Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Navigating trusted and untrusted knowledge sources: Perspectives from UK Sheep Farmers.

Mukhtar Muhammad

10345094@rau.ac.uk

Royal Agricultural University https://orcid.org/0000-0001-8725-5150

Louise Manning

Lincoln University https://orcid.org/0000-0002-9900-7303

Research Article

Keywords: farmers, veterinarian, relationship, knowledge exchange, trust, peer learning animal welfare, positive welfare

Posted Date: July 7th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10244046/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Navigating trusted and untrusted knowledge sources: Perspectives from UK Sheep Farmers.

Abstract

UK sheep farmers rely on a blend of knowledge: family traditions, peer networks, veterinarians, advisory services, digital communities, and international experts. This study explores how trust and relevance shape their choices, especially for animal welfare. Farmers value advice grounded in practical sheep experience and strong relationships. Family and peers remain central, but credible advisory services and select online groups add practical value. International perspectives, notably from New Zealand, also inform decisions. Building trust and tailoring knowledge to farm realities are key to improving welfare outcomes. As an exploratory contribution, this paper opens up a new research agenda on farmer knowledge networks and the conditions under which different knowledge sources gain legitimacy in agricultural decision-making.

Keywords: farmers, veterinarian, relationship, knowledge exchange, trust, peer learning animal welfare, positive welfare

1. Introduction

Farmers operate within complex knowledge environments that include advisory services, veterinarians, peer networks, family traditions, industry organisations, social media platforms, and international knowledge systems. Understanding how farmers evaluate and navigate these diverse sources is increasingly important for agricultural innovation and the improvement of animal welfare. Veterinarians are widely considered key intermediaries in agricultural knowledge exchange, positioned at the intersection of scientific research and farming practice (1,2). They are uniquely placed to translate complex scientific concepts into practical, on-farm advice, influencing farmer decision-making on animal health, welfare, and productivity. However, the effectiveness of veterinarians as knowledge brokers depends on the quality of the farmer-veterinarian relationship, which is shaped by trust, communication, and perceived expertise (3).

Existing research has examined the role of veterinarians in specific disease management contexts, such as lameness (4), flock health planning (1), and welfare (3,5) . While considerable attention has focused on veterinarians as trusted advisors, less is known about how veterinary

advice is situated within the broader range of knowledge sources farmers draw on when making welfare-related decisions. Beyond veterinary relationships, farmers engage with multiple knowledge sources—advisory services, peer networks, social media, intergenerational knowledge, international networks, and formal organisations—each with varying degrees of trust and credibility. This reflects broader understandings of agricultural innovation as a process of knowledge exchange occurring through interacting networks of farmers, advisors, opinion leaders, and institutions rather than through linear knowledge transfer (6).

To understand how farmers engage with and evaluate different knowledge sources, it is useful to consider the types of knowledge they seek and value. Lundvall and Johnson (7) distinguish between four categories: 'know-what' (empirical knowledge of facts), 'know-why' (knowledge of scientific principles), 'know-how' (practical skills and competence), and 'know-who' (understanding of the knowledge community and who to access for advice). While these categories are analytically distinct, they interact in practice—farmers' know-how is developed through experience, their know-what through observation, their know-why through understanding underlying mechanisms, and their know-who through social networks and relationships. Ingram and Morris (8) have applied this framework to agricultural advisors, noting that effective advice requires the presence of know-what, know-why, and know-how, with know-who shaping how farmers access and trust knowledge. Similarly, Thomas et al. (9) demonstrate that farmers' knowledge-sharing practices are embedded in social relations, with know-who playing a central role in the flow of knowledge through farming communities. Using animal welfare as an empirical context, this paper examines how UK sheep farmers navigate multiple knowledge sources, exploring how trust is negotiated, what farmers expect from veterinary advice, how they engage with formal and informal knowledge networks, and the implications for welfare knowledge exchange. The findings contribute to understanding the conditions under which veterinarians and other intermediaries can effectively facilitate the communication and uptake of emerging welfare concepts.

2. Methodology

2.1 Study Participants

The sampling frame targeted individuals with active roles in the UK sheep farming sector, encompassing farmers, veterinarians, advisors, certification scheme representatives, and supply chain stakeholders. Recruitment relied on convenience snowball sampling, drawing on

knowledge exchange events, established farmer networks, and introductions within the industry.

A total of 25 sheep farmers from across the UK participated, the majority of whom operated mixed livestock enterprises (including poultry, pigs, and cattle), with sheep farming as their principal activity. The sample also included eleven industry actors: veterinarians (n=2), certification scheme representatives (n=2), agricultural advisors (n=2), an academic researcher (n=1), and supply chain representatives from the wool (n=3) and meat (n=1) sectors.

2.2 Data Collection and Analysis

Data collection involved semi-structured interviews along with a facilitated group discussion conducted via Zoom in March 2022, which lasted 1.5 hours. Participants were allocated to homogenous breakout groups to encourage open exchange of ideas. The research team employed a semi-structured guide, centring on farmers' relationships with vets and their expectations regarding welfare advice. All sessions were recorded and transcribed verbatim using Otter.ai.

Transcripts were imported into NVivo for thematic analysis. The analytical process adopted a hybrid inductive-deductive approach (10): initial deductive coding was informed by existing literature on farmer-vet relationships, followed by inductive coding to allow emergent themes to surface, and subsequent comparison to identify novel insights. Coding was iteratively refined through collaborative team review.

3. Results and Discussion

This section presents findings on farmer relationships with their sources of knowledge and their implications for the exchange of animal welfare knowledge. The structure below, with clear subheadings, is intended to guide the reader through each theme and highlight the different knowledge typologies involved.

3.1 Intergenerational Knowledge as a Foundation of Trust (Know-How, Know-Who)

A dominant theme across interviews was the importance of intergenerational knowledge transfer—learning from parents, grandparents, and other family members. Farmers consistently identified family as their primary source of knowledge, perceived to outweigh formal advice from vets or advisory services.

One farmer described the value of having access to generations of family knowledge:

"That's why it's so good to be able to take on a family farm... I see my granddad most days. He's 88, he's done a lot of farming, so he's always glad to ask." (Farmer 12)

The same farmer confirmed that most of their farming knowledge comes from family: "Most of my farming knowledge comes from my family."

This intergenerational connection was deeply personal and identity-based for some farmers. One farmer reflected on the emotional bond with her grandfather's farming legacy:

"My grandfather was a farmer... I've always been very much my grandfather's granddaughter... I came back to my roots and I started farming in my own right." (Farmer 9)

Another described how family knowledge is integrated with formal training: "You've got to enjoy the job... if you're interested in it, you had got the stockmanship, you have to ally that with training as well. Formal training as well, which again, is very important." (Farmer 2)

For younger farmers, formal education complemented rather than replaced family knowledge. One farmer described the sequence of learning:

"I learned a lot of my practical skills in farming from my family anyway. They sort of trained me up before I went off to uni." (Farmer 10)

Another farmer noted that her family background—her grandfather was a vet—influences her approach to flock health planning:

"We don't have one that we've gone through with a vet. We have a plan ourselves. We haven't consulted with our vet, but my granddad was a vet. So it's kind of unofficially discussed with that." (Farmer 13)

This highlights the enduring influence of family knowledge, even when it is no longer directly available. The "unofficial" consultation with a grandfather's veterinary knowledge suggests that intergenerational knowledge persists, shaping current practices without formal institutional support.

One farmer noted that his son, being younger, was more engaged with digital knowledge sources:

"The web is a good place to get information... my son is far more into it than me being 22, 23 year old... with various groups and people that he tags and listen to their views." (Farmer 16) This suggests generational differences in knowledge seeking, with younger farmers more engaged with digital platforms (11). The farmer also noted the intergenerational transmission of stockmanship skills:

"My son works with me, he's very good with sheep he is probably better than me as a stockman." (Farmer 1)

This highlights how stockmanship skills are passed down through generations, contributing to the continuity of farming knowledge.

However, some farmers came to farming without a family background (Farmer 17), and instead talked about having formal education. This highlights the importance of formal education as an alternative pathway into farming for those without family connections and suggests that first-generation farmers may rely more heavily on formal knowledge sources and advisory services.

Intergenerational knowledge transfer served not only as a source of technical knowledge but also as a mechanism for establishing trust and credibility. Unlike formal advisory relationships, family-based knowledge was embedded within long-term social relationships and shared farming experience. Consequently, advice received from parents and grandparents was often perceived as immediately relevant, context-specific, and practically tested. This suggests that the legitimacy of knowledge in sheep farming is shaped not only by expertise but also by social proximity and lived experience.

3.2 Veterinarians as Conditional Knowledge Sources (Know-What, Know-Why, Know-Who)

Farmers described their trust in veterinary advice as conditional and depended largely on perceptions of veterinarians' sheep-specific expertise and practical understanding of farming systems. While veterinarians were recognised as important sources of technical knowledge,

some farmers in this study questioned whether vets possessed sufficient experience of commercial sheep production.

"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)
"I'd say that I know far more than vets do about sheep because they don't see and deal with sheep that often. So they haven't got the knowledge." (Farmer 4)

These findings suggest that veterinary knowledge was evaluated not solely on professional credentials, but on whether it was perceived as relevant and applicable to the realities of sheep farming.
Experiences of veterinary engagement varied considerably. Some farmers described collaborative relationships in which welfare and flock health were discussed regularly, while others characterised interactions as largely transactional and centred on health plans, medicines, or regulatory requirements.

"Working with the vets is very important... you find the cheapest way of dealing with reducing welfare issues or disease or whatever it is to work very closely with a vet and take their advice." (Farmer 2)
"We have a flock health plan that we work through with the vet... they have a fair input and also they're the ones that supply the drugs." (Farmer 16)

Despite these positive examples, most farmers reported that they consulted veterinarians primarily when problems arose. Veterinary involvement was therefore often reactive rather than preventative, reflecting a continuing "fire-fighter" role within sheep farming.

"We take responsibility for the animals day to day health... and if there's a problem, and if we don't know how to tackle that will then call the vet." (Farmer 13)
"Normally just talking about health issues can't say we're very talking about positive... welfare." (Farmer 15)

Consistent with previous research (1), these findings suggest that veterinarians remain important but conditional knowledge sources whose influence depends on trust, perceived expertise, and the extent to which they engage proactively with farmers' management systems.

3.3 Formal Advisory Services and Institutional Trust (Know-What, Know-Why)

Farmers valued formal advisory services such as Farming Connect, which were perceived as providing reliable, trustworthy information. One farmer described their engagement with this service:

"I'm part of Farming Connect, which is a Welsh, I think a Welsh Government type thing. They publish a lot of information and occasionally gets sort of invited to talks and farm walks and things." (Farmer 7)

The credibility of such services was contrasted with the unreliability of open online sources:

"Often, you sort of have, have a suspected health issue and then turn to Google and come across a variety of information, some of which may not be trustworthy. But I think a lot of the resources that have to do with the Farm Connect or HCC, which is the Meat Promotion Wales, have more reliable information for guidance and support." (Farmer 7)

This suggests that farmers distinguish between trusted institutional sources and less reliable online information, actively seeking out credible intermediaries to validate their knowledge.

Formal advisory services were valued for providing both know-what (factual information) and know-why (scientific principles), but their effectiveness depended on their ability to connect with farmers' existing know-how and know-who.

A young farmer, new to the industry, also described his engagement with Farming Connect:

"I'm part of Farming Connect... started off as a three-month course... we've got like a WhatsApp group chat, and then we're going to schedule catchups every three months." (Farmer 17)

The farmer noted the value of this knowledge exchange:

"I think it would add value to the business, not necessarily value to price of lamb that I'm going to get but it adds value to the business." (Farmer 17)

This suggests that formal advisory services provide not only technical knowledge (know-what, know-why) but also business value and social connections (know-who), supporting Sutherland and Labarthe's (11) findings on the value of farmer-centric knowledge exchange.

However, farmers also emphasised that knowledge should not be imposed top-down. One farmer articulated the need for co-creation:

"I think it's a good balance of you need sort of academia and research to collate these things because they've got the expertise to do that. But you need the farming opinion as well." (Farmer 10)

This suggests that farmers value institutional knowledge but are wary of knowledge that does not incorporate practical farming perspectives—a theme that resonates with the know-who framework.

3.4 Peer Networks, Discussion Groups, and Social Learning (Know-How, Know-Who)

Farmers were part of multiple peer networks, including formal organisations such as the National Sheep Association (NSA) and the National Farmers Union (NFU), as well as informal groups such as local WhatsApp groups and Facebook communities. One farmer described their extensive network:

"I'm on British Wool so I represent 17 counties. I'm in touch with farmers virtually daily... I'm part of the NFU... I'm a member of the National Sheep Association... my neighbouring farmers have created a WhatsApp group." (Farmer 8)

A female farmer described her engagement with Facebook groups:

"I am on stuff like Facebook. There's a group called ladies that Lamb... and then there's a few others, what they're called now. There's a regenerative farming one and a grazing group." (Farmer 12)

Another farmer described her involvement in formal farmer groups:

"I'm chair of the local Young Farmers Club... we do a lot of events aimed at helping them learn about keeping animals... and we are in our regional Ryeland group... we get together and they probably do training once or twice a year." (Farmer 13)

Farmers also participated in discussion groups that covered a wide range of practical topics. One farmer described his involvement:

"Part of two [groups], one was started as an AHDB, but now that's off because the funding is gone. So it's a farmer-funded group. And I'm part of another one that's just started up another AHDB farm discussion group." (Farmer 15)

The topics covered in these groups were practical and varied:

"We do have a mixture from, you know, from discussing grass or soil quality… to health issues within the livestock to husbandry, you know, husbandry issues, is probably quite, quite a mixed bag of what we're talking about." (Farmer 15)

The value of these groups was described in practical terms:

"We meet at the gate to generally walk away with either a new idea something new to try or something to avoid... they are pretty good." (Farmer 15)

This highlights how peer networks serve as sites for building know-how (learning practical tips and what to avoid) and know-who (identifying trusted knowledge sources and peers). One farmer described his engagement with the National Sheep Association:

"I went to a meeting last night [NSA]... I think it's just all things... if you're with a load of other sheep farmers you soon pick up what they're up to." (Farmer 16)

He also used online forums for practical advice:

"There's a farming forum I get on quite a lot. And you pick up tips and things off there when topics get discussed." (Farmer 16)

This reinforces that farmers value peer-to-peer learning for practical problem-solving. However, farmers were selective about which platforms they engaged with, recognising the potential for misinformation:

"There is one dreadful one called farmers forum. And there are some very agitated, naive narrowminded people that are very vocal on there... they're very inaccurate... they add so much more anxiety to an already anxious sector." (Farmer 8)

"I am very connected, but I'm very picky in what platforms I use." (Farmer 8)

This selective engagement reflects a strategic approach to knowledge seeking, where farmers actively curate their information sources to build reliable know-who networks and avoid misinformation.

3.5 Navigating Digital and International Knowledge Sources (Know-What, Know-Why, Know-How, Know-Who)

Farmers drew on a combination of traditional and digital knowledge sources. Some valued traditional sources such as books and manuals:

"I used to read, I read a lot of books before I became, I used to read every vet book under the sun... a lot of sheep keeping and veterinary manuals on sheep." (Farmer 6)

One farmer described their learning sources:

"We get our knowledge from reading the Farmers Weekly, the Farmers Guardian, veterinary books, things like that." (Farmer 13)

Others embraced digital platforms, including podcasts and social media, to access specialist knowledge:

"Yes, I use the internet, especially with regenerative farming. I listen to quite a lot of podcasts and I'm also part of NSA National Sheep association." (Farmer 4)

However, farmers also expressed concern about the reliability of digital sources, emphasising the need for peer-reviewed or institutionally validated information:

"If you want information, technical information peer-reviewed proper information you have to go to reliable source." (Farmer 5)

This suggests that while farmers are open to multiple knowledge formats, they actively assess the credibility of sources, prioritising those that provide trustworthy know-what and know-why while building know-who networks that they can trust.

Farmers 1 and 15 looked beyond UK borders for knowledge and validation, particularly to New Zealand. One farmer described importing genetics from New Zealand and using a New Zealand recording system because British systems would not recognise the value of imported genetics:

"All our data that we collect goes out to New Zealand. And we use a system out there called Sheep Improvement limited... we use that because we import genetics from New Zealand to the Rams we import have their own set of figures, because they come from flocks that have been doing the same things as us." (Farmer 15)

This farmer also explained their perceived limitations of British livestock systems:

"If we brought the rams in and then tried to put them on a British system like Sigmet they'd have to start at the bottom. So they wouldn't take any notice of the fact that we bought the ram that's got the highest EBV in the whole of New Zealand."

This suggests that some farmers perceive international knowledge systems as more advanced or credible than domestic ones, reflecting a strategic approach to knowledge seeking that transcends national boundaries (9,12).

The farmer also noted the value of New Zealand genetics for their specific farming system:

"The New Zealand Romney's are bred for easy lambing so that when you look at them from above they're sort of triangular shaped... we have very few lambing issues very rarely do we have to assist the ewe at lambing time." (Farmer 14)

This international knowledge network serves as an alternative to domestic advisory services, providing farmers with access to specialised expertise that may not be available locally.

Another farmer demonstrated a different form of international knowledge engagement—exporting knowledge through specialised products:

"A lot of it goes abroad to the Netherlands, to the USA and to Germany. So I can make quite a lot of money out of my fleeces." (Farmer 9)

This suggests that international knowledge flows are not only about receiving knowledge (as with New Zealand genetics) but also about understanding international market demands and producing for them.

3.6 Knowledge exchange and the challenge of animal welfare communication

Trust in veterinary advice was reported to be conditional, and vets are often limited to a reactive, "fire-fighter" role. In the absence of stronger farmer-vet relationships and proactive engagement, veterinarians may encounter difficulties in introducing and promoting new welfare concepts. The Lundvall and Johnson (7) typology provides a framework for understanding these dynamics. Farmers' knowledge systems are rooted in know-how (practical skills) and know-who (trusted relationships). Veterinary advice, which primarily offers know-why (scientific principles) and know-what (diagnostic facts), may be regarded as less valuable if it does not relate to farmers' existing know-how or foster trust through know-who. In contrast, intergenerational knowledge transfer and peer networks are highly valued because they convey practical competence and trusted relationships. These findings align with broader models of agricultural knowledge exchange that highlight the interplay between formal and informal knowledge systems, including farmer-to-farmer learning, advisory services, and trusted intermediaries (6).

However, a major barrier to knowledge uptake appears to be generational, as argued by Farmer 9:

"Education is difficult in some of the older farmers... 'Well, it was good enough for my granddad. So it's good enough for me.' There is that element out there."
"It's usually the younger generation that will talk about the new ideas."
"How do you think the barrier between the older generation and the younger generation can be overcome? ... With difficulty, I think." (Farmer 9)

This suggests that knowledge adoption is not only perceived as a matter of trust or expertise, but was also understood to be shaped by age, tradition, and openness to change. Intermediaries, therefore, should understand the social and generational dynamics of the farming communities they work with.

Another barrier is the language of new welfare concepts themselves. One farmer reflected:

"I was a little bit concerned that it implied that the general standard of welfare across the country wasn't very good... There can be a lack of understanding of what it means, and that might be confusing—it's not very clear to farmers. But I think once you look into it, it does make a lot of sense." (Farmer 10)

This highlights the importance of clear communication and the risk of defensive reactions to new terminology.

These findings also indicate that farmers assess knowledge in relation to their underlying motivations and priorities. Across the wider dataset, farmers described animal welfare decisions as being shaped by considerations such as disease prevention, economic resilience, professional identity, stewardship, and long-term sustainability. These priorities influence not only the practices farmers adopt but also the forms of knowledge they regard as legitimate and worth acting upon. For example, farmers concerned with reducing disease risk placed greater value on information that improved flock health (for example, farmer 13), while those who prioritised good stockmanship relied heavily on the experiential knowledge of respected family members and fellow farmers. Similarly, farmers responding to market expectations and reputational concerns attached greater importance to advice related to assurance schemes and consumer standards, whereas those seeking resilient production systems actively engaged with knowledge of breeding, grazing management, and adaptive farming practices. Knowledge, therefore, acquires legitimacy not only through trusted relationships and practical experience but also through its perceived capacity to help farmers achieve the goals and priorities they themselves consider important.

To overcome barriers, veterinarians could:

Demonstrate sheep-specific expertise through continuing professional development and active engagement with sheep farming.

- Build trust through collaboration, involving farmers in discussions of welfare findings and decision-making processes—thereby strengthening know-who.
- Adopt motivational communication strategies that empower farmers and align with their values and priorities.
- Engage proactively through welfare-focused meetings, farm visits, and knowledge exchange events.
- Recognise and build on farmers' existing know-how, rather than assuming that know-why alone is sufficient for behaviour change.
- Beyond veterinarians, intermediaries such as formal advisory services, peer networks, and farmer discussion groups play crucial roles in knowledge exchange. One farmer noted that farmers need to get a positive message out to consumers: "As farmers, as sheep farmers, we need to get a positive message out. And the good news stories out to the consumer... the consumer always likes a positive welfare story. They certainly do not like negative welfare stories." (Farmer 2)
- This suggests that while farmers recognise the importance of positive messaging to consumers, they may not see abstract terminology as the appropriate vehicle for that message.

3.7 Limitations and Future Research

These findings emerged while exploring positive animal welfare concepts within a broader research programme on discourses of positive welfare among UK sheep farmers and industry actors. The knowledge source dynamics identified here were a significant theme in that wider investigation, not the primary focus of the original study design. Consequently, the data, though rich, were not collected to comprehensively map farmer knowledge networks. A more focused, detailed study specifically designed to investigate farmer-veterinarian relationships, peer learning networks, and knowledge source evaluation would greatly advance understanding in this area.

Similarly, the findings are exploratory and based on a small sample of 25 UK sheep farmers. It does not allow generalisation to all UK sheep farmers or other livestock sectors. Moreover, the accounts shared here reflect farmers' reported experiences and perceptions, which may differ from observed practices, none of which has been empirically tested. The UK context also means that findings may differ from agricultural systems with different knowledge infrastructures, advisory services, or cultural norms.

Since the main study focuses on animal welfare, the findings may not directly apply to other aspects of agricultural knowledge exchange, such as crop production, soil management, or agri-environmental practices. The knowledge sources farmers use, the trust dynamics they face, and the advice they seek may differ across agricultural domains. For example, farmers may trust external advisors more on technical agronomy than on animal welfare, where experiential and intergenerational knowledge is especially valued. However, some crossovers may exist. The broader patterns identified here, such as the central role of intergenerational knowledge, conditional trust in formal advisors, and the importance of peer networks, may resonate with other agricultural contexts, especially those involving complex, experiential, and value-laden decisions. Further research is needed to test these findings beyond the context of animal welfare.

4. Conclusions

This study examining the trusted and untrusted knowledge sources among UK farmers was part of wider research exploring knowledge, attitudes and practices regarding positive animal welfare. The thematic findings here reveal that trust in veterinary advice is conditional, shaped by perceptions of sheep-specific expertise and the nature of veterinary engagement. Intergenerational knowledge transfer emerged as a dominant theme, with farmers identifying family—particularly parents and grandparents—as their primary knowledge source. This contrasts with the more limited role of veterinary advice in shaping farmer practice. Farmers' knowledge is grounded in practical experience and observation, and cannot easily be replaced by formal advice. As one farmer put it, traditional knowledge should not be dismissed:

"I'm a firm believer in going back and learning a little bit from our ancestors, they didn't often know what they were doing it for, but they knew it worked. We have more knowledge and more technology, but they knew it worked." (Farmer 9)

Farmers expressed a preference for advisors who understand farming systems and can provide contextualised, practical guidance. Formal advisory services such as Farming Connect were valued as trusted sources of reliable information, while social media platforms were viewed with caution due to the risk of misinformation. Peer networks, including Facebook and WhatsApp groups, as well as formal organisations such as the National Sheep Association,

provided valuable forums for practical problem-solving and knowledge exchange. Farmer discussion groups were described as essential for learning "new ideas" and "what to avoid." Some farmers looked beyond UK borders for knowledge and validation, particularly to New Zealand, perceiving international systems as more advanced or credible than domestic ones. This reflects a strategic approach to knowledge seeking that transcends national boundaries.

The findings also suggest that different knowledge sources fulfil different knowledge functions. Family members and peers primarily contributed practical know-how developed through lived experience, veterinarians and advisory services were expected to provide scientific and diagnostic knowledge, while formal organisations and specialist networks connected farmers to wider communities of expertise. Effective welfare knowledge exchange therefore depends not on replacing one source with another, but on integrating complementary forms of knowledge.

These findings have significant implications for the dissemination of emerging welfare concepts. The paper calls for enhanced communication strategies—including motivational interviewing, collaborative flock health planning, and proactive welfare engagement—to strengthen farmer-veterinarian relationships and position vets as trusted conduits for welfare innovation. However, given the diversity of knowledge sources that farmers engage with, a multi-pronged approach that leverages trusted intermediaries—including advisory services, peer networks, international networks, and family knowledge—may be more effective than relying solely on veterinarians.

5. Conflict of Interest

The authors declare no conflict of interest.

6. Author Contributions

Removed for peer-review

7. Ethics Approval

Ethical approval was obtained from the Royal Agricultural University Research Ethics Committee. The Ethics Review reference number for this research is 20213216- (reference anonymised for double blind review). All research was conducted in accordance with the

ethical guidelines and regulations of the Royal Agricultural University for research involving human participants.

8. Human ethics and consent to participate declaration

Human Ethics and Consent to Participate

Ethical approval for this study was granted by the Royal Agricultural University Research Ethics Committee. All participants were provided with a participant information sheet explaining the purpose of the study, the voluntary nature of participation, data handling procedures, and their right to withdraw. Written informed consent was obtained from all participants prior to participation in interviews and group discussions.

9. Funding

This research received no external funding.

10. Data Availability Statement

This study forms part of a broader qualitative research programme examining positive animal welfare in UK sheep farming. For the purposes of peer review, anonymised interview transcripts and the semi-structured interview guide underpinning this manuscript have been provided as supplementary material for reviewers. The full qualitative dataset is not publicly available because participant consent and ethical approval do not permit unrestricted public sharing. Additional anonymised materials may be made available by the corresponding author upon reasonable request, subject to ethical approval and participant confidentiality.

11. References

1. Kaler J, Green LE. Sheep farmer opinions on the current and future role of veterinarians in flock health management on sheep farms: A qualitative study. Prev Vet Med. 2013;112(3–4):370–7. doi:10.1016/j.prevetmed.2013.09.009

2. Bard AM, Main D, Roe E, Haase A, Whay HR, Reyher KK. To change or not to change? Veterinarian and farmer perceptions of relational factors influencing the enactment of veterinary advice on dairy farms in the United Kingdom. J Dairy Sci. 2019 Nov 1;102(11):10379–94. doi:10.3168/jds.2019-16364

3. Hockenhull J, Main DCJ, Mullan S. 'Would it sell more pork?' Pig farmers' perceptions of Real Welfare, the welfare outcome component of their farm assurance scheme. Animal. 2019;13(12):2864–75. doi:10.1017/S1751731119000946 PubMed PMID: 31104650.

4. Clark B, Proctor A, Mahon N, Holloway L. Exploring farmer and advisor lameness management behaviors using the COM-B model of behavior change. Front Vet Sci. 2024 Jan 17;11. doi:10.3389/fvets.2024.1258906

5. Brunt MW, Haley DB, LeBlanc SJ, Kelton DF. Perceived role of the veterinarian in promoting dairy cattle welfare. Front Vet Sci. 2023 Dec 18;10:1325087. doi:10.3389/fvets.2023.1325087 PubMed PMID: 38164396; PubMed Central PMCID: PMC10757964.

6. Manning L. A knowledge exchange and diffusion of innovation (KEDI) model for primary production. Br Food J. 2013 Apr 12;115(4):614–31. doi:10.1108/00070701311317883

7. Lundvall B äke, Johnson B. The Learning Economy. J Ind Stud. 1994 Nov 1;1(2):23–42. doi:10.1080/13662719400000002

8. Ingram J, Morris C. The knowledge challenge within the transition towards sustainable soil management: An analysis of agricultural advisors in England. Land Use Policy. 2007 Jan 1;24(1):100–17. doi:10.1016/j.landusepol.2005.07.002

9. Thomas E, Riley M, Spees J. Knowledge flows: Farmers' social relations and knowledge sharing practices in 'Catchment Sensitive Farming'. Land Use Policy. 2020 Jan 1;90:104254. doi:10.1016/j.landusepol.2019.104254

10. Fereday J, Muir-Cochrane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. Int J Qual Methods. 2006 Mar 1;5(1):80–92. doi:10.1177/160940690600500107

11. Sutherland LA, Labarthe P. Introducing 'microAKIS': a farmer-centric approach to understanding the contribution of advice to agricultural innovation. J Agric Educ Ext. 2022 Oct 20;28(5):525–47. doi:10.1080/1389224X.2022.2121903

12. Šūmane S, Kunda I, Knickel K, Strauss A, Tisenkopfs T, Rios I des I, et al. Local and farmers' knowledge matters! How integrating informal and formal knowledge enhances sustainable and resilient agriculture. J Rural Stud. 2018 Apr 1;59:232–41. doi:10.1016/j.jrurstud.2017.01.020