare in farming practices. Further research is needed to explore the reasons behind the lack of language use and to better understand the relationship between language, awareness, and the actual implementation of positive welfare practices by farmers.

Many factors influence husbandry discourses and attitudes towards welfare, including the farmers' situation, environment, psychology, and mindset (cognition). In previous animal welfare studies, farmers have been known to identify with, and are accustomed to, certain routine husbandry through daily interactions with farm animals and farm inputs (Burton et al, 2012). In the long run, these interactions build a routine culture of intuitive "just knowing" or "empathic responses" to the animal, which contributes to "positive stockpersonship" (Burton et al, 2012), and becomes a certain "farming style" and "identity" (Moore, 2014; Vanclay et al, 2006). In other words, experience and skills learnt over time appears to promote the cognitive belief that farmers are already doing "positive welfare", which has become part of the cultural repertoire and identity of the farm. Cultural identity of farming styles has implications for behaviour change when industry stakeholders promote higher husbandry practices designed to enhance welfare. As Burton and others outlined (2012), changing the stockperson's attitude alone (through framed language, for instance) can be insufficient to ensure a change in behaviour and the culture at farm level.

Multiple factors reinforce the existing culture on farms and across the farming community, making both attitudinal and behavioural change difficult. For example, Vickery et al (2022) found that farmers were unwilling to change their management practices because of their perceived risk of reduced productivity or increased difficulty in applying the new practices. This is because their primary concern was to maximise productivity and ease of application, rather than to optimise the welfare of their farm animals. Similar findings were reported by Chiron et al (2022), who reported that farmers may be hesitant to adopt pro-welfare innovations unless there is a clear economic benefit or reduction in animal health issues. Albernaz-Gonçalves et al (2021) also reported that economic, technical, and social factors also influence farmer decision-making. Clearly, these findings demonstrate the difficulty in

changing farmer practices from productivity-based husbandry practices that prioritise the economic interests and utility of their farm animals.

Farmer 7 as an example, disagrees with the influence of framed welfare language and positioned that farmers have internalised the importance of *husbandry* in their farming practices:

"I think daily in the back of your mind without realising it. You are looking at welfare, just such as sort of things that sprang to mind now, like, you know, trying to keep the most sheltered fields, you know, fresh for lambing time and things like that. So that, you know, when you have younger, more vulnerable lambs, they have got more chance in bad weather and things. I think sort of, you know, how to put it like that. I think that is at the back of your mind. I do not go out in the morning and think, how can I have high welfare?" (Farmer 7).

This internalisation of the importance of *husbandry* aligns with the concept of "implicit welfare attitudes" (Wojnowicz et al, 2009), which refers to individuals' subconscious or automatic thoughts and beliefs about animal welfare. These implicit attitudes clearly influence farmer behaviour and decision-making, even without conscious awareness. Therefore, further research on implicit attitudes and their influence on actual welfare practices can provide valuable insights for promoting and improving positive animal welfare in agriculture.

5.1.2 Negative welfare language affects farmers' mental wellbeing.

Participants in the study expressed concerns about the use of negative welfare language, particularly when it is applied to farmers by individuals such as veterinarians or regulators.

Farmers and industry actors (n=13) highlighted that negative welfare language could be perceived as accusatory or judgmental, potentially leading to feelings of defensiveness or resistance among farmers communicated via interpersonal relations contributes to conflicts between farmers and industry actors, for example during inspections, assessments or because of public outcry:

"Yeah, it [welfare language] does [affect farmers], to be honest. And I think that there is tension, I think, between farmers' attitudes, and the welfarist attitudes, and probably many farmers, you know, at times they are panicked out to get things right, and you do things your, which most people would not bother doing. And [farmers] will push the boundaries, as far as, you know, attending animals at night or an extreme circumstance or extreme weather sort of things. And yet they find that they feel that welfarists are criticising them for the outcomes. And I think that does create tension, and yeah…. And I think that parachuting other people's standards will always be difficult." (Actor4_grp)

"We find quite a lot of spin in our line of work, that farmers are very protective, maybe over their fibre [wool]. Most of the farmers care for their sheep the best they can. So, when we turn around and say, oh, maybe there is a husbandry issue, which is why your fibre has got breaks in it, farmers naturally get very defensive." (Actor3_grp).

"The negative terminology makes you feel like you are being accused of not doing such a good job. So, you know, if that were to say that it looked like we had a high level of lameness in our sheep, but although, yes, we would accept that that needs targeting, I think we would feel that was criticism and probably be a bit on the defence." (Certification scheme 1_grp).

These narratives are also closely related to and support the findings of Väärikkälä et al (2018). Their research found that farmers who have undergone farm animal welfare inspections were more likely to have a negative attitude towards the inspection process. The negative attitude also led to feelings of distrust, frustration, and confusion, as the farmer were not clear on why the inspection is taking place or why the inspector/assessor was making certain decisions. The lack of clarity (or expectance) in the inspection findings also made it difficult for the farmers to take the necessary action to address issues of concern. Negative language used in such inspections can contribute to farmers viewing the inspection process and assessors in a negative light.

Roe et al (2011) contend a shift from assessing inputs to outputs in farm assessment, which they argue necessitates the implementation of feedback processes, particularly when the outcomes reveal shortcomings in the inputs. The authors further argue that farmers providing assessors with feedback of their assessment processes has the potential to significantly impact the relationship between assessors and farmers. This shift towards outcome-based measures introduces a subjective element that differs from the more objective and numerical assessment procedures associated with resource-based measures. Therefore, assessors will need to justify their practices and address criticisms of the method, thereby assuming a role that involves responding to concerns and justifying their assessments in a two-way dialogue process.

The impact of negative language framing can be so significant that it has been suggested by Certification scheme 1_grp that when used upon farmers, it can have adverse effects on farmers' mental health. The quotes provided indicate that farmers may not be affected solely by the explicit spoken discourse or narrative, but also by the underlying silent meaning or

narrative that accompanies it. The perceived unspoken implications of the language used may lead farmers to feel blamed or held responsible for certain issues.

A recent survey conducted among farmers in the UK, as highlighted by Rose et al. (2022b), identified government inspections, pressure from activists, and the media's portrayal of farmers as among the top ten factors impacting farmers' mental health. These factors are all related to the use of negative language. This suggests that the negative language used in these contexts can contribute to farmers' feelings of stress, pressure, and potential mental health challenges.

In response to perceived messaging and negative narratives surrounding sheep farming, farmers often employ denial and dismissal as coping strategies (Olff et al, 1993; Monfort et al, 2019). This defensive response can be seen as a cognitive defence mechanism, as farmers struggle to accept criticism and feel compelled to protect long-standing traditional husbandry practices that are deeply intertwined with their own sense of identity. These practices are often passed down through generations, further reinforcing their significance to farmers.

The use of denial and dismissal as coping mechanisms allows farmers to shield themselves from the perceived criticism and potential threats to their established practices. By rejecting or downplaying the negative narratives, farmers can maintain a sense of control and preserve their self-perception as competent and knowledgeable practitioners.

This defensive coping style highlights the psychological and emotional attachment that farmers have to their farming practices. It underscores the deeply ingrained nature of these practices within their personal and cultural identities. The resistance to change can be

attributed to the fear of losing a sense of heritage, expertise, and connection to the land and animals:

"If you think … the most important time of the year to record deaths, most people will be resistant because of the negative connotation of death, people will be resistant because nobody wants to see death and to say they are not doing a very good job." (Certification scheme_grp)

The findings emphasise the importance of considering the psychological and emotional well-being of farmers when communicating about agricultural practices and issues. It highlights the need for a more constructive and supportive approach that avoids blame and fosters understanding. By promoting positive and respectful language, stakeholders can contribute to a healthier and more supportive environment for farmers, ultimately benefiting their mental health and overall well-being.

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For industry actors such as Actor1 and Actor4, the use of negative language is seen as a necessary approach because of the major issues farmers are battling related to health and diseases:

"One of the reasons that we would [use negative terms] is that if we look at the feedback of figures that come back from the veterinary investigation centres and the conversations we have with vets, most of the problems that are reported would be endemic disease problems that would relate to either an inability to control parasites or diseases." (Actor1)

Actor1 further added that farmers respond to issues relating to *health* rather than *welfare*. Citing two negative affective experiences from mutilations (pain as a welfare concern) and lameness (pain and suffering from health challenges), they argued that farmers show more concern towards negative experiences resulting from health challenges than management practice likely to cause pain to sheep. A major difference between these two here is that pain from mutilations is a direct consequences of farmer actions, while pain from lameness is influenced by environmental factors and may be perceived as less controllable or impacted by farmer behaviour. In any case, vets/assessors/policymakers are more inclined to use negative terminologies to address welfare concerns:

"I think our farmers respond more to the word health. They respond more to health rather than welfare. I think that welfare has ended up being more connected to the conditions in which animals are kept in the more intensive livestock sectors. And I think most people think this sheep farming is extensive and free range. I think most people feel that when you are talking about welfare, were talking about the conditions in which animals are kept and possibly, probably some people will call it mutilation, and others might call it management operations, guess things like castration and tailing, I guess. I think what interest's farmers more is discussions around what more can be done to improve the health and well-being of animals." (Actor1).

The narratives also indicate that industry actors focus on husbandry language to operationalise their support for farmers (de Greef et al, 2006). Industry actors such as vets or other advisors, most of the time, need to work within their clients' (livestock farmers) economic constraints (Stafford, 2014). Disagreeing with the farmers' positioning of an animal as a productive unit or introducing ideas around enhancing animal welfare often

results in conflicts (de Greef et al, 2006). Animal welfare science urges vets to engage in ethical discourse with ethical dynamics (Croney, 2010; Strafford, 2014). However, there is clearly a need to redefine language and the approach to collaborate with farmers, especially on moral issues such as positive animal welfare. However, how farmers react to language is key to instigating an engaging dialogue and subsequent action around enhancing animal welfare, so communication strategies need to focus on active listening and empowering farmers to take ownership over behaviour change (Bard, 2018; Bard et al, 2022).

Supply chain industry actors, differing in their dialogue with vets and scientists, argue that they employ a more *dynamic and involvement approach* to their dialogue with farmers, as this help to avoid conflicting debates with farmers. Supply chain 3 further added that:

"So, to give that education is more of a timing thing for us because we do not want to be offending people. But at the same time, we need to get that education out there for the sheep, for the welfare of the sheep, and for our benefit as well and for theirs (farmers)."

In summary, these narratives suggest that industry actors employ different types of dialogue with farmers, while farmers also adopt a response strategy as a counterapproach within the dialogue space. Farmers often find themselves facing negative discourse or criticism regarding their practices especially during welfare assessment processes. When confronted with such negativity, farmers develop coping mechanisms to navigate and manage these challenging situations. As previous stated, when negative welfare language is used, it can have silent meanings for farmers, perceived to be critical and derogatory of their (farmers) farming practices. Farmers, therefore, reject the dialogue cognitively, and as such employ defensive mechanisms to protect their husbandry practices. Here, negative welfare dialogues

with industry actors are not able to effectively empower farmers to confront and improve any welfare challenges, or introduce positive welfare opportunities, since the dialogue (mostly) is disempowering for farmers.

5.1.3 Farmers' expectations regarding welfare (improvement) advice

There were mixed views regarding livestock farmers' interpersonal relationships with vet practitioners. Livestock farmers (n=20) stated they would only have vet visits to their farms when serious issues arise. These narratives corroborate (Kaler & Green, 2013), who revealed that sheep farmers in the UK mostly use vets as "fire-fighters" to address immediate health and welfare concerns. One-third of these respondents (n=6), however, clearly perceive their vets as lacking in knowledge regarding husbandry issues and concerns:

"We will ask for a vet's advice, but I never take it as gospel. No. Sorry. I have found that not all vets know everything." (Farmer 1).

"We do not have them on the farm. I mean, they do come on the farm from time to time. But we get the vet to [do the] health plan for us. And we talk to them regularly. We find the vets they are not as helpful as we would like" (Farmer 15).

These results corroborate the findings of Kaler and Green (2013), who reported the perceived lack of expertise in sheep farming among veterinarians as a barrier impacting the farmer-vet relationship. The interaction between vets and farmers is the heart of knowledge exchange (Bard et al, 2019). And in relation to positive welfare, where the farmer is sceptical of a vet, they are sceptical of concepts the vet introduces. This quote highlights the importance of vets as a source of welfare knowledge and associated behaviour change:

"I think the vets [are] in a very good position to help with welfare because they have got the knowledge and expertise to advise. So, yes, I think the vets are very important or somebody who can take time to understand a farming system and understand what goes on and what issues there are and have the knowledge to help with that." (Farmer 12).

Croyle et al (2019) reported that livestock farmers' expectations regarding welfare advice are that it should be provided by someone who knows about animal welfare not just health and disease. Industry actors Veterinarian 1 and certification scheme 1 believed the *tension* and *lack of trust* between vets and sheep farmers could be mediated if vets do more for welfare by raising awareness and engaging farmers on welfare-related concerns. Here positive welfare could be seen as an added value between the farmer and vet. Communicating effectively using the correct welfare language can be key:

"I probably say we probably don't do enough meetings all aimed at welfare. And so maybe like more specific to welfare would be quite good. I know we do ones on like, you know, say lameness and stuff, which is a welfare issue, but maybe welfare on its own would be quite good" (Veterinarian 1).

Furthermore, Hockenhull et al's (2019) findings showed that the farmers interviewed in their study had a greater appreciation of the benefits of the Real Welfare protocol if the vet was actively involved in the process and actively included the farmer, for example, through discussion of their findings, where farmers could take ownership in the process. Similarly, McFarland et al (2020) reported that vets played an influential role in farmers' likelihood to adopt and use diagnostic services for the surveillance of animal health. These studies by Hockenhull and McFarland highlight the influential role of veterinarians in farmers'

appreciation and adoption of practices related to animal welfare and health surveillance. Active involvement, collaboration, and effective communication by veterinarians contribute to farmers' understanding, acceptance, and utilisation of these practices. By fostering partnerships and including farmers in the decision-making process, veterinarians can play a crucial role in promoting positive changes in animal welfare practices within the farming community. farming community. Similarly, motivational communication strategies which can build the farmer vet relationship and empower farmers in the welfare enhancement process (Bard et al, 2022).

Farmer 1_grp also suggested that alternative sources of knowledge should be more accessible to farmers to discuss issues relating to farm animal welfare (and possibly positive welfare):

"I do not think liver fluke is what it was 30 years ago. That is one instance. I can name another one. But I would like to speak to somebody doing a PhD on a liver fluke; that will be very interesting. Very interesting. But, you know, we have got a new regime now. And it is certainly better, but it is not one the vets have given me well; I have found out by trial and error."

The narratives and discourse flowing through farmers' interpersonal relationships with vets, assessors, advisors, and other farming peers have significant implications for livestock producers' awareness, understanding and implementation of the concept of positive welfare. Conducting a large-scale observational study actors such as with farmers and industry would provide further support for these findings regarding the importance of interpersonal and social relationships and networks in the establishment of positive welfare practice. Such a study would offer insights into the dynamics of these relationships, the exchange of

information and knowledge, and their impact on the adoption and implementation of positive welfare practices. Additionally, the study would allow for analysis of patterns and trends across different regions, sectors, and demographics, helping to identify common challenges, barriers, and facilitators in establishing positive welfare practices. Comparisons between different groups, such as small-scale farmers and large-scale operations, or different sectors within the industry, could also be made. Overall, this large-scale study would provide a comprehensive understanding of the role of interpersonal relationships and social networks in promoting positive animal welfare.

5.2 Perceived benefits of positive welfare

Three major themes emerged from this study about the potential benefits for farmers who implement positive welfare strategies. These themes are positive economic value, as well as social and human capital.

5.2.1 Potential economic value

According to the literature, current market structures do not provide rewards for positive welfare even though there is evidence suggesting that farmers go above and beyond legislative standards to provide good life opportunities for their animals (Stokes et al, 2020). Conversely, the majority view (n = 14/35) from both farmers and industry actors was that it is difficult for positive welfare to derive economic values for farmers if it is neither expressly valued by the market nor paid for by the government. As introduced in section 4.1, there is an opportunity now for farmers to be paid by the government in England as part of the Animal Health and Welfare Pathway where the success of this scheme will rely on the farmer vet relationship (Defra, 2022a). A key challenge however is the differences in perception of farmers and that of society: On one hand, farmers are advocating for and seeking clarification

regarding the financial benefits they would gain from embracing positive welfare in the market. They are looking for tangible incentives that would justify the costs and efforts associated with implementing these practices.

"I would say you need to better group and make that linkage of benefits through because if it is simply public welfare, so the sheep is happy there's no link then to anything else then it feels like it's something they must do for no benefit to them. I mean I don't agree with that but at the same time I think there may be some that do think that. so, it's like anything if you are requiring any change then for the demonstrators there is a point in making that change."

On the other hand, there is a societal belief that positive welfare for sheep should be a standard practice for farmers, regardless of any financial benefits. This perspective assumes that farmers have a moral obligation to prioritise the well-being of their animals, regardless of the economic implications.

"I was just going to say another front in the wool side and the stumbling block we have come across is that consumers and brands expect animal welfare as a given. So, they the response to us is why should we pay more for this?"

Thus, bridging the gap between these two perceptions is crucial for promoting the widespread adoption of positive welfare practices among farmers. It requires addressing farmers' concerns about the economic viability of such practices while also promoting the ethical responsibility of ensuring positive animal welfare:

"We need to clarify what is meant by positive welfare so that it would be possible for a farmer to the tick boxes and say I am a positive welfare sheep farm" (Actor2).

Price has also been cited as a major factor determining consumer purchases (Banshack, 1995; Hughes, 1995). One farmer here also corroborated this, arguing that regardless of how farmers raise the welfare bar, consumers will make their purchasing decisions according to their purchasing power:

"I did a poll and helped them at aaaa last summer in Stoke. And the guy that runs aaaa, who was temporarily managing xxxxx, your xxxx [have] resources to do a survey, the three priorities from the public when shopping is price, presentation, and the Union Jack, not necessarily in that order. And we all know when we are shopping, even when we are going out to buy a ton of feed or whatever, price is the first criterion. And I think what is facing us soon, the price is going to go up high anyway, certainly to us and hopefully to our consumers to cover our costs" (Farmer 14_grp).

As a result, not all consumers consider or can consider animal welfare at the point of purchase. It is therefore crucial to understand the unresolved issues resulting from often contested or hidden animal welfare-related narratives that mediate between citizens' concerns, preferences, and consumers' consumption. Some studies have examined the influence of expressive or descriptive language (positive or negative) within narratives in disseminating information about animal welfare to consumers and society. Vigors (2019) discusses the framing of positive animal welfare and its communication implications in the context of citizens and farmers. The author explores the internal frames and associations triggered by specific words, such as the term "positive", in the effective communication of

positive welfare. The perception of farm animal welfare among consumers varies, but there is an increasing belief in the need to protect and improve it. Information about low standards of animal welfare can influence consumer willingness to pay and align with their expectations (Napolitano et al, 2010). These findings highlight the complexities and implications of framing animal welfare issues on consumer attitude and decision-making processes. Further research in this area will contribute to a better understanding of the dynamics of consumer choices and the impact that words, language, and the monologue/dialogue within a specific narrative may have on those choices.

Some suggestions (n = 7/35) from industry actors and farmers indicate that positive welfare can be a differentiating factor in trade and standards at national and international levels. However, these assertions focus on generating economic revenue rather than the benefit to the animal:

"I think there is scope in, you know, with, with schemes, if you were selling under a banner of high welfare or something, you know, maybe then you would sort of look at, you know, it would, you know" (Farmer 7_grp).

Similarly, Farmer 4 also argued that positive welfare could generate potential economic benefits if it is sold in the form of storytelling advertising and marketing – a way of narrating one's identity and culture to potential consumers (Kent, 2015):

"Well, I am coming at it from a slightly different angle to everybody else because I am not selling meat; I am selling wool. And we felt we were selling globally as well. So, we are higher end price wise. So, it is important that we communicate our story about welfare, how

our farms run, what we do to the wildlife, etc. And that people want to buy into the story. And we find they will pay more because they like how we look after our animals and run the farm. And they want to buy into that and are happy to pay more for the product. And just going back to the labelling we have, we ran several different levels of labelled and individual skeins that are going out to knitters, and we have positive welfare messages on the labels. You know, it is not a company name that is not at the forefront going on there. It is a positive, you know, welfare and environmental statement on the front of the labels. So, the consumer is saying that that is the first message that comes across to them."

There would be value in engaging (meat-producing) sheep farms and consumers in research investigating the impact of storytelling on the willingness to pay for positive welfare.

"It [positive welfare] could add value but it depends on the consumer willing to pay more for it because it's had a had a nice life. And it's meant to (have good death) that it's been it's been produced responsibly" (Farmer 21).

5.2.2 Social benefits

Animal rights groups raise concerns with specific farm practices and systems, outlining the negative consequences for the animals' welfare. These industry actors focus on inducing negative emotions using words like pain, fear, or stress to describe outcomes caused by certain husbandry practices, justifying moral and ethical claims against these practices. Thus, through their discourses, animal rights groups challenge and reject the commodification of animals in society, condemning animal products such as meat, wool, or fur because the animal may experience pain and other negative experiences during the production process, and fundamentally they believe animals are not production units for human use. Interestingly,

the farmers (n=6/35) stated that positive language and positive messages could be used to change public perception and "tackle" the animal welfare movement narratives:

"I think, to be honest, there is probably more of an issue with bad stories getting out of bad welfare. It is always the same old thing: no one notices you doing a good job, but everyone notices you as soon as you do a bad job. And I think to be honest if everyone had high welfare that, you know, there would not be any sort of, would not give any clout to the. anti-meat movement then."

Therefore, these farmers believed that positive welfare could be a viable counter-narrative to the anti-animal narratives currently dominating mainstream dialogues and discourses spaces (Sievert et al, 2022).

5.2.3 Human benefits

Most animal welfare studies have reported the potential to increase productivity as one of the main benefits of improving welfare from the perspectives of the farmers/caregivers (Sinclair et al, 2019). Supportively, most of the views herein (n= 13/35) relating to the perceived benefits of positive welfare relate to the caregivers' internal joy and satisfaction of having and seeing a healthy, happy animal thriving. This ties in and further supports the previous section on the impact of negative language on farmers. An exemplary quote from Farmer 19 highlights this theme:

"I think so, yeah. It is beneficial to us to see the sheep are in good health and are sort of happy or as happy as sort of [they] can be. I think it is probably a more mental thing when

you know you see a happy lamb skipping along, you know.... it is the more mental bonus more than anything else?"

In summary, most of the perceived benefits by farmers are associated with the internal satisfaction a caregiver experiences when their flock are thriving. As previously highlighted, promoting mental health, job satisfaction and empowering farmers to take ownership over animal welfare improvement, is both ethical and socially imperative, and more likely to engage them in enhancing animal welfare (Bard, 2018; Rose et al, 2022b).

5.3 On-farm welfare improvement strategies and evidence of positive welfare

The farming participants were asked to describe how they implemented welfare improvement strategies on their farms. Figure 10 illustrates how farmers adopt and implement their welfare strategies based on the daily husbandry culture (or farming culture) embedded in their mindsets. The welfare improvement strategy is represented as four circles under each previously defined positive welfare frame. The first circle contains strategies primarily aimed at providing aspects of accepted good husbandry/proactive welfare improvement through positive welfare intervention strategies. There is a clear association between the level of positive welfare understanding and their implementation strategies, especially around good husbandry, and proactive welfare improvement. These frames link directly with the most common welfare improvement strategies here (see Figure 10). The link between what farmers say positive welfare is, rather than the academic positioning of the concept, with what they are doing to improve sheep welfare on their farms indicates that stockperson skills are the principal resource for providing positive welfare. The themes around welfare improvement strategies are now discussed.

Figure 10 Level of adoption of positive welfare strategies

5.3.1 Good husbandry/proactive welfare improvement strategies

Approximately two-thirds of the farmers (16 out of 25), mainly from the meat-producing sector, discussed that they mostly adopt a management policy for improving the health of their flock. Specifically, the farmers refer to their "flock health plan" as how they make their welfare improvements, indicating that the farmers' daily focus is primarily on improving health through productivity.

"Well, you look at, you get a vet health plan. So, you look at what challenges they could face, whether abortion or the worm, so you produce a worming programme. You produce a vaccination programme; we use the heptavac p course, which covers eight in one. You pre-empt the fly strike problem's Blow Fly, we use the CLIK or whatever to protect them to protect sheep from flies... maggots. As I said, regular faecal counts to see if they need worming and whether or which (wormer) is appropriate. And rotating around, rotating them around the fields, keeping fresh grass in front of them all the time. Clean water is probably something that's underestimated. Yeah. But now you go back to a health plan, which you work out with the vet" (Farmer 16).

Interestingly, more than half (n = 8) of the responses who reflected on a "flock health plan" indicated that they rarely *consult* flock health plan paperwork as it is mostly a legal requirement or for assurance schemes for them to have:

"In all honesty, I probably do not look back at the flock plan enough to check if I am sticking to it. I probably, you know, it is all it is what I can remember from it [that I try to do], I then try and put in practice for the next year" (Farmer 7).

"For me? No, it is a requirement to be farmer assured. It is more for farm assurance. But I am interested in the livestock. I am not interested in paperwork" (Farmer 1).

Instead, when improving animal welfare daily, farmers rely on their technical "know-how" tied with experience:

"We have a plan ourselves. We have not consulted with our vet, but my granddad was a vet. So, it is kind of unofficially discussed with that. And we just follow that. So, like this time of year, we will be doing our Heptavac injections. But it is not like an official written-down thing. We will write it down once we have done it. If suddenly the weather changes and we need to bring them in at a different time to what we originally thought, we keep it quite flexible in responding to the changing environment" (Farmer 10).

Or based on their pre-existing views on risk.

"So, the fact that we found Johne's (in our flock) about four or five years ago, so now we are vaccinating for Johne's. We had Enzo a few years ago as well, which we now vaccinate for" (Farmer 12).

To ensure good welfare of their flock, some of the farmers (n=14/25) state that they observe the behavioural changes in animals to ensure that they can see if they need to intervene to improve the welfare of their flock. Farmers again here rely on the perceived severity of the risks to determine if, or when, to take "action" to prevent issues (Hamilton-Webb et al, 2017):

"Well, obviously, we inspect the sheep daily. And if we see an issue, I will be straight back to the vet if I do not know anything about a particular issue. Most of the things that come up are, "yes, we have got this problem". And yeah, I might consult my vet about it, I may not if it is quite an easy thing to put right" (Farmer 21).

"It will depend on how severe. If it is one that you think is something like twin lambs' disease: well, I want to drench to bring them round or mastitis, early stages of mastitis, when they. Again, when they just look a bit off and maybe walk stiff back legs where the mastitis is just starting, we will catch them starting treatment immediately. If it is not as severe as that, then, you know, we will know to keep an eye on them and look for the next day you know, the next time we look to see if we can make a note to look them again" (Farmer 13).

Farmers employ cognitive appraisal processes, including the perceived severity of risks and pre-existing views, to assess the level of damage before intervening in farm-related situations (Hamilton-Webb et al, 2018). This cognitive appraisal approach often leads to a "wait and see" attitude towards implementing on-farm measures, as consistently reported in the literature (Hidano et al, 2018). Farmers tend to prioritise disease control and management only when they observe signs of sick animals, reduced production, or increased mortality (Hidano et al, 2018).

The perceived severity of risks plays a crucial role in farmers' decision-making. They assess the potential harm or impact of a situation before acting. If the perceived severity is low or the risks are not seen as immediate threats, farmers may delay implementing biosecurity measures. This approach is influenced by their pre-existing views, which are shaped by their

experiences, knowledge, and beliefs about the effectiveness and necessity of certain interventions.

The “wait and see” attitude can be attributed to several factors. Farmers may adopt this approach to minimise costs, as implementing health measures can involve financial costs and labour. Additionally, farmers may rely on their experience and judgment, waiting for clear signs of disease or production issues before acting. This approach is also influenced by the belief that intervening too early may be unnecessary or even counterproductive. However, this attitude can pose risks, as delayed intervention may allow diseases to spread or production losses to escalate. It highlights the importance of proactive and preventive measures in farm management, including regular monitoring, early detection, and timely implementation of best practices.

Conversely, four farmers highlighted their use of rotational grazing as a method for managing their sheep grazing practices. This involves dividing the grazing area into smaller sections and rotating the sheep between these sections to optimise grazing efficiency and promote pasture health. Additionally, six farmers mentioned their utilisation of stocking management, which involves regulating the number of sheep within a specific area to prevent overgrazing and ensure the sustainability of the pasture. Moreover, one mixed farmer specifically mentioned employing strip grazing as part of their approach to managing grazing. Strip grazing involves dividing a larger pasture into narrow strips and allowing the animals to graze one strip at a time, thereby ensuring better control over grazing patterns and preventing excessive depletion of the pasture. These different approaches to sheep grazing management demonstrate the farmers’ active efforts in implementing strategies that promote sustainable land use and efficient utilisation of resources. The use of rotational grazing, stocking

management, and strip grazing techniques exemplifies their commitment to promoting optimal grazing conditions for their sheep while also prioritising the long-term health and productivity of the pasture.

5.3.2 Good welfare practices

As part of their daily improvement strategies, some farmers mentioned that they focus on handling the sheep gently, especially when conducting routine checks, herding the sheep, or moving them to new grazing grounds. The purpose of gently handling was associated with the stock person's knowledge of the animal to ensure that the animals are not stressed in these intervention routines:

"We make a principle of when we move the sheep in trying not to rush them. If you have good enough control over the dog, then you do not know that if the dog decides to get one that tends to get rushed a bit, but we are trying to get them moving calmly and quietly. That is paramount" (Farmer 14).

Farmer 4 also added that she uses her low-stress methods with her sheepdog to "work" the sheep, and she believed this seems to improve her sheep's fitness levels. Similarly, farmers mostly from the meat and wool sector (n=7) mentioned that they try to ensure that the shearing experiences for the animal are as positive as possible:

"We do... like, for instance, we have one breed of sheep that they will rub before they are shorn. They have got heavy coats. So therefore, we always make sure they are on a field that's big so that so they can turn over. Or they have a rubbing post, so they have got somewhere to scratch" (Farmer 18).

As part of their husbandry care and management for sheep, some farmers (n=4) like to perform worm tests (faecal egg counts) before deciding which wormer to use or whether drenching is necessary. This practice allows farmers to assess the level of parasitic worm burden in their flock and determine the appropriate course of action for parasite control. By monitoring faecal egg counts, farmers can evaluate the effectiveness of their current worming protocols and make informed decisions based on the specific needs of their sheep.

Other farmers explained that they are aware of and empathetic to the sheep's negative experiences resulting from some routine operations. As such, they tend to include pain anaesthesia (n=3) during mutilations (castration, ear tagging), although this practice is considered costly for commercial farms. Four farmers mentioned a "pen" where sick animals are quarantined from the main flock and given extra special care and attention. At the same time, they perform soil, grass, and mineral tests to ensure that the grass eaten by the animals has all the nutrients they need for optimal growth.

In summary, some farmers here expressed the importance of basic animal health and welfare strategies. These include gentle handling of animals, providing adequate shelter and nutrition, as well as treating animals separate "hospital pens" to avoid disease outbreak among flock. These strategies are designed to reduce physical and psychological distress, which ultimately results in improved animal welfare.

5.3.3 Higher welfare

Fewer respondents discussed higher welfare as a focus when they implemented strategies for improving animal welfare. Only three farmers mentioned that they go above and beyond

normal legislative standards when improving the welfare of their sheep. Three farmers also mentioned that they are using technology such as automated weighing systems on their farms to improve the welfare of their flocks while reducing handling stress. Livestock technology includes using sensors and cameras to collect livestock-related data that farmers can use to improve the animals' quality of life (Niloofar et al, 2021; Schillings et al, 2021). For instance, sensors, cameras, positioning equipment, and uncrewed aerial vehicles (UAVs) can improve animal health and welfare surveillance on large pastures (Herlin et al, 2021). Livestock technology has many benefits and ensures maximum use of farm resources, thus enabling the control of animals' health status (Niloofar et al, 2021; Schillings et al, 2021). They also show high data collection accuracy and stability (Zhang et al 2020). These technologies can help farmers and researchers to make real-time changes to benefit farm animals. However, their utilisation in the sheep industry remains limited, despite their potential advantages. In the UK, changes to farming support payment schemes offer an opportunity to engage with sheep farmers and improve welfare through initiatives like the Sustainable Farming Incentive's annual health and welfare review.

However, even though precision technology appears to be a potential prospect for animal welfare improvement, two farmers remained sceptical of its function and application:

"I think I know many sheep farms are now really data driven. And I have seen it in some quite good farms and, yes, the shepherds know their numbers for weights and how much their lambs again each week and what age they can get them off at and how much pence per head it has cost them. But they are not... they have not got the shepherding sort of stockperson skills to see a problem when it's staring them in the face because it is a computer, as I told them, as a problem. They are not seeing it and noticing it until it comes out in the figures, they are suddenly not gaining the weight they should be and when somebody who has got that

sort of good stock eyes would pick up and program earlier and prevent sort of it getting any worse" (Farmer 4).

A large-scale study to explore the impacts of livestock technology on driving higher welfare standards for sheep welfare, particularly around monitoring the use of positive welfare opportunities provided to sheep, would be useful. Equally, it may be desirable to see how farmers interact with technology daily and their perceptions of positive welfare. Rose et al (2022a) have laid a foundation for future studies. Their study examines day-to-day exchanges between people and technology, thereby allowing researchers to better understand farmer behaviour as it relates with adoption of technologies. Their study also empowered researchers to take steps towards creating meaningful solutions on a local level adoption of innovations.

5.3.4 Positive welfare interventions

Although most farmers have focused their discussions on husbandry as the pivot for their welfare improvement strategies, there is some evidence of the application of positive welfare interventions. These interventions focus on feeding and pasture choices, positive, healthy life through genetics, social grouping and interactions, comfort from the thermal environment, physical environment, playing opportunities and maternal bonding. These themes are now presented:

5.4.3.1 Pasture and feeding choices.

To promote the positive welfare principle of interest in sheep, pasture management and food choice can be utilized to provide sheep with the opportunity for choice and autonomy in selecting their diet (Stokes et al, 2017). In extensive outdoor systems, sheep have the freedom to move within a habitat that offers a variety of preferred grasses and shrubs for grazing shrubs (Silva et al, 2016). The composition and diversity of pastures play a significant role in

influencing sheep's grazing behaviour and forage intake. Feeding behaviour in sheep is not solely driven by the biological need to maintain body homeostasis but is also influenced by hedonistic behaviours, sensory cues, and post-ingestive effects (Cosgrove et al, 1999; Favreau et al, 2010; Villalba & Provenza, 1997). Sheep can learn and reinforce their preferred diet through sensory cues. The concept of "post-consummatory satisfaction" or satiation can be a positive effect derived from past activities, such as consuming a flavoured food. By understanding and considering these factors, farmers and researchers can develop management strategies that optimise sheep welfare and align with their preferences.

Therefore, it was not surprising that these interventions were the most reported opportunity for sheep among the farming participants (n=12/25). Previous positive welfare studies on livestock, including sheep (Vigors & Lawrence, 2019) did not report these interventions as part of the livestock farmers' intervention strategies, but a cattle study did report this intervention as of benefit and value to dairy farmers (Stokes et al, 2022). One farmer in this study stated:

"We have a saying in this country that sheep do not like to hear the church bells twice in the same field. They like to move regularly. We move them, from fresh grass to fresh grass, or just a different field, when we can, you know, as often as we can. So, they do not get bored. And they, they like that, they seem to do better. We try and keep them not [in] massive [groups]. We try to keep them in smaller groups. We find lambs do much better if they are kept in slightly smaller groups than large ones. And that is the commercial sheep. Of course, my Herdwicks that graze on the cliff have a fantastic life because they roam wherever they really want to go. And they have a very choice variety of diets. So, they have wildflowers, shrubs, grasses, and other things to eat" (Farmer 6).

Another farmer mentions that when presented with feed choices, the sheep show anticipatory behaviour, further indicating that as an important part of their pasture choices:

"Well, if they see me walking down the hill, and they can see me from a distance[walking] towards them. And they all stop what they are doing. And they all gather towards the electric fence. Because they are hoping something is going to happen, other than me going down, chatting with them, and checking them. And if they see me switching off the energizer and starting to unhook the fence. You can see the excitement on their faces. And then I move it, and they move into the next grazing section. And some of them will be leaping in the air. They are excited to know what plants might be there and who will get their favourite plant. You see sheep leaping around, and they do it for joy. Yeah, it just took off in their faces" (Farmer 3).

Evidence shows that sheep can learn self-medicative behaviour when grazing in diverse environments, which is transferred through intergenerational knowledge from ewe to lamb. For instance, in a specific study, ewes demonstrated the capability to distinguish between medicinal compounds containing polyethylene glycol, grape pomace, and tannin-rich diets (Sanger et al, 2011). When exposed to these feeds, experienced ewes and their lambs preferred medicinal plants compared to an inexperienced group. Furthermore, when the lambs from both groups were separated from their mothers and exposed to the same feeds, the lambs of experienced ewes showed a stronger inclination to consume medicinal plants compared to those of inexperienced ewes (Sanger et al, 2011). These findings indicate that the preference for choice and selection can be passed down through generations from ewes to their offspring. Moreover, these learned behaviour patterns have a positive impact on the welfare response of lambs, resulting in beneficial neurological, morphological, and physiological changes in the animals. Similarly, farmers (n=4) stated that sheep develop

anthelminthic and worming effects from grazing a variety of plants, leading to a decrease in the cost of worming products for sheep, although it was not stated whether a such transfer of knowledge was done here:

"You have got stuff called cow parsley, and at certain times when that is in flower, they will go and eat it, but they will not eat it any other time of the year if sheep is ill if it has got an upset stomach, for instance. I do use homoeopathy to a degree. But if a sheep has got an upset stomach, if you let them eat by the leaves, and I do not mean the flowers, all the berries because they are poisonous, but the actual leaves, it will clear its stomach up as you have, I do not know something from the chemist. It is just brilliant. And yes, it works. So, the grazing ground I have has a variety of things, not just grass, all to do with sheep welfare" (Farmer 6).

In addition to the discussion, one farmer made an important observation regarding the use of plants that contain condensed tannins, such as chicory and plantain, to address worm egg burdens. The inclusion of these plants in the diet of sheep can have positive effects on managing parasite infections:

"And these two leafy herbs the chicory and the plantain to help develop an anthelmintic effect in the pasture. Yeah, and with that in mind, we have we find we are using a lot less anthelmintic in the routine management of the flock which has got to be a big plus."

Research has indicated that incorporating chicory and plantain into sheep diets can reduce gastrointestinal nematode infections and faecal egg counts (Athanasiadou et al, 2007; Grace et al, 2019). Therefore, the use of these plants like chicory and plantain as a natural means of

managing internal parasites showcases a sustainable approach to parasite control adopted by some of the participants.

Another interesting finding regarding grazing management was that farmers (n=4/26) mentioned that they are already adopting or have planned to adopt regenerative farming practices to provide food choices to sheep and improve the nutritive value of their grasses. This is noteworthy because, in the previous section, where the study explored the meanings of positive welfare from participants' perceptions, farmers suggested that positive welfare has value when integrated with regenerative farming practices:

"Practically, we are through the regenerative farming approach. We are working with a lot of young people coming into the industry. We are hoping that their nutrition [the sheep] is much better for them. They have a diverse, diverse environment around them. So, they can choose where they lie down, what they eat, and what area they are in. So, we are trying to show them [young people coming into the industry] and demonstrate to them the best practice. So, there will be a positive future for the next generation not only of the shepherd but of the sheep as well" (Farmer 2).

This suggests that some farmers already aim to provide positive welfare opportunities by providing choices for sheep in parallel to also practising principles of regenerative practices (aimed at improving soils, biodiversity, and land management), and taking this holistic approach adds value to the farming community. Therefore, in future research should critique the similarities, compatibilities, and trade-offs to bring innovative and future facing farming concepts together (positive welfare and regenerative farming).

5.4.3.2 Positive healthy life through resilience and genetics

One of the interventions towards creating a positive, healthy life for sheep is through breeding for resilient animals (Colditz, 2022a, b). In the context of animal agriculture, including the dairy and pig industries, resilience is regarded as a crucial attribute for sustainable farming systems, positively impacting animal welfare and resource sustainability (Barber et al, 2019; Giersberg et al, 2022). It has been observed that resilience contributes to positive health and welfare outcomes in animals, supporting their competence to thrive (Colditz, 2022b).

The participants in this study emphasised the role of genetics in enhancing resilience in sheep. It was recognised that genetic factors play a crucial role in enabling sheep to withstand and cope with various environmental challenges. Genetic selection and breeding strategies was thought to promote traits associated with resilience, such as disease resistance, adaptive immune responses, and efficient utilization of resources. Some of the farmers from both meat and wool production (n=9/25) mentioned their breeding strategies for resilience, with particular focus on overcoming foot diseases:

"We are trying when we are breeding these pedigree sheep, we are trying to breed sheep that are good on their feet, and we are buying tups that they have they are good on their feet as well. So that's trying to keep them right here" (Farmer 22).

"We try and breed from anything that isn't (lame three times in a row). It is a lot of man hours for sheep. Well woman hours in my case" (Farmer 6).

"I am trying to breed out any health problems that are in the flock. And so that we cut down on our use of antibiotics and anthelmintics" (Farmer 9).

Conversely, three farmers stated their genetic-related breeding goal hinged mainly on productivity. As an outcome of the breeding process, farmers (n = 7) mention that they need to implement a culling strategy to support their genetics-related goals.

In summary, the participants acknowledged that genetics plays a crucial role in enhancing resilience in sheep. By employing selective breeding strategies, and considering a holistic approach to trait selection, farmers can gradually improve the resilience of their flocks, resulting in more robust and adaptable sheep that can thrive in various environments.

5.4.3.3 Supporting social groups and interactions within the flock.

Farmers (n = 8/25) mention that they, in their inventions, ensure that sheep groups and hierarchies are created among flocks to allow sheep to experience positive experiences within the flock, and avoid negative experiences. These findings corroborate earlier reports in positive welfare studies (Vigors & Lawrence, 2019). Farmer 10 narrates as follows:

"And then there are little things like keeping them in groups they like. So, we have different breeds. And they tend to get raised together and like staying together. So, we keep sheep together that seem to get on" (Farmer 10).

These social structures within the flock facilitate positive interactions, such as bonding, grooming, and mutual support, which contribute to the overall well-being of the sheep. The presence of a well-defined hierarchy can also help reduce the likelihood of aggressive

behaviour or conflicts, improving social harmony within the flock. By taking proactive measures to establish group dynamics and hierarchies, farmers demonstrate their commitment to fostering a positive welfare environment for their sheep.

Overall, the farmers' recognition of the importance of sheep groups and hierarchies in facilitating positive experiences within the flock reflects their understanding of the role of social interactions in promoting animal welfare. These findings add further support to the existing body of knowledge on positive welfare studies, reinforcing the significance of creating a socially enriching environment for sheep.

5.4.3.4 Comfort from physical and thermal environment

As part of the positive welfare interventions stated in the literature, where animals are housed in a building throughout the year, they should be loose-housed and at a stocking density that does allow them to choose a lying area, so they can all lie synchronously without displacement (Stokes et al, 2017). In this study looking at primarily extensive systems, except when ewes are housed by some farmers for lambing, farmers placed less emphasis on comfort from the physical environment:

"I cannot think of anything we do in addition to the obvious environment we create. Because we obviously want them to lamb in a very easy way. And we also want to be able to draw the ewes and the lambs out of the big pens in smaller pens. And so, the focus on the environment, when the sheep come in, is all about labour and the practicalities of having them. I am not sure we focus too much on where the sheep enjoy being inside. We leave small bales in the pens, which is when we have the lambs because they can play and run around. And that is the only sort of toy concept that I think we do with sheep."

However, farmers (n = 6/25) did express that they are adopting intervention strategies to improve thermal comfort for the sheep:

"So, I suppose, like days like today where it is wet. It just started raining. We are trying to make sure that wherever we graze, the stock or you know, where possible, we make sure that stock has got like hedge or trees or, you know, some natural ideally and natural barriers, you know, that they can, they can get behind when the weather is you know when the weather is inclement. Either because, you know, like today when it is raining, they can get behind the hedge to keep out of the rain or in the summer, they have got shade under to keep them, you know, keep them happy. And, and you know, like, keep in bagging food, like keep bagging food in front of them" (Farmer 19).

Other farmers (n=2) mentioned that they allow the sheep freedom to explore the novel environment and associate with other sheep. This intervention has also been reported in prior studies (Vigors & Lawrence, 2019).

5.4.3.5 Playing opportunities for sheep.

Play behaviour is a source of pleasure in farm animals although it remains complex and not fully understood. Held and Špinka (2011) showed that play covers a wide range of the welfare spectrum, signalling both the absence of bad welfare and the presence of good welfare. However, the authors also acknowledge some challenges and complexities associated with using play as a welfare indicator. Play behaviour can increase in stressful situations or as a rebound after deprivation, which may not consistently reflect favourable environmental conditions (Ahloy-Dallaire et al, 2018; Held & Špinka, 2011). Additionally,

the interpretation and study of play behaviour can be difficult, considering the variations within and between species.

Previous studies have reported that play results directly from welfare provisions made by farmers, and they considered it (play) as an indicator of good welfare (Vigors & Lawrence, 2019). In this study, less emphasis was placed on providing enrichments since sheep are in their natural environment:

"And then, like we put straw bales in the lambing shed, the lambs always love jumping up and down on those. Or we will use them as extra shelters if it is quite a windy day. And there is a breeze coming through the shed. And we notice more play behaviour and interaction with the lambs if we put in these little obstacles for them to play around with on the shed" (Farmer 10).

Sources of enrichment such as straw are increasing considered as unfriendly to the environment (Wonfor, 2017). Two alternative enrichments materials have been explored so far in the literature. Given the choice, sheep appear to choose softer flooring materials, such as mats and woodchips, as demonstrated by their ability to lie on the mats for extended periods compared to the straw (Færevik et al, 2005; McGreevy et al, 2007; Wolf et al, 2010). The reason for this choice is relatively unclear, and there has been little research to date addressing this crucial gap. It will be interesting to investigate what alternative enrichments farmers are providing their sheep to facilitate positive welfare experiences. Also, it will be interesting to undertake further research to determine the attitudes of livestock producers toward promoting other forms of play, including locomotor play.

5.4.3.6 Maternal bonding

There were differing perspectives among the farmers regarding the feasibility of promoting the bonding processes between ewes and lambs. While only a minority of the farmers (n = 2) reported that they actively encourage and allow ewe-lambs to develop a natural bonding relationship as they would in the wild. Farmer 12 for instance stated:

"We wean them at least five months old, preferably six. And that's the age when in the wild, they naturally move away from the maternal group".

Others expressed alternative perspectives shaped by their farming business needs. These farmers may have considered factors such as optimising productivity, managing herd size, or meeting market demands as the primary drivers in their decision to separate ewes and lambs at an earlier stage. Early weaning enables them to allocate resources efficiently and pursue their farming objectives effectively (Hansen et al, 2023):

"I think the system I have (pedigree farming plays a role in ewe lamb separation). No animal ever likes being weaned from its mother; humans included. So, you also must consider the welfare of the mother and child. I guess the primary challenge for all livestock farmers is balancing what the animal wishes to have happened and using them as a production animal. Because if I did not wean my lambs, it would be more difficult to put the ewes back to the ram again, and so if I were only focused on their welfare, I would not be worrying too much about breeding from them. But if I do nothing from them, I do not have anything to sell" (Farmer 24).

It was intriguing to observe that only a limited number of responses from the farmers were related to the promotion of ewe-lamb bonding. It is plausible that the farmers focused more maintaining a cohesive social order and fostering positive social dynamics within the flock based on established hierarchies (see section 5.4.3.3). This emphasis might have led to a perception that social interactions and bonding among ewes and lambs would naturally follow suit without requiring explicit intervention or promotion. In essence, the farmers may have placed greater emphasis on the broader social context within the flock, if the hierarchical structure inherently facilitated group cohesion and social interactions. The concept of social hierarchy is an important aspect of sheep behaviour and welfare, shaping their social dynamics and promoting social order. It should be noted, however, that further investigation and exploration of promoting specific ewe-lamb bonding behaviours may reveal potential benefits and opportunities for enhancing welfare and social dynamics within the flock. While the focus on hierarchies is crucial, it is also valuable to consider and investigate further the feasibility and practical aspects of ewe-lamb bonding and its potential implications for overall welfare management.

5.4 Drivers for making welfare improvements and positive changes.

Farmers were asked to describe what drives them to improve their farm animals' welfare. Figure 11 shows their keywords describing the drivers of positive welfare improvements on farm.

Figure 11 Word cloud showing keywords for drivers of positive change for farm welfare.

The drivers for positive change are happy, healthy, and productive flocks (grouped as economic drivers); rights, morals, and conscious grouped mainly as (internal factors or farmers' characteristics, see (Balzini & Hanlon, 2020) and political drivers. These are now discussed.

5.4.1 Health and Productivity of sheep

Similar to previous positive (and wider animal) welfare studies (Vigors, 2019; Vigors et al, 2021b), farmers (n=14) indicated that they are driven by the motivation to keep and maintain a flock that is healthy and profitable. In line with more general animal welfare studies, the description of productivity by the farmers here is associated with the profitability of the flock. For example, Farmer 20 states:

"Everything I talk about - look at grass growth, look at just how they are to see if they are in good shape. Those are [the factors that drive] my decisions, but the grass growing is the biggest decision-maker. If the grass is not growing well, sheep will not be happy, and I am

not. The more grass you grow, the more sheep you can have on your land, and the more meat you can produce, the more money goes in the bank."

These narratives are of interest because they suggest for these farmers, minimising negative aspects is as important as providing positive experiences, mostly related to ensuring productivity. Therefore, a healthy and happy animal can mean (lead) to an increase in animal numbers, resulting in the farmer being rewarded not only with healthy and content animals but also with a larger livestock herd. Most previous animal welfare studies (for example (Van Huik & Bock, 2007) have found this economic driver to be one of the main drivers leading to positive change on farms, and therefore, it is not surprising to see that farmers are thinking about the economics of making positive changes on their farms.

5.4.2 Farmers value a quality of life for their sheep.

Cattle farmers reportedly value their animals having a good quality of life as they believe it influences the animals' longevity (Stokes et al, 2022). Similarly, some farmers (n=7/25) here believe that having a good life for an animal is morally right, and this was defined by the animal being free of any harm. The collective discourse, that animals as sentient beings that do not deserve negative experiences and should be well cared for and that this links to better performance, is highlighted by Farmer 4:

"As for the farm animals, be they ducks, chickens, sheep, cattle, or pigs, they deserve a good life and to be well cared for. At the end of the day, they have feelings and emotions too. A happy animal is a well animal in general. It costs in monetary terms no more to do the job properly than not, especially if they are in constant poor condition, then you get big vet bills."

In other words, respondents suggested that their animals deserve a good life while serving the economic goals of the farmers. Having such a mentality (farmer consciousness) as a driver means doing what these actors believe is morally *right* -fulfilling moral and ethical obligations is linked to being *productive*.

5.4.3 Political drivers

Some of the farmers (n=7) mentioned that they are driven to adopt welfare improvement strategies because they want to protect the public welfare reputation of the industry. Farmers stated that the strategy adopted is mainly aimed at reducing or removing negative welfare focus from the public e.g., with people viewing farming practices from footpaths. For example:

"And, you know, with the welfare, we have loads of footpaths across the farm. And, you know, the public eye is always on us. And we are just trying our best to be a good example of what we are supposed to do" (Farmer 7).

Therefore, farmers perceive it is their responsibility to model good practice about animal-based agriculture.

5.4.4 Personal beliefs and development

Based on the study data, there was motivation to improve the farm and continuously develop personally (CPD) expressed by some farmers (n=7). It was stated as important to continually explore ways to improve the treatment of their flock while also looking after their own well-being, as emphasized by this group of respondents, most of whom were sheep meat farmers:

"I think what drives me is that as I suppose as I observe better my sheep, I see the sort of distress that is caused if I do not do things positively for their welfare. So, I guess I am becoming more aware of their needs. Cause I think it is very easy for all of us, if we do not look very hard, not to see what is going on. And therefore, not to think it is a problem. But as you watch more, you can see. if you watch their behaviour, you can see what is helpful and less helpful" (Farmer 24).

5.4.5 Family, peer, and consumer network

Rose et al (2018) in their critical literature study, found evidence of farmers' decision-making being influenced by their social relations. Here farming participants (n= 5/25) reported that they are driven to improve their welfare to ensure that certain standards are met due to their social and business relations. Some exemplary quotes illustrating that animals with improved welfare are inherently linked with consumers needs are presented below:

"I have the sort of customer base I sell to; it is a high-end high-value product that my wool goes into, and they are very well-educated, aware consumers. Young professional people are usually very aware of animal welfare and environmental concerns, and through my retailers, they will frequently come back to me and ask questions. I get questions like do you cut the tails off your sheep? Why? How do you do it? What happens if a sheep gets sick? What happens when a sheep gets too old to produce a good wool crop? That sort of thing, you know. I must be prepared to answer those questions directly after an answer, and I must justify what I do every year; for example, at lambing time, we castrate and tail our animals. I must go through a mental process of justifying what I am doing because I must be able to look at my consumer when they ask me that question and justify tailing those lambs, causing

them discomfort. Am I doing the right thing? Am I doing it in the best possible way that minimises discomfort? so that is one of my prime reasons for being so concerned about welfare" (Farmer 5).

The provided quote highlights the importance of customer awareness and concerns regarding animal welfare and environmental issues. The farmers express a genuine concern and a sense of responsibility and concern for animal welfare, recognising the discomfort caused by certain practices like tail docking and castration. Their motivation to be attentive to animal welfare stems from the need to satisfy their well-informed and conscientious customer base.

Overall, the quotes highlight the influence of consumer awareness and expectations on the speaker's farming practices. It underscores the importance of transparency, accountability, and continuous evaluation of farming methods to meet the demands of an informed consumer base and uphold animal welfare standards.

5.4.6 Breed type is important.

Some farmers (n=3) expressed preferring traditional breeds because they are more resilient and are better suited to the UK weather and environment. It was believed by these farmers (mainly from the wool sector) that consideration of breed type is important for a particular location, especially with sheep farming:

"I mean, I know we farm in a very traditional way, which I would not like to see us move away from. With the wool market being so poor, there is a sort of interest. So you have the traditional Norfolk horn, but the easy-care breed is starting to become quite visible through

the national flock. And there has been anecdotal evidence that the sheep, when they shed their wool, will shed more hair than wool when they shed it in the early spring if you get a very hot spring, like very hot April, which naturally encourages the shedding. Then very cold north easterly winds in May, then these animals have been seen to suffer. So, I would say that breed-type farming for your location is important when considering how happy your sheep are. you know" (Farmer 8).

5.5 Fostering common welfare language between farmers and society.

Fostering a common welfare language allows for collaboration and co-creation, as previously suggested by the participants in this study. Therefore, participants were asked their thoughts on establishing a common welfare language between farmers and society. This related to addressing research question f, which aims to explore how a common understanding can be established between farmers and society using a standardised language The most frequent view from the farmers and industry actors (n = 12/35) is that it is difficult to establish a common welfare language since society has different perceptions of farming to the farming community. There is also divergence within the farming community on the definitions, practices and language associated with animal welfare. Three main reasons emerged why it is difficult to establish a common welfare language. Four farming participants (mainly from the meat supply chain) and two industry actors collectively agreed that there is a *lack of understanding of animal agriculture* today:

"People do not know now [where their food comes from]. The public has become so far removed from their food. They all want it, you know, vacuum-packed on a supermarket shelf in a neat little polystyrene tray. They do not want to think about where it has come from, or how old it is, or do not know" (Farmer 6).

"I think generally, I think consumers [do not] understand how food is produced. Even sheep, you know, is limited. I mean, the real baseline level is very low" (Actor2_grp).

Farmer 23_grp, using their experience and surveys and statistics, to present their picture of societal understanding of agriculture:

"So, if I were to say that 60 - 80 years ago, I would say that I would think 60 to 70% of people would have some connection to farming through a grandparent through a son through various connections. And I would think now, if we were to do the same survey, I would think that we would be looking at somewhere in the region of 10 to 20% of the population would have a connection to agriculture in some way. And the guy that came up to me said - well, I do not need to know about farming because I know that my milk bottle comes from [retail shop]- [suggesting] there is no connection back to agriculture. So, they do not know that it comes out of a cow. And I was at a wool festival over the weekend. And we did not know that wool came from a sheep. Quite a few people said, oh, I did not know wool came from a sheep, how we return that and how we send that back again. I am not 100% sure."

This misunderstanding of animal agriculture among the public is not new. It has been well-covered in the traditional animal welfare literature as discussed in the chapter two of this thesis. Indeed, this is an interesting observation that requires further investigation with a larger sample of sheep farmers to explore how different sectors perceive this issue. One of the solutions proposed here to solve this perceived barrier is re-education of the public through storytelling and PR (e.g., open days), as will be discussed further in the thesis.

Secondly, it was discussed by some farming participants and industry actors (n= 5) that society *has a different perception of farming*. In other words, there is a big gulf of understanding between what farming is and the desired societal outcome (what society wish for). This perceived barrier is like the first point but is different. Here, the claim is that the public (citizens and consumers) can use "prescriptive statements" (e.g., we want responsibly sourced meat) or "culpability language" (e.g., intensive farming is terrible for welfare, or shearing is terrible for the animal) to hold industry actors to account (See section 2.8 of this thesis), and participants suggested that when accountability-based standards are developed they are often not in tandem with farming practicalities:

"I know somebody in the egg industry who had had huge trouble when the debeaking was stopped because that is what the customer wanted. And that was what [retailer] wanted" (Farmer 12_grp).

Finally, two farming participants suggested that *geographical location* influences understanding and interest in welfare. Some areas of the UK are more interested in welfare, and some show no interest or affected by their lack of knowledge towards animal-based agriculture (Schwartz, 2020):

"So we are in west Wales, we do not have an issue with as much of the like a customer not knowing what good practices and things, everybody knows our farming is around in this area. We got six farms around us now. I do not know. It is hard [to foster a common welfare language]. I think it is more for people in highly populated areas than us. So, if I want to get a good piece of meat from somewhere, either take it from my freezer to eat for lunch, but if I

want, I go to, like, we have got an organic shop for or someone next door which might have killed the beef animal, and we love beef from there. It is for urban areas" (Farmer 20_grp).

This is an interesting finding which further highlights the need to look at mechanisms to engage with different farming communities on their own terms, whether that is facilitating farmer to farmer knowledge exchange, or how industry actors, particularly vets and other advisors, engage with different farmers in constructive dialogue around animal welfare improvement.

With the aim of overcoming all the highlighted challenges in fostering a common understanding between farmers and society, which will empower and facilitate farmers ownership over positive welfare, participants gave the following recommendations:

5.5.1 Societal engagement

Industry actors (n = 5) suggested that there should be collaborative efforts between farming, science and society (general public) in developing dialogue and creating welfare practices, as this can increase engagement, understanding and a greater acceptance between people with different perspectives. Farmers mentioned that the participation of farmers in research towards finding solutions to agricultural problems is increasing; however, more efforts are needed to engage society (citizens and consumers) with farmers, and not engage in research and knowledge exchange with these groups separately. Indeed, Duijvesteijn et al (2014) have proposed such a precedent in recent times, having discussed the importance of acknowledging and considering the potential for divergent conclusions in qualitative assessments of welfare due to subjective interpretations. Duijvesteijin and others highlighted need to recognise and understand the varying perspectives of stakeholders to improve

consensus and collaboration in animal welfare assessments, although the focus towards such collaborations has still not received the required attention it needs in practice. Industry actors debated on the best approach towards improving societal engagement. Actor4, representing an organisation focused on helping improve ruminants' health and welfare, suggested more *consultative participation*, a top-down process starting with vets/practitioners producing knowledge and then getting the knowledge out as a societal level:

"I think that vets and behavioural scientists, animal scientists, or some welfare groups got to sit down and work out what standards and areas we must progress on and our benchmarks. And then you must go to society and explain the pros and cons of your actions. And give them a window into that world and explain why we think these things are valued. At that stage, you may get pushback, which is fair enough, and you may have to take note of it. But I do not think that many people in wider society usually have, you know. I do not think many people go to bed; you are having sleepless nights about how you are your sheep feeling? Or whether it is going to be okay in the morning or whether it is shivering because it is a hell of a night. It is just not their world."

Interestingly, Researcher1_grp, with background expertise in animal science and ethology, and Actor1_grp, from the organisation that represent the views and opinion of farmers argued that more *collaborative participation* is favourable, where society and scientists come together to create a common welfare language. Researcher1_grp argued:

"What if society turns around and says, no, that is not what I think, that is not what I want. We have just talked about engaging farmers in this, which, you know, and having ownership. And I think there has got to be a role for involving society in this and giving them ownership rather than just a complaint and saying, look, this is how it is, you have got to suck it up."

Researcher1_grp further claimed that *consultative participation* (top-down approach) has so far had little impact in terms of driving the adoption of improved welfare strategies and therefore suggested that facilitating purely research, government, or societal ownership (without farmers) on what welfare is and how it is to be improved (top-down) is not the most appropriate or productive approach.

5.5.2 Storytelling and public re-education: it is a PR Job

The farmers (n = 7) and industry actors (n = 3) that considered this described the importance of educating society about animal agriculture, with animal welfare being part of an important narrative. Industry actor2 in the group both mentioned:

"Yeah. So, I think just a bit of a story about, you know, how sheep are producing and why certain things are done and linking that to welfare is probably just a simple starting point."

Industry actor Supply chain 1_grp also discussed the need for educating wider society on farming, products, and regulations.

"We have to educate them on firstly what wool is and then what is the five animal freedoms and what that means to a UK farm and the cost of wool types that we have in the UK".

Two farmers highlighted that farms could hold open days and tell stories of farming to consumers. Farmers can use their *ethos* as a unique selling point to consumers. Farmer 4 describe how they are doing this on their farm. As farmer14_grp coined, *it is a PR job* –

which is needed to educate the public and change negative perceptions around the industry. Farmer 15, in support of the PR narrative, outlines that:

"We used to do farm walks as part of the Hay Festival. And the people who attend the Hay Festival are classed as C1 C2s. So, they [C1 C2s] are supposedly the cream of our society. But the questions just astounded my husband and me; one person asked and said they thought sheep had to be killed for it to be sheared. So, I agree that PR is the key to educating the public. I think that is what we need to do. And we need to work harder at (PR).

Farmer 16 also suggested that the farming industry should be more open, and from time to time, farmers should invite their neighbours and explain how and why their farming operates the way that it does:

"I take it in farming, in general, it is important. I mean, what we tend to do that our places do not go for the big farm but invite people from the parish in the surrounding areas or the neighbours here to come on to the farm, and then we might have a bit of a barbecue afterwards and just explained to them what we are doing. And then we find that if we need to go for planning permission or anything or any issues, they can come and talk to us. Sorry, it is just communicating with your neighbours; it is not rocketing science."

Providing neighbours with more information to make informed decisions and utilising positive stories through a PR campaign can help society be part of the discussion around farming challenges, as well as opportunities for change. There can be a change in public perception because of people conversing with one another:

"I think it does percolate out because one person is very impressed, and one of your sorts of farm visits will go back down the pub on that, and it will percolate out with the positive impression" (Farmer 14_grp).

5.5.3 Change in negative mindset required.

There were suggestions by both sheep farmers and industry actors (n=6/35) on the need to change mindsets from one dominated by negative welfare language to one which uses positive language in farming, public and vet discourses. Industry actor certification scheme 1 stated:

"Is the change in mindset, though, isn't it? Because if you think in time for one, the most important time of the year to record deaths, most people will be resistant because of the negative connotation of death. People will be resistant because nobody wants to see death and say they are not doing a very good job. Whereas if you say you are monitoring survivability, how a mindset change could influence someone to record that better to get better results in the future."

Farmer 5, in the interview, argued that a change in mindset is also needed for consumer orientation and a shift in perception around the animal industry:

"I think we must think wider than that [welfare of sheep] because the industry, in a sense, is not the issue. It is how it looks to the outside world, and I think the negative language used within the industry has a major impact on the perception of the industry by the consumer. We should focus on doing that, reversing it for the outside consumer. I think it is the consumers' opinion of the industry, but we are always talking about all; we only lost 10% of our lambs

this year; when you are in Australia, that happens. They leave out [the dead] in the Bush and say - we got 90% lambing this year. Wow, wonderful."

Two farmers and one industry actors further suggested that using positive language that is more understandable, non-culpable and co-owned across farming, science, and society is key to fostering communication and an open dialogue between different members of the industry:

"I think it is about being comfortable with that language [that should be used] and understanding it. I mean, I still do not understand positive welfare. So, you know, that instantly makes me feel like half my brain is trying to get my head around it while the other is listening to the conversation" (Farmer 8_grp).

5.6 Chapter Summary

This chapter set out to answer the following research questions:

d. In what capacity are farmers currently applying positive welfare practices? Are there any links between interpretations of meanings and practical considerations? How does this link (if any) influence the widespread uptake of more positive welfare practices? What are the benefits of positive welfare as perceived by different industry actors?

e. What effect does the framing of welfare language have on sheep farmers' decision-making? Are they (farmers) affected by the language at all?

f. How can a shared understanding between farmers and society using a common language be created?

According to the responses, overall sheep farmers do not consider (positive) welfare to be an important factor in their decision-making since it is not part of their current discourses or

narratives. In this sense, farmers explained that their priority is ensuring the sheep have at least a life without harm in terms of diseases and negative experiences (i.e., eradicating negative concerns). Similarly, negative welfare language used by vets/assessors/practitioners can have a personally detrimental effect on farmers and crucially, not necessarily lead to the desired behavioural change to improve animal welfare. Negative welfare language tends to make farmers feel negative about themselves and how they are perceived and often leads to tension and conflict between farmers and welfare assessors. These findings have serious implications for the wide uptake of positive welfare practices, as it demonstrates the effect that language can have on a lack of adoption. Therefore, industry actors, especially vets, have a very influential role to play in the adoption and implementation of positive welfare at farm-level but the language they use could limit farmer engagement, as opposed to motivation interviewing which has been found to empower farmers in the behaviour change process (Bard et al, 2022).

According to Bard et al (2022), motivational interviewing involves a collaborative conversation style that aims to elicit and strengthen motivation for change. The approach focuses on exploring and resolving ambivalence towards behavioural changes, with the goal of enhancing the individual's intrinsic motivation to change. By emphasising empathy, active listening, and reflective questioning, motivational interviewing helps farmers to identify their own goals and values, and to develop their own strategies for making positive changes in their farming practices. This approach has been found to be effective in promoting behaviour change among farmers, as it respects their autonomy and helps them to find their own motivation to adopt sustainable farming practices.

The farmers described the ways in which they implement welfare improvement practices daily. The descriptions showed that most farmers were limited in implementing positive welfare, as they primarily focused on basic to good husbandry practices. A few farmers provided their sheep with additional opportunities through widening their practice to develop regenerative agriculture, as part of a holistic transition on their farms. In addition, participants considered whether positive welfare could offer any potential benefits to them. Most participants felt that the concept was not intended to benefit farmers economically, although they would encourage government and market incentives that did so (DEFRA, 2022b). Farmers and industry actors proposed that particularly storytelling, rather than a dominant focus on standards and welfare outcomes data, and use of this within marketing is a more effective tool to articulate positive welfare to consumers. The positive welfare concept was also viewed by some as a means of countering more extreme anti-meat narratives.

The farmers and industry actors highlighted that bridging the communication gap between farmers and society may be challenging due to the varying understandings of and applications and advances of animal welfare in different sectors and systems. As a first step, promoting a common language can be addressed in several ways. These include social engagement, challenging and changing mindsets, promoting positive messages, and clearly unpacking the associated benefits of positive welfare.

Two key propositions were also considered on the role of language in promoting farming behavioural change to embed welfare improvement strategies. These were:

Proposition 1: (Positive) welfare language does not affect the adoption of welfare improvement strategies.

Proposition 2. The use of negative language in association with animal welfare influences farmers.

Both propositions were supported in this study. Negative associations with certain terms related to farming and/or animal welfare were seen as counterproductive where farmers expressed discouragement in adopting practices which provide animals with positive welfare opportunities. Similarly, this study does suggest that more nuanced approaches to communication are necessary, where farmers feel they can take ownership and are empowered to make changes on their farms (Bard et al, 2022; Morgans, 2019). In the next chapter, the implications of the findings on positive welfare adoption and implementation are now discussed and recommendations are made.

Chapter six Conclusion

This study aimed to better understand positive animal welfare through the perspectives of UK sheep farmers and associated industry actors. Positive welfare, a new phase of animal welfare science promoting positive experiences in farm animals, was considered as a *socio-constructive* concept within the scientific literature which has not yet been significantly developed and applied within the sheep industry. Therefore, to address this research aim, six sub-questions were developed to guide the study and answer its aims and objectives:

a. How well are the UK sheep farmers and industry actors aware of positive welfare terminology? Does positive welfare feature prominently in industry actors' discourses? If not, what other terms do they use?

b. How do industry actors interpret and define the concept of positive animal welfare? How is it (positive welfare) approached from industry actors' perspectives?

c. What are the differences in the level of awareness, what different interpretations of established meanings are there, and what are the new meanings among different industry actor groups?

d. In what capacity are farmers currently applying positive welfare practices? Are there any links between interpretations of meanings and practical considerations? How does this link (if any) influence the widespread uptake of more positive welfare practices? What are the benefits of positive welfare as perceived by different industry actors?

e. What effect does the framing of welfare language have on sheep farmers' decision-making? Are they (farmers) affected by the language at all?

f. How can a shared understanding between farmers and society using a common language be created? What animal welfare benefit could this bring?

To answer these research questions, the first author examined industry actors' discourses by exploring the multiple meanings associated with their use of language, and crucially the role of language in initiating behavioural change and its impact on farmers' adoption of positive welfare practices. Findings from the study provide insights into these questions and demonstrate how important language is as an engagement (or not) tool when promoting positive welfare improvement strategies. Some of these findings are novel and contribute to existing literature on how to advance positive welfare in practice.

For example, the study highlights the significance of using effective language to engage farmers and promote behaviour change. By understanding how language is perceived and interpreted by farmers, better strategies can be developed to communicate the benefits and feasibility of implementing positive welfare interventions. The research emphasises the need to understand the role of language in shaping stakeholders' views and conceptions of welfare, as it plays a significant role in farmers' responses to the concept of positive welfare.

The research also found differences in the understanding of positive welfare between farmers and stakeholders, with stakeholders displaying a higher level of understanding. The understanding of positive welfare is influenced by various factors, including farmers' roles and responsibilities, language, understanding of good farming practices, market and policy arrangements, and individual attitudes towards animal welfare. It is crucial to consider these different perspectives when communicating and framing positive welfare to ensure effective engagement and comprehension (Vigors, 2019).

The study contributes to the existing literature on positive welfare by discussing the implications of the findings and their overlaps with the positive welfare literature. Other

studies have also focused on developing frameworks and indicators for assessing positive welfare, involving farmers in the process to refine the framework and gather their perspectives (Stokes et al, 2022; Vigors & Lawrence, 2019).

The study highlights the significance of using effective language to engage farmers and promote behaviour change. By understanding how language is perceived and interpreted by farmers in given situations, better strategies can be developed to communicate the benefits and feasibility of implementing positive welfare interventions. The research emphasizes the need to understand the different views and conceptions of welfare, as they play a significant role in farmers' responses to the concept of positive welfare (Vigors et al, 2021).

Furthermore, two conceptual papers have been published to date as part of the literature review phase of this study (Muhammad et al, 2022a, 2022b). These studies present an empirical examination of the spectrum of animal welfare discourse and debates, through their usage of language and the argumentative narratives adopted by key actors in animal welfare dialogues. These papers also provided a critique and synthesis of existing evidence behind positive welfare opportunities, as well its current and potential assessments methods in sheep.

Some of the key findings from the PhD research are now summarised.

6.1 Key findings

The study set out to answer six research questions in chapter 3, which included how UK sheep farmers and industry actors view and understand positive welfare based on their understanding of the concept. To focus on the discourse, a novel methodological approach

was followed that allowed for multiple reflective and iterative steps, which allowed the data enquiry to evolve and tell its story free from the constraints of a more deductive approach.

This study was initiated and guided by an iterative literature review approach (Kowalska & Manning, 2021). This method involves continuously modifying and formulating new research inquiries as the investigation progresses, with the literature serving as the foundation for constructing the narrative. The findings derived from the iterative literature review were utilised to develop two published articles, which significantly contributed to enhancing our understanding of the connections between animal welfare and discourse studies. By reviewing and synthesising existing literature, this study was able to build upon previous knowledge and generate valuable insights that shed light on the intricate relationship between animal welfare and discourse. The iterative nature of the literature review allowed for a comprehensive exploration of the topic, enabling the researchers to refine their research questions and develop a more nuanced understanding of the subject matter.

This discourse framework (Figure 6) is a new addition to the literature on animal welfare related discourse, building upon existing research in this field within the context of sheep welfare. It offers an innovative conceptual approach that could be further explored to investigate and facilitate more meaningful and productive dialogue between animal welfare scholars, activists, and advocates, farmers, and consumers. This framework can also then be built upon as a tool to develop more effective communication when engaging with different audiences about animal welfare to animal rights.

In the primary data collection phase, a participatory research methodology was established through semi-structured interviews and a facilitated POW to achieve the research aim,

consider the propositions, and answer the research questions. The following conclusions will now be drawn from this study:

1. There is a lack of awareness of positive welfare concept among farmers, and gender seems to impact the level of awareness and engagement for the farmers that were interviewed.
2. Farmers and actors differ in their perspectives on what constitutes positive welfare. Farmers tend to see things from a more practical perspectives (good husbandry, proactive improvement measures), rather than focusing on legislation, standards or philosophical frameworks when constructing their views on positive welfare. Industry actors debated the definition of positive welfare, but largely agreed that it involves providing higher levels of care and resources for animals. From the industries' point of view, consumer's concerns are considered to ensure higher welfare of animals is maintained over time.
3. There are limited levels of adoption of measures on farm indicative of positive welfare practices, however farmers highlighted their own on-farm welfare improvement strategies.
4. There was disagreement with the use of anthropomorphic terms such as "pleasure" to describe positive experiences for animals. Similarly, the brushing and stroking of sheep were also controversial, as farmers believed that these practices went beyond their cultural relationship with animals. It was feared that equating human standards with animal standards might lead individuals (consumers) to view farm livestock differently (as pets or companion animals), which ultimately would lead to devaluing agricultural industry practices since nobody would want to consume their pets and companion animals.

5. There are persisting issues of language differences in the industry; between sheep farmers, veterinarians; and other industry actors.
6. Negative language can be internalised in the farming industry, and this can lead to negative perceptions of self and farmers' reporting an impact on their behaviour and engagement with positive welfare concepts. Negative language can lead to cognitive defence, coping or "fighting back" mechanisms by farmers when engaging with vets and/or assessors, and these responses could inhibit action and behaviour change rather than empower farmers and encourage them making changes to enhance animal welfare.
7. The use of negative language can alienate farmer groups within the industry who see themselves, or others, accused "by implication" (silent dialogue), creating counter-productive social barriers and preventing progress in collaboration with stakeholder groups.

Some of the key recommendations from this study to the UK sheep and wider livestock sectors are now presented.

6.2 Recommendations for UK sheep (and wider livestock) sectors

6.2.1 Rethinking the welfare language is necessary.

Farmers have shown less receptivity to the phrasing of positive welfare, which can potentially hinder the adoption of positive welfare practices. This lack of receptivity is attributed to the binary nature of the term, leading to scepticism among farmers. Additionally, the term is perceived as a high-level concept primarily used by academics rather than being relatable to farmers and farming practices.

The findings suggest that the framing of a message can significantly influence how it is perceived and accepted by its intended audience, in this case, farmers. The term "positive welfare" may not resonate with farmers due to its abstract and academic connotations. This lack of resonance can create a barrier to the adoption of positive welfare practices, as farmers may not fully understand or connect with the term.

To effectively promote positive welfare practices among farmers, it is crucial to consider the framing of, and language used, in communication. The findings highlight the importance of using terminology that is relatable, practical, and aligned with farmers' existing knowledge and experiences. By framing the message in a way that resonates with farmers and addresses their specific concerns and priorities, the adoption of positive welfare practices can be facilitated.

This emphasises the need for effective animal welfare. communication strategies that bridge the gap between academic terminology and practical on-farm implementation. By using language that is accessible, tangible, and relevant to farmers' daily operations, the acceptance and adoption of positive welfare practices can be enhanced. It is essential to tailor the messaging to the specific needs and perspectives of farmers, ensuring that it aligns with their values, experiences, and understanding of

6.2.2 Positive welfare and environment

This study found that farmers were more likely to embrace the concept of positive welfare if it is incorporated into environmental discourses, particularly regenerative farming. This is an important opportunity for animal welfare since regenerative agriculture, in contrast to other agro-ecological systems has gained great traction in recent years (Rhodes, 2017). This

research highlights the need for an integrated and interconnected approach to investigate the dual environmental benefits associated with animal welfare opportunities within emerging the positive welfare concept. The complexity of these interrelationships necessitates a comprehensive examination that considers the intricate connections between environmental sustainability and animal welfare in agricultural practices. For example, the criticism of animal farming regarding greenhouse gas emissions, is a current key issue that concerns, and is concerning for, sheep farmers and the future of sheep farming. The environmental and animal welfare impacts of future sheep systems need to be studied together so that industry can work with scientists and policy makers to develop humane and sustainable systems. Therefore, creating collaborations between universities, government agencies, businesses, NGOs, and other organisations in order to facilitate cross disciplinary farmer led research and innovation has never been more valuable.

6.2.3 Social and interpersonal relations have a key role to play.

Social relations play a crucial role in the success of positive welfare practices in farming. Farmers often rely on advice and guidance from various sources, including trusted actors within their social networks. While veterinarians are traditionally seen as primary sources of information, there is recognition that other farm advisors can also provide valuable insights and knowledge related to positive welfare. These trusted actors, such as experienced farmers, agricultural consultants, or industry experts, may possess a deep understanding of farming practices and have practical insights into implementing positive welfare measures. They can offer advice and support based on their own experiences and expertise, which farmers may find relatable and applicable to their specific contexts. In some cases, these farm advisors may be perceived as being more aware of current farming practices than veterinarians. This perception can stem from the advisors' direct involvement in the farming community and

their continuous engagement with farmers. As a result, farmers may view them as valuable sources of information and guidance on positive welfare practices.

A few barriers were identified that hindered the interpersonal relationship between farmers and veterinarians (vets) and affected the quality and trust relationship. Some of these concerns are perceived lack of knowledge and financial costs associated with employing a vet. There is, however, a strong belief that if trust can be (re)built between vets and farmers, vets can play a transformative part in promoting the adoption of positive welfare practices in the future. Vets are seen by policy makers and some farmers as trusted advisors, sources of evidence-based information and knowledge, and experts in animal health care, e.g., in the Sustainable Farming Incentive measures that UK government has proposed. Vets also have the advantage of drawing on their experiences with other farmers and facilitate farmer to farmer knowledge exchange. As such, vets can provide valuable insights and experience on farmer journeys towards implementing positive welfare practices, as well as providing individual farmers with the space and support to explore and encourage what they want to focus on to enhance animal welfare on their farm.

Through connections with other farmers, vets can collect important data related to farmer led innovation being undertaken, as well as drawing on initiatives and resources of other organisations. Additionally, vets can also act as advocates for new initiatives, helping raise awareness among their farmer clients about the benefits of new strategies, services or innovation that may otherwise go unnoticed or potentially misunderstood by some farmers.

The available data for this study was limited, particularly in terms of the number of veterinarians included in the sample. Therefore, it is difficult to draw definitive conclusions or develop theories regarding the issue of getting veterinarians on farms. Additionally, the

willingness of farmers to pay for this information is another aspect that has not been addressed in the research. It is uncertain whether the findings from the limited sample can be generalized to the broader population of veterinarians and farmers. Furthermore, the absence of a government veterinary service poses challenges in envisioning how this issue could be effectively addressed. Further research with a larger and more diverse sample, as well as consideration of the economic factors involved, would be necessary to gain a more comprehensive understanding of the feasibility and potential solutions for getting veterinarians on farms.

6.3 Study limitations

In the study, the industry actors chosen for this study did not include consumers, who play a role in influencing the direction of agriculture and policy development by government accordingly. It is therefore a limitation of this study that it does not capture consumer perspectives and attitudes to and expectations for positive welfare. Consumers' views on positive welfare products would have been an added addition to this study, as well as their thoughts on how they perceive the framing of or the language they prefer when talking about and communicated to regarding the welfare validity of products on the market. What would be of interest and value particularly given farmers concerns raised here around consumer perception of sheep production, is to bring consumers and sheep farmers together in a knowledge exchange programme to create consensus and greater understanding of (positive) animal welfare perspectives. Furthermore, labelling around method of production and animal welfare is something that animal welfare scientists and NGOs has been advocating for some time (Farm Animal Welfare Forum, 2011). Policymakers should engage in a co-design approach bringing scientists, consumers and industry together (DEFRA, 2022a).

6.4 Future research

1. As hinted in chapter 3, future research on consumer discourses on positive welfare can be explored further by examining how consumers perceive the concept of "positive welfare". Research could focus on identifying the ways in which this group of people understand, discuss and debate what constitutes a benefit to society when it comes to positive welfare. Through such analysis, researchers may gain insight into where disagreements exist as well as potential solutions that could bridge these divisions and resolve (public) debates related to them. Additionally, research may also explore changes over time regarding consumer attitudes about positive welfare by tracking any shifts in discourse between periods where new policies are implemented versus those preceding their introduction/implementation. Finally, exploring similarities across national contexts regarding peoples' perceptions and understanding of certain animal welfare terms (i.e., good welfare, higher welfare, positive welfare) would provide more comprehensive evidence across a wider sample of the population.

2. The primary focus of this PhD research has been to analyse the discourses and dialogues surrounding the concept of positive welfare. The research findings have uncovered a lack of consensus or shared understanding among stakeholders regarding the definition and meaning of positive welfare. This lack of common understanding underscores the intricate and subjective nature of the concept, which can have significant implications for policymaking and the implementation of welfare practices. The research has highlighted the necessity for further exploration and clarification of the concept of positive welfare to establish a more cohesive and effective approach to welfare provision. In future studies, it would be valuable to investigate how the discourse employed by and between stakeholders

influences the interaction and how to facilitate a common understanding among actors with differing definitions of positive animal welfare.

3. There has been evidence in this research suggests that negative welfare messages may have undesired impact on farmers' self-reported self-identity and behaviour. Negative messages can create feelings of negativity and can lead to increased stresses and anxieties among farmers that are further exacerbated by perceptions of culpability or blame within dialogues design to support farmers to make animal welfare improvements. Such negative welfare language could in some cases cause mental health issues for the individuals involved, or more generally lead to defensive strategies as an individual or as an industry. The adoption of defensive strategies creates barriers for transitioning the industry. Further research is needed to investigate how the polarity of welfare-related and indeed environmental-related language (positive and negative) affects the level of engagement and the mental health of farmers in the broader context.

This study has provided a platform for participants, particularly farmers, to express their dissatisfaction with animal welfare policies and inspection practices that are not informed by farming language and therefore farmers do not feel ownership over the approach. Through this journey it was hoped that farmers have also been able to gain some insight into the current state of research in this field.

The output of the study is a compilation of scientific research and analyses, as well as tangible recommendations to improve engagement with animal welfare at a farm and industry level. This study has further highlighted some barriers of facilitating and disseminating

innovation such as positive welfare though a top-down approach, and the need for collaborative participation in developing welfare enhancement frameworks.

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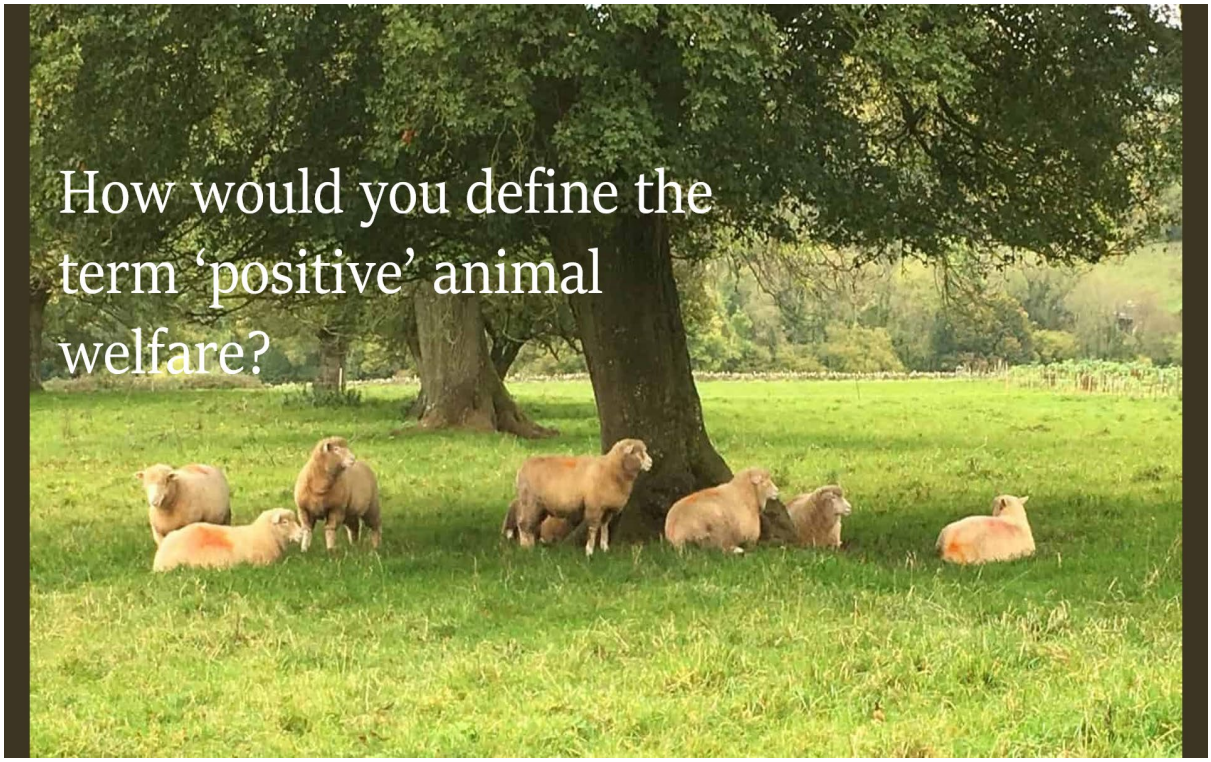
Appendices

Appendix A

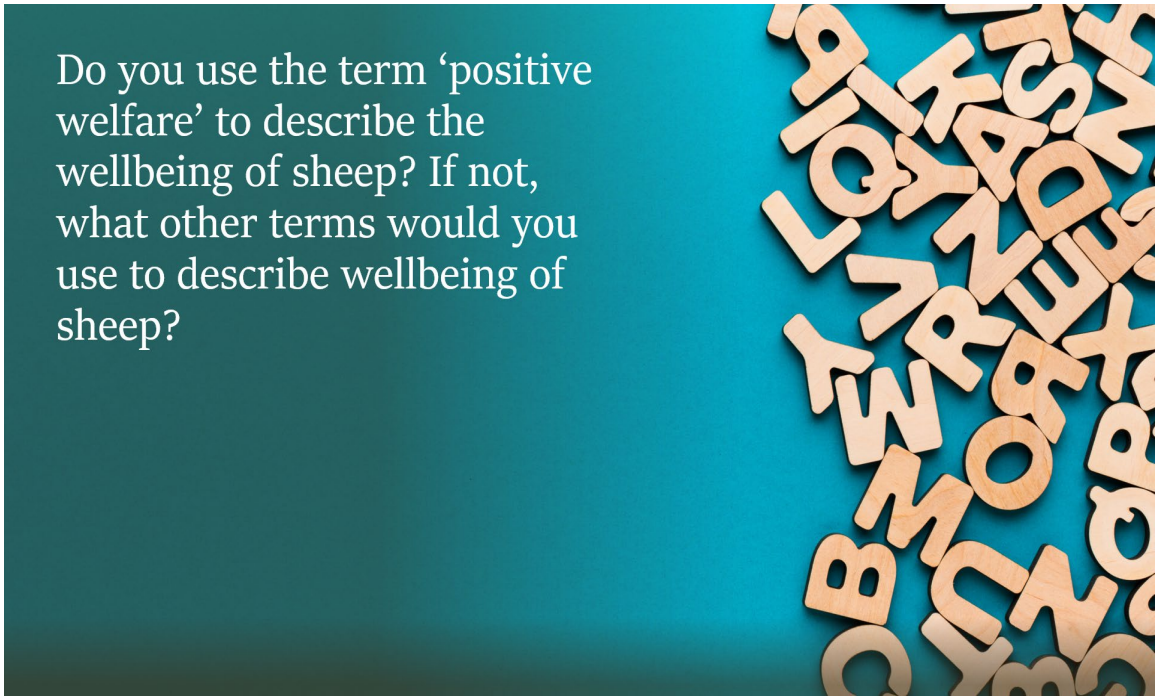
ELEMENT 1 – "Positive animal welfare discourses: perceptions and understanding of the concept.

Picture 1 Sheep in natural environments



ELEMENT 2 – "Positive welfare typological terms."

Picture 2 Terms used instead of positive welfare

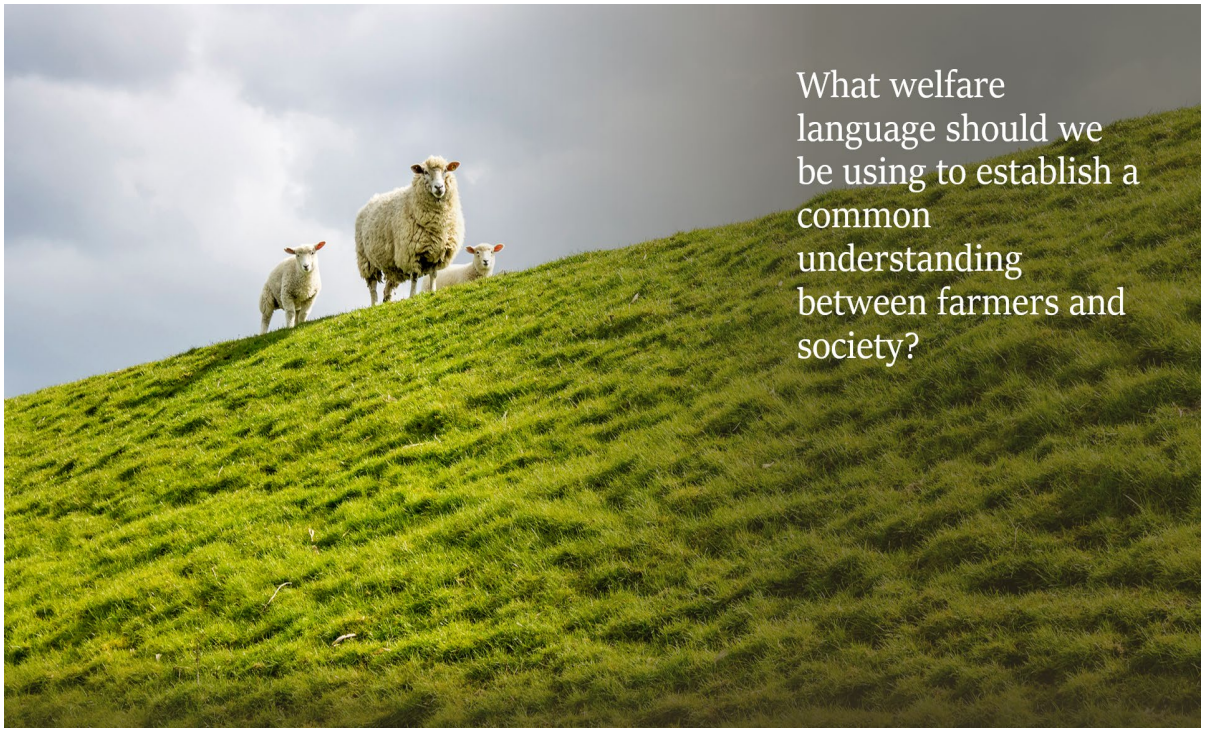


ELEMENT 3 – The impact of language on stakeholder decision making

Picture 3 Power of language

ELEMENT 4 - Establishing common welfare language between farmer and society

Picture 4 Developing common vocabulary



ELEMENT 5 - Perceived benefits of positive welfare practices to farmers

Figure 5 Positive welfare potential economic values

Appendix B

Date: 21 Jun. 21

Version: 2.0

Information Sheet

Research Title: POSITIVE WELFARE PRACTICES: ASSESSING KNOWLEDGE, ATTITUDES, AND APPLICATION IN THE UK SHEEP SECTOR

We would like to invite you to participate in our research on the knowledge, attitudes and perception around positive animal welfare, and how the industry's overly negative perception has dominated our approach to measuring and improving welfare. For your information before embarking on this multi-stakeholder participatory project, we invite you to read the below information to advise you on what is involved. Feel free to discuss this with other people and please do contact me if there is anything you wish to ask or clarify.

What is the purpose of the research?

This research greatly is a multi-stakeholder participatory research. It draws its strength from the pragmatic school of thought, which gives it the flexibility to explore the patterns and themes that emerge from the lived experiences and expertise of farmers, rather than attempting to impose a pre-existing welfare framework. Thus, we place a greater emphasis on what participants say rather than how many people make a certain type of decision because of the qualitative nature of this study. The aim is to frame a learning experience that allows language to be used in a way that promotes inclusivity and co-operation and co-creation of knowledge. The method is centred on farmer led changes, on farm, for farmers and is unique to policy making in the UK. We want to inform policy from the bottom up, rather than top down.

Why have I been invited?

You have been invited to participate in this research for one of the following reasons:

a) You have been suggested as a suitable participant for this research by your veterinary practice
b) You have responded to an invitation sent to participate (email, social media (Twitter or Facebook), or post), and have indicated an interest to participate in the research
c) You have been approached by the research supervisors directly because you fit the criteria for the research

Do I have to take part?

It is up to you to decide to participate in the research. We will describe the research and go through this information sheet with you. If you agree to take part, we will then ask you to sign a consent form. You are free to withdraw from the research at any time, without giving a reason.

What will happen to me if I take part and what will I have to do?

This is participatory research has a short time span. In the first step, you will have a semi-structured interview with the primary research face-face, online or via phone call – whatever works best for you. If you decide to participate in the upcoming multistakeholder focus group discussion (1 day event). The focus group discussion is expected to hold at the Royal Agricultural University and is expected to last for just a day. It is absolutely fine if you only want to partake in the interview (30 mins max) and not the focus group. Although we would appreciate if you partake in both

Prior to and during participation in the focus group/knowledge exchange group, you will be expected to;

a) Sign a participation consent form allowing us to handle your farm data and to use farm data anonymously and without financial data being included.
b) Fill in a questionnaire about your farming enterprise, which will include optional inclusion of personal data and will be kept secure and confidential.
c) Attend the 1-day focus groups, which will be at Royal Agricultural University.
d) Actively contribute to discussion and questions at the focus groups/knowledge exchange
e) Consent to having the knowledge exchange meetings video recorded.

What are the possible disadvantages and risks of taking part?

There are no foreseen risks of taking part in this research, physical or psychological.

A disadvantage may be the amount of time invested in the semi-interview/focus group research if you feel like it was not worthwhile by the end.

What are the possible benefits of taking part?

f) We cannot promise that this study will provide any immediate benefits to you, however due to the nature of the knowledge exchange process, you will get to experience how other farms work and get advice from farmers and potentially external sources for free. Additionally, the outcome of the focus group or farmer action groups cam help farmers in enabling welfare discourse in the sheep industry. Communication barriers or language inconsistencies in the supply chain could be identified and addressed. This will be able to generate a shared value in the industry by enhancing product information, which may lead to more consumption
g) The information we get from this research will help to inform the agricultural community, veterinarians, supply chain, those in research development and policymakers about how animal welfare is debated.
h) Many people enjoy participation in research, particularly expressing their views during in-depth interviews.

Will my taking part in the research be kept confidential?

i) All information gathered about you and the farm will be handled in confidence by us. All data will be stored on encrypted computers or in locked cabinets at the Royal Agricultural University. Video-recordings of the focus group/knowledge exchange group meetings and audio-recordings of any interviews will be made using an encrypted dicta-phone. These meetings and interviews will be transcribed, coded and the results anonymised. If using an external company to transcribe recordings, these will be subject to the same strict data handling rules as at the Royal Agricultural University.
j) Quotes from interviews may be used, but these will also be anonymous, any names or identifying features will be removed.
k) Data from this study will be available to suitable researchers upon request, and maybe will be stored for 10 years, as per Royal Agricultural University. After this point it will be disposed of securely.
Any data shared within your individual focus groups/knowledge exchange groups will be completely confidential and optional.

What will happen if I don't want to carry on with the research?

You can withdraw from the research at any time without giving a reason.
Any video or audio-recordings with you or your voice on it that have been processed before withdrawing from the research, cannot be deleted but any other information given can be deleted at the time of withdrawing from the research.

What will happen to the results of the research study?

It is intended that the results of this research will be published in the scientific literature and presented at national and international conferences. Results may also be publicised through the agricultural press. Your identity will be confidential in all public reports and publications. Regular summary reports will be made available to each member of focus group/knowledge exchange group after each meeting. These will detail individual farmers at the discretion of the farmers in each focus group/knowledge exchange group and will be optional. A report giving an overview

of the overall research results will be sent to you and all other participants once the research and analysis has been completed. You will also be invited to a meeting where the results will be presented. You can withdraw your information at any time.

Who is organising and funding the research?

The research is the basis of a PhD by Mukhtar Muhammad at the Royal Agricultural University. This research has received no funding, and there is no conflict of interests.

Who has reviewed the research?

The Royal Agricultural University,
For: The Royal Agricultural University Research Ethics Committee (Ethics approval number 20213216-Muhammad)

Further information and contact details

l) For any queries, concerns or further information please contact the lead researcher, details below.

m) Mukhtar Muhammad
n) Royal Agricultural University
o) Stroud road,
p) Cirencester

Semi Structured Interview Questions with Sheep Farmers Version 3.0

Farmers Background

Tell me about your farm.
When did you begin your farming activity?
What is your highest level of formal education?
How big is your farm? (Farm size). Is sheep enterprise your primary? If not, what other enterprises and livestock do you have?
Do you consider yourself to be a sheep farmer primarily producing meat, wool, milk, other?
Gender.
Age and Location

Narrative-inducing question	**Action**	**Follow up questions example**
Positive animal welfare – Is this term positive welfare how you would describe a good life for their sheep? How would you best describe what we are talking about?	Active listening	What does positive welfare look like in practice on a sheep farm? Can you explain which you think is important elements of positive welfare? In what way are you currently practically applying these elements on your sheep farm?
Decision making factors - What factors drives your decisions/ what makes you want/ or are implementing of the positive welfare (or good life) in sheep?		Would say if there are any factors that you find difficult or challenging when implementing these positive elements? Suggest ways to overcome these challenges
Perceived usefulness of positive welfare - Do you consider that positive welfare is a beneficial term to you? If this term isn't beneficial, what term would use?		What is it that attracts you about positive welfare in sheep? Is there any difference between positive welfare and negative aspects? Would you consider that positive welfare concept/practice is consistent with your existing values and experiences? how do you perceive the simplicity of positive welfare practices? Why? How do you think positive welfare adds value (or not) to your sheep?
Breadth of Positive welfare among farmers – how do you try and improve the lives of your sheep (continuous improvement)		To what extent do you feel you are reducing negative welfare and trying to improve positive welfare? Do you think improving positive welfare is part of your health flock plan? From research science, we have developed 5 opportunities for PW: health? Pleasure? Interest? Comfort? Confidence are there any opportunities you give to your sheep that don't fit in this category?
Farmer language (farmer angle) relationship – Can you talk to me about your relationship with your sheep	Concern, worry, confidence, satisfied	What satisfaction or motivation do you experience from being a sheep farmer? Does your sheep welfare influence your wellbeing? perception on their welfare? If so, how? Tell me, do you talk to your sheep? How do you talk to your sheep? Can you give an example? Do you talk about your sheep? With who, your vets? Family? describe the expressions use in this context
Knowledge engagements in		Are you part of any knowledge exchange group? If

positive welfare		yes, Do you discuss positive welfare with farmer groups? Who are part of the group? Can you tell me how you interact with the group? What changes do you make because of being part of the group? What is the value of knowledge exchange for you?

Appendix C

Proposed Interview questions with Sheep Stakeholders

Meeting objective:

To gain an insight and understand NSA position on the contested narrative about sheep as a resource unit (performance being) or as a sentient animal.

Ethics/Disclaimer: Subject to signing the consent form, this meeting would be recorded on an audio-visual device. The outcome from this meeting is expected to be a part of a critical discussion in a PhD research study at Royal Agricultural University. The discussion will be transcribed and analysed using qualitative analysis software. All stakeholders and associated data will be anonymous in the final thesis, or any papers published from this study. The results will be used to explore the impact of stakeholder language on learning experiences and behaviours among sheep farmers.

Interviewers: Mukhtar Muhammad, Louise Manning, and Jessica Stokes

Question 1 Definition of positive animal welfare

a. I am interested to know, how would you define animal welfare?
b. In practice, on a sheep farm, what does that mean?
c. How do you think your organisation defines/considers animal welfare?
d. Have you heard the term positive welfare? Yes/No
e. If yes, can you explain what the term means to you?
f. What does positive welfare look like in practice on a sheep farm?
g. If there are any other term you used at your organisation in place of welfare, what are they
h. Has your organisation developed a practical framework for sheep welfare?
i. Do you think a sheep welfare framework is important? Why?
j. Do your organisation positive welfare to be of value to the you, the farmers?

Question 2 Stockmanship

a. What do you think about the stockmanship element of sheep management?
b. Is it a key part of your organisation's focus when it considers the competency of farmers in its supply chain? Why?

Question 3 Environmental protection

a. What do you feel are the important aspects of environmental protection in terms of sheep production?
b. How does your organisation assure environmental protection standards are maintained by sheep farmers in its supply chain?

Question 4 Knowledge exchange/transfer on sheep welfare

I am interested to find out about how your organisation interacts with farmers on sheep welfare.

a. Can you describe your relationship with farmers in terms of information sharing/gathering?
b. What information does your organisation feel it is important to share?
c. Do you carry out knowledge exchange events with sheep farmers in your supply chain? Is so what? How often? What are the subjects, and intended outcomes?

Question 5 Public disclosures – sheep and generally with livestock

a. In public disclosures, corporate social responsibility or environmental and social governance reporting, how do you share information regarding animal welfare?
b. What types of information do you believe are important to share or not to share?
c. What benefits do you believe there are in the communication with suppliers or consumers in terms of animal welfare?
d. Do you think there are negative impacts or consequences to communicating welfare issues with stakeholders or consumers?
e. Are there aspects that you feel are important in terms of frequency, the mode they receive this information and the amount and quality of information they receive in terms of animal welfare?

Question 6 Argument type/Language wars

We have been looking at a wide range of knowledge exchange stakeholders, and how they frame sheep welfare in their communication. Looking at what your website has reported

regarding animal welfare, we have (or have not) analysed that your organisation communicates about animal welfare from the perspective of animal sentience or resource unit. We would like to know whether you feel this is:

(a) What can you say is a fair analysis of the narrative used in your organisation– why?
(b) Whether the narrative is intended or unintended. – And why?

(c) Does the way you frame animal welfare on your website translate to how you discuss animal welfare at knowledge exchange events with farmers?

(d) What impact do you think the framing of sheep welfare has on sheep farmers?

(e) Do you feel there are any other questions I should ask?

Appendix D

Date 2 June 2021

CONSENT FORM

TITLE OF PROJECT: Positive Welfare Practices: Assessing knowledge, attitudes, and application in the UK Sheep Sector.

Researcher: **Mukhtar Muhammad**

By signing your initials to the following numbered sentences, you voluntarily and willing accept that

1. I confirm that I have read and understand the information sheet dated 2 June 2021 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. ☐
3. I understand that the discussion will be transcribed and analysed using qualitative analysis software. ☐
4. I agree to the collection of and the use of data which will be anonymous in the final thesis, or any papers published from this study. The results will be used to explore the impact of stakeholder language on learning experiences and behaviours among sheep farmers ☐

5. I agree to the use of videorecording and audio-recording equipment in this study and the possible use of anonymised quotes and photographs in future publications, upon request. ☐

6. I agree to take part in the above study on behalf of my organisation/Industry ☐

7. I confirm that I am eligible to speak on behalf of the organisation I represent. ☐

Name of Person taking consent	Date	Signature
_____	_____	_____

Appendix E

Codebook

Name	Description
4.0 Positive welfare awareness understanding and narratives	Parent node for awareness, meanings and interpretations of positive welfare
4. 3 How established meanings for positive welfare are being problematized	Comments for the understanding the complexities of positive welfare
4.3.1 Problems with the terminology	Comments from participants who find it difficult to understand the nuances associated with the positive welfare terminology
4.3.1.1 Difficult and non descriptive term	
4.3.2.2 Judgemental and academic	
4.3.2.3 Skepticism and vauge	
4.3.2 Problems with assessments and measuring positive welfare	Sub code on issues with (positive) welfare assessments and the need to have a positive welfare framework
Different thresholds for farmers	
Framework and tickbox needed	
No one size fits it all	
Positive is immeasurable and is inherent in minds of shepherds	
4.3.4 Problems with natural systems	Sub node capturing comments on tradeoffs associated to positive welfare in natural environments
Difficult to enforce welfare standards in an outdoor natural systems	
Intensively managed sheep are more easier to handle	
Naturalness is good but with more human intervention	
The trade-offs in positive welfare	

Name	Description
4.3.5 Problems related to farmer welfare being excluded in the discourse	Parent node on comments indicating that the positive welfare doesn't not include farmer welfare
A lack of attention is paid to the discourse on improving health	Parent node on comments indicating that the positive welfare doesn't not include health of the animal (negative aspects)
Disease eradication could also contribute to positive welfare	
Medicine plays a crucial role in achieving positive welfare	
Positive health is something that needs to be discussed more	
4.1 Level of awareness of positive welfare term	Parent node on comments indicating that the levels of awareness and knowledge on positive welfare
Age related factors	
Farmer2Farmer discussions	
High awareness	
Its part of our vocabulary	
early science	
Market	
Positive welfare captures all scientific and subjective terms	
supply chain position	
Values	
No awareness	
It is not part of our vocabulary	
More detailed discussions	
Some awareness	
Not well understood	

Name	Description
4.2 Evidence of understanding of established meaning of positive welfare	Parent node on definition of positive welfare
Good husbandry	Established definitions relating to good husbandry
Five freedoms	
Good stockmanship	
Making decision that are good for the animal	
Healthy animals in good condition	
Negative attitude to concept	
No overstocking	
Happy healthy definitions	Established definitions relating to happy-healthy theme
Absence of pain	
Adequate nutrition	
Basic needs	
Low intervention	
Higher welfare related definitions	Established definitions relating to high welfare
Living conditions	Established definitions relating to living conditions
creating a natural systems for sheep	
The positive experiences are related to the sheep's environment	
Positive experiences	Established definitions relating to positive experience outweigh negative experience
Associated freedoms	
choice and agency	
Enrichments	
Expressing play behaviours	

Name	Description
Feeling good from the negative eradication	
Mother lamb bonding	
Proactiveness	
Proactive welfare improvement	Established definitions relating to proactive welfare improvement
Low veterinary bills	
Resilience and Longevity	
4.4 New meanings of Positive welfare and why	New meanings and narratives associated with positive welfare
4.4.1 Emerging welfare terminologies	Preferred and motivational terms
Animal welfare term	Alternative term to positive welfare
Awareness of good practice	Alternative term to positive welfare
Good condition	Alternative term to positive welfare
good life	Alternative term to positive welfare
Good welfare	Alternative term to positive welfare
blame language	
Good welfare is acheivable	
More understood	
Not encompassing	
Happy healthy sheep	Alternative term to positive welfare
Content sheep	
Normalcy	
Scientific	
Happy sheep - how it is problematized	

Name	Description
Content sheep	
Health and welfare used interchangably without acknolwedging their differences	
High welfare and why	Alternative term to positive welfare
High has more standards than positive	
High welfare - how it is problematized	
High welfare means those at the peak of welfare implementation	
low vet bills	
market segmentation with assurance schemes	
Positive wellbeing	Alternative term to positive welfare
communication tool	
Welfare is human impacted	
wellbeing is animal focused	
wellbeing is human focus	
Stockman	Alternative term to positive welfare
Thrive	Alternative term to positive welfare
4.4.2 Environment as the sixth indicator	Narratives and discourses around positive welfare incorporating environmental elements
Intentions to act	
Biodiversity	
Carbon footprint measurement	
Depending on Government	

Name	Description
policies	
Education	
Facilitation	
Issues surrounding the environment	
Emissions	
Ammonia emissions	
Carbon emissions	
Carbon footprint	
greenhouse gases	
Wool burning	
Financial constraints	
Hedgerows funding	
Land poaching	
Sheep farming is environmentally friendly	
Sustainable products market	
Sustainable is no longer enough - regenerative farming is needed	
Sustainable sheep farming practices	
Advisory	
Agroforestry	
Grow more trees	
Feeding choices	
shade for sheep	
Dung management	

Name	Description
Bokashi innovations	
Safe disposal of chemicals	
Slurry storage	
Feed efficiency	
Feed conversion	
reducing concentrate feed	
Fertilizer	
Less fertilizer application	
Use of Farm yard manure	
more nutrient to the soil	
Holistic management	
renegerative farming	
Land and soil management	
No overgrazing	
can incur more costs	
can risks of worm infections	
has no benefit to human	
has no benefit to land	
has no benefit to sheep	
Rotational and mob	

Name	Description
grazing	
Soil water conservation	
PPE management	
stocking rate management	
4.4.3 Petification of sheep	Petting or brushing the back of sheep moves beyond the farmer-animal relationship. Seen as a negative
4.5 Differences across different stakeholder groups in their level of awareness, how established meaning of PW have been problematised and the new meanings of PW	
5. 0 Influence of message framing (or language) on decision making	Farmer behaviour and welfare language
5. 1 Effect of language framing on decision makings	Parent node on whether how we frame welfare as positive or negative, how that might influence farmers adoption of welfare improvements on on farm. Does it matter? Do we just need to talk about good good husbandry or whatever? Or does actually thinking about the language of positive negative potentially help farmers and perhaps new farmers, as well as old established farmers? Is this new sheep home is coming in?
Interpersonal relationship affects language use	
Fertility specialist	
Vet after money	
Larger ruminants	
Vet not helpful	
Vets as champions of welfare	
The use of negative language adversely affect farmers	Narratives and discourse describing the effect of negative language on farmer behaviour
Consumer wants metric - difficult to have positive metrics	

Name	Description
Different farmers have different threshold for welfare	
Thresholds are important - but should be collaboratively set to address difference in farming objectives	
Farmers mentality	
Farmers respond to health language	
Health sentience	
Judgemental welfare language creates tension with farmers	
Motivate farmers	
Raising welfare awareness	
Target can be limiting, use positive language to recognise achievable	
Benchmarking	
we are doing positive welfare anyway	
Positive impact of language	
Positive welfare and farmer consciousness	
5. 2 Perceived benefits of positive welfare	Some perceived impacts of positive welfare
Human capital	Sub node on perceived benefits capturing its human benefits
Internal satisfaction	
Positive economic value	Sub node on perceived benefits discussing its economic impacts
Difficult for positive welfare to generate financial values	
Animal welfare in sheep is primarily an expectations	

Name	Description
Farmers expecting financial value to adopt	
Price determines consumer purchase	
Supply chain is fragmented in beef and lamb	
Positive welfare brand as a selling tool, but must incorporate environmental aspects	
Can be a differentiating factor in trade and standards with other countries	
Challenge with shelf label	
Depends if consumers are willingness to pay for premium	
Supermarket contracts	
More branding and advertisement needed	
Should Include elements of environment	
Storytelling can influence price - depending on taraget market	
Traceability	
Social capital	Sub node on perceived benefits discussing its social impact
Positive message to change perceptions	
5. 3 Current practices for positive welfare	Farmers own framing of positive welfare improvement strategies
Good husbandry	Evidences of husbandry practice as identified in the literature

Name	Description
Animal care and management	A good husbandry practice
Biosecurity	
Caring for pregnant ewe	
No overstocking	
Pain management	
Castration	
ear tagging	
Tail docking	
Rotational grazing	
Sick sheep needing further care	
Disease prevention through behavioural observation	A good husbandry practices requiring good stockmanship to proactively identify farm issues
Management policy for positive health	Routine farm operations classed under good husbandry
Health flock plan	
Feet management	
Fluke control	
Cognitive assessment	
Parasites control methods	
Chemical methods	
Dipping	
Treatments for lice and ticks	
fluke sampling	

Name	Description
Non chemical methods	
vet product used	
Routine Vaccination	
Cognitive assessments	
water	
Worm programme	
Worming products	
Perceived importance	
Benchmark for welfare improvement and productive efficiency	
Source of information	
Problematization	
Farmers rarely use plan - they know what they are doing	
Flexibility	
Self planned	
Focused on intensive species	
Medicine hub	
Records negative indicators	
Disease assessment	
Growth rates	
Mortality records	

Name	Description
Vet medicine interventions	
Tick boxes	
Assurance inspector	
Everything about farm	
Legal compliance and assurance schemes	
Medicine book	
Positive healthy life through enetics	
1 Breeding for resilience	
cognitive experience	
Breeding for production efficiency	
Breeding Problematization	
Culling	
Responsible use of antibiotics	
Good welfare	Evidences of good welfare practices as identified in the literature
Faecal Egg Count test	
Gentle handling	
Good shearing practices	
Improving fitness levels	
Soil and Grass and mineral testing	
Higher welfare	
Precision farm technology	

Name	Description
Automated weight systems	
EID	
Negative perceptions	
Data centric	
Involves restraining animal	
Positive perceptions	
Sire referencing	
Tracking performance	
Space provision	
Positive welfare	Evidence of positive welfare practices as identified in the literature
Comfort by physical environment	
Problematization	
Space allolwance	
Comfort from thermal environment	
Feeding choices	
anthelminthics and worming effect	
Anticipatory behaviour	
Mob grazing	
Regenerative agriculture	
Maternal bonding	
ewe lamb seperation	
Playing opportunities	
Social synchronization	

Name	Description
5. 5 Fostering common welfare language to drive change	So how can this language (positive vs negative) be used to help with a common understanding between farmers and society?
Change in negative mindset and perception required	
Language matters	
Difficult to foster common language in larger communities	
Society has different perception of what farming is - big gulf in understanding and desireable outcome	
There is a lack of understanding of farming among today's consumers- reeducation and story telling are key	
variance in socieities in terms of level of welfare knowledge	
Public engagement	
Engage only practioners in stakeholder consultation	
Engage society in action - stakeholder first followed by wider engagement with society	
Farmers talking to farmers is not enough there is need to stimulate dialogue and mutual learning	
Scientists and practioners should engage farmers and discuss areas of welfare improvment rather than Focus on components rather than word	
Reeducation and storytelling are key	
Farmers being there as a focal point	

Name	Description
Its a PR Job - Open days and farm walks for the public	
Market orientation	
Right impact and impression perculates out into community	
Schools - impactful experiences	
Tell your neighbours what we are doing	
5.4 Factors driving decision making	Parent node on factors driving decision making. These are what matter to consumers and through them positive welfare adoption can be increased
Breed type	
Family peer consumer	
Good life for the animal	
Institutional factors	
Maintaining a flock that is healthy, happy, and productive	
Personal beliefs and development	
Protect positive public image of welfare	