University of East Anglia

Exploring the impact of care farm animals on people with mental health difficulties through a realist evaluation approach

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Doctorate in Clinical Psychology

University of East Anglia

Faculty of Medicine and Health Sciences

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Submission date: 4th March 2025

Thesis Portfolio word count: 38,693

Portfolio Abstract

Background: Care farm interventions show promising benefits for people with mental health difficulties. Animals are frequently part of these environments; however, research about the impact of care farm animals specifically remains limited. This thesis aimed to better understand how and why these animals may impact adult mental health.

Methods: This thesis portfolio used realist methodology to answer the question 'How, why, for whom, and in what context do care farm animals impact adults with mental health difficulties?'. Through a realist synthesis of existing literature, an initial programme theory was created, which begins to answer this question. This informed a realist evaluation focused on how and why care farm animals may impact adults with experiences of adverse life events. Data from ten interviews was used to refine the initial programme theory.

Results: The initial programme theory highlighted that care farm animals provide a calm therapeutic environment, individuals experience connection with the animals who present with desirable traits, and they make individuals feel safe. Through refinement with realist evaluation data, this expanded to include the farm and its people as a necessary context for the animals, which individuals perceive as a safe second home. A wide range of positive health, wellbeing and social changes are empowered by the animals, which can support individuals' mental health recovery.

Conclusions: The portfolio reports the first research using realist methodology in the context of care farm animals and adult mental health. The refined programme theory indicates that care farm animals may be helpful for individuals with mental health needs, including those who have experienced adverse life events, by having a wide-reaching transdiagnostic and psychosocial impact. This suggests considering care farm (animals) through lenses of personal mental health recovery, focused on individuals rebuilding a meaningful life. Attachment Theory is proposed as a model to explain this impact.

Access Condition and Agreement

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Acknowledgements

Firstly, I would like to express my gratitude to my participants, managers and other staff from the two care farms. Without you, this project could not have happened. I have been fortunate to have learnt so much from every single conversation and enjoyed every minute of them. Thank you!

I would like to thank my research team, Bonnie Teague and Aaron Burgess. I would like to particularly thank Bonnie, first of all, for her continuous support throughout the last few years in designing, conducting and writing this project. It's been a joy to be supervised by her and to spend our supervisions talking and laughing about animals. And secondly, I would like to thank Bonnie for having introduced me to the topic of care farms, and for having made this project possible in the first place – I'm so grateful to have been able to spend the past two- and a-bit years thinking, reading and talking about animals because of her! On top of that, this has made the hardships of this degree easier and the joys greater. Thank you.

I would also like to thank the Granary Girls. The nine of us were thrown together in happenstance during our first teaching block. You guys have been a joy and the best support I could have asked for over the course of this degree. Please, let's make all our mad ideas become real. Also, a big thank you to all my friends, my partner and family who have shown such understanding towards my lack of availability over the past year.

Lastly, and even though they will never read it, I cannot help but thank my cats, Buddy, Teddy and Maia. Adopting those mischiefs was the best decision of my life because quite simply, even in (or maybe because of?) their naughtiness, they bring me joy and put a smile on my face every single day without fail.

This project has introduced me to the world of care farms and has inspired me to work towards making the world of care farms and care farm animals accessible to more people. There is a whole world of hardly tapped into potential out there – let's make use of it!

Chapter One: Introduction to the Thesis Portfolio

Word count (excluding references): 3105

This thesis portfolio aims to explore the role of care farms and, specifically, care farm animals as a green care intervention in supporting adult mental health. In this introduction, the concepts of green care, care farms, animal-assisted interventions and care farm animals are discussed, presenting some of the existing evidence that points towards these interventions being beneficial for adults' mental health. This provides the context and sets the scene for the portfolio that follows. Lastly, a brief summary of each chapter of this thesis portfolio is outlined. Note that individuals visiting the care farms as active participants in the farm activities will henceforth be termed 'farm participants' throughout the portfolio.

Green Care & Clinical Psychology Applicability

Green Care is a health-promoting approach that encourages the active (e.g., engaging with nature) or inactive (e.g., being in nature) therapeutic use of animate (e.g., plants, animals) and inanimate (e.g., water, soil) nature and the outdoors. This may, amongst others, involve activities including gardening, nature-based exercise, woodwork or animal-related activities and is believed to be beneficial for participants' wellbeing (Haubenhofer et al., 2010).

In terms of its applicability to clinical psychological practice, green care is considered to be an umbrella term for natural environmentally based psychosocial interventions which, amongst other things, enhance social support, self-efficacy and behavioural activation (Salomon et al., 2018). Given the diversity of activities that fall under the header of green care, this approach may have the potential to target the individual needs of many different mental health service users. Currently, green care interventions are delivered in the third sector and are, therefore, separate from healthcare services. However, the growing evidence of the approach's benefits indicates an important potential for clinical psychologists to promote green care interventions within their

practice. Green care activities and environments are often perceived as providing a sense of calm and safety (Sempik & Bragg, 2016). Therefore, they may be well able to complement psychotherapy, such as that it may allow patients to test out beliefs discussed in the clinic room in a real, safe environment, and engaging in green care activities after psychotherapy may allow patients to continue to build on what they have learnt in therapy in a safe environment. Green care activities are already well-established in some countries, such as the Netherlands, Belgium or Norway (Social Farms & Gardens & Thrive, 2021).

Care Farms

Care farming, also called social farming, is the therapeutic usage of agricultural practices using the Green Care philosophy (Elsey et al., 2016) connecting 'multifunctional agriculture and social or health services at the local level' (Jarábková et al., 2022, p. 542). The care farm environment may include social interactions with peers, volunteers and staff. Activities may be, amongst others, horticultural or crop-related, forestry or woodwork and animal husbandry (de Bruin et al., 2021). Activities and tasks offered differ between care farms. Whilst care farms are generally seen as beneficial for individuals' mental health, they differ regarding the particular client group they provide support for, whether this be physical (e.g., post stroke, Mitchell, 2021), mental (e.g., trauma, Cacciatore et al., 2020), intellectual (e.g., learning disabilities, Rotheram et al., 2017), neurological (e.g., dementia, de Boer et al., 2017) or social difficulties (e.g., autism spectrum disorder, Torquati et al., 2019). Many care farms will offer support to a mix of these and other client groups. Furthermore, some care farms focus on adults only, whereas others support children and young people, and others again may support a range of age groups. A number of care farms have also been developed to function as care homes for those with dementia (e.g., Rosteius et al., 2022). The number of care farms across the globe is growing (de Bruin et al., 2021). In the United Kingdom alone, in 2012, there were 180 care farms (Bragg, 2013) which by 2021 had risen to over 400 and is estimated to continue to grow (Bragg et al., 2022).

The impact of care farms on human health is demonstrated in a study by Iancu et al. (2014) who compared adults' experiences of mental health recovery between those attending care farms to those in work and creative projects (i.e., day services). Workers of each service reported somewhat differing outcomes and benefits; however, comparatively, farm participants described a greater range of activities compared to single-type activities in day services. This was perceived as preferable by those who'd previously attended day centres and were now attending care farms, as individuals reported being able to switch activities in line with their motivations, interests and abilities on each given day. Additionally, the authors reported that in their explorations, no negative accounts were given about care farms compared to day services.

When considering *why* individuals benefit from care farms, Hassink et al. (2010) explored the characteristics that clients value on care farms. They identified that farm participants appreciated both the social qualities provided through the care farm (e.g., belonging to a safe community and the personal attitude of the farmer) as well as the green care environment (e.g., being in nature and the type of work, such as the work being real and meaningful or diverse). Elsey et al. (2016) reported that individuals valued the provision of safe opportunities for social connections and the increased physical activity care farms can offer. Furthermore, Murray et al. (2019) conducted a systematic review of 31 studies of individuals attending care farms. Their results indicate that individuals benefitted from contact with others on the farm and that they gained a sense of achievement, fulfilment and belonging.

Care Farm Animals & Mental Health

Most care farms are home to a range of animals that farm participants can engage and interact with in a variety of manners, which may include feeding them, cleaning out their stables or paddock, exercising them (e.g., walking donkeys) alongside generally being in the animals' company and, as desired, engaging in physical contact with them (e.g., cuddles).

Animal-assisted therapy and animal-assisted interventions (AAIs) are increasingly accepted and used as alternative or additional therapeutic support options for individuals with a variety of physical (Holleman et al., 2016), mental health (Germain et al., 2018; Iancu et al., 2015), neurodegenerative (Yakimicki et al., 2019) or neurodevelopmental difficulties (Juríčková et al., 2020; Nieforth et al., 2023) for reducing symptomology, enhancing quality of life or improving different wellbeing factors such as self-esteem. AAIs have also been shown to be effective in supporting students in classrooms or at college in reducing stress and anxiety levels (Kivlen et al., 2022) as well as in many other contexts or settings, such as promoting emotion comprehension in primary school children (Scandurra et al., 2021), helping to reduce cravings in drug users (Contalbrigo et al., 2017), supporting correctional plans of inmates in a psychiatric prison, alongside positively impacting their conduct and increasing recognition of their own emotions (Dell et al., 2019) or improving the wellbeing of residents in nursing homes (Orr et al., 2023). AAIs may be extended to pet ownership, and it is unsurprising that in 2024, 51% of adults in the United Kingdom had a pet (PDSA, 2024). The health and wellbeing benefits of having a pet have been documented extensively and may be noted through pets increasing exercise, enhancing quality of life and facilitating communication, alongside improving parameters of good physical health, such as heart rate or blood pressure (Wells, 2019).

However, despite the growing field of research and acceptability of AAIs, the evidence base for the benefits of care farm animals specifically remains more limited, particularly from the perspectives of farm participants themselves. Instead, it appears that most studies investigate the care farm environment as a broader, holistic intervention and may mention care farm animals, but few studies exist that focus on the farm animals as an ‘intervention' themselves.

Pedersen et al. (2011) researched the impact of a 12-week care farm programme on a dairy farm where nineteen adults with depression engaged in activities related to dairy production but could also engage with other companion animals such as horses or cats. Their results indicated reductions in both levels of anxiety and depression, alongside improvements in participants’ self-

efficacy. Moreover, they found that participants seemed to benefit more from actively engaging in activities with the animals instead of passively being in contact with them.

However, two randomised control trials (RCTs) provide less univocally positive outcomes: Berget et al. (2008) conducted an RCT examining the impact of a twelve-week intervention with care farm animals on the mental health and wellbeing of individuals with psychiatric diagnoses. Quantitative data collection methods were gathered before, at the end of the intervention and six months afterwards. Their results showed improvements in participants' self-efficacy and coping ability for those in the animal intervention group, however, they did not find changes to participants' quality of life. In another RCT, Berget et al. (2011) found significant reductions in anxiety levels for the farm AAI group at six-month follow-up compared to baseline, but not during the intervention phase. There was also no statistically significant impact on depression scores.

Whilst these RCTs did not find any 'negative' outcomes related to care farm animals, the results may lead to questions around the extent to which care farm animals may be helpful for individuals' mental health compared to control groups, and in regard to the durability of effects.

Considering farm participants' perceptions and experiences of care farm animals in supporting mental health, Pedersen et al. (2012) conducted interviews with eight adults living with depression who had engaged in a 12-week dairy-farm programme. Four key themes arose from their analysis, namely the participants feeling that the intervention provided the experience of an ordinary work life and distracted them from their mental health difficulties. They appreciated the flexibility and adaptability of the intervention and associated tasks, which was important in participants' experience of their ability to cope. Whilst these results indicate participants' experience to have been positive and the intervention helpful, the results do not seem specific to the care farm animals, but rather the overall care farm intervention and environment.

Another qualitative study focusing on the impact of care farm animals on those with histories of traumatic grief was conducted by Gorman and Cacciatore (2023). This intervention was

set on a care farm that housed animals who had their own trauma histories of abuse, neglect or homelessness. The authors summarised that participants benefitted from the shared narratives of trauma through which they connected with the animals and that seeing elements of rehabilitation and resilience in the animals proved meaningful for study participants' own recovery.

Moreover, Hassink et al. (2017) conducted a literature review and focus groups with care farm staff exploring the role of animals on care farms. They summarised that farm animals can provide numerous benefits, including a sense of meaningful occupation, stimulation of healthy behaviours, facilitation of interactions with other people, relaxation and distraction from problems.

Comparing the selected quantitative and qualitative results, albeit limited, two differences are noticeable. Firstly, whilst quantitative results were not 'negative', the evidence from the RCTs was more mixed towards care farm animals being helpful for clinical symptomology comparative to the control groups; in contrast, qualitative outcomes appear more univocally positive, which may be in line with findings from Iancu et al. (2014) who found no negative reports about care farms from their participants. Secondly, it appears that quantitative studies on the topic examine and describe the benefits of care farm animals along a spectrum of clinical symptomology and diagnosis (which may be the nature of the measures available and used), in contrast with qualitative research, whereas participants seem to describe the benefits of animals to their mental health much more broadly from a social and connection perspective.

This differentiation may also be reflected in how some farmers view their farm participants, such as that they see them for who they are as a whole person, rather than in regard to their symptoms, diagnosis or background (Pettersson & Tillmar, 2022). With this attitude, farmers may be much less likely to exclude potential farm participants on the basis of having the 'wrong' diagnosis, thus increasing accessibility to a wider range of individuals. Moreover, unlike traditional, more diagnosis-driven mental health interventions (e.g., psychotherapy), activities on care farms may not necessarily target symptomology and language related to 'illness' or 'disability' may be used less or

not at all. These attitudes and perspectives may help to create an environment that fosters clients perceiving themselves and describing how they benefit not in relation to symptomology and diagnosis, but rather more transdiagnostically and in regard to their lives and wellbeing, thus potentially outlining the impact of care farm (animals) on individuals' mental health much more broadly.

However, these differences and perspectives are theorised from relatively few studies focused specifically on care farm animals, and thus, further empirical research is required that examines the impact of care farms and care farm animals through a more holistic lens, rather than through a focus on pure symptomology to better understand what impact care farm animals may truly be able to have on mental health and wellbeing.

Gaps in the Care Farm Animal Literature and Why Examine Them

At least two gaps in the literature arise from the above. Firstly, existing evidence and theories report largely positively as to the benefits of animals in therapeutic settings, as well as care farms as therapeutic entities. It would only be natural to assume that consequently, care farm animals, as a combination of both of these fields, would also be of therapeutic benefits, and in fact, initial scarce evidence described above does suggest so. However, the lack of substantial evidence alongside a lack of understanding the underlying *how* and *why* (i.e., the mechanisms, factors and theories) that may make care farm animals beneficial requires scientific addressing. Some theories exist aiming to explain how and why animals may be beneficial for human mental health and wellbeing (e.g., Attachment Theory, O'Haire et al., 2019), however, they do not appear to have been empirically explored in the context of care farm animals. Underlying meanings and interpretations of experiences and attitudes are best explored via qualitative research (Greenhalgh & Taylor, 1997). Synthesis of existing qualitative data will be outlined in chapter two. This is followed by qualitative empirical research described in chapter four, which focuses on the impact of care farm animals on the mental health of those with a history of adverse life events.

Secondly, it appears that whilst research on care farm animals is sparse, research specifically focused on the impact of care farm animals on individuals with a history of adverse life events, including trauma, is even more scarce. Many care farms offer support that is not time or session limited, thus providing greater and less pressured opportunities for farm participants to create positive experiences and durably adapt their beliefs about themselves, others and the world (Wenzel, 2012). This may be particularly helpful for individuals who may fall through the more diagnostically orientated medical system, such as individuals who have had adverse or traumatic experiences but do not meet the threshold for post-traumatic stress disorder (Cukor et al., 2010), and thus, may struggle to receive, for example, psychological treatment (Bergman et al., 2015).

Adverse life experiences are very common and can significantly impact individuals' lives across different areas of functioning and wellbeing (Carstensen et al., 2020; Smyth et al., 2008). Given the theorised whole-person and transdiagnostic benefits that care farms and care farm animals may be able to offer, individuals with experiences of adverse life events may particularly benefit from longer-term involvement with care farms and their animals as a way of allowing the re-learning about and re-framing of past experiences and previously held beliefs. The empirical project outlined in chapter four will attempt to fill this gap.

Care farms are somewhat unique contexts given the typically wide range of activities and opportunities they offer, both psychologically but also socially, and in some cases in regard to additional factors such as employability or education (Gorman, 2019). It would be helpful to better understand the impact of animals on care farms as they are often seen as an essential part of the care farm environment (Gorman & Cacciatore, 2023); in fact, Hassink et al. (2017) described them as 'the fabric of the care farm' (p.8). Likely, given the intertwined nature of care farming activities it will be difficult for researchers to fully separate the impact of care farms from that of care farm animals, however, a better understanding of these factors will not just help tailor care farm interventions to individual farm participants needs but also provide stronger arguments in conversations about

funding and expansions of existing or new services to support the holistic mental health needs of adults outside of core clinical settings. This will be discussed in chapter seven, using newly gathered evidence from chapters two and four.

Overall, this thesis portfolio will aim to explore and enhance our understanding of why and how care farm animals may be beneficial for adults' mental health. Due to the need to understand "What works for whom, under what circumstances, how, and why?" in terms of care farm animals as an 'intervention' or 'programme' for people with mental health difficulties and adverse life histories, a realist approach will be used throughout this portfolio. Using this approach, the research presented in this portfolio will provide a better understanding of the impact of care farm animals on farm participants with mental health difficulties or a history of adverse life events, therefore helping to tailor care farm interventions towards individuals' needs. Additionally, the portfolio may also help to broaden our existing understanding of what may constitute as support interventions for people with mental health difficulties.

Chapter Summaries

This portfolio will explore the contexts and mechanisms underlying adults' interactions with care farm animals and the positive mental health outcomes these may lead to using realist methodology. The realist review is the first to synthesise relevant data from twelve published studies to create an initial programme theory to improve our understanding of the topic (chapter two). This is followed by a bridging chapter (chapter three) that links the gaps found in the realist review with the empirical project (chapter four). This realist evaluation qualitatively focuses on the impact of care farm animals from the perspectives of ten adults with a history of adverse life events attending care farms and refines the initial programme theory created in chapter two. Extended methodology (chapter five) and extended results (chapter six) precede an overall summary and discussion of the results amalgamated across the portfolio, including a critical evaluation of the

research presented and recommendations for future research, as well as theoretical and practical implications for the field of clinical psychology (chapter seven).

Chapter 2 - Systematic Review:

Identifying the current evidence base for the impact of care farm animals on adult mental health – a realist synthesis

Word count (excluding abstract, tables, figures and references): 6585

Word count for Health & Place (excluding tables, figures and references): 6835

Author guidelines for Health & Place can be found in Appendix A. *Please note that Health & Place request references to be indicated by numbers in square brackets. This was not done for this portfolio, but will be amended for submission*

Further details about the realist review quality assessments can be found in Appendix B.

Additional quotes can be found in Chapter Six (Additional Results).

Details of the realist review quality assessment and the additional quotes will be submitted to Health & Place as supplementary materials to this review.

Identifying the current evidence base for the impact of care farm animals on adults' mental health – a realist synthesis

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Funding

This research was completed as part of the University of East Anglia's Doctorate in Clinical Psychology programme, which is funded by NHS England.

Conflict of Interests

No conflicts of interest are reported by the authors.

Abstract

Background: Growing evidence demonstrates that care farms may benefit a range of individuals' wellbeing and lifestyle factors. Engagement with animals is frequently one element of intervention on care farms, yet research into why and how individuals' mental health can be impacted by care farm animals specifically is scarce.

Methods: A realist review was conducted following a five-step process: identifying the research question (1), searching (2) and screening the evidence (3), extracting and appraising data (4), analysing and synthesising data (5). Academic Search Ultimate, AMED, APA PsycInfo, APA PsycArticles, CINHAL Ultimate, Medline Ultimate, Scopus and Embase were searched, focusing on studies reporting findings from adult clients' perspectives attending the farm primarily due to their mental health. Studies were appraised using relevance, richness and rigour criteria.

Results: Animal-related quotes from participants and related author interpretations of 12 articles were synthesised into an initial programme theory comprising two Context-Mechanism-Outcome configurations exploring the role of care farm animals on adult mental health. Common themes identified were feelings of connection with the animals due to them presenting with desirable traits, experiencing the animals as calming and therapeutic, and feeling safe with them. Positive mental health related outcomes were identified alongside wider psychosocial improvements.

Conclusion: This synthesis amalgamation of evidence provides initial insights into how and why care farm animals can impact wide ranges of health, wellbeing and social factors. Combined, this had positive effects on adults' mental health, beyond diagnostic labels and clinical symptomology, which may be facilitated through secure attachment relationships with the animals.

Keywords: animal, care farm, green care, mental health, realist synthesis, realist review, adults

Care farms are green care environments that make therapeutic use of agricultural activities (Elsey et al., 2016). These farms can include activities related to crops, gardening, forestry, woodwork and animal husbandry (de Bruin et al., 2021). Additionally, social encounters with other care farm clients (who will henceforth be referred to as 'farm participants'), as well as volunteers and staff, are fostered, and evidence suggests care farms are perceived as safe environments that are highly valued by farm participants (Elsey et al., 2016).

Care farms can support populations by life stage or age (e.g., children, older adults) or health-related reasons for attendance (e.g., mental health difficulties, neurodevelopmental disorders, substance misuse, dementia). However, other farms welcome a range of farm participants collectively from diverse backgrounds and health conditions (Galardi et al., 2021). Given the perceived therapeutic nature of care farming, individuals with a variety of mental health difficulties are commonly seen on care farms. Additionally, some individuals seem to prefer the rather informal nature of the farm to more traditional medical or psychotherapeutic mental health approaches (Hassink et al., 2010). Murray et al. (2019) conducted a systematic review of 31 studies focusing on the impact of care farms on the quality of life, depression and anxiety of a range of service user groups (e.g., disaffected youth). Whilst there were some differences in outcomes among the groups, care farms seemed to generally provide a sense of achievement, fulfilment and belonging.

Care Farm Animals and Mental Health

One element common to most care farms is animal husbandry, which may include a variety of animal-related care activities and interactions, such as feeding, exercising or general caretaking. Positive health and wellbeing effects fostered by farm animals may be anticipated, given the growing evidence on the benefits of animal-assisted interventions for a variety of mental health (e.g., Germain et al., 2018) or other difficulties (e.g., see Orr et al., 2023 for their impact on nursing home residents' wellbeing), but research focusing on the role of care farm animals on individuals' (mental) health specifically remains limited.

Pedersen et al. (2011) researched the impact of a 12-week care farm intervention where participants were involved in dairy production but could also engage with other farm animals. Their results highlighted improvements in participants' levels of anxiety and depression, as well as improvements in their self-efficacy. Additionally, participants seemed to particularly benefit from active contact with the animals (e.g., engaging in tasks such as milking) instead of passive contact. Berget and Braastad (2011) conducted a literature review of fourteen studies and found that care farm animals can positively impact individuals' levels of anxiety, depression, self-efficacy and perceived social support.

In an interview study, Ellingsen-Dalskau et al. (2016) identified that farm participants benefited from having someone else to take care of and experienced a calmness and inner peace around the farm animals, as well as that the animals understood them.

Hassink et al. (2017) also conducted a brief literature review of one database searching for studies that consider the benefits of care farm animals. They found six studies which presented qualitative data from different stakeholders (farm clients, farmers, children, etc.) and included participants attending the care farms for differing reasons (e.g., school drop-out, people with mental illness, etc.). They aggregated their results into 10 themes denoting the impact of care farm animals on farm participants, including that animals provided warmth and closeness, and a welcoming environment. In their same paper, they presented focus groups with farm staff building on the findings from their review. They identified various benefits such as that care farm animals distracted farm participants from their problems, offered relaxation and a purpose and helped farm participants foster relationships with others.

Furthermore, care farmers may view their participants "as individuals beyond any characterisation in terms of diagnosis", putting aside their diagnoses and background to get to know the person beyond these labels, so that they "get a chance to start over again" (Pettersson & Tillmar, 2022, p. 1457). Considering this lessened focus on clinical symptomology in combination with the

selected qualitative and quantitative evidence above, this may indicate that care farm (animal) interventions may not aim to target clinical symptomology as may be typical in more traditional mental health treatments (e.g., psychotherapy, medication) and may instead aim to have a more widespread impact on individuals' lives and wellbeing.

Gaps in the Literature & Review Question

However, whilst the selected evidence may indicate that care farm animal interventions may be able to impact a wide range of mental health and wellbeing factors, this perspective is based on limited empirical evidence. Additionally, our understanding as to why this may be the case remains not well understood. Some theories exist that attempt to explain the benefits of engagement with animals on human health and wellbeing, such as 'Attachment Theory'. O'Haire et al. (2019) discussed some theoretical and empirical evidence that points towards humans forming attachment bonds with animals, which may be mutually beneficial and bring feelings of safety. However, attachment theory has not yet been explored in relation to care farm animals, nor tested for its applicability in that context.

Whilst Murray et al. (2019) conducted a systematic review on the topic of care farms, their review did not specifically explore the impact of care farm animals. Hassink et al., (2017) conducted a literature review on the role of care farm animals; however, this was in 2017, limited to one database only, not specific to the impact of animals on participants' mental health, and data was from different stakeholders.

Thus, there has been no systematic review or explanatory model which has focused purely on the role of care farm animals and their impact on mental health from the perspective of farm participants. Consequently, our understanding as to why and how care farm animals may be helpful remains lacking. In the context of care farms, it would be beneficial to better understand the impact of care farm animals specifically, as they are seen as one very important element of care farms (Hassink et al., 2017). This may also support evidence-based decisions on care farms about the most

effective interventions and approaches needed to support farm participants. Additionally, achieving an improved understanding of one element of care farms may aid our overall understanding of this multifaceted intervention.

Therefore, to gain an in-depth understanding of the impact of care farm animals, a realist synthesis will be conducted, which will answer the question: why, how and in what context do care farm animals impact adult mental health?

Methods

Design

Realist reviews or realist syntheses are theory-driven approaches that explore relevant evidence to explain how and why interventions work and for whom (Pawson & Tilley, 1997). This approach is particularly helpful for rather novel interventions with a limited evidence base to help set the scene regarding what elements of the intervention are or aren't working (Handley et al., 2024). Given the newly emerging evidence in the field of care farm animals and mental health, a realist synthesis is an ideal approach for examining care farm animals as a mental health and wellbeing 'intervention'. The outcome of a realist synthesis is the creation or refinement of an initial programme theory (IPT) that explains 'why, how and for whom and in what context' an intervention or programme is effective or not. This new in-depth understanding can be used to inform policies and practices, recommendations for the development of the intervention in question, as well as subsequent primary research, which may be used to refine an IPT (Wong et al., 2017).

To aid understanding of a programme theory in practice, a realist programme theory consists of three elements which combined form 'CMOcs': Context-Mechanism-Outcome configurations (Wong et al., 2017) or 'explanatory statements' which detail how interventions work in a real-life context. Contexts describe the social, political, or emotional environments that an intervention takes place in. These trigger or hinder activation of 'mechanisms', which are the unseen

drivers or reasons for change to occur. Outcomes are empowered by mechanisms and denote the impact of the intervention as defined by those who are involved in the programme (Wong et al., 2014).

This realist review of published literature was the first part of a two-stage project, followed by a qualitative exploration of the impact care farm animals can have on mental health, which will be used to refine the IPT created here. The review was, where possible, planned and conducted in line with realist synthesis quality (Wong et al., 2014, pp. 31-36) and publication standards (Wong et al., 2013, p. 4).

Reflexivity/ Management of Bias

The authors approached this synthesis's choice of topic feeling passionate about the therapeutic benefits of animals. This may have led the researchers to overlook potential aspects of the literature that may be non-confirming to the benefits of care farm animals. To mitigate this, all evidence referring to the impact of care farm animals was included in this synthesis. Furthermore, in an effort to reduce positivity bias and broaden the researchers' (and readers') perspectives and expectations, the research question was changed from exploring the 'benefits' of the care farm animals to exploring their 'impact' instead.

Realist Synthesis Process

A five-step process was used to guide this realist synthesis, adapted from Dada et al. (2023).

Step 1: Identifying the Research Question

On exploring the literature, it was noted that studies on the benefits of care farm (animals) exist from a variety of perspectives, such as farm participants themselves, carers, next of kin or family members, as well as different professionals involved in care farms. Whilst every stakeholder's perspective is likely to add a piece to the overall puzzle of the benefits of care farm animals, for the sake of seeking nuggets of clarity and streamlining the IPT to a more specific population, this

synthesis will focus on studies where qualitative evidence is provided by adults whose primary reason to attend care farms is their mental health difficulties.

After careful consideration, studies describing equine-assisted interventions were not considered in this synthesis, even if set on care farms, for the following reason: Sargsyan and Beebe (2023) described how horses have somewhat lost their status as working farm animals and are primarily used for recreational purposes now; additionally, on considering existing evidence on equine-assisted interventions, these tend to be more structured and goal-focused than what traditional agricultural animal care and maintenance activities would be (Hemingway et al., 2019).

Lastly, whilst quantitative data can be integrated into a realist synthesis, the voices of farm participants are needed to best understand the contexts and mechanisms explaining 'how' and 'why' an intervention works or doesn't work, and to develop an IPT. This is best investigated through qualitative data (Tenny et al., 2022); therefore, quantitative studies were excluded from this review.

Considering this, study inclusion criteria were:

- Empirical, with codable qualitative data.
- Set on a care farm where farm participants can engage with animals.
- Contains elements that describe the impact of care farm animals on the mental health of adult farm participants (aged 16+ who were able to consent to the research for themselves).
- The target population are adults whose primary reason to attend the care farm is in relation to their mental health.
- Qualitative data must include perspectives from farm participants themselves or author interpretations about the target population. Studies containing qualitative elements from multiple stakeholders are included but only quotes from and author interpretations about the target population are considered in the synthesis.
- Peer-reviewed publications

Study exclusion criteria were:

- Quantitative data only.
- Non-peer-reviewed, review-only or case studies.
- Not accessible in the English language.
- Qualitative data only from stakeholders other than the target population.
- Describing the impact of animal-assisted interventions not set on care farms.
- Describing activities with the care farm animals without reference to any level of impact on farm participants' mental health.
- Describing the impact of care farms without mentioning the mental health impact of the care farm animals specifically.
- Describing purely equine-assisted interventions. Care farms that described having horses but not employing them for equine-assisted therapy were included.

Step 2: Searching for the Evidence

Searches for eight electronic databases were conducted: Academic Search Ultimate, AMED (The Allied and Complementary Medicine Database), American Psychological Association (APA) PsycInfo, APA PsycArticles, CINHAL Ultimate (Cumulated Index in Nursing and Allied Health Literature) and Medline Ultimate were all searched via the EBSCO platform using 'All Fields' as field code. EMBASE was searched via the platform Ovid using 'All Text' as field code. Scopus was searched using 'All Fields' as field code. No limit on publication year was set to the search. The searches were conducted on 24th May 2024. The following terms were searched:

(("care farm*") OR ("social farm*") OR ("green care") OR ("community farm*") OR ("therap* farm*") OR ("farm animal-assisted"))

AND

(quali* OR interview* OR ("focus group*") OR ("discussion group*") OR experience* OR view* OR attitude* OR belief* OR perspective* OR outlook* OR view* OR opinion* or subjective)

Step 3: Screening the Evidence

See Figure 1 for the PRISMA flow chart depicting the screening process (Page et al., 2021). A total of 12 studies met inclusion criteria. The data reference manager EndNote (v21) was used for the screening process. Results were screened by JF, and uncertainties were discussed with authors. Reasons for uncertainties were: whether the article was set on a care farm, peer reviewed or the primary motivation for the participant visiting the farm. A random 20% sample (three out of twelve) of the articles included in the final sample was screened by co-authors using the inclusion and exclusion criteria to ensure consistency in the final selection process. A third party was ready to settle disagreements; however, this was not required.

Step 4: Extracting and Appraising the Data

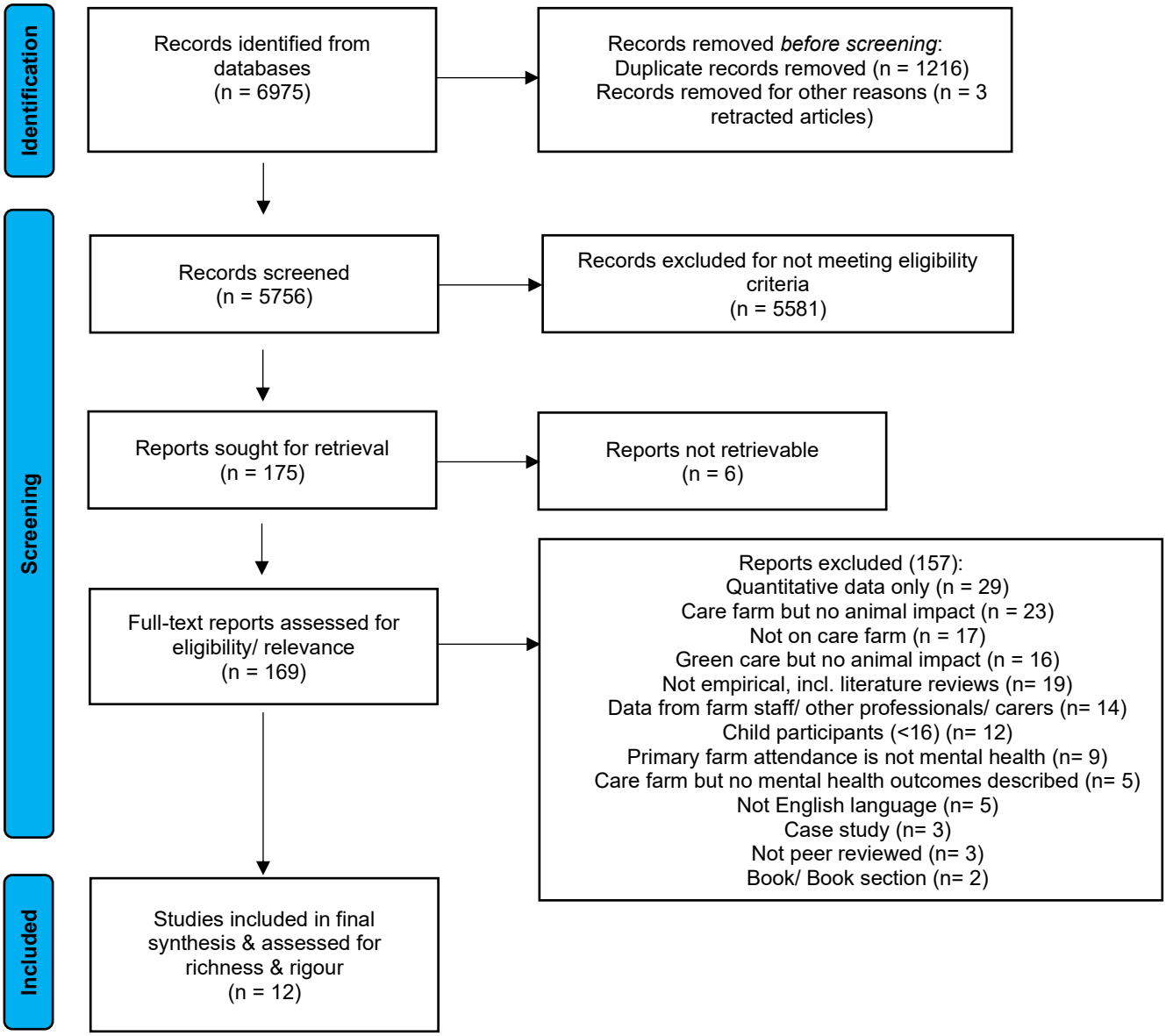
JF extracted the following data from the final selection of papers, which were amalgamated in Excel: author, year, country, description of animal-related activities or animals present on the care farm (if described), number of care farms involved in each study, participant characteristics, including how many, age and gender, see Table 1.

Data for the synthesis were extracted if it was clearly in relation to the impact of care farm animals on adults' mental health and wellbeing. Both farm participant quotes (first order) and author interpretations (second order) were acceptable.

Quality assessments of included papers were conducted in line with realist synthesis recommendations, and thus, studies were assessed for rigour, richness and relevance (Dada et al., 2023; Wong et al., 2014).

Figure 1

PRISMA diagram outlining the screening process



Rigour considers the credibility or trustworthiness of the method used to generate the data. Richness considers how valuable said data is in terms of contributing to the programme theory. Relevance considers whether data points can add to the theory-building or testing process (Dada et al., 2023). However, disparities remain in the literature regarding how to conceptualise the three R's and how to best conduct realist quality assessments. Acknowledging these uncertainties, Dada et al. (2023) suggested that researchers could design individualised tools or adapt existing checklists. In

light of this, a combined approach was used: the Oxford Centre for Evidence-Based Medicine (2020, CEBM) quality assessment checklist was used to gather information about studies. To assess rigour, this information was applied to six criteria: detail and depth of data; were data longitudinal; were data critically evaluated; were data based on real-world examples; robustness of measures used; appropriateness of sample (adapted from Morton et al., 2021). Each criterion was interpreted along a traffic light scale (green, orange, red). The consideration of these criteria fed into an overall rigour rating of high, medium or low, adapted from Morton et al. (2021).

To assess richness, a four-point scale was created based on descriptions by Dada et al. (2023) considering the amount of relevant data per study (no data of value; limited data of value that may be found in other articles, but adds to the evidence base; some data of value; lots of data of value). Relevance was assessed using traditional study inclusion and exclusion criteria.

Using these criteria, out of 169 articles considered at full-text screen for eligibility and relevance, 12 remained to be assessed for richness and rigour. Given the scarcity of available studies and information in those studies, and in line with recommendations from Dada et al. (2023) no papers were excluded based on lack of richness or rigour; instead, the quality assessment of papers was used to inform the relative dominance of initial themes and CMOcs generated from the reported data. See Table 2 for the outcome of the richness and rigour assessment. A random 20% sample of these received a second quality assessment by BT to ensure consistency of criteria application and results.

Considering richness, half of the studies received a rating of ‘1’, indicating that most studies provided limited data of value, largely pertaining to the studies not specifically focusing on the animals on the care farms or describing the animals as important without detailing any impact they have on farm participants' mental health. Considering rigour, most studies received a ‘medium’ rating. Common reasons for this were papers not describing their methodological process with sufficient transparency or studies being of cross-sectional rather than longitudinal nature. In

summary, the quality of papers included in the review varied, as would be expected. A level of implicit bias was naturally present as the concepts of the 3 R's and their assessment are not well-defined in the literature, affecting the meaningfulness and comparability of this and other realist reviews' quality appraisals. See Appendix B for in-depth descriptions and reflections on this review's quality appraisal.

Table 2

Richness and rigour assessment outcomes

Authors & Year	Richness Rating (0-3)	Rigour Rating (low to high)
Cacciatore et al., 2020	3	medium
Ellingsen-Dalskau et al., 2016	1	medium
Gorman & Cacciatore, 2023	3	medium
Granerud & Eriksson, 2014	2	low
Hassink et al., 2010	1	low
Iancu et al., 2014	1	medium
Leck et al., 2015	1	medium
Pedersen et al., 2012	3	high
Poulsen et al., 2020	1	high
Schreuder et al., 2014	1	medium
Steigen et al., 2022	2	medium
Thieleman et al., 2022	3	medium

Step 5: Analysing and Synthesising the Data

Full texts were uploaded into the qualitative analysis software NVivo (v14) for coding and read multiple times. Realist analyses are meant to use retroductive iterations focusing on the realist principle of generative causation (Rees et al., 2024). Relevant text describing the impact of care farm

animals was coded. These data nuggets were considered retroductively in relation to one another and amalgamated into two CMOcs. This was an iterative process whereby elements of the CMOcs and the IPT were re-considered inductively and deductively on re-reading the data, which then impacted the perception of these elements, and vice versa. Analysis and synthesis were led by JF, however, codes and their relationships as part of the CMOcs were discussed with BT to challenge initial interpretations and enhance depth of sense-making.

Results

Evidence Description

Evidence from twelve papers was included in this synthesis (see Table 1 for description of details). Where studies gathered data from multiple stakeholder groups (e.g., farmers and adults), only data nuggets that clearly applied to the group under investigation were used; descriptive details for populations outside of the scope of this synthesis were not reported on.

Of the 12 studies included in this synthesis, only two specifically focused on the impact of care farm animals on participants' mental health. Six studies generated at least one theme specific to care farm animals or discussed their impact at greater length. The five remaining studies mentioned the impact of the animals but briefly as part of other themes, henceforth providing less interpretable input for this synthesis. The presence of usable animal-related quotes per study ranged from zero (only author interpretations were drawn from these studies) to 20. Additionally, the nature of the care farms differed substantially: some offered short-term or more structured interventions on the farm or with the animals, and others focused on particular groups of individuals (e.g., adults with traumatic grief), where other care farms offered a longer or broader spectrum of activities or support for a greater range of populations. Moreover, three studies noted specifically that their animals had experienced adversity or abuse themselves; these three studies seem to have taken place at the same care farm, although they were included separately as different studies were conducted with different participants.

Table 1

Descriptions of the twelve papers included in this synthesis

Author & Year	Country	Description of animals or animal-related activities in methods	Number of care farms involved	Participant numbers, characteristics & data collection method	Participants age range	Participants gender
Cacciatore et al., 2020	Arizona, USA	All animals are rescued from abuse, neglect or homelessness. 30 animals (incl. horses, donkeys, pigs, sheep, goats, dogs, cats). Animals are never coerced to engage with participants.	1	21 adults with experiences of traumatic grief, semi-structured interviews	unclear - descriptors given for quantitative sample (22 participants) where one didn't participate in qualitative element - quantitative mean age is 42	unclear - descriptors given for quantitative sample (22 participants), where one didn't participate in qualitative element - 68% women in quantitative
Ellingsen-Dalskau et al., 2016	Norway	no description given	4	10 unemployed adults with mental health problems, semi-structured interviews	20 - 42	2 men, 8 women
Gorman & Cacciatore, 2023	Arizona, USA	All animals are rescued from abuse, neglect or homelessness. 30 animals (incl. horses, donkeys, pigs, sheep, goats, dogs, cats). Animals are never coerced to engage with participants.	1	120 adults with experiences of traumatic grief, survey	18-65+	20 men, 99 women, 1 non-binary person
Granerud & Eriksson, 2014	Norway	no description given	unclear	20 adults with mental health problems (current or former care farm participants), semi-structured interviews	22-55	8 men, 12 women
Hassink et al., 2010	Netherlands	no description given	12	16 adults with severe mental health problems, semi-structured interviews	no description given	12 men, 4 women
Iancu et al., 2014	Netherlands	no description given	13	14 adults with mental health problems, semi-structured interviews	mean age 39.6	9 men, 5 women

Table 1 *(continued)*

Author & Year	Country	Description of animals or animal-related activities in methods	Number of care farms involved	Participant numbers, characteristics & data collection method	Participants age range	Participants gender
Leck et al., 2015	United Kingdom	no description given	13	adults with mental health problems - 216 (initial survey), 137 (follow-up survey), 33 interviews - however, these numbers include groups and ages not considered in this synthesis	unclear as data was gathered across different groups and ages	unclear as data was gathered across different groups and ages
Pedersen et al., 2012	Norway	ordinary work tasks in the cow shed, e.g., grooming, mucking, feeding, taking care of the calves, milking; all farms also had companion animals such as horses, cats, dogs or rabbits	6	8 adults with depression, semi-structured interviews one year after intervention	25-54	1 man, 7 women
Poulsen et al., 2020	Denmark	stables for sheep and horses	1	28 unemployed adult refugees with social, physical and mental health challenges, 20 semi-structured interviews across 4 time points; 9 focus groups across 3 time points	21-63 (of the 9 quoted – descriptives only given for those 9)	5 men, 4 women (of the 9 quoted – descriptives only given for those 9)
Schreuder et al., 2014	Netherlands	no description given	unclear	11 young people with severe social & mental health problems, semi-structured interviews (2 interviews were removed as different programme, but unclear which)	17-22	9 men, 2 women
Steigen et al., 2022	Norway	no description given	unclear	9 young adults with mental health problems across 20 semi-structured interviews (4 time points)	19-26	majority were women
Thieleman et al., 2022	Arizona, USA	All animals are rescued from abuse, neglect or homelessness. 30 animals (incl. horses, donkeys, pigs, sheep, goats, dogs, cats). Animals are never coerced to engage with participants.	1	115 adults with experiences of traumatic grief, survey	18-56+	82.6% women

Initial Programme Theory (IPT)

As no existing programme theory or similar model focusing on the impact of care farm animals on mental health was found in the literature, this realist review created an IPT outlining how, why and in what context care farm animals may be helpful for adult mental health.

Considering the above-described restricted range in animal-related quotes and author interpretations, some of the elements that arose were less commonly reported than others, which may not be a reflection of their importance but rather reflect the lack of breadth of evidence and studies only reporting select interpretations and quotes. Therefore, the created IPT should not be interpreted as a complete understanding of the impact of care farm animals on mental health, but rather as providing an initial awareness and early explanation as to why and how care farm animals may be helpful to mental health that will, however, require further exploration through future empirical research.

From the 12 papers, two CMOcs were created with multiple mechanisms and outcomes and one overarching outcome; see Figure 2 for a diagrammatic presentation of the IPT and chapter 6 for additional quotes not included in the main body.

In line with the realist principle of generative causation, CMOcs should be constructed using *if…, then…, because…* statements with 'if' referring to Contexts, 'then' referring to Outcomes and 'because' referring to Mechanisms (Leeuw, 2003).

The outcome overarching both CMOcs was categorised as 'positive health, wellbeing and social changes' and should be considered as a summary outcome reflecting the fact that a combination of the individual outcomes can lead to a wide range of positive changes in individuals' health, wellbeing and social life. Therefore, it partially reflects the impacted clinical symptomology (e.g., less trauma memories, Poulsen et al., 2020, p. 11) alongside more holistic wellbeing and social outcomes, such as decreased loneliness, feelings of relief or elevation in mood.

CMOc1: Animals Create an Environment for Healing

The first CMOc describes the healing environment that the care farm animals created through their presence, one that was calm, tranquil, quiet and therapeutic (C1). One survey participant described the care farm animals as "calming and reassuring" (Thieleman et al., 2022, p. 2438); another participant described the environment created by the animals as following: "It is a special tranquillity when you are in the milk parlor milking; it is… a sort of harmony." (Pedersen et al., 2012, p. 1530) and Granerud and Eriksson (2014) summarised that their participants "experienced a sense of inner quietness, which could be likened to meditation" (p.325).

Mechanism 1: Motivation for Meaningful Activity & Mechanism 2: Valuing Trust and Responsibility. This peaceful healing environment increased participants' motivation to engage in animal-related tasks, which were perceived as meaningful (M1); additionally, it allowed participants to take on and value the trust and responsibility that caring for the animals as other living beings created (M2).

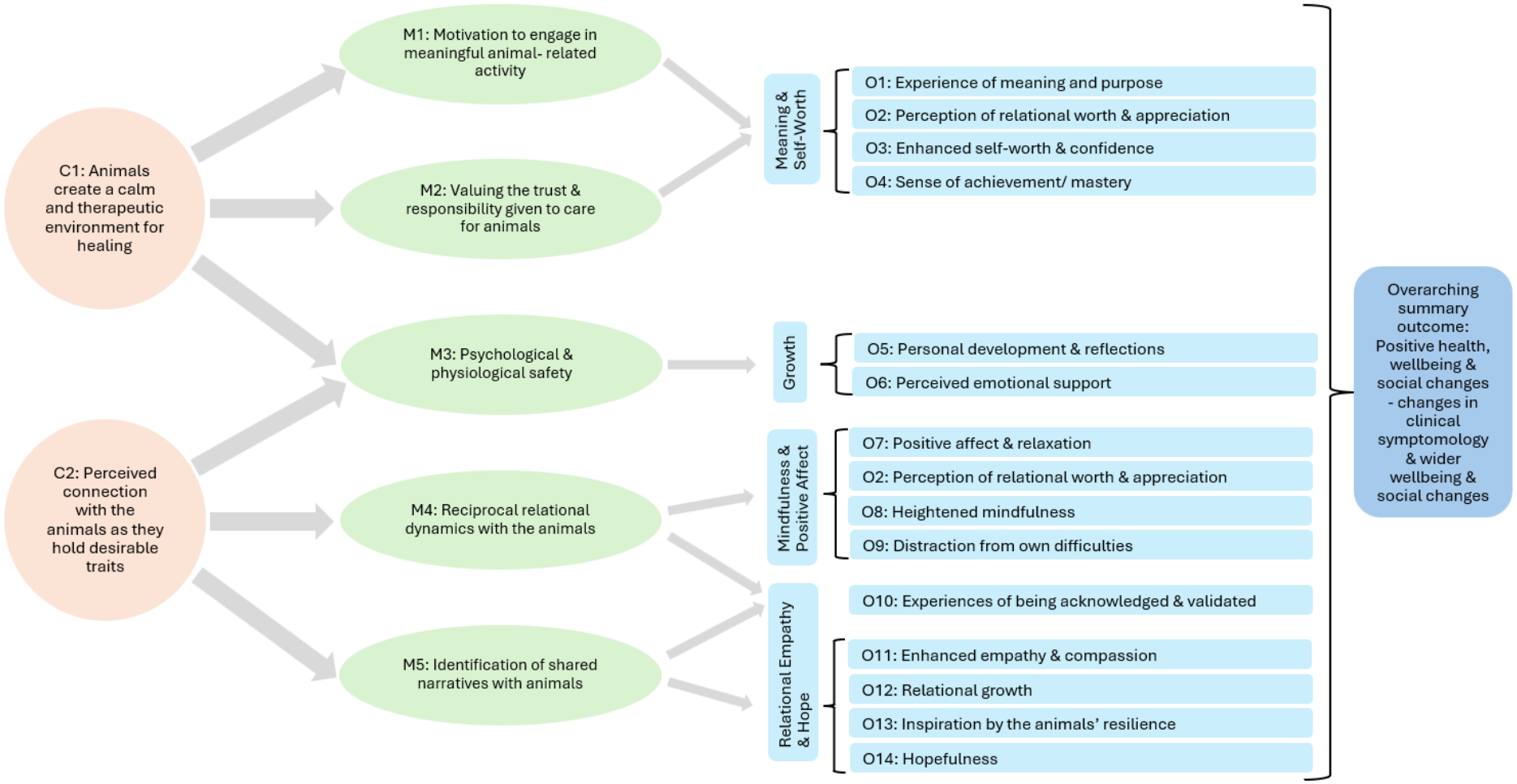
> Contact with animals, and the competence to take care of animals, may be the strongest expression of meaningfulness in the empirical material. In their contacts with farm animals, the participants encountered an immediate and unconditioned need, and they received immediate confirmation when that need was met. (Granerud & Eriksson, 2014, p. 329)

> The farmer, he constantly reminded me that I didn't, I couldn't give up, and he also said, yeah, you can't say like, I put my stuff down and I quit. Who will feed those animals then?... If you don't do that, the animals will die. And that's just something where you, well, you just start to realise that walking away is simply not an option, is just no possibility. (Schreuder et al., 2014, p. 146)

By engaging in meaningful activity as well as accepting and valuing the trust and responsibility inherent to caring for other living beings, participants experienced a sense of purpose (O1).

Figure 2

Initial programme theory explaining why, how and in what context care farm animals are helpful for adult mental health



For instance, one participant stated that their motivation to come to the farm and work there stemmed from the animals (Iancu et al., 2014). Participants also felt needed, useful and appreciated by the animals (O2), with one participant saying that "they showed me that they appreciated it, when I stroked and brushed them." (Pedersen et al., 2012, p. 1529). Farm participants experienced an increase in self-worth and confidence (O3), as can be understood from the following two quotes: "It feels so incredibly good in your heart to know that you have helped, even saved a living, breathing, helpless animal." (Gorman & Cacciatore, 2023, p. 170) and "I have had problems with self-assertion. So, then I started to fetch the cow herd alone. I had to be firm with them, and then they listened to me." (Pedersen et al., 2012, p. 1531). Alongside this, farm participants felt a sense of achievement or mastery (O4), "Actually, I managed to get close to the cow and to use my shoulder to move her. It gives you such a feeling of mastery. You grew in accordance with the challenge." (Granerud & Eriksson, 2014, p. 327).

Mechanism 3: Feeling Safe. A third mechanism triggered by the therapeutic healing environment the animals provided is a sense of psychological and physiological safety (M3), for instance, reported by Thieleman et al. (2022), "The horses and nature helped me to feel safe and calm." (p.2438) or by Pedersen et al. (2012), "Because you feel very safe and calm, when you look after and have contact with animals." (p.1530), but also by Cacciatore et al. (2020), where a participant described a safe environment facilitated by the animals:

> The care farm, like just being in wandering around and touching the animals and being with animals. And it was we were so receptive and comfortable because we were so at ease from just existing in a world where it wasn't like, come into my office, sit down. (p.5)

Feeling safe due to the animals allowed participants to grow, which may include reflections about and processing of difficult past experiences, which may be fostered through talking to the animals (O5): "For some, the animals provided a possible way of understanding, connecting, and relating their own experiences in ways that they had not previously been able to express, both to

themselves and to their counsellors/service providers." (Gorman & Cacciatore, 2023, p. 168). Participants also felt emotionally supported by the animals (O6), reported by both Steigen et al. (2022) and Thieleman et al. (2022), "Animals were cited as providing unconditional emotional support" (p.2441).

CMOc2: Feeling Connected to the Animals

The second CMOc described how participants experienced a sense of connection to the care farm animals, a connection that is facilitated by the desirable (human) traits the animals present with (C2): lack of judgment or pressure, acceptance ("Animal do not pressure humans and they do not stigmatize or differentiate.", Granerud & Eriksson, 2014, p. 325), they gave love and made individuals feel understood ("The animal contact also gave several participants a sense of being understood and having someone to turn", Ellingsen-Dalskau et al., 2016, p. 79). Care farm animals were perceived as honest and easier to be around than humans; they were welcoming, could provide social support and feel, and could respond to and mirror participants' emotions:

> You can feel it on the whole horse, if you have a bad day, then yes… yes, at least noticing it on Loke (a horse)… that… if I have a bad day, then he nearly also has it a little bad somehow…. (Steigen et al., 2022, p. 6)

> You can still have a bad day when you are in contact with animals, because the cows don't care if you are in a bad mood or if you haven't put your make up on. So, you knew you could go anyway. (Pedersen et al., 2012, p. 1530)

Mechanism 3: Feeling Safe. Experiencing the animals with these qualities also created a sense of psychological safety (M3) in farm participants, which further encouraged personal development (O5) as well as a sense of being emotionally supported (O6).

Mechanism 4: Reciprocal Relationships. Moreover, feeling connected with the animals facilitated participants' experiences of their relationship with the animals as reciprocal and mutually

beneficial, which allowed participants to focus on others' needs (e.g., those of the animals) instead of their own (M4):

> I think they are great space holders for our grief and they too need someone to hold their grief, to love them and teach them that it's ok to trust again. It's a mutually beneficial relationship and I've asked myself several times, who's rescuing who here? (Gorman & Cacciatore, 2023, p. 171)

> If I were dealing with dead things, it would not give me the same sense of responsibility (laughing). Perhaps it would be easier to give a damn on a bad day. But I do; as long as you are dealing with live animals, you do care. (Ellingsen-Dalskau et al., 2016, p. 79)

This was associated with experiences of positive affect and relaxation (O7) (e.g., "offering moments of laughter, joy", Thieleman et al., 2022, p. 2441), alongside an increased sense of being mindful (O8) (e.g., "I have become more attentive and aware", Pedersen et al., 2012, p. 1530). Participants were also made to feel needed, useful and appreciated by the animals (O2) and described feeling distracted from their own problems (O9). They also felt acknowledged and validated by the animals (O10): "So, there is always someone who is happy to see you here. If you are going in to the goats, for example, they start jumping on you.", (Steigen et al., 2022, p. 6).

> When I am at the farm, it doesn't hurt, it doesn't matter … aches, they a sort of, vanish, … when I'm in the barn, I doesn't think, I just am. So … I don't think on all the negative stuff … that were there before, it just disappears. (Pedersen et al., 2012, p. 1530)

Mechanism 5: Identification Through Shared Narrative. Finally, some participants described feelings of identification with the care farm animals, particularly through shared narratives (M5); this was particularly the case where care farm animals had a history of trauma or abuse, which participants experienced as a powerful realisation and connection. One participant described how this shared, similar experience means they can relate better to the animals and vice versa (Gorman

& Cacciatore, 2023) and another participant from the same study reported: “There is something very powerful and healing about looking into another soul which has also experienced a certain pain and isolation.” (p.168).

This allowed for increased feelings of empathy and compassion towards others (O11), which was described by Cacciatore et al. (2020) as stemming from the connection with the animals, “both the animals as a metaphor and signifier that instilled hope, but also the opportunity to develop empathy and compassion through encounters and relationships with the animals” (p.5).

Seeing the traumatised animals interact and rebuild relationships with people also helped some participants reflect on and re-learn about their own relationships with other humans, as well as their experiences of trust in others (O12); as part of this, the animals were also perceived as helpful for participants to “practise their social skills in a secure context” (Steigen et al., 2022, p. 7).

Furthermore, participants felt inspired by the animal’s resilience and ability to cope with or have overcome their own trauma (O13), which fostered feelings of hope for their own future, coping and recovery (O14), both of which are aptly summarised by the following two quotes from Thieleman et al. (2022): “Witnessing the animals and their ability to trust after such pain and abuse is both inspiring and grounding” (p.2439) and “seeing the animals who also had grief and fear helped me realise that I can feel it and I don’t need to run away from it” (p.2438).

Discussion

This realist review is the first to consider the impact of care farm animals on the mental health of adults who attend a care farm. An IPT was created from published research that begins to provide an improved understanding of the how and why that underlies the impact of care farm animals on mental wellbeing.

Data was synthesised into two CMOcs that together make up the IPT, which highlighted that if farm participants experienced the animals exuding a calmness, quietness and tranquillity that

creates a therapeutic environment for healing (C1) or experienced a sense of connection with the farm animals as they present with desirable traits (C2), this can activate several mechanisms that can lead to positive health, wellbeing and social changes. Examples of mechanisms were: valuing the trust and responsibility given to take care of the animals, feeling safe due to the animals and experiencing the relationships with animals as reciprocal. These mechanisms provide insights about how and why care farm animals may impact adults with mental health difficulties, as discussed further below.

Wider Mental Health Impact

This synthesis amalgamation of evidence indicates that care farm animals can impact a wide range of health, wellbeing and social factors, which combined will have a positive effect on adults' mental health, beyond diagnostic labels and clinical symptomology. For instance, participants' mental health was influenced by their social skills and functioning (O12, relational growth) or their emotional skills and empathy (O11, increased experiences of empathy & compassion; O6, feeling emotionally supported). As per the broader conceptualisation of mental health suggested by Galderisi et al. (2017), these factors may be able to support individuals' harmony with themselves and the world around them, thus leading to improved mental health and wellbeing.

The IPT and Attachment Theory

Attachment Theory has previously been empirically tested in its relevance to the human-animal bond (Zilcha-Mano et al., 2011), but not to the context of care farm animals. This IPT provides new information about how and why care farm animals may be beneficial for adults with mental health difficulties. This indicates support for the relevance of attachment theory as an explanatory model for this impact. O'Haire et al. (2019) described attachment as "the social bond created between two individuals, whether human or animal […] characterised as a relationship that provides feelings of safety as a secure base" (p.24). 'Connection with animals' (C2) was one of the most commonly found themes in this synthesis, alongside the mechanism of 'feeling safe' (M3). This is

further compounded by the animals creating calmness (C1), which facilitates perceptions of safety (Ainsworth et al., 2015). These findings might be interpreted as participants perceiving the animals as their secure base from which they can explore, heal and grow (O5) and be welcomed back to (Bowlby, 1988). Reciprocity (M4) is seen as a central element of secure attachment relationships, which encourages compassion (O11) and social functioning (O12) (Mikulincer & Shaver, 2007). Other outcomes that were present in this IPT that may be interpreted as consequences of secure attachment relationships are increased self-worth and confidence (O3), feeling needed (O2) or feeling emotionally supported (O6) (Mikulincer & Shaver, 2007).

Critical Appraisal - Strengths and Limitations

This IPT is the first of its kind in the context of care farms and care farm animals, thus bringing new insights and an improved understanding into the field of care farms and care farm animals. Despite three of the papers not having reported how many care farms were involved in their study and three papers having been conducted on the same care farm, this IPT was generated with data from a minimum of 50 care farms. Whilst some of the themes informing the IPT may have been mentioned less frequently than others, given that no contradictions or discrepancies were found across more than 50 care farms, this suggests a level of generalisability of the theory to other farms and similar contexts.

However, the IPT lacks a level of coherence given the poor data quality in several papers, the relative frequency of some of its data nuggets and the overall scarcity of data available. In light of this, this IPT should not be viewed as a completed theory but rather as an initial and incomplete explanation that will require further exploration and refinement.

Where possible, this review was planned and conducted in line with realist synthesis quality (Wong et al., 2014) and publication standards (Wong et al., 2013), which were broadly met except for the review having undergone but one round of searches focused on academic materials, rather

than multiple iterative rounds that included non-academic materials such as newspapers or social media content. This may have impacted the IPT's depth and coherence.

Future Research

Dada et al. (2023) propose that, for less rigorous available data, as presented in this review and resultant IPT, additional information should be sought to refine or refute the programme theory. As part of realist methodology, the use of non-academic materials is encouraged, such as newspaper articles or social media content, to inform an IPT (Hunter et al., 2022). Aside from this, future research should focus on conducting high-quality empirical research projects that focus on how care farm (animals) impact the mental health and wellbeing of adults as a way of testing and refining the IPT, which includes further testing the applicability of Attachment Theory to this context.

Further high-quality research should also be conducted in non-Western countries. The twelve papers synthesised in this study stem from five Western High-Income countries (four in Norway, three in the Netherlands and the USA each, and one in Denmark and the United Kingdom each). This impacts the applicability of the IPT to non-Western environments and should be cause for further research in diverse and lower-income settings.

Implications for Policy and Practice

This IPT indicates that engagement with care farm animals may support adults' mental health through improvements in a wide range of health, wellbeing and social factors. One avenue through which contact with care farms and their animals can be increased is by educating both healthcare professionals and service users about the existence and possible impact these unique environments can have, particularly for those who may not be able to access or do not benefit from traditional psychological therapies. Care farming interventions are generally delivered within the VCSE sector (voluntary, community and social enterprises) and are often accessed via referrals through social prescribing schemes (Garside et al., 2020). Social prescribing is a non-medical

'intervention' that recognises that health and wellbeing are impacted by factors outside of the biomedical sphere; it promotes individuals' connection with social and psychological aspects of the community they perceive as meaningful and engaging (Drinkwater et al., 2019). Social prescribing is gaining increasing recognition and funding, and is outlined in the 2019 NHS (National Health Service) Long Term Plan as a way of supporting individuals to have control over their own health and receive more personalised care. Care farms and engagement with (care farm) animals fit neatly into a social prescribing space, and better awareness about care farms and their potential benefits may perhaps increase such referrals and, therefore, connect more individuals to local community assets in support of their mental health and wellbeing.

Conclusion

Findings from this realist review support theories that indicate that human-animal relationships are beneficial to mental health and that this may apply to the context of care farm animals too. The IPT created begins to enhance our understanding of how and why care farm animals can impact adult mental health, which may be facilitated by secure attachment relationships formed between farm participants and care farm animals. Whilst this understanding remains in its infancy and this theory should be viewed as an early hypothesis, results are highly promising and should thus be considered by policy makers and professionals who support individuals with mental health difficulties.

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Chapter Three: Bridging Chapter

Word count (excluding references): 757

The realist synthesis in chapter two presents an initial programme theory (IPT) that begins to enhance our understanding as to why and how care farm animals may be beneficial for adults with mental health difficulties.

However, as outlined, the IPT is based on limited evidence from twelve studies, most of which were not primarily focused on exploring the impact of care farm animals on individuals' mental health, and many of which provided limited first (direct quotes) and second order (author interpretations) information that were relevant to be included in the synthesis for the IPT. Furthermore, only one of the twelve studies synthesised in the IPT was conducted in the United Kingdom (UK). The number of care farms is steadily increasing in the UK (Bragg et al., 2022), and a lack of context-specific data in the programme theory may affect its generalisability to the relevant systems in the UK.

Therefore, the IPT created should not be perceived as a completed explanation but should instead be considered as providing initial insights into why and how care farm animals can be helpful for adults with mental health difficulties. Moreover, further research on the topic is needed to gather new empirical evidence that can be used to review and refine the IPT for UK contexts and systems and increase its generalisability across different contexts and its overall explanatory strengths.

In addition to the above, another more specific gap was highlighted, namely, how care farm animals may be helpful for individuals with a history of trauma or adverse life experiences. Only four of the twelve studies recruited participants with trauma histories (Cacciatore et al., 2020; Gorman & Cacciatore, 2023; Poulsen et al., 2020; Thieleman et al., 2022), however, three of these focused on experiences of traumatic or prolonged grief, and these three studies seem to have been conducted

on the same care farm; none of the studies explored the impact of care farm animals on individuals with a history of adverse life events more generally. Therefore, conclusions that may be drawn from the impact of care farm animals on adults who have experienced trauma or adverse life events are limited and not generalisable beyond their specific settings (Neria & Litz, 2004).

Given how meaningful care farm animals are indicated to be for individuals' mental health, as explored in the systematic review and IPT, further research should consider exploring their impact on individuals with a history of adverse life events, which includes experiences of trauma.

Experiences of adverse life events are very common, and whilst they can be experienced as traumatic (Smyth et al., 2008), only the minority of individuals develop post-traumatic stress disorder (PTSD) (Kessler et al., 2017). Specific guidance for the recommended treatment of adverse life events only exists for those who meet criteria for PSTD (e.g., see National Institute for Health Care Excellence, 2018) and those who do not can struggle to access, for instance, psychological support (Bergman et al., 2015), despite the significant widespread impact that adverse life events can have on many areas of an individual's life (Carstensen et al., 2020; Smyth et al., 2008). The consequences of adverse life experiences may be interpreted in line with the wider conceptualisation of mental health proposed by Galderisi et al. (2017), whereby the adverse life event interferes with the state of internal equilibrium by impacting individuals' cognitive, social, physical and emotional states.

Additionally, adverse life experiences are often an underlying cause for secondary mental health conditions, which may be treated in the absence of PTSD symptomology without actually targeting the cause of the issues. Considering this and the prevalence of exposure to adverse life events, it is crucial that more interventions are explored that may be helpful for those who have experienced prior adverse life events but who may not meet the criteria for PTSD therapy.

Therefore, whilst the IPT presented in chapter two proposes that care farm animals are helpful for those with mental health difficulties, it would be helpful to gain a better understanding of

how care farm animals may impact the mental health of those who have experienced adverse life events.

Consequently, the following chapter presents a UK-based empirical qualitative interview study that explores the impact of care farm animals on the mental wellbeing of individuals with a history of adverse life events. Given that the consequences of experiencing adverse life events can be conceptualised as mental health related (Galderisi et al., 2017), this realist evaluation uses the newly gathered interview data to review and refine the IPT created in the realist synthesis described in chapter two.

Chapter Four - Empirical Research Paper:

Understanding the mechanisms through which care farm animals impact humans with a history of adverse life events – creating a programme theory using a realist evaluation approach

Word count (excluding abstract, tables, figures and references): 7482

Word count for Health & Place (excluding tables, figures and references): 7731

Author guidelines for Health & Place can be found in Appendix A. *Please note that Health & Place request references to be indicated by numbers in square brackets. This was not done for this Portfolio, but will be amended for submission.*

Additional quotes can be found in Chapter Six (Additional Results); these will be submitted to Health & Place as supplementary materials to this project.

Understanding the mechanisms through which care farm animals impact humans with a history of adverse life events – creating a programme theory using a realist evaluation approach

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Acknowledgments

The authors would like to express their gratitude to the study participants for giving up their time to share their experiences. We would also like to thank the care farm managers and other care farm staff for their support in making this project become reality.

Funding

This research was completed as part of the University of East Anglia's Doctorate in Clinical Psychology programme, which is funded by NHS England.

Conflict of Interests

No conflicts of interest are reported by the authors.

Abstract

Background: Care farm animals are common features on care farms accessed by individuals with mental health difficulties, such as experiences of adverse life events. However, our understanding of how and why individuals may benefit from care farm animals remains limited.

Methods: A realist evaluation was conducted to better understand care farm animals' impact on individuals with experiences of adverse life events. Qualitative data from ten participants across two care farms gathered via purposive sampling was used to refine an initial programme theory about the impact of care farm animals on adult mental health.

Results: The refined programme theory (RPT) consisted of three Context-Mechanism-Outcome configurations. Common themes were the animals allowing participants to forget the outside world, participants feeling connected with the animals as they present with desirable traits, and the farm environment and its people acting as a safe second home and family. An overarching mechanism of 'feeling safe' emerged from all interviews. Positive health, wellbeing and social changes were facilitated by the animals through additional mechanisms such as self-reflection or relearning about human relationships, all of which can contribute to individuals' mental health recovery.

Conclusion: The RPT provides a model for how care farm animals can benefit the mental health recovery journey of adults with experiences of adversity, in line with the CHIME framework. This may be facilitated through safe attachment relationships farm participants form with the animals. This can have implications for the development of policies and protocols embedding care farm (animals) into mental health care delivery.

Keywords: animal, care farm, green care, adverse life events, mental health, realist evaluation, adults

Care farming (or social farming) is broadly defined as the therapeutic usage of agricultural practices (Elsey et al., 2016) and is a practice that is growing across the globe (de Bruin et al., 2021). The environment and activities may often include socialising with other clients (henceforth called 'farm participants') or staff, horticultural or crop-related tasks, woodwork or animal husbandry (de Bruin et al., 2021). Different farm participants have different reasons for attending the farm, which may be related to mental or physical health, but also due to social, behavioural or neurological difficulties.

Evidence towards the benefits of care farms is growing (Iancu et al., 2014), including our understanding of the social impacts (Elsey et al., 2016) and the role of the green care environment itself (Hassink et al., 2010). Hassink et al. (2010) concluded their qualitative study stating that care farms create a unique 'informal context that is close to normal life' (p.428) rather than being an artificial, formal, medical environment with little resemblance to real-world activities, tasks and interactions.

Care Farm Animals and Mental Health

One of the nature-related activities care farms offer may be engagement in various animal-related activities, which can include feeding the animals, cleaning or tidying up their living area, as well as enjoying the animals' company and the physical contact with them.

In their literature review, Berget and Braastad (2011) summarised the outcomes of fourteen studies on the effects of care farm animals, finding that they can have positive impacts on participants' experiences of anxiety, depression, self-efficacy and social support. Ellingsen-Dalskau et al. (2016) interviewed ten care farm participants with mental health difficulties about their experience on the farm. One of the arising themes was in relation to animals and nature, with participants noticing how the animals bring calmness and inner peace, a feeling that they have someone to turn to who understands them. Participants also benefitted from the animals in regard to having someone else to take care of. Hassink et al. (2017) conducted focus group meetings with

care farmers as well as summarised outcomes from previous related studies. They identified a range of benefits, such as the animals providing meaningful occupation and relaxation, distracting from problems, and facilitating relationships with other people.

Additionally, interactions with care farm animals may have added benefits to non-farm animal-assisted interventions (AAIs), such as that engagement with the farm animals may be seen as more purposeful (e.g., feeding an alpaca rather than 'merely' stroking a dog in a non-farm AAI context) or participants being genuinely responsible for the animals' welfare and survival (Ellingsen-Dalskau et al., 2016).

Care Farm Animals and Adverse Life Events

Adverse life events may be described as "sudden, dramatic experiences" which are "typically unexpected" and "require significant change in an individual's life pattern and adaptive or coping behavior" and may be described as "potentially traumatic events" (Richardson et al., 2023, p.342). Bonanno (2004) suggests that most people will experience such significant negative events in their life, whereas other studies propose a lifetime prevalence of between 55.8% to 84.5% (Smyth et al., 2008). Adverse life events have the potential to significantly disrupt an individual's life and can lead to manifestations of physical, neurological and mental health difficulties (Carstensen et al., 2020; Smyth et al., 2008). However, not all adverse life events are traumatic (Smyth et al., 2008), and only a minority of those who experience adverse life events go on to develop post-traumatic stress disorder (PTSD) (Kessler et al., 2017). Targeted treatment options only exist for those who meet the threshold for PTSD (e.g., see National Institute for Health Care Excellence, 2018) and those who do not can struggle accessing appropriate support (Bergman et al., 2015).

No studies exploring the impact of AAI or care farm animals on individuals with a history of adverse life events more broadly were found in the process of researching for this project. However, existing evidence points towards the benefits of AAIs for PTSD: In a meta-analysis, animal-assisted psychotherapy has been shown to be effective in reducing symptoms of PTSD (Germain et al., 2018).

In another meta-analysis and systematic review, Hediger et al. (2021) summarised that AAIs enabled similar reductions in PTSD symptoms as standard psychotherapy for PTSD.

Studies about the impact of care farm animals on individuals with a history of trauma are sparse, and only four were identified (Cacciatore et al., 2020; Gorman & Cacciatore, 2023; Poulsen et al., 2020; Thieleman et al., 2022) in a realist synthesis (Fath et al., 2025). Three of these studies were conducted on the same care farm and with farm participants' reasons for attendance being that of traumatic loss and grief, which is seen as differing from other forms of trauma (Neria & Litz, 2004).

Research Question

Although care farms and care farm AAIs are showing promising evidence towards improving people's wellbeing, the robustness and quality of these findings vary substantially, with few studies having been conducted about care farm animals, particularly from the perspective of farm participants themselves and with individuals with a history of adverse life events (Fath et al., 2025). Furthermore, our understanding of *why* and *how* care farm animals may be beneficial remains limited. O'Haire et al. (2019) proposed some theories that might begin to explain the impact of animals on human mental health, including Attachment Theory, and further empirical research on human-animal relationships has demonstrated that humans can form safe attachment bonds with animals (Faner et al., 2024). In a recent realist review, an initial programme theory (IPT) was created aimed at explaining why and how care farm animals may be beneficial for adults' mental health (Fath et al., 2025). This IPT also provided initial support for the use of Attachment Theory as an explanatory model for the impact care farm animals can have on adult mental health. However, more qualitative empirical evidence is required to understand how and why care farm animals can impact adult mental health, how their impact may relate to existing psychological theories, and to test and refine this IPT's applicability to individuals with a history of adverse life events (including trauma) more specifically. This would also enhance its explanatory strength as a theory of the benefits of care farm animals on mental health.

Therefore, given our continued limited understanding of the mechanisms underlying the potential benefits of care farm animals, this research aims to refine the IPT created by Fath et al. (2025) from a realist review of prior literature, with empirical realist qualitative data to answer the following question:

> What are the mechanisms through which care farm animals may impact adults with a history of adverse life events? In what context does it work, for whom, how and why?

Methods

Research Design

A realist evaluation was chosen as this project's methodological approach (Pawson & Tilley, 1997). An increasingly popular theory-driven approach, it aims to answer the question "What works, for whom, in what circumstances and how?". It achieves this understanding through the creation of a programme theory, which explains why and how an intervention is successful in some but not other circumstances, for some but not other people. A programme theory typically has three components called CMOcs: Context- Mechanism- Outcome configurations. Realist approaches recognise that an intervention or programme is only effective when it is delivered under the right social and organisational conditions or contexts (i.e., 'contexts', which may be, amongst other things, of geographical, political, social, or inter-relational nature). An understanding of the reactions or responses to these contexts is required; these are 'mechanisms', which are triggered (or inhibited) by certain contexts and are the unseen drivers or reasons for change, therefore providing understanding about what aspects of an intervention do or don't work. These collectively influence the 'outcomes' of an intervention or programme, which are the changes experienced by the contexts and mechanisms of a programme (Wong et al., 2017).

Qualitative data gathered via semi-structured in-situ realist interviews was used to refine the IPT created in a realist review by Fath et al. (2025). One-to-one face-to-face interviews were chosen

as the data collection method as they are well-suited to qualitatively exploring individuals' perceptions and experiences; the one-to-one set-up allows participants to feel safe to explore and share personal experiences without fear of judgment by others, and conducting interviews face-to-face is perceived as the 'gold standard' way to conduct interviews (Braun & Clarke, 2013).

The project was, where possible, planned and conducted in line with realist evaluation quality (Wong et al., 2017, pp. 21-29) and publication standards (Wong et al., 2016, pp. 4-5).

Participants

Care Farms

Inclusion criteria for care farms were that the farms 1) hosted animals that farm participants could engage with, and 2) that they were willing and able to facilitate interviews on their premises. Registered care farms were searched for via the members page of Social Farms & Gardens (2024). Out of 15 care farms contacted, eight replied, and two wanted to participate.

Farm 1 houses sheep and lambs, ducks, geese and chickens, dogs, cats and pigs. Animal-related activities included: feeding the animals, cleaning their sheds or fields, or simply spending time in the animals' company.

Farm 2 houses donkeys, two types of goats, sheep and lambs, alpacas, pigs, rabbits and guinea pigs, chickens, ducks and geese, and a dog. Animal-related activities included: feeding the animals, cleaning their stables or fields, walking them, keeping an eye on their wellbeing and, with support, administering health interventions (e.g., medication) or simply spending time in the animals' company.

Interview Participants

Participants needed to be 18 years old or older, self-identified to have a history of adverse life events or trauma from any time in their life and be currently accessing one of the two participating care farms.

Five farm participants were recruited from each care farm, providing ten participants in total who consented to be part of the study. Age was gathered in ranges to enhance anonymity. Two participants were male. All identified as 'White British or White Other'. See Table 3 for participant demographics and interview details.

Recruitment was conducted via care farm managers as gatekeepers using a purposive sampling method. They approached participants meeting inclusion criteria. This was checked through pre-interview eligibility forms. On meeting criteria, interviews were arranged.

Table 3

Participant ID, demographics and interview details

Participant ID (interview order)	Gender	Age range	Interview conducted with animals & outdoors?
PP1	Male	45-54	No
PP2	Female	55-64	Yes (geese, ducks), and outdoors
PP3	Female	55-64	No, but outdoors
PP4	Female	45-54	No
PP5	Female	65-74	No
PP6	Female	25-34	Yes (goats), and outdoors
PP7	Female	35-44	Yes (pigs), and outdoors
PP8	Female	18-24	Yes (goats, donkeys, pigs), and outdoors
PP9	Female	35-44	No
PP10	Male	25-34	No

Interviews

The semi-structured interview schedule was co-developed with volunteering care farm staff. Guidance for realist interviews (RAMESES, 2017) was reviewed to suggest possible topics and inform question framing (Westhorp & Manzano, 2017), which was then refined with suggestions by care

farm advisors and in line with the project's aim. Five areas of questions were developed, leading to eleven questions in total, see Table 4. Completed interviews informed explorations of themes arising in subsequent interviews in line with realist data collection models (Rees et al., 2024).

Table 4

Questions used during semi-structured interviews

	General questions about the care farm
1	How long for and how often have you been coming to the care farm?
2	What are your favourite activities at the care farm or with the care farm animals?
	General questions about the care farm animals
3	How important are the animals to your experience of the care farm? Would you come if there weren't any animals?
4	Do you have a preferred care farm animal, and if so, which and why?
	Feelings in relation to the care farm animals and participants' adverse life events
5	What words would you use to describe how you feel when you are with the care farm animals? Does it differ between animals?
6	Does how you feel when engaging with the care farm animals change throughout the day?
	Benefits of the care farm animals in relation to participants' adverse life events
7	Do you feel the care farm animals have helped you manage the adverse life events that you have experienced differently? If so, how?
8	Experiencing adverse life events can have a negative impact on many areas of someone's life. Has engaging with the care farm animals had a helpful or unhelpful impact on any areas of your life? (Examples given as prompts, if required, were: impact on confidence, relationships with humans, self-worth, sense of control, etc.)
9	Do you feel engaging with the care farm animals helps your physical and or mental wellbeing? If so, how?
10	How does the impact of the care farm animals permeate into your life outside the farm?
	Closing Question
11	Is there anything else you'd like to share or discuss in relation to this topic?

Interviews took place in situ between March and May 2024. With the care farm manager's agreement, participants were offered the option to conduct their interview in the animals' presence or whilst engaging in an activity with them, alternative to conducting the interview indoors in a confidential space on the farm. Interviews lasted between 43 and 123 minutes and were recorded with dictaphones. Participants were debriefed after the interviews and were offered to review their transcripts.

Analysis

Considering suggestions by Rees et al. (2024) on how to conduct realist analyses, the analysis process involved deductive and inductive reasoning as well as retroductive iterations following the realist principle of generative causality aimed at the creation of CMOcs or explanatory statements.

Interviews were automatically transcribed via Microsoft Word and corrected manually while listening to the recordings. Transcripts were read multiple times, and line-by-line coding related to care farm animals took place in NVivo, which was used to manage the data. Using inductive reasoning, across all transcripts, initial codes were generated where there were areas of commonality or contrast. These initial codes were inductively and deductively merged and refined to create unique, grouped codes. Data saturation was felt to be achieved on development of refined thematic codes when no new content arose that would form independent themes. Codes were inductively and deductively developed into CMOcs or explanatory statements. These were then considered in relation to the IPT created by Fath et al. (2025), leading to an eventual merging of both sets of data. These steps were conducted by the primary researcher (JF) independently, followed by discussions with the secondary researcher (BT) in a retroductive realist process. This process took several iterations, during which different individual Cs, Ms and Os were merged with other, similar themes and repeatedly re-arranged until they were felt to be most meaningful to their related Cs, Ms and Os, thus, creating a finalised, refined programme theory (RPT). This process's aim was not to

detect an underlying truth in the data but rather to identify recurrences, contradictions and commonalities in the participants' experiences with the care farm animals.

Ethics

Ethical approval was sought and gained from the University of East Anglia Faculty of Medicine and Health Sciences Research Ethics Committee on 29th November 2023 and 19th January 2024 (ETH2324-0011 and ETH2324-1318). Informed written consent was obtained from all participants. To reduce potential for distress, participants were not asked about their history of adverse life events. Interview breaks and withdrawal were highlighted as possibilities. Data protection was maintained by anonymising interview transcripts. Animals were not experimented on or manipulated; their presence in interviews was voluntary, and their welfare was monitored by care farm managers.

Results

It was evident from the interviews that for all participants the care farm animals played a very important role in their overall experience of the care farm: "It wouldn't be the same if there weren't the animals. So, I suppose they play a key part in the whole role of the care farm, really." (PP10).

At the same time, most participants were clear that they would still come to the farm if there weren't any animals, as they also value other aspects that the farm offers, and they perceived their positive experience of the farm to be made up of multiple parts, with animals being one of them.

> But they [the animals] are my main purpose of why I come here. But regardless of having animals here or looking after them, I've still got people as well. My people around me. I wouldn't miss them for the world either. (PP8)

Some participants spoke about how they felt initially hesitant to come to the care farm, however, how the promise of the animals' presence became a deciding, encouraging factor: "When I first started coming here, if it wasn't for the animals, I wouldn't have come." (PP6).

Refined Programme Theory (RPT)

Whilst the focus of this research was on investigating the impact of animals on care farms, the RPT takes into consideration that the animals are a part of the care farm, and thus their impact cannot be seen solely in isolation from the farm itself. Consequently, the RPT is an expansion of the IPT presented by Fath et al. (2025) and consists of three sets of CMOcs: two about the impact of care farm animals specifically and one about the impact of the care farm as the host of the care farm animals overall. Each set of CMOcs has one context with multiple mechanisms and outcomes; given the number of outcomes, each set of outcomes connected to a mechanism was also summarised. Additional to traditional programme theories, a context, a mechanism and a summary outcome overarching all CMOCs were identified.

True to the realist principle of generative causation, CMOcs should be read as 'if (context)…, then (outcome)…, because (mechanism)' statements to highlight their explanatory strengths (Leeuw, 2003).

Overarching Elements

Overarching Context: Peacefulness, Calmness and Tranquillity. Experiencing a sense of peacefulness, calmness and tranquillity that creates a therapeutic environment for healing was central to every participant's description of the care farm animals and the farm itself, "The goats calm me down." (PP6). This peacefulness set the tone for all interactions and experiences on the farm and, as identified in the IPT, motivated farm participants to engage in meaningful (animal-related) activities on the farm. Therefore, this was identified as an overarching environmental and social context.

Overarching Mechanism: Psychological & Physiological Safety. A recurring, all-encompassing theme across all interviews was the sense of safety that the care farm animals offered to farm participants, “Because when I speak to animals and I'm with them I feel safe.” (PP8). This was identified as a mechanism in the IPT. On immersion into the newly gathered data, this sense of safety arose as an overarching mechanism rather than an individual mechanism, or a context or outcome, although in reality, it is likely that it interconnectedly influences all stages of the programme theory.

Overarching Summary Outcome: Personal Mental Health Recovery. This project aimed to identify why and how care farm animals would impact individuals with a history of adverse life events. Throughout all conversations, all participants voiced the significant impact the care farm animals had on them, particularly in relation to how they positively impacted a wide range of health, wellbeing and social factors in individuals’ lives (e.g., “They [the animals] taught me that it’s okay not to be okay.”, PP1). Given the breadth of what may be perceived as ‘mental health’, one could consider all outcomes mentioned in this project as related to an improvement in participants' mental health. Building on this, this overarching outcome should be considered as a summary outcome to the individual outcomes that combine to support individuals’ personal mental health recovery. This incorporates the overarching summary outcome from the IPT (‘positive health, wellbeing and social changes’). This may be aptly summarised by participant 5, who stated: “I think it is healing.”

CMOc1: Animals Make Me Forget the Outside World

The first set of CMOcs was set in the context of care farm animals making individuals forget the outside world (C1), see Figure 3.

> I can leave everything, my worries in life at home or at the gate. As soon as I'm on the farm... Just, yeah. A feeling of relief sort of thing. Not got to worry about anything else, just make sure all the animals are happy and content. (PP10)

Mechanism 1: Space for Self-Reflection. C1 triggered the mechanism of self-reflection, whereby individuals felt safe and able to reflect on themselves or their life more neutrally or positively (M1).

> [Manager] said that I am changing since when I first came. For the good, for the good, she said. And I am getting in touch with my feminine side, as I say [PP giggles]. Because I just had problems identifying as being a woman, I'm not transgender, because of the upbringing I just didn't like my body and stuff like that. (PP3)

Outcomes related to personal growth and insight (O1-O3), which included participants feeling or thinking differently about their past adversities or as if they can move forward or accept them, “I think the animals helped me come to terms with it or helped me process it.” (PP1), (O4).

Mechanism 2: Mindfulness. A second mechanism triggered by C1 was that participants felt able to be more mindful, more present in the moment. This also facilitated individuals being able to notice the animals being funny, which all participants noted (M2): “When you are sat with them your brain is not racing. You're not going like 100 miles a minute. You could just be here in a moment.” (PP6) and “If I'm feeling down or cross for any reason, fed up, you just have to look at them and they make you laugh.” (PP3).

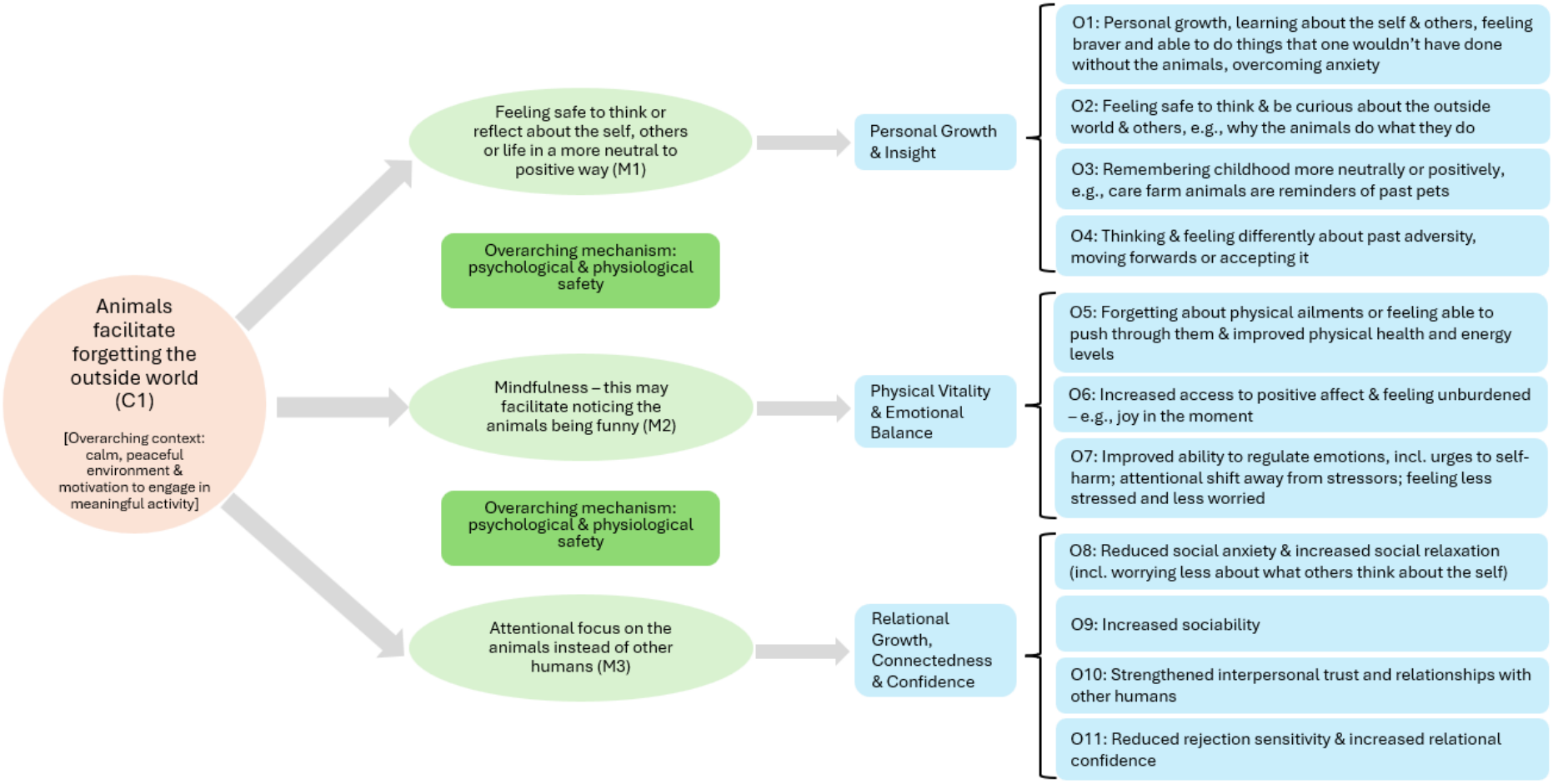
Outcomes related to improvements in participants' physical health (O5) and emotional regulation and balance (O6-O7).

Mechanism 3: Attentional Focus on the Animals. A third mechanism triggered by C1 is that it allowed farm participants to focus on the animals instead of other people (M3).

> When I was first here, I would focus on the animals because there was people. My anxiety was awful and because I didn't know the people, I didn't know what people were like here, I would focus on them [the animals]. They would take my mind off of the people around me here and what was going on. (PP8)

Figure 3

CMOc1: Animals make me forget the outside world



This facilitated several positive social outcomes leading to experiences of increased relational growth, connectedness and confidence (O8-O11).

CMOc2: Animals Have (Desired) Human Traits Facilitating Connection

The second set of CMOcs was set in the context of the care farm animals demonstrating human traits, some of which were desired in others, that increased connection with the animals (C2), see Figure 4. This connection is aptly summarised by the following quote: “It's just two souls sitting next to each other that seem to have a bond or seem to have a connection.” (PP1).

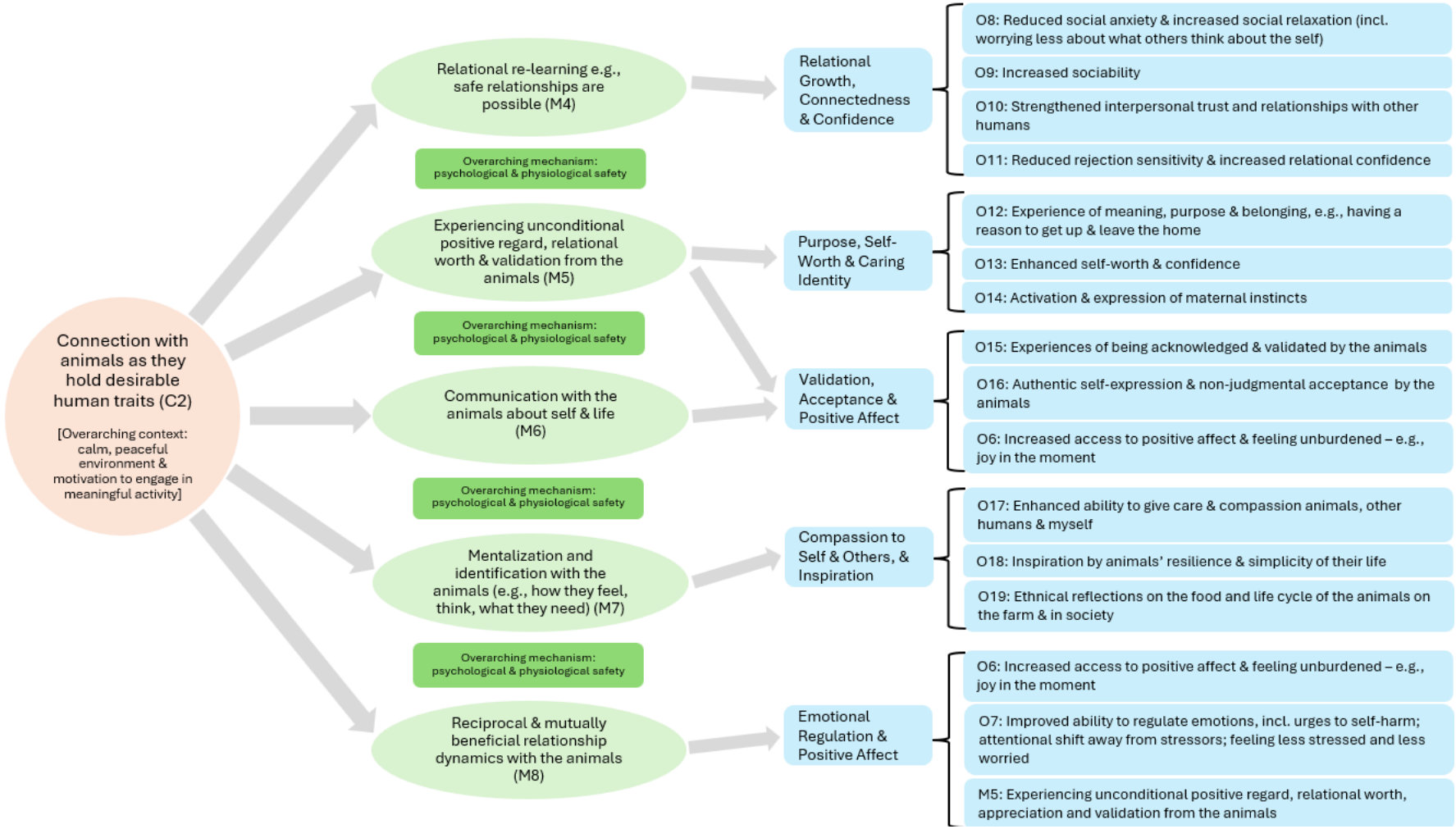
Examples of such traits were the animals demonstrating personalities (“They’re all different. They've all got their different little quirks and things, just like people have.” PP2), being innocent, cute and playful like children, expected and desired routine, were greedy for food or were reliable and predictable. All participants also perceived the animals as funny: “The ducks like to tease them as well when they are in the pen and isn’t that comical, a tiny duck going after a goose.” (PP2).

Other traits that made farm participants feel connected with the animals was feeling that the animals understood them and their needs, were feeling their emotions, and were accepting of their emotions and them as who they are (“You’re not getting pushed away by them.” PP5), whilst only wanting and demanding what the individuals were able to give. For instance, during her interview, participant 7 pointed to one of the pigs and said: “You can see him smiling.*”,* thus superimposing human traits. However, participant 1 said these weren’t ‘human’ traits, but ‘animal’ traits, as humans were animals too:

> Maybe I put human emotions or feelings, but I truly think that we'll find in the future that animals have all the same feelings as us, envy, jealousy, happiness, kindness. […] That's not a human trait. That is an animal trait.

Figure 4

CMOc2: Animals have desired human traits facilitating connection



Participant 8 warned the researcher not to wear pink around the Pygmy goats as they dislike that colour, and participant 2 said: “They’re like people, you know, they're a family unit. If you get between, you know, get there in the middle of them, they get distressed. If you change their routine, they get upset, you know?”.

Mechanism 4: Relational Re-Learning. C2 triggered several mechanisms, such as that individuals felt safe and able to re-learn about other humans in a more positive way (M4), such as that they aren’t so bad and that safe relationships are possible, which empowered experiences of relational growth, connectedness and confidence in regard to human relationships (O8-O11).

> They help me get… I trust the animals here. And I think that helps with the trust of the people who are here, because watching them guys help with the animals, knowing that they're all doing what they've got to do. (PP8)

Mechanism 5: Unconditional Positive Regard, Relational Worth & Validation. Through noticing desirable traits in them, the animals made farm participants feel good enough, needed and appreciated (M5), “I feel loved by the animals because when you're there, they do come to you. When you give them a fuss, they are like ‘oh hello, I like this’. There is always an animal that will come to you.” (PP8).

Examples of outcomes were a sense of purpose (O12), an increase in confidence or self-worth (O13), or participants feeling or expressing maternal instincts (O14), therefore, allowing a caring identity. This was significant in the light of some of these women’s past adversity being related to the topics of motherhood and care. It felt as if the safety of the animals allowed possibly painful maternal instincts to not just arise but also be fostered, and their expression encouraged.

Mechanism 6: Communicating with the Animals. Animals demonstrating (desired) human traits also made farm participants feel they can talk to the animals about themselves and their life and other things (M6), which a number of them did during the interviews as well: “Hey, beautiful

boy. Yeah, you're beautiful. And yes, you're gorgeous too." (PP6). Participant 4 expressed a level of safety that talking to the animals brings, "Just talking to them, telling my secrets, and thinking it's good no one can hear me. And no one can find out what's going on in my head, and they won't tell anyone."

Examples of outcomes were participants experiencing validation, acceptance and greater positive affect, such as feeling acknowledged and validated by the animals (O15) or feeling able to express oneself authentically alongside being non-judgmentally accepted (O16).

Mechanism 7: Mentalisation & Identification with the Animals. Through identifying (desired) human traits in the animals, farm participants felt safe and able to mentalise the care farm animals (e.g., wonder about what they may feel, think or need) and identify with them in a manner that felt helpful to them (M7). Participant 2 reflected on how one of the chickens, Alice, dislikes it when someone puts a hand on her head and could identify with this herself, saying that "it would frighten me and I would, I'd have some sort of reaction. I don't know what it would be, but it wouldn't be a happy one."

Examples of outcomes were participants being more caring and compassionate to others and themselves (O17), such as participant 6, who reflected on learning to be less perfectionistic on realising that not every single goat poo nugget needed to be cleaned up, or participants feeling inspired by the animals' resilience and the simplicity of their life (O18).

Mechanism 8: Reciprocal Relationships with the Animals. By feeling connected with the animals, farm participants were able to experience a sense of reciprocity and mutual benefit in their relationship with them (M8):

> There was one chicken that had no feathers at all. And we got her feathers back. We helped calm them down, fed them, and looked after them. It makes you proud knowing that you've done that, you've helped them become what they are now. (PP8)

Examples of outcomes were participants experiencing a greater range of positive emotions (O6) or recognising an attentional shift away from daily stressors or difficulties (O7).

CMOc3: The Care Farm and its People are a Safe Second Home and Family

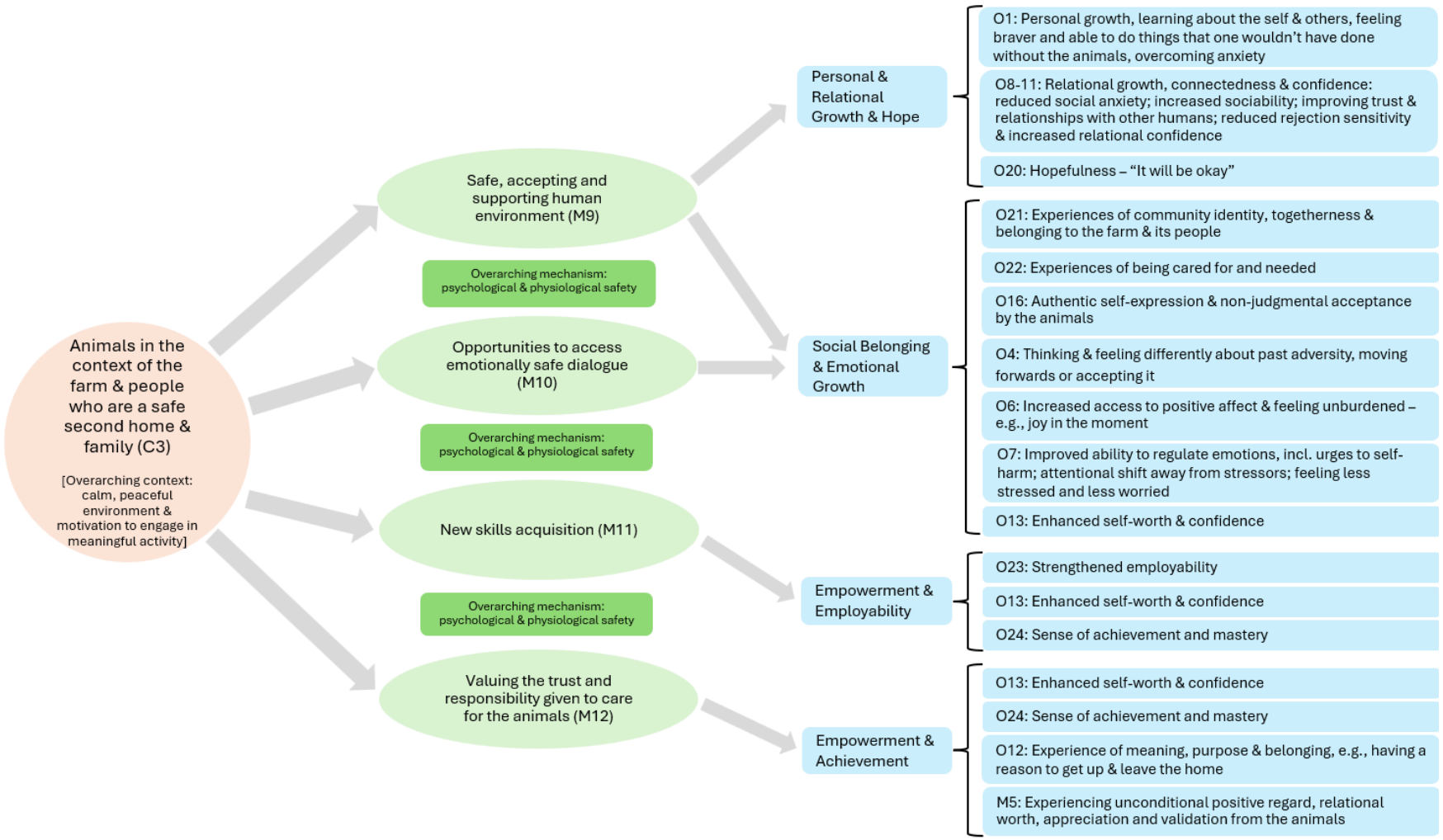
This CMOc relates to the context of the care farm environment itself. Despite not being asked about this within the realist interviews, every participant spoke about the care farm and its benefits, particularly the social elements. This may be a reflection of most participants' perception of the animals being one part of the wider care farm environment, and participants valuing many different aspects of the farm, see Figure 5.

Therefore, the third set of CMOcs are set in the context of individuals perceiving the farm, including its social (with staff and other farm participants), nature and animal-related activities as a safe second home and family (C3), “This lot are my second family. […] I wouldn't miss them for the world either.” (PP8), “It's like the people are like family and the animals are like my family. I love them.” (PP2), and staff are spoken of very highly: “The staff’s personalities helped. If they, if you came and it’s a bit like ‘pull yourself together’. Tough staff. You'd be like ‘whatever’. Yeah, but the kindness and the sort of mothering that happened at first.” (PP1).

Mechanism 9: Safe, Accepting & Supporting Human Environment. The safe, homely family feeling of the farm offers compassion, kindness and lack of judgment; it provokes a feeling of acceptance and being cared for in farm participants, alongside the sense that everyone is sharing support and working as a team (M9). This is aptly summarised by two quotes from participant 7, “But here, it's like everyone's the same, well, obviously we're all different too, but it's not… your differences aren't… kind of… they accept you for how you are.”, and participant 8, “It’s like you know you read a book and you're in a different world. That's what it's like in real life. Being here, I feel free, safe, and I feel like me. Knowing that I'm not getting judged.”

Figure 5

CMOc3: The care farm is a safe second home and family



Participant 5 also spoke about how newcomers are welcomed: “I find it quite family orientated. Yeah, and like if someone new comes, we're all there, you know. We’re all there to sort of help or just to be quiet.” Participant 6 reflected on how everyone works as a team and communicates well.

Outcomes related to personal and relational growth (O8-O11), social belonging (O16, O21-O22), hope for the future (O20) and emotional growth (O4, O6-O7, O13).

Mechanism 10: Opportunities for Emotionally Safe Dialogue. The safe, homely farm environment made farm participants feel that they have the option to talk, if they so wish (M10), “And cause it is a care farm you’re not left, only if you want to have like 5 minutes, so you will always have someone that will say ‘do you want to chat’ or something like that.” (PP5).

Outcomes related to social and community belonging (O16, O21, O22) and emotional growth (O4, O6-O7, O13).

Mechanism 11: New Skills Acquisition. The care farms provide safe, practical learning opportunities (M11), such as mentoring younger farm participants, learning about pottery, woodwork or gardening, or working in the café. On care farm 2, farm participants can work towards specific certificates, such as in cooking, baking or animal care. Participant 9 reflected on how working in the kitchen and the café allowed her to learn more about nutrition and health: “That’s the other bonus about doing the café, it does teach you about nutritional levels, what is good, lactose and sugars, diabetes and that sort of stuff. So, I learn quite a bit.”

Outcomes related to experiences of empowerment through increased employability (O23) and a sense of achievement (O24).

Mechanism 12: Feeling Trusted with Responsibility. The context of the safe family and second home that the farm offers meant farm participants were trusted with the responsibility to take care of the animals, which they valued (M12). This experience empowered, amongst other

things, feelings of achievement and mastery in farm participants (O24): “And that's what the people here do and the animals. They do boost you. They make you feel like you're achieving something in life.” (PP8).

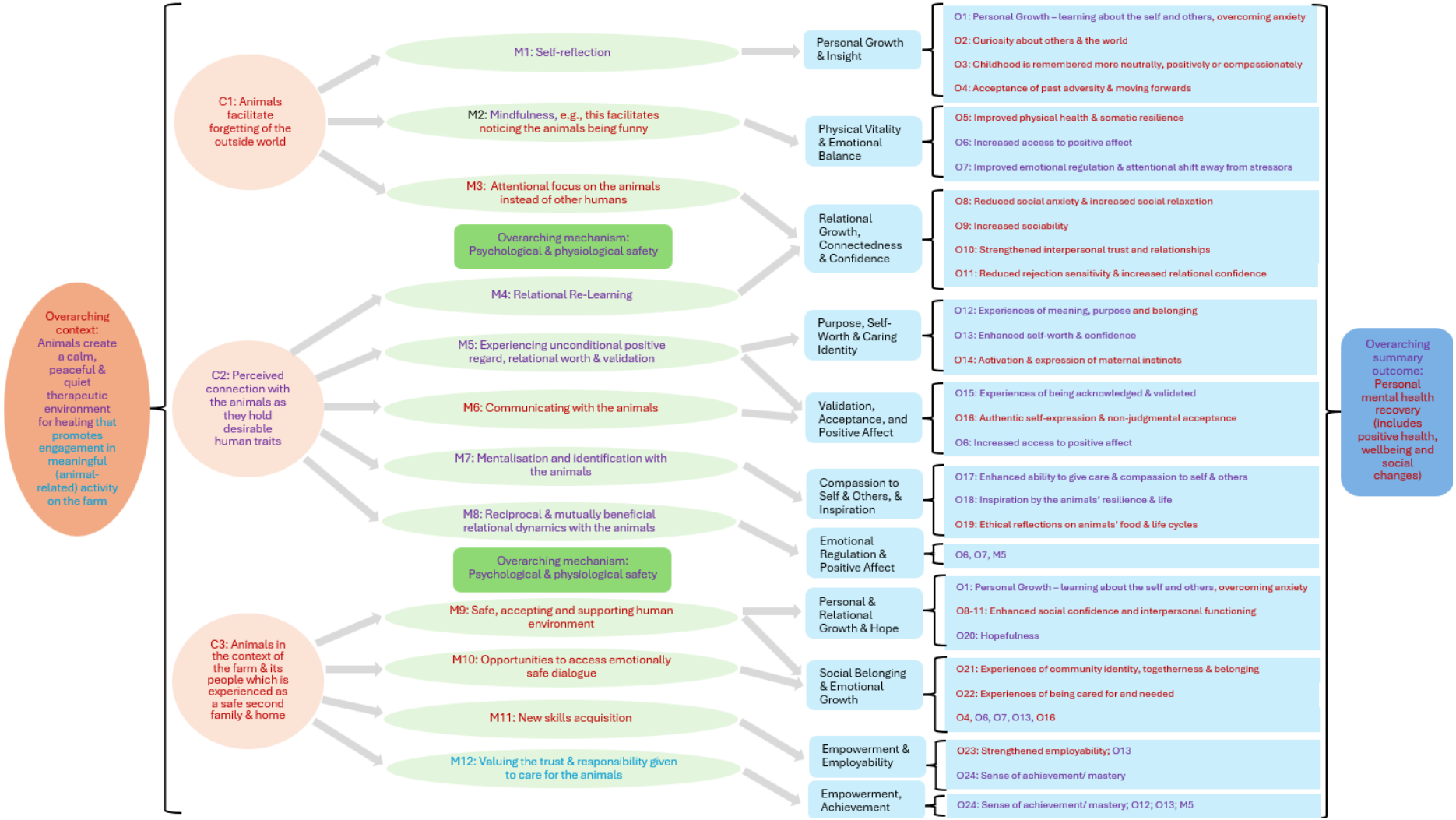
Discussion

This research aimed to refine the IPT created by Fath et al. (2025) that forwards our understanding of the role of care farms and care farm animals in supporting adults with a history of adverse life events. The RPT (Figure 6) consists of three separate but interconnected CMOcs.

It highlights that if farm participants feel that the animals allow them to forget the outside world (C1) or if they feel connected with the animals due to them presenting with desirable traits (C2), this may activate several mechanisms leading to positive changes in psychosocial and clinical elements of farm participants' lives. Examples of these mechanisms are: self-reflection, relational relearning about (human) relationships or experiencing unconditional positive regard, relational worth and validation. These mechanisms shed light on how and why care farm animals can have the impact they do (i.e., outcomes).

Where CMOc1 and CMOc2 give credit to the power of animals, CMOc3 is a reflection on the care farm animals existing within the context of the care farm as the provider of a safe second home and family for farm participants. It felt important to create a third, non-animal focused CMOc, as during interviews it became evident that whilst all participants saw the animals as one very important part of the care farm, they also felt that it was but one of the important aspects of it, particularly highlighting the social elements with other farm participants, staff and volunteers as crucial to their experience. Additionally, the care farm animals cannot exist without the care farm. Consequently, it was to some degree not possible to completely separate the impact of the animals from the impact of the farm itself. Therefore, the interplay between the animals and the farm, particularly in relation to the social consequences of this enmeshment, is given credit through CMOc3.

Figure 6 *Refined programme theory denoting the impact of care farm animals on adults with a history of adverse life events*



Note: background colour: orange (context), green (mechanism), blue (outcome). Text colour: red (new data from this project only), purple (data from both the IPT and this project), blue (data from the IPT only)

These three CMOcs are interconnected through an identified overarching context ('peaceful and calm environment for healing promoting activity'), which shone through all interviews as an all-encompassing backdrop and an overarching mechanism ('feeling psychologically and physically safe'), which fundamentally motivated change in farm participants. An overarching summary outcome termed 'personal mental health recovery' was identified, which seemed to logically follow as a consequence and combination of all more specific outcomes (i.e., the individual positive health, wellbeing and social changes) included in the programme theory.

Adverse Life Events & Wider Mental Health

It is noteworthy that whilst the focus of this research was on discovering how individuals with a history of adverse life events benefit from care farm animals, farm participants spoke little about the impact of the animals or the farm on their adverse life events themselves. This is despite having been asked about the impact of the care farm animals on their perception of the adversity they experienced.

This may be due to several reasons, such as that many of the farm participants may not perceive their experiences as 'adverse', but rather as an unchangeable element of their past; this reflection was given by the manager of care farm 2. Additionally, what constitutes an adverse life event is not necessarily the experience itself, but rather the impact it has on individuals' lives. This may take the form of physical or mental health difficulties, low self-esteem, difficulties with their own identity and interpersonal relationships (Richardson et al., 2023; Smyth et al., 2008; Tiet et al., 2001; Wang et al., 2025). This programme theory identified positive changes to all of these areas through contact with the care farm animals, such as strengthened interpersonal trust and relationships (O10), personal growth through self-reflection (M1, O1), improved physical health (O5) or an improved sense of self-worth and confidence (O13). These are all elements of life that adverse life events may take away from individuals. These can be restored over time in the calm and safe, non-pressured environment that was identified to be underlying the care farm animals in this

project. Therefore, making care farm (animals) suitable ‘interventions’ for individuals with a history of adverse life events, as is reflected in the overarching summary outcome of personal mental health recovery.

The RPT and Attachment Theory

The RPT expands our knowledge about how and why care farm animals may be beneficial for adults with adverse life experiences. The paper which first described the IPT on which this RPT is based indicated that attachment theory could be considered as an explanatory model for the described impact (Fath et al., 2025). Notably, the new and detailed information contained in the RPT provides further scientific evidence for this, which is in line with existing research that links humans’ relationships with animals to attachment theory (e.g., Faner et al., 2024; Groenewoud et al., 2023).

Positive and safe attachment relationships with the animals could be considered as central to farm participants' experiences. This is evidenced through participants' feeling safe (overarching mechanisms) and calm around the animals (overarching context), experiences that encompassed reports from all interview participants. Both experiences of safety and calmness are central elements of attachment theory and indicators of safe attachment relationships (Bowlby, 1988; Mikulincer & Shaver, 2007).

Furthermore, many participants described the animals as possessing desirable traits, such as that they understand them and their needs, feel and accept their emotions and accept them for who they are (C2). This reflects concepts of emotional attunement and unconditional positive regard, which are fundamental elements of safe attachment experiences (Bowlby, 1988; Rogers, 1967). Safe attachment figures are also known to support the development of self-regulatory emotional abilities (Pallini et al., 2018; Sroufe & Waters, 1977). A number of mechanisms and outcomes related to improvements in participants' emotional expression, regulation and balance (O3, O4, O6, O7, O13, O14, O15, O17).

Several elements of the RPT related to improvements in social relationships (M4, O8-11). Considering this in the light of attachment theory, participants may 'use' the care farm animals as their safe base from which to safely (re-)explore and improve relationships with other humans (Bowlby, 1988). This may be particularly relevant for adults who have experienced adversity in their childhood, especially if of interrelational nature. Moreover, participants also felt able to grow (O1) and heal (overarching context, O3-4), which can be interpreted as further evidence of animals acting as a secure base providing emotional stability, which supports personal development and recovery.

Overall, the RPT provides further evidence indicating the use of attachment theory as a model explaining the impact care farm animals can have on adults with experiences of mental health difficulties and adversity.

Recovery Perspectives

What is noteworthy from the current results and previous qualitative studies on the topic is that the mental health benefits are typically not described by farm participants in relation to clinical symptomology and diagnosis, but much more transdiagnostically and psychosocially. This is in line with broader definitions of mental health, such as that by Galderisi et al. (2017) who describe mental health as a 'dynamic state of internal equilibrium' (p.3) affected by a range of psychological, social, cognitive and physical factors.

This encourages the perception of the RPT from a more general personal mental health recovery framework rather than adverse life events specifically, as is reflected in the overarching summary outcome. Recovery perspectives may stipulate that recovery may not necessarily be about removing clinical symptomology, but rather about recovering a meaningful life which is worth living (Liljedahl et al., 2023). Considering this, it was felt that farm participants may indeed experience the care farm animals and the farm itself as a process, an opportunity to recover and rebuild their life whilst living alongside remaining (and new) challenges, rather than with the goal to recover from their adverse life events and its symptomology. This may indicate that care farm animals and the RPT

may be applicable and helpful for the mental health recovery journey of not just individuals with a history of adverse life events, but also for those with other mental health difficulties or other needs.

It is noticeable that many elements of the RPT lend themselves to interpretation in line with the CHIME framework, which stipulates five core experiences necessary for mental health recovery: Connectedness, Hope and optimism, Identity, Meaning and purpose, and Empowerment (Leamy et al., 2011). For instance, 'Connectedness' is a core element of participants' experiences, whereby they connect deeply with the animals (C2), but also other farm participants (O8-O11). 'Hopefulness' (O20) arose as an outcome but may also be reflected in farm participants' feeling inspired about their own future by the animals' resilience (O18). Through self-reflection (M1) and personal, relational and emotional growth (e.g., O1, O13, O8-11), participants may rebuild a positive sense of 'Identity'. Farm participants experience the work with the animals as meaningful (overarching context) and purposeful (O12). Lastly, considering the factor of 'Empowerment', all mechanisms could be regarded as empowering positive change in farm participants' lives and wellbeing. Whilst a definite conceptual overlap is noticeable between the RPT and CHIME framework, further research would benefit from exploring the applicability of care farm (animals) to this particular mental health recovery framework, particularly in relation to recovery from adverse life events.

Reflexivity/ Management of Bias

The authors approached the topic, design and conduct of this project feeling passionate about the therapeutic benefits of animals, which was openly communicated to care farm managers and farm participants. Displaying this passion may have impacted individuals' readiness to share potentially less positive experiences of the animals. Simultaneously, hiding this passion would have felt deceitful, and it is hoped that sharing it helped to build rapport and emphasise the rationale for the project; thus, hopefully allowing participants to feel comfortable enough to share a broad range of experiences. At the beginning of interviews, participants were also advised clearly that there were no right or wrong answers, and that the interviewer was only interested in the farm participants'

perspective; at the same time, where relevant, participants were advised that their experiences could be both positive and negative.

In an effort to reduce recruitment bias, care farm managers were advised to recruit farm participants who *engaged* with the animals, rather than specifically *benefited* from them. Whilst no participants spoke negatively of the animals, all participants spoke highly not just of the care farm animals, but of all aspects of the farm, and most rated all aspects of the farm, including the animals, as similarly or equally important.

Critical Appraisal & Future Research

This project was, where possible, conducted in line with realist evaluation quality (Wong et al., 2017) and publication standards (Wong et al., 2016). These were broadly met, except that, given temporal restraints, data collection was not multi-method and was restricted to one round of interviews, which may have impacted the depth of theory enhancement.

The generalisability of these findings is limited by the involvement of two care farms only, meaning the participants in this study may not be representative of everyone attending care farms in relation to both their strong connection with the animals and their demographics. Research building on this study could further investigate the impact of care farm animals on individuals with a history of adverse life events or trauma specifically, or in relation to different demographic factors (e.g., all participants in this study identified as White), which could lead to further expansions of the RPT and help to identify the proportion of individuals, and which individuals in particular may benefit from the animals specifically.

A strength of this project is that it is the first piece of research exploring the mechanisms underlying the impact of care farm animals on adults with a history of adverse life events. Additionally, the two care farms that participated in this project differed structurally regarding their offered activities, number and type of animals, number of daily farm participants, structure of the

day and other factors. However, despite these substantial differences, findings from interviews as well as the IPT overlapped so that a shared cohesive RPT could be created. Future research would benefit from investigating how individuals on differently operating care farms may perceive care farm animals and how this may impact the emergence of CMOcs differing from or aligning with the factors identified in the presented programme theory. This could further our understanding of which individuals may benefit from what type of care farms and care farm animals and why, thus increasing the suitability and effectiveness of care farm interventions.

Existing evidence suggests that involving animals in psychological therapy can increase its effectiveness (Marr et al., 2000). Therefore, future research should explore how attending care farms and engaging with care farm animals during, alongside or after engaging in psychological therapy may impact individuals' therapeutic journey in the short- and long-term.

Lastly, further research may wish to continue exploring Attachment Theory or other psychological theories as explanatory theories for the impact of care farm animals on adult mental health, as well as the animals' role in individuals' recovery journey as per the CHIME framework.

Implications & Conclusion

The authors believe that the RPT furthers our understanding as to why and how care farm animals can be helpful for some people and how central the care farm animals can be to some individuals' mental health (recovery) journey, which may be understood through the CHIME framework. The RPT provides support for this impact being facilitated by adults forming safe attachment bonds with the care farm animals, because of which they may feel safe to re-explore themselves, relationships and the world.

Additionally, more widely so, we hope that this novel piece of research can aid decisions related to the development or set-up of care farms with animals, as well as support the

development of policies and protocols, which are currently lacking in the field of AAI, particularly on care farms.

Clinical Psychologists could work alongside commissioners, policymakers and care farms, providing psychological understanding that could lead to the creation of such policies and protocols. This cooperation could also help maximise the already existing psychologically supportive and safe approach and, thus, the impact of care farms and their animals on personal mental health recovery.

Lastly, it is hoped that this new piece of work may support the recognition of how impactful animals can be and help embed AAIs and care farms into mental health care delivery.

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Chapter Five: Extended Methodology

Word count (excl. tables, figures & references): 5118

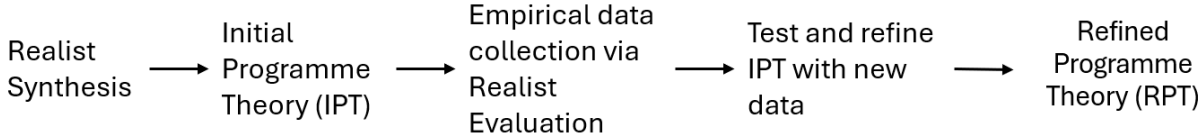
This chapter provides brief additional information about the relationship between the initial and refined programme theories and the design of the realist synthesis (chapter two). This chapter also includes additional information about the design and methodology of the empirical paper (chapter four), including details about: recruitment of care farms; recruitment of participants; details around the development of the interview schedule including patient and public involvement; more detailed ethical considerations; a detailed description of the analysis process and descriptions of ontological and epistemological stances and how the researcher's positionality was managed.

Clarification on the Relationship between the Initial and Refined Programme Theories

Realist methodology aims to answer the question of 'how, where, when and why programmes are and are not effective' (RAMESES, 2017, p.1). Typically, a realist synthesis is conducted from existing literature through which an initial programme theory (IPT) is created that answers this question. A realist evaluation is then conducted to gather new empirical information (e.g., via interviews) to challenge and refine the IPT, leading to a merging of the IPT and the new data. The outcome of this is a refined programme theory (RPT), which is based on the IPT. See Figure 7, which summarises this process.

Figure 7

Relationship between IPT and RPT



Realist Synthesis – Extended Methodology: Adaptation of the 'Five-Step Process'

The realist synthesis followed a five-step process, which was an adaptation of the five-step process proposed by Dada et al. (2023) to be used for realist reviews. This was adapted to give space to 'screening the evidence', which was created as a separate third step. Dada et al.'s step 5 'dissemination' was removed as dissemination via publication of the paper would naturally follow completion of the project. Therefore, it was not felt necessary to state this in the manuscript.

Realist Evaluation – Extended Methodology

Care Farm Recruitment

15 care farms were contacted once or twice via email; eight responses were received. Six of those who replied didn't feel that they would be able to or be an appropriate farm to partake in this research (e.g., farm participants would not meet inclusion criteria). Two care farms that met inclusion criteria were willing to participate. These two farms differed in their layout, number and type of animals and activities offered.

Interview Participant Recruitment

One of the factors considered in the setup of this project was how to conceptualise trauma and how to ensure that participants had a history of trauma without asking what their 'trauma' consisted of and without creating artificial criteria around what does and does not count as 'traumatic'. Consequently, the researchers decided to leave this decision to the care farm managers and farm participants themselves, therefore giving them autonomy over whether they perceive their experiences as traumatic or not, in line with the idea that what one person may see as traumatic, another may not (Mind, 2023).

Recruitment was conducted via the care farm managers as gatekeepers who were given detailed information about the study's aim and procedures, as well as participant requirement. Managers were instructed to use a purposive sampling methodology and to approach farm

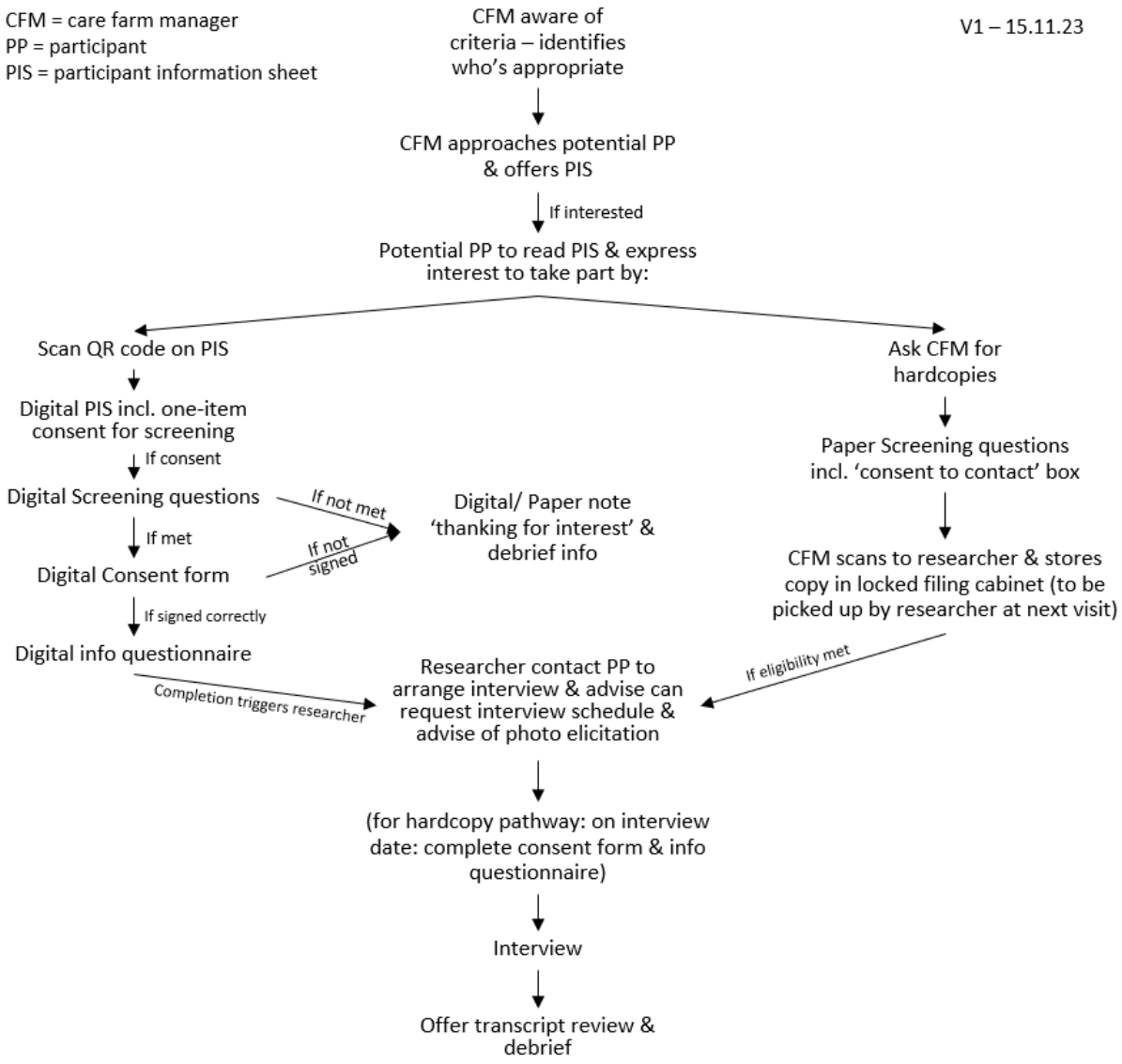
participants they considered eligible, providing them with the participant information sheet (Appendix C) and an eligibility screen (Appendix D). See Figure 8 for a flowchart that outlines the recruitment and interview process, and Appendix E (consent form), Appendix F (information gathering questionnaire) and Appendix G (debrief sheet). The platform JISC was used for elements of digital paperwork. The interview schedule was offered to all participants ahead of interviews (see chapter four, Table 4). On the day of the interview, the study purpose was explained, and consent was checked again verbally (and in writing, for those who hadn't completed the pre-interview forms digitally). Participants were also reminded that they would not be asked about their adverse life experiences directly, but that they could talk about these if they wanted to.

Naturally, there are benefits and disadvantages to a purposive sampling approach and to participants having been selected by the managers of the care farms. The latter was decided given the sensitive nature of the topic of research, i.e., adverse life events. It felt important for managers to select possible participants as they knew their farm participants well enough to decide whether they would firstly, be eligible to partake, and secondly, be well enough to participate. The researchers wanted to avoid participants selecting themselves who might be more likely to be triggered or become upset through the interview, given their history of adverse life events. This consideration lent itself to a purposive sampling approach and naturally excluded probability sampling methods. Self-selection and snowball sampling were not felt to be appropriate sampling methods for the same reasons.

A benefit of purposive sampling may be that the results may be more generalisable to others that would fall within that select group. A natural downside of this is that a study is prone to recruitment bias and thus, whilst the results may be generalisable within that particular type of group, the sample and, thus, the results may not be representative of, in this case, everyone on care farms. This may be a challenge towards generalisability outside of the particular group or setting (Sharma, 2017).

Figure 8

Flowchart outlining recruitment and interview process



Interview Schedule Creation

Theory Behind Realist Interviews

Realist interviews are driven by theory and aim to investigate the 'how, where, when and why programmes are and are not effective' (RAMESES, 2017, p. 1). Typically, interviews would focus on the programme theory (or elements of it) and explore whether participants confirm or reject the

theory or can provide information to refine it. This is meant to be an iterative process through multiple rounds of interviews.

However, given the temporal practicalities of this thesis project (i.e., lacking capacity to do multiple rounds of interviews) and the lack of an existing programme theory in the field (as the realist review presented in chapter two was not yet fully completed by the point the realist interviews happened), the authors had to adjust the typical realist interview process. Given the absence of a programme theory to inform interview questions, based on existing research, the authors decided to use the initial evidence lens that 'care farm animals are helpful for individuals' mental health' as the 'theory' to guide the interview schedule creation. Guidance for realist interviews (RAMESES, 2017) was considered in the development of possible topic guides (Westhorp & Manzano, 2017).

Patient and Public Involvement (PPI)

Additionally, to develop the interview topic guide around the initial theories, the author spoke with three staff members from the participating farms on a one-to-one basis, either via telephone or email. This was done as a way of 'gathering intelligence' in the form of interview questions from people who were actively involved in supporting farm participants with care farm animals and in the care farm environment.

These PPI advisors were informed about the research focus and asked what they felt would be important questions to ask to elicit information to be able to answer the research question. After initial conversations, an extensive list came together, which the primary researcher shortened by removing questions that were not specific to the animals on the farm. This amalgamation of possible questions was discussed with the same PPI advisors again to gather perspectives as to the phrasing of questions and which questions should definitely or definitely not be included. See Table 4 for the final interview schedule.

Two of the PPI advisors (joint managers of the second care farm) were initially apprehensive about the study's focus on animals as they felt the animals were only one aspect of the farm, and focusing on just them would limit the results. This was discussed in depth and explained why it was important to have a focus and emphasised that the focus on animals was not to dismiss the benefits of other elements of the farm. They were also concerned about the usage of the word 'trauma' as they felt that many of their farm participants might not identify to have experienced 'trauma' given the medical nature of this word; after discussions we agreed to use the word 'trauma' alongside 'adverse life events', which they felt was a term that farm participants were more likely to identify with.

Ethical Considerations

The University of East Anglia Faculty of Medicine and Health Sciences Research Ethics Committee granted approval for this research (ETH2324-0011 and ETH2324-1318; Appendix H).

Consent

Care farms and participants were informed about the purpose of the study and what their participation would involve, which included detailed written information (Appendix C) to allow participants to make an informed choice about partaking in this study. Participants were given at least 48 hours to read the participant information sheet before participating in the study, where verbal and, in some cases, written consent (for those who had not completed the pre-interview questionnaires digitally) was gained a second time (Appendix E). Participants' right to withdraw their participation and data up until four weeks after the interview (or four weeks after receipt of their transcript, for those who requested their transcript) was highlighted as a possibility for all participants; four weeks was felt to be sufficient time for participants to reflect on their participation and, if applicable, read their transcript. Deception was not part of this research.

Confidentiality & Data Protection

The University of East Anglia (UEA) is the data controller of this research. All information gathered about participants was dealt with in compliance with the UK's Data Protection Act (UK Government General Public Acts, 2018).

Paper-based information about participants (e.g., the eligibility questionnaire, Appendix D) was initially held in locked filing cabinets on the care farms, and on transfer to the researchers' home in a locked drawer. All information was scanned in and uploaded onto the UEA OneDrive before being deleted or shredded. The OneDrive is accessible only to the researchers of this project. Audio recordings of interviews and transcripts were also uploaded onto OneDrive before being deleted off the dictaphones; this was done immediately on return home after interviews. Digital information about participants who completed their pre-interview forms digitally was stored on the survey platform JISC, which was recommended for use by the UEA.

For the purpose of anonymisation, each participant was allocated an ID dependent on their order of interview participation. See Participant Information Sheet section 6 (What happens with the information that is collected about me?, Appendix C) for more details.

A separate document on OneDrive was created that held participant IDs with their contact details; this was important initially in case of withdrawal and later, to be able to share the summary of findings with those participants who wished to receive them.

Coercion

A £10 Amazon voucher was provided for all participants to reimburse them for their time and effort. This was considered in terms of having the potential for coercion as it may incentivise participation. However, the British Psychological Society suggests that compensating participants for their time is acceptable and indeed important to not disadvantage them (Oates et al., 2021). To reduce the potential risk of coercion, participants were advised that their participation was entirely voluntary and their decision to partake or not would not impact the support they receive from their

care farm (see participant information sheet, Appendix C). Furthermore, if participants did not respond to two emails from the researcher this was seen as the participant communicating that they were no longer interested in participating.

Potential for Distress

Whilst it was emphasised on at least two occasions (in the participant information sheet and ahead of interview) that participants would not directly be asked about their adverse life experiences, a potential for participants to become distressed talking about the impact of the care farm animals on their past was considered throughout set up and conduct of the study. To minimise this as much as possible, participants were offered the interview schedule ahead of interview and advised that they should let the researcher know if they did not want to answer a particular question. Ahead of interview, they were also advised that they could terminate or pause the interview at any point and did not have to answer questions they didn't want to answer. A plan had been in place to support potentially distressed participants through, for instance, the interviewer encouraging an interview break or the rescheduling or complete termination of the interview, alongside discussions with the farm managers if required to ensure participants' safety. This plan was also outlined in the participant information sheet, so participants were aware.

No participants became distressed during the interview or wished to terminate it early; instead, everyone reported having enjoyed participation as it allowed them to reflect aloud on their experiences; some participants even found the interview experience beneficial to their own journey of reflection and recovery.

At the end of the interview participants were debriefed verbally and provided with a printed debrief sheet (Appendix G). This included information about where they could seek support if required.

Analytical Process

Except when stated, all elements of the analysis were conducted by primary researcher JF. The quality and reporting standards for realist evaluations created by Wong et al. (2017) as well as realist analysis guidance by Rees et al. (2024) were used to guide the analysis. Analysis of data in realist evaluations follows the principle of 'generative explanation for causation', which refers to the formation of CMOcs as explanatory statements of how and why an intervention does or doesn't work for whom and in what contexts (Wong et al., 2017). The process of realist analysis follows several retroductive rounds of deductive and inductive reasoning, aiming not to detect an underlying truth in the data but rather to identify recurrences, disparities and commonalities in the participants' experiences with the care farm animals. The analysis took the following iterative steps:

1. **Transcription**. Interviews were automatically transcribed via the 'transcribe' option in Microsoft Word. The recordings were then listened to at least twice in order to both perform manual corrections to the transcript and immerse into the data. At the same time, notes were made separately about reflections and possible codes that arose in re-hearing the content of the interview, such as noticing that participant 8 referred to the care farm animals as her 'pets'. This notetaking was done throughout the whole analysis process; see Figure 9 as an example.
2. **Initial open coding**. All transcripts were coded line-by-line in NVivo. This was done by reading a transcript from start to finish whilst creating new codes or adding to existing codes. At this initial point of analysis, coding was done in an unstructured manner. This meant codes were created based on anything that was reported in relation to the care farm animals, including, e.g., activities farm participants engaged in with the animals. This was done to immerse myself more thoroughly into the data and, at this point, not to dismiss anything that may later be relevant for the programme theory. When new codes were created, they were named using similar wording or phrasing used by participants; this was

done to avoid missing potential meaning-making later on, but also not to lose momentum of data immersion and to avoid getting stuck overthinking code names. Consequently, a number of codes were created that were similar in their underlying meaning but phrased differently. Through this process, more than 200 codes were created. Some of these codes included quotes from all ten interviews (e.g., 'peaceful, calmness, relaxed'), while others were mentioned but by one participant (e.g., 'never bored'). See Figure 10 for an example of a coding extract from participant 8's transcript.

   a. **Author discussion**. BT also coded one of the interviews. Shared author discussions about coding revealed consistency in arising themes, particularly for elements of meaning that were felt to be central to the participant's experiences (e.g., for PP1, connection with the animals and animals having human traits were central).

3. **Inductive & deductive merging of codes (throughout)**. After this open initial coding, all codes were re-considered in relation to one another in order to merge codes with themes that felt to have similar meaning (e.g., merging 'joy from animals' with 'happiness'). Additionally, the researcher set up a number of 'parent codes' into which numerous 'child codes' were transferred (e.g., 'learning from animals' became a parent code with 'child codes' such as 'growing or learning about oneself'). This act of re-immersion into the data and codes led to a final total of 187 codes (see excerpt of this in Figure 11). This merging was conducted throughout all coding as relevant but finalised after ten interviews.
4. **Inductive & deductive development of theories and hypotheses (throughout)**. Throughout the processes of transcribing and coding all interviews, the primary author continuously reflected on possible theories and hypotheses that may answer the research question and form part of or refine the IPT (RAMESES, 2017). This was, at times, also done in discussion with BT. For instance, one hypothesis that inductively arose after coding two or three interviews was that farm participants formed a strong connection with the animals. On further coding interviews, this hypothesis was deductively refined to be related to the traits

that the animals present with. In the process of coding all interviews, this was retroductively further refined with specific desirable traits that the animals presented (e.g., human-like traits such as non-judgmentalness). Later, this would become the 'context' of one of the CMOcs.

Figure 9

Example of notetaking per participant during transcription and analysis process

Participant 2

- Identifying with the animals
- She's really trying to understand the geese… is she using human traits to understand them?
    - She uses lots of 'human' language to describe what the animals are doing and why…
- Lots of talking about the animals, noticing what they are doing – mindfulness element ?
    - Also talks lots TO the animals
- Maternal elements of the animals… due to PP2 never having had own children…
- Said a few times that she admires an animal or animals… not sure how to code this ? – put one of them in undefined, the others not marked
- Much more animated talking about the animals
- Code: 'connection w animals' separate PP2's bits about identification as a sub-code

Participant 3

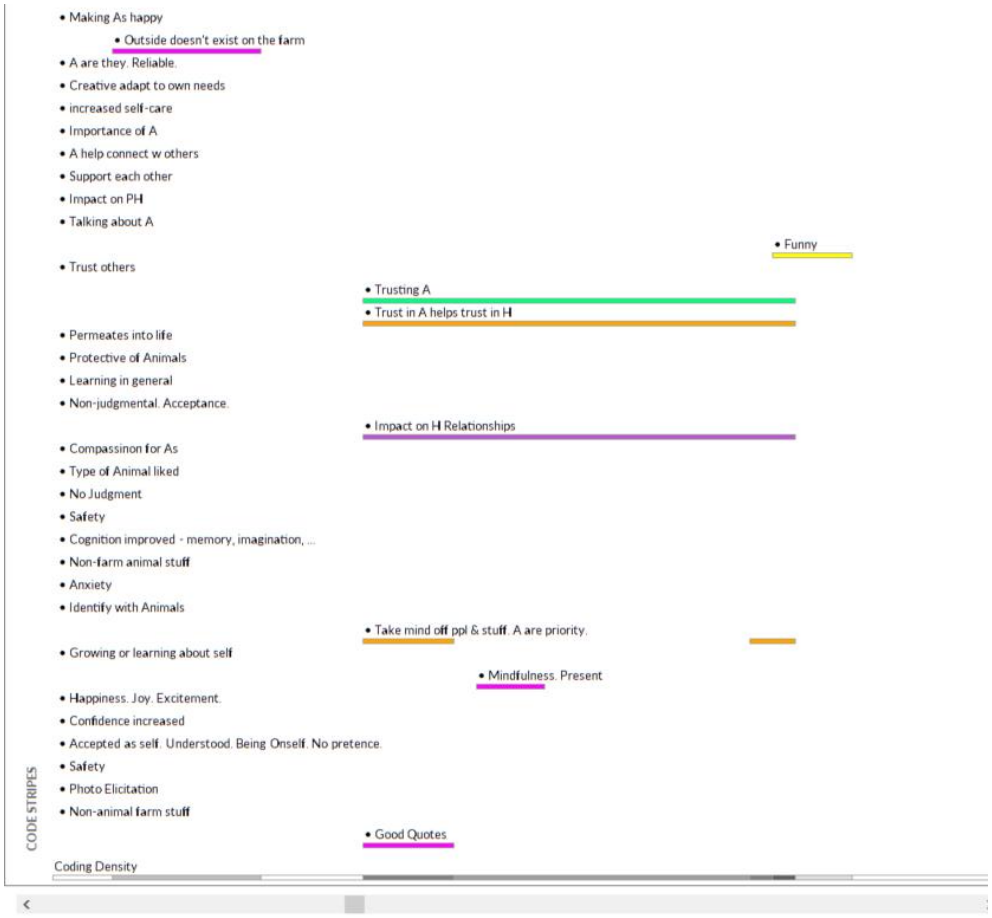
- Giggles at times when talking about the animals but not otherwise!
- Something about the mucking out/ cleaning that she (others?) like – is it an element of cleaning them out is cleaning my life out?

Participant 4

- Feeding a lamb was like feeding her babied she miscarried – BUT doesn't talk further about what this means/ does for her in terms of the trauma and loss
- She seems to have found it really hard to vocalise some of the deeper connections like WHY she likes the animals etc.
- Animals bring happiness out in her – transference of emotion – they are happy so goes over into her
- Element of moving due to the farm/ animals
- Summary of her: animals – give secrets – more relaxed – easier to talk to humans – self-confidence
- She repeatedly talks about 'telling her secrets' – where should that fall under? 'talking with animals' ? 'counselling' ? 'impact on MH' ?
- Added 'comfort' to the existing code 'peaceful calmness relaxed' but also feel like this code is getting quite diverse so might need editing in future

Figure 10

Coding example of interview transcript from participant 8



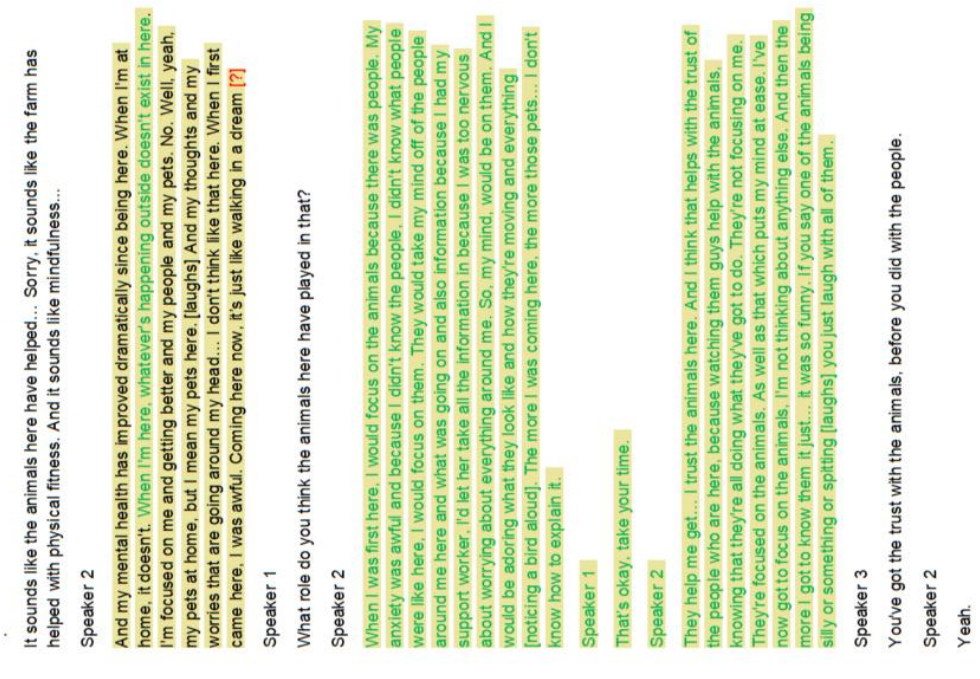


Figure 11

Example excerpt of mother and child codes in Nvivo

5. **Data saturation (throughout)**. There is no set guidance on how to achieve data saturation in realist interviews, as they are about continuous theorising and hypothesis testing; however, RAMESES (2017) state that this process should be followed until an IPT seems to be fully refined. After openly coding ten interviews, some new codes arose in most interviews, however, they appeared more specific to the particular participants rather than something

central to the so far created theories and hypotheses (e.g., ‘animals help manage changes’ came up in two interviews and did not fit existing hypotheses).

6. **Retroductively turning codes into CMOcs**. In order to analyse the data, every code was written on a sticky note, with larger sticky notes denoting more common themes. First analysis steps were conducted by placing the code sticky notes in meaningful relation to one another on a big piece of paper, in line with the previously considered theories and hypotheses (Figure 12). Additional hand-written notes were created to make further sense of individual code relationships (see Figure 13) for some initial sense-making of relationships). Two initial CMOcs were created as a consequence of this process (see Figure 14 and Figure 15; the red text highlights uncertainties to reflect on further).
    a. **Author discussions**. Once meaningful CMOcs had been created by JF in the above-described step, these were discussed and specified in open reflections with BT (see Figure 16 and Figure 17). Two CMOcs were discussed, and agreement was reached about creating a third CMOc that would take into consideration participants' experience of the farm as the host of the care farm animals.
    b. **Finalisation of CMOcs**. A third CMOc was created, and the previous two CMOcs were further refined, particularly to take into consideration some of the less frequent codes (see Figure 18, Figure 19 and Figure 20; the red text highlights uncertainties; the green text highlights newly added or adapted elements). At this stage, the diagrammatic CMOcs were also written out as statements (see chapter four), which helped to further clarify some of the connections as well as recognise the existence of each a context, mechanism and outcome that was overarching all three CMOcs created.
7. **Merging the IPT with new CMOcs**. The purpose of a realist evaluation is to create or refine an IPT. In this evaluation, the data were gathered to refine the IPT created by Fath et al. (2025). However, the Doctorate in Clinical Psychology training programme is inherently

restricted in time. Therefore, the realist review that led to the creation of the IPT was largely conducted simultaneously with the realist evaluation during which the above analysis steps happened. The finalised IPT was considered in-depth in relation to the CMOCs created during the above-described stage 6. This led to the rearrangement and merger of several elements of the IPT with the CMOCs created from the interviews during the empirical project. For instance, O5 from the IPT ('personal development & reflections') was separated into M1 ('self-reflection'), leading to O1 ('personal growth'), which was felt to be a better reflection of participants' explorations and the theory created from it. Another example is that C1 in the IPT ('animals create a calm and quiet therapeutic environment for healing') was refined into an overarching context with added data from the realist evaluation. A third example is that M1 in the IPT ('motivation to engage in meaningful animal-related activity') was also refined to become part of the overarching context rather than remaining as a mechanism, as this was felt to better represent all available data at this point.

8. **Refined programme theory (RPT)**. Thus, through iterative retroduction, an RPT was created that synthesised the combined information gathered from the studies included in the realist review (see chapter two) and in the interviews conducted as part of the realist evaluation (see chapter four).

Figure 12

First analysis steps

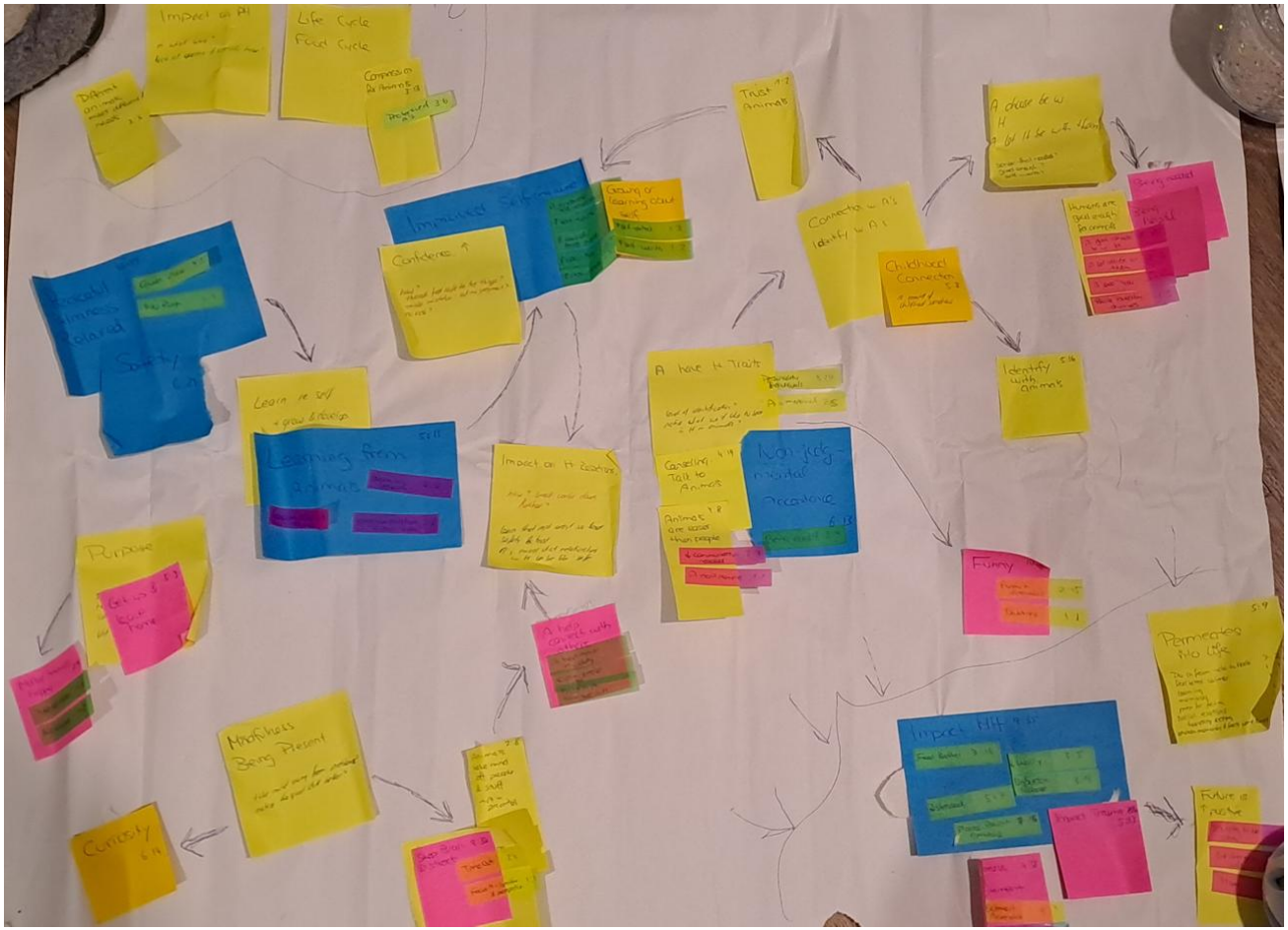


Figure 13

Hand-written sense making of some relationships between codes

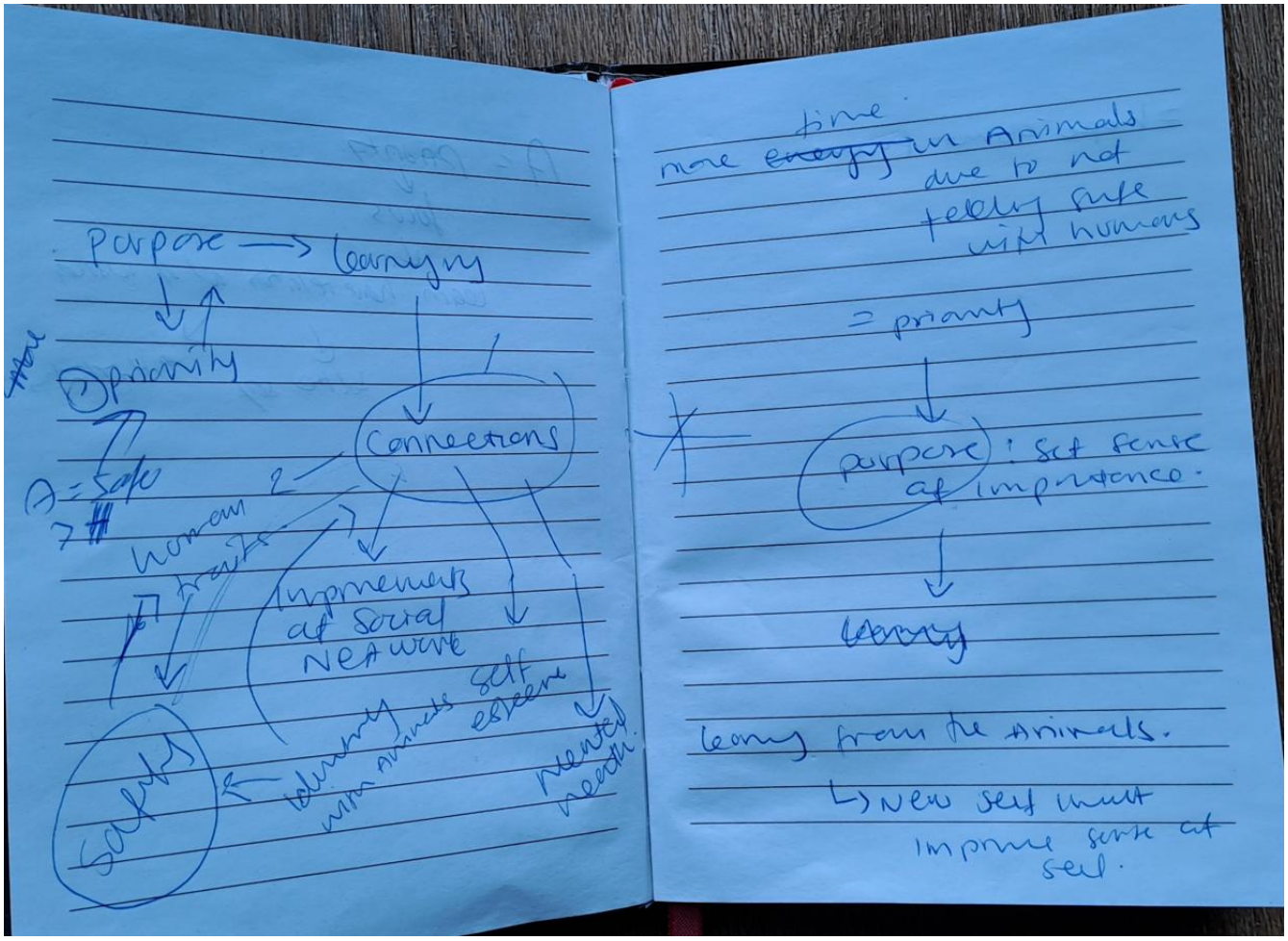


Figure 14

Initial first CMOc

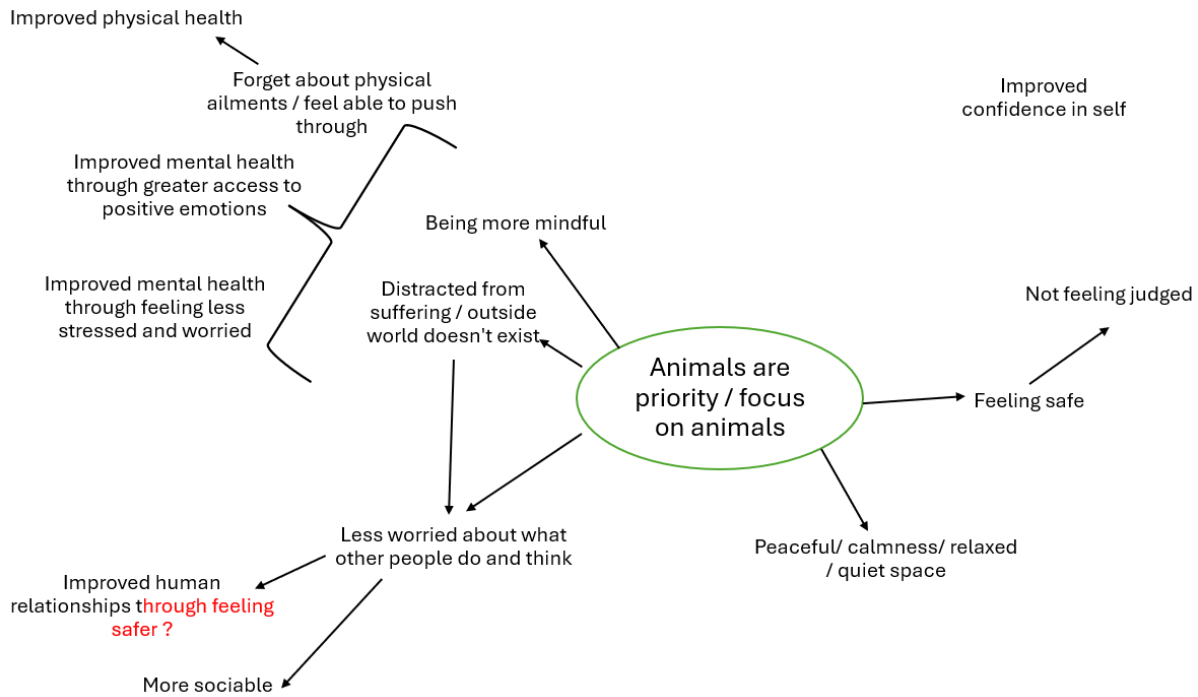


Figure 15

Initial second CMOc

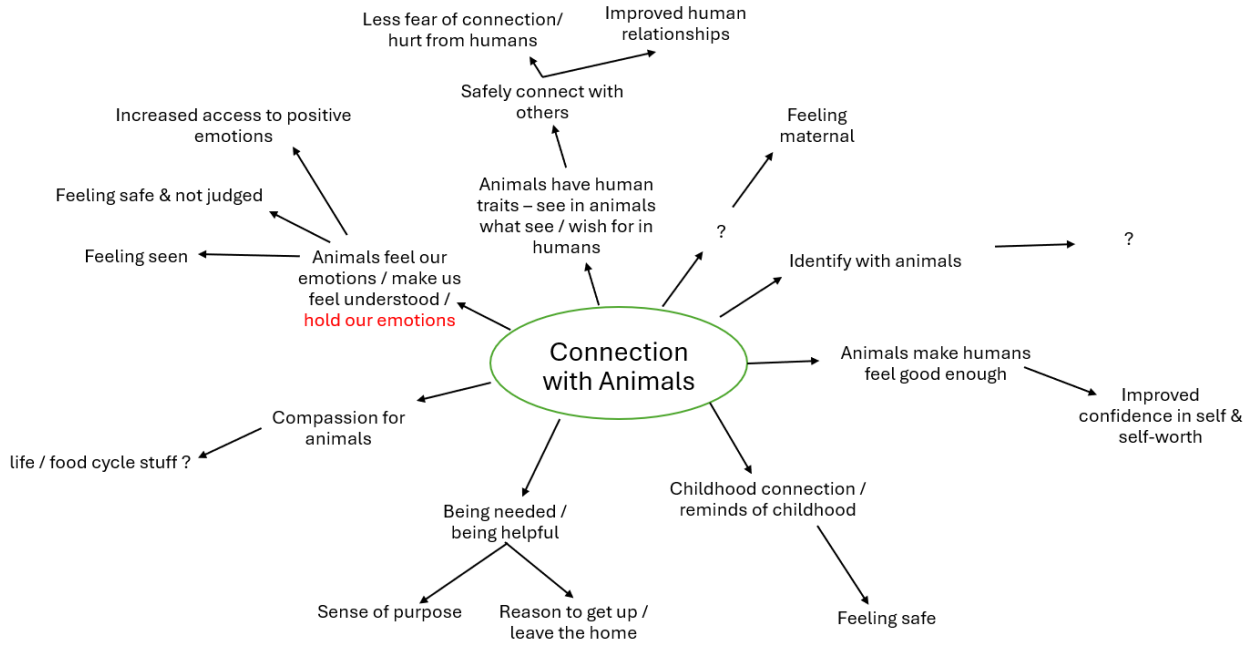


Figure 16

Refinement of first CMOcs based on shared reflections between JF and BT

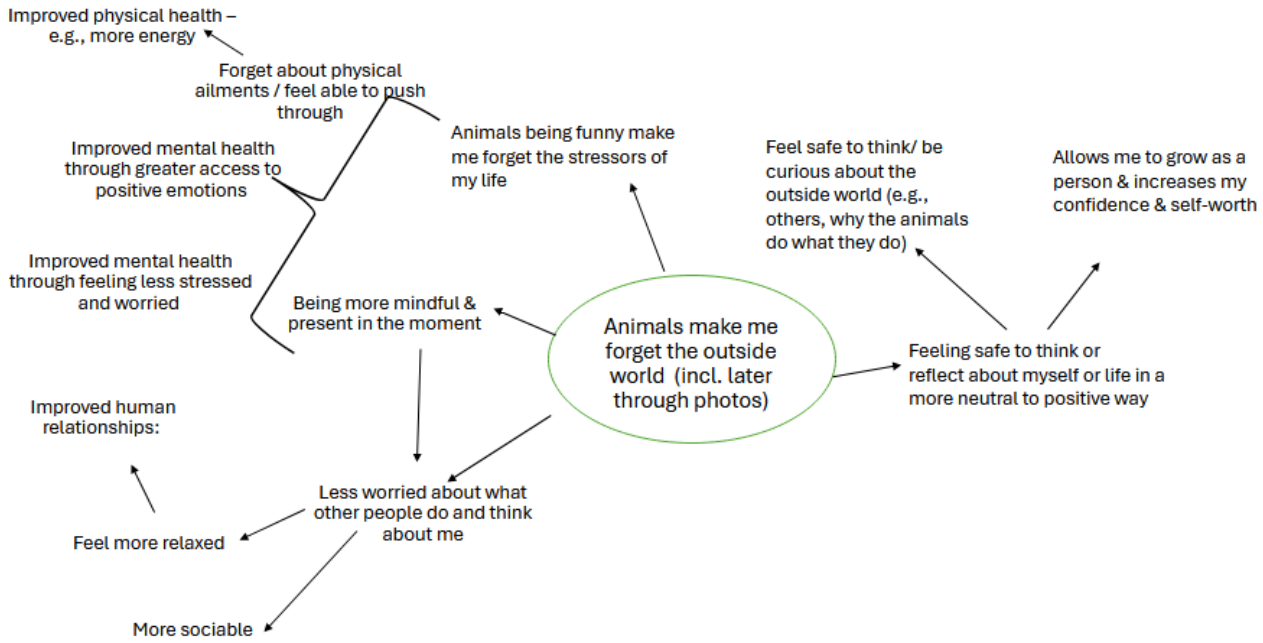


Figure 17

Refinement of second CMOc based on shared reflections between JF and BT

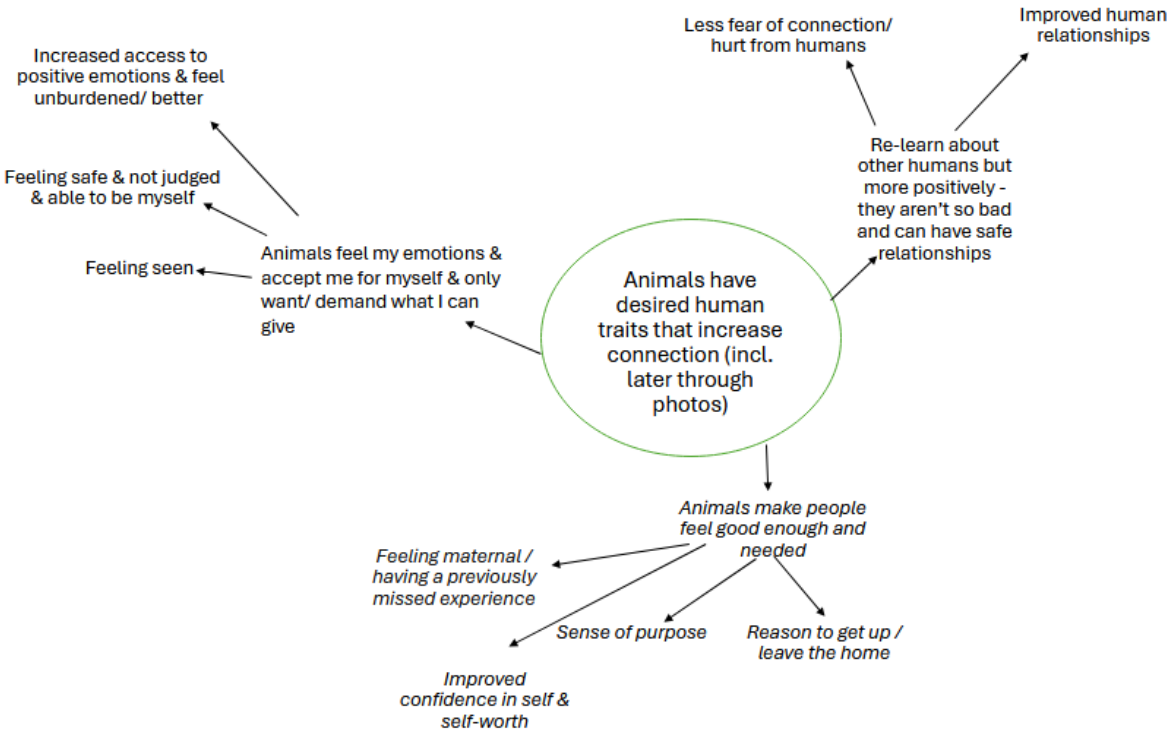


Figure 18

Further refinement of first CMOc

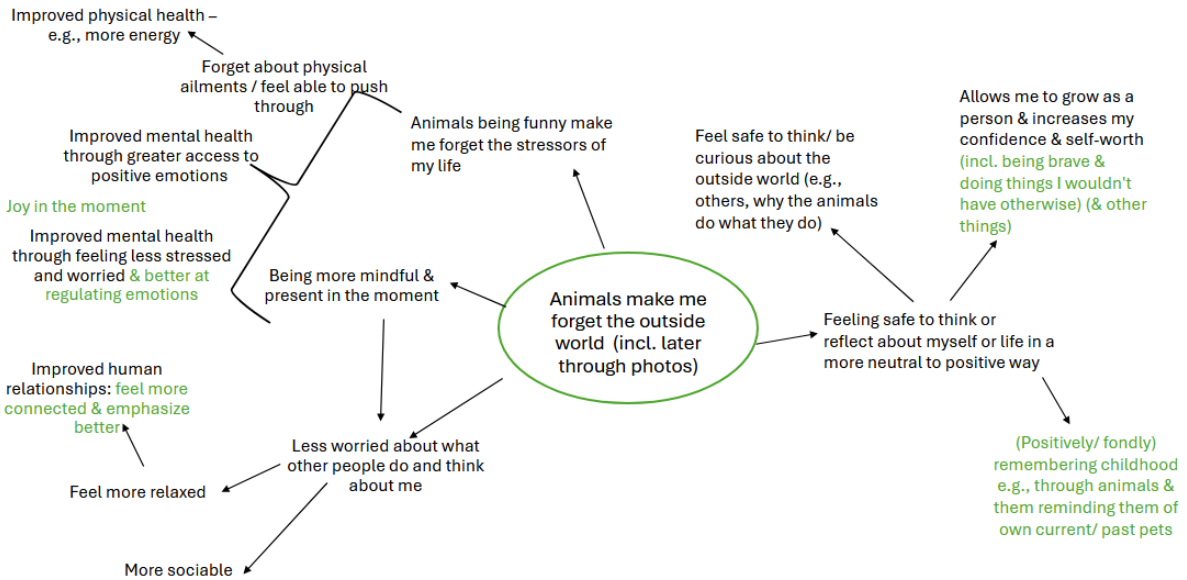


Figure 19

Further refinement of second CMOc

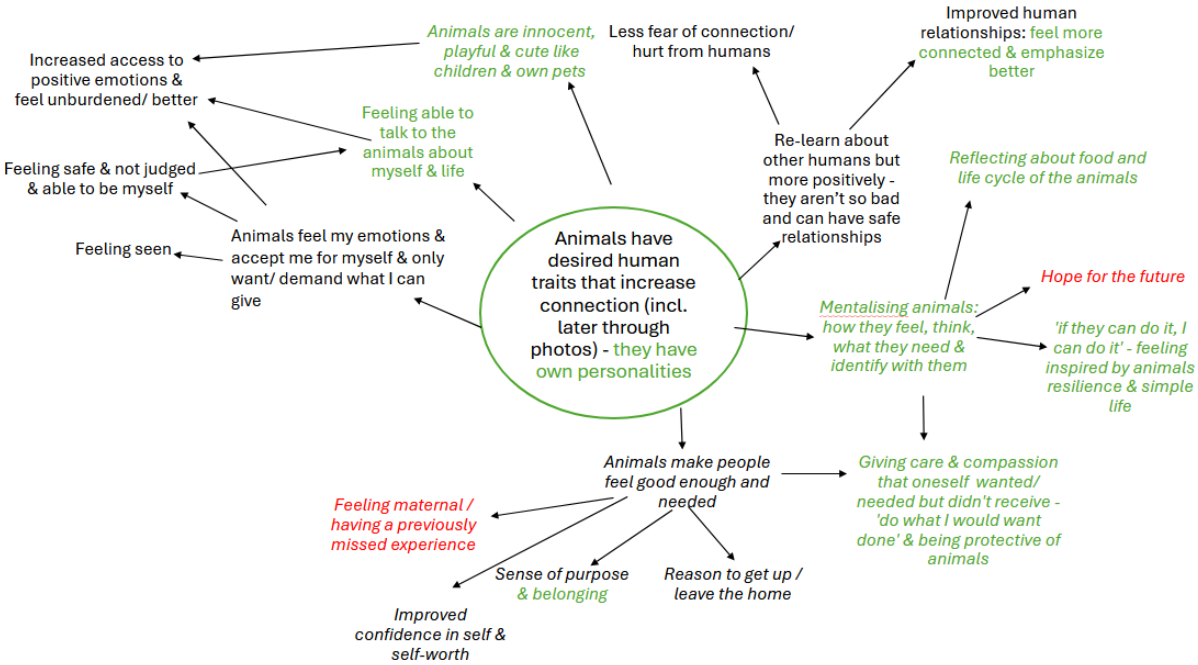
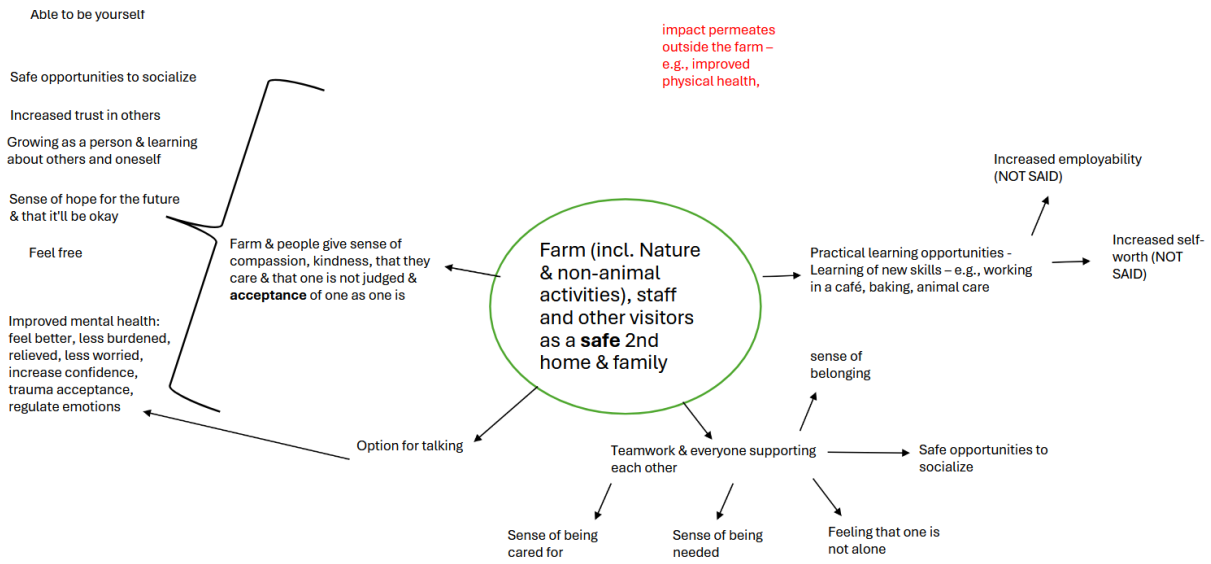


Figure 20

Initial third CMOc



Philosophical Considerations

Ontology & Epistemology

Ontology refers to our awareness of whether an objective, measurable truth exists and whether this truth is separable from human perspectives. It may be seen as ranging between two opposites, namely 'relativism', which proposes that reality is fully dependent on human interpretations, and 'realism', which assumes an independently existing truth; in the middle, there is 'critical realism', which supposes that a truth exists, i.e., there is something real we need to know about, but that we can only ever discover knowledge of it through the lenses through which we view it, such as social phenomena or cultural contexts, i.e., people will perceive different things about what we want to find out (Braun & Clarke, 2013).

Epistemology concerns the nature of knowledge, what we can know and how this knowledge or belief is acquired, i.e., whether that knowledge is discovered or created through, for instance, research. Examples of epistemological stances are positivism (reality and thus, knowledge

exist independently and can be discovered through unbiased collection) or constructivism (reality, and thus, knowledge is created through, e.g., research and does not exist independently). In between the two sits relativism, which doesn't assume an objective truth but rather truths dependent on contexts, thus being similar to critical realism, which seeks explanations or mechanisms from different perspectives formed from their social contexts (Braun & Clarke, 2013).

Manzano and Williams (2025) describe that ontologically, realist evaluations are realist in nature, however, influenced by critical realism (i.e., reality is observable but filtered through human understanding and experiences). Epistemologically, critical realism takes a stance aligned with relativism: as this reality is perceived through individual human experiences (e.g., senses, culture, history, etc.), humans interpret and respond to the 'reality' through their personal lenses, thus, creating the contexts inherent to programme theories that trigger mechanisms and outcomes (Wong et al., 2017). This influences the study's participants' reflections, but also the researchers, who perceive participants' explorations through their own lenses. This means that as realist researchers, we are exploring constructs and mechanisms which are not always immediately evident or spoken.

Reflexivity

Given the described ontological and epistemological perspectives on this research, it is evident that all researchers have their own positionality, their own lenses, which they bring to their research. This will naturally influence the design and conduct of a project. As this is unavoidable, it is therefore crucial that they are acknowledged and their impact considered (Holmes, 2020).

Reflexivity can be seen as an introspective method or process that highlights the researcher's positionality and, thus, its influence on the conducted research (Palaganas et al., 2017). Consequently, alongside remaining consciously aware of my passion for animals as detailed below, I kept a reflexive journal (see Appendix I for some selected excerpts from the different stages of the project, including reflections on the analysis process and the usage of a reflective journal).

Researcher Position – What I Brought to This Project. I am a White German woman who grew up with two cats and a love for pretty much all animals. I left my home country Germany when I was eighteen. Over the ups and downs of the years that followed, I grew to appreciate animals more and more, realising how much happiness they bring me. I had already acquired part-ownership of a horse and was volunteering at a cat shelter, and decided it was time to embrace my passion for animals further, thus deciding to adopt two cats from the shelter, which, to this day, I can honestly say was the best decision I have ever made.

In my late teens, a then-friend of mine told me about animal-assisted therapy. This blew my mind – people making therapeutic use of animals?! This newfound knowledge paved the way for me to do a BSc in psychology and motivated me to work towards becoming a Clinical Psychologist, a profession in which I could see myself helping people feel better about themselves and live more satisfied lives through (amongst other things) the assistance of animals. My path was set.

I hope this brief excerpt helps to paint a picture of my motivation to conduct this research and gives an insight into how my own experiences and values may have influenced it, which is outlined further below.

Reflections on the Influence of Positionality and How I Managed This. As is clear from the above, my passion for animals has influenced the design of this project and also likely the conduct of it. For instance, in the initial stages of creating a thesis proposal, I noticed that my passion for animals and my conviction about how helpful and important they can be for human mental health drew me to initially look for evidence that was in line with this belief and dismiss evidence that could contradict it or cast doubt over it. Once I'd noticed this happening, I made a conscious effort to consider evidence with all outcomes. This effort is noticeable in previous chapters of this portfolio where I present papers from both perspectives to create a more holistic picture of the intervention and evidence base.

Additionally, in awareness of my passion for animals and to compensate where possible for it, I adapted the phrasing employed in this research from how the animals 'benefit' humans to how they 'impact' them. This felt to me a move away from the stark focus on the animals' powers towards a more balanced perspective that allowed both for the animals to be perceived as beneficial, but also as having no impact or even being unhelpful.

Participants were approached by their care farm managers. As a way of reducing recruitment bias and the impact of my passion for animals, when I advised care farm managers on the participant inclusion and exclusion criteria (see chapter four), I did not specifically highlight that they needed to *benefit* from the care farm animals, but only that they engaged with the animal-related aspects on the farm. All participants spoke highly of the care farm animals; however, everyone also highlighted that the animals were but one element of the farm and most farm participants experienced other farm elements as equally or similarly important to the animals. It is unclear whether participants' positivity remains a recruitment bias whereby the managers approached farm participants whom they knew felt more connected to the animals, or whether farm participants were more likely to want to participate if they felt more connected to the animals.

My passion for animals was a little more difficult to compensate for during the interviews as I initially explained the project from my perspective, i.e., that I felt passionate about the therapeutic powers of animals, as a way of showing something from 'me' to enhance rapport and make participants feel safe (Braun & Clarke, 2013). Additionally, from reading the participant information sheet, participants knew that the focus of the project was on exploring the impact of the care farm animals specifically. I attempted to compensate for this in the following ways: at the start of the interview, I emphasised to participants that there were no right or wrong answers and that I was only interested in their individual perspectives. Additionally, where relevant, when I asked participants about their experiences with the animals, I also highlighted that these could be both negative and positive experiences.

Despite the majority of interview content highlighting how farm participants benefit from the animals, I made a conscious effort during transcription and analysis to remain aware of when my passion for animals may affect my perception and interpretation of the data. For instance, some participants briefly reported some anxiety in relation to the animals. This was either about feeling somewhat anxious when they first attended the farm and engaged with animals they'd never engaged with before (e.g., donkeys) or about the geese, which participants felt somewhat anxious around, given that they were noisy and could be a little aggressive. I decided not to report this as part of the programme theory for the following reasons: firstly, participants did not describe it as impacting their overall experience of the farm, the animals or their mental health; and secondly, a certain level of anxiety is to be expected on encountering new animals or engaging in new tasks, or when faced with animals whose behaviours may be interpreted as a little aggressive. In the effort of transparency, I decided instead to include this as an additional paragraph in the additional results chapter (chapter six).

Ultimately, it is difficult to gauge to what extent my interest in animals has influenced the different elements of this thesis. It would have felt deceitful to participants and care farm managers to hide my passion for animals, and so I hope that in expressing this it was helpful in building rapport and a rationale for the project, which others could become fascinated with too, and that the compensations I consciously put in place were sufficient to minimise any 'negative' impact this may have had.

Chapter Six: Extended Results

Word count (excl. tables & references): 2176

This chapter presents additional quotes from the realist review. This is followed by additional results not in the main empirical paper, namely, focused on the differences in characteristics and approaches between the two participating care farms, observational reflections made during interviews, reflections on the importance of the animals, and additional results that arose from the empirical data. Additional quotes supporting the refined programme theory (RPT) are also presented.

Extended Results to the Systematic Review

See Table 5 for additional realist review quotes in support of the Context-Mechanism-Outcome configurations (CMOcs) which form the initial programme theory presented in chapter 2.

Table 5

Additional realist review quotes

CMOc Elements	Participant Quotes
C2: Connection with the animals as they have desirable traits	"Participants indicated that they often had not initially felt willing or able to interact effectively with the other human beings at the care farm but looking after the farm livestock was presented as having allowed them to enjoy non-judgmental and open interactions with other living creatures." (Leck et al., 2015, p. 752)
	"Animals have a body language that is easy to read, which means that the participants could easily grasp what they communicated. The participants who had felt unsecure when communicating with other human beings and had been sceptical about humans because of their experiences with lies and dishonesty in the past appreciated this. Honesty was essential for many of the participants to feel safe. 'Animals don't judge you… they don't look at you in an ugly way […].'" (Steigen et al., 2022, p. 8)

Table 5 *(continued)*

CMOc Elements	Participant Quotes
M4: Mutually beneficial & reciprocal relationships	"A few clients with mental illness and older persons state that it is important to take care of other living beings; this provides a better balance: you not only receive care but also provide care." (Hassink et al., 2010, p. 427)
M5: Identification through shared narrative	"There is a real beauty in finding common ground with animals who have known true pain. They carry a different meaning than an animal that has always known love and protection." (Gorman & Cacciatore, 2023, p. 168)
O12: Relational Growth	"Acted as an important signifier of the possibility of different forms of relationships with therapists and therapy." (Cacciatore et al., 2020, p. 8)
	"These rescue animals give me hope. Every living being deserves to live without violence and abuse. I feel love like they made it. They survived. It shows me that there is still love in the world, that there are still good people in the world, in order to learn how to live again." (Gorman & Cacciatore, 2023, p. 170)
O13: Inspired by the animals' resilience	"That was one of the most moving things for me that help me realize that I could heal like the animals did. They all felt many of the same things I've felt, and they are living life free and happy now but they didn't forget what happened to them they just learned to deal with it and were now safe." (Gorman & Cacciatore, 2023, p. 169)
O14: Hopefulness	"Relatedly, many participants suggested that they found a sense of hope and inspiration from witnessing a level of rehabilitation and resilience in the animals dwelling on the care-farm. Several talked about finding a renewed optimism toward their own integration of grief as a result of identifying perseverance and survival in the animals." (Gorman & Cacciatore, 2023, p. 169)

Extended Results to the Empirical Project

Differences between the Participating Care Farms Characteristics and Approaches

Whilst sharing the same goal (i.e., supporting those with mental health and other needs), the two participating farms were noticeably different in their layout, activities and size. For instance, on both farms, staff, volunteers and farm participants shared lunch; however, on farm 1, this was a shared lunch cooked by staff and farm participants that day, versus on farm 2, everyone brought

their own lunch or bought something to eat from the farm's café. Another noticeable difference is that farm 2 hosts not just more animals, but also more animals that farm participants can directly engage with, such as goats or donkeys, versus farm 1, which mainly hosts chickens, ducks and geese, alongside, occasionally, sheep and pigs. Additionally, on farm 1, more activities seem to happen indoors (e.g., arts and crafts, music), whereas it was the researcher's impression that on farm 2, more activities were happening outside (e.g., woodwork, more animal-related activities). Interviews on farm 2 typically lasted longer than on farm 1 and were more likely to happen outside and in the company of the animals. On coding, more codes and references were created for interview transcripts from farm 2 compared to farm 1. Lastly, the participants interviewed on farm 1 were older (age range 45-74) than those on farm 2 (age range 18-44), although it is unclear whether this is a reflection of age differences on the farms themselves or coincidental to this project.

Whilst no qualitative data comparison between both farms was conducted (this was not calculable in NVivo), on conducting the interviews, transcribing and coding them, the researcher felt that despite the above-described differences between the farms, the contents of the interviews were largely similar, although possibly somewhat more detailed for interviews conducted on farm 2. However, a possible influencing factor is that interviews on farm 2 were conducted only after all interviews on farm 1 had already been completed; i.e., it is possible that the increasing experience of conducting interviews and coding transcripts, as well as the increasing knowledge about the type of information revealed in interviews also factored into the detail that was extracted from participants and coded later on.

Observational Reflections made during Interviews

During the interviews that were conducted in the company of care farm animals, it was noticeable that all participants actively spoke with the animals. This was often in short statements, such as "hey, beautiful boy. Yeah, you're beautiful. And yes, you're gorgeous too." (PP6, talking to the goats), but also more 'conversation-like', such as "Don't lie on top of her, she won't like that, you

know that, and then it'll just be trouble. Oh, my days! I don't think she'll like that." (PP7, talking to the piglets) or asking them questions as if expecting an answer, such as "have you got attitude today?" (PP2, talking to one of the geese). Research suggests that many people talk to animals as if they were other humans; talking to animals can feel to some people less stressful than talking to other humans and may have a positive impact on reducing stress and blood pressure (Beck & Katcher, 1996). This may be an important feature of farm participants' connection with the animals, as highlighted in mechanism 6 of the RPT.

Additionally, it was noted that when participants talked about the animals versus other aspects of the farm or their life, they appeared generally more animated, smiled and laughed more. This was even more pronounced during interviews where participants sat with or engaged with the animals, which in some interviews was frequent cause for laughter and obvious joy. This may be a reflection of how these participants perceived and felt about these and possibly other animals, but also demonstrates the joy that animals can bring in people's lives, whether in that moment of laughter or later on, when remembering the moment or when looking at a photograph taken with the animals, "I often try to do a bit of a selfie as well because that makes me laugh and smile." (PP7), or "And I can look at the pictures and it helps me to feel less stress." (PP6).

Reflections on the Importance of the Animals

It was evident from the interviews that the animals play a big part in farm participants perception and experience of the farm, which is highlighted further through additional quotes, such as: "They're [animals] a big part. There is other sections that make up like the sort of the pie, the big part, for me, there's a big part, it's the pigs." (PP1) or "Without the animals, it's just… if [manager] decided not to do it [have animals] anymore, it would leave such a void." (PP2).

> I think that they are probably one of the biggest parts of coming in. They are the farm. I think you know, without the animals, it would kind of just be more like a support group rather than you know, having any sort of actual experiences with these guys [goats]. I mean to be

> fair, this place would be fantastic even without the animals and the people here are just so lovely and kind. But yeah, I think the animals, they bring that extra bit of…. (PP6)

> If it weren't for them, I wouldn't be here really. … Then I suppose animals kind of make it because what else would you do if they weren't here? You would just build stuff, grow stuff. And we have crafts and craft days. People come in and make things. All that sort of stuff up there. (PP9)

Other farm participants noted that the promise of the animals was essential for them to decide to come to the farm: "I think I'd still come even if there weren't animals, but the animals were definitely a selling point." (PP10).

Participant 8 highlights how important the animals were for her connection with the rest of the farm and its people:

> Yeah, the animals were my seeds. And then just gradually, it started growing till it was just one big, I don't know what to say, just everything all came into the same. How I feel about animals, is how I feel about my people here now. (PP8)

Considering all three CMOcs in light of this, it is of interest to notice that many of the outcomes noted in CMOc3, i.e., the farm as context, are also reflected in CMOc1 and CMOc2, i.e., those more specific to the animals. This is perhaps expected given that the animals are part of the farm environment and will, thus, be required to inform the outcomes of the environment as a whole (i.e., CMOc3). However, given how substantial many farm participants perceive the animals to be, it would be important to explore what unique contributions care farm animals can make to farm participants' mental health recovery. To examine this, it would be worth comparing data from farms with animals with farms without animals, which may instead offer purely horticultural or agricultural activities. This may help distinguish which outcomes are triggered by the animals and which are the care farm environment itself.

Additionally, it may be worth exploring what potentially unique wellbeing contributions other aspects of care farms can make, such as woodwork or gardening activities. An improved understanding of the potential unique impacts of all aspects of care farms may help match clients to farms that are more likely to match their needs.

Additional Results from the Empirical Project

Photography

Some participants spoke about how they enjoyed taking pictures of the animals in particular and how looking back at these can trigger positive memories and feelings from the time when the photo was taken. On being asked what comes up when looking back at photos, participant 7 said: "Nice feelings. You know, thinking, that was a good day, or it helps you to remember what it was like or, helps you remember what you did, if you forget, like I do."

Anxiety relating to Animal Care

It is noteworthy that every participant spoke very highly of their experiences with the care farm animals and the care farm itself. However, four participants also briefly mentioned some anxiety in relation to the animals, which was mainly about being around animals they had never met (e.g., donkeys) or the geese, who some farm participants perceived as noisy and aggressive. This was not felt to be a significant enough theme to enter into the CMOcs, partially as participants felt supported even in their anxiety and worries (which is incorporated in CMOc3) or because over time, they overcame at least parts of their anxiety (which is incorporated in CMOc1 in terms of personal growth). Additionally, a level of anxiety is likely normal and healthy on meeting new animals or animals that may appear aggressive.

Different Animals meet Different Needs

Some participants spoke about different care farm animals meeting different needs for them: "There is sometimes when I feel like I just want to go and sit in the bird hide and just watch

the birds. And then other times. I feel like I need that interaction, so it'll be a case of going and seeing the goats because they'll always come over and have a cuddle." (PP10), or that they can learn different things from different animals, "I think each animal has taught me something new." (PP6). Additionally, participant 10 spoke about getting the same experiences from all animals, but through different processes, so that some animals provide a 'slow release' versus others provide a 'fast release' of stress, which leads to him feeling more peaceful. For instance, for him, watching the animals provides him with a 'slow release' that allows him to 'process it all in my mind', whereas 'actually seeing the animals' or cuddling them provides him with a 'fast release'.

This highlights the importance of considering that, like in relationships with humans, feeling connected with different animals can meet different needs. At this point, the authors do not believe that research has been conducted that considers how different (care farm) animals may meet different needs in individuals with mental health difficulties and what factors may influence which needs may be met or not. However, to enhance our understanding of care farm animals as an 'intervention', it would be important to explore this in future research.

Interview Participants having Pets

Seven out of ten interview participants reported having pets at home (dogs, cats, tortoise, fish, guinea pigs). It is interesting to note that despite having pets at home, i.e., being able to have daily interactions with animals, participants still perceived the care farm animals as immensely helpful. Some participants also felt that some of the care farm animals reminded them of their pets at home, ("They remind me of my cats, because when they like something, you keep your hands still and carry on itching and they'll move it to where they want it.", PP8, in reference to the goats), and interestingly, participant 8 also referred to the care farm animals as her pets.

Given that all these participants spoke very highly of the care farm animals and how they benefit from them, future research would benefit from exploring if, why and how the impact of pet animals differs from the impact of non-pet animals that people can experience connections with

(e.g., care farm animals). A better understanding of this could lead to more appropriate (mental health) support being put in place for individuals, whether this be in the form of acquiring pets or attending care farms or other institutions where individuals can interact and connect with animals.

Additional Realist Evaluation Quotes in Support of the Refined Programme Theory

Given the word limit of research articles, below are additional quotes in support of different elements of the RPT. This section will be submitted as supplementary material as part of submission to Health & Place. See Table 6, Table 7, Table 8 and Table 9 for additional quotes for the overarching context, mechanism and outcome, and CMOc1, CMOc2 and CMOc3, respectively.

Table 6

Additional quotes for overarching context, mechanism and outcome

Overarching Elements	Participant Quotes
Overarching Context - peacefulness, calmness and quiet therapeutic healing environment	"I feel personally a calmness." (PP3) "That's my sort of quiet place. They know if I'm struggling, they'll let me just sit with the pigs for a little while." (PP1)
Overarching Mechanism – feeling psychologically & physically safe	"With the animals I know I'm safe." (PP6) "[…] because when I speak to animals and I'm with them I feel safe." (PP8) "There was, I could sense there was something different here. It was like an aura, or a vibe, that was just so like safe feeling." (PP1)
Overarching Summary Outcome – personal mental health recovery (includes positive health, wellbeing and social changes)	"They've taught me it's okay not to be okay." (PP1) "That's just kind of happy, really, I don't know, I feel good about myself." (PP10) "I think just new life. I don't know, it brings hope as well." (PP7)

Table 7

Additional quotes in support of CMOc1

CMOc Elements	Participant Quotes
C1 – animals facilitate forgetting the outside world	"Whatever you're stressing about on the way over here… I can even be like marching from my house to be here, I'm really angry or stressed over something. But as soon as I step through those gates, it's just like this weight has just been lifted. The animals do play a really, really big, important part in this." (PP6)
M2 – mindfulness incl. noticing animals being funny	"One of the things they've helped me with is that it's better to just do one day at a time the way animals do and to prioritise the most important things and the rest of it doesn't matter. Not until tomorrow. You know, and you don't have to think about tomorrow because tomorrow isn't here. They do what's in front of them, don't they?" (PP2)
	"All these scenarios building up in your brain, you can just shut that out and just be in the moment. […] It's kind of like, I don't know, not meditation. I'm not sure what the word is. It's kind of just like getting a better headspace, just sort of breathing. Listening to the noises and the birds chirping, the sound of them crunching on the grass." (PP6)
	"The ducks like to tease them as well when they are in the pen and isn't that comical, a tiny duck going after a goose." (PP2)
	"Pigs, they make you laugh. They've got such brilliant quirkiness to them." (PP6)
M3 – attentional focus on animals instead of people	"And I'd been listening, kind of, I'd be focused on them, but I'd also be listening and taking in what they're saying, most of what they're saying, so that I didn't feel so scared." (PP8)
O1 – personal growth	"I was in quite a dark place before coming here. So yeah, the animals and the people have definitely made a drastic difference. I'd say it's hard to explain really how exactly. But it's coming back to that same… that sense of self-worth, like actually doing something good. And that I am actually able to physically still do certain little things what I maybe thought I wouldn't be able to do again." (PP10)
	"So you get the main bulk of it [goat poo nuggets] up and if you leave a few it's not the end of the world. That's something I learned. Because before I was OCD with it. I thought it has to be clean. I thought if I wouldn't want to sit on it then why would I expect the animals? I had such high standards and it's relaxed a bit since being here and thinking 'OK, you know what? Not everything has to be perfect." (PP6)

Table 7 *(continued)*

CMOc Elements	Participant Quotes
O2 – curiosity	"But you also question the animals. How the goats can poo on the top of where the window… I actually can't believe it. It's like someone scooped it up and put it up there specifically, but it's really… and the thing you then find out about animals that you wouldn't ever thought about thinking of questioning." (PP8)
	"I think working here with the animals, with the food, gives you more of a curiosity of how everyone else does it." (PP9)
O3 – childhood memories	"I've always loved being around animals. So just being able to just come here and sit. It's almost like living childhood dreams. Like look at me, I'm sat here in the middle of nowhere with a nice goat." (PP6)
O4 – accepting adverse life events	"I think the animals helped me come to terms with it or helped me process it. […] Being around the animals sometimes helps sort of lay things to rest, maybe. I don't know, not sure if that's the right way to stress it. But being around the animals, you could just, you're unburdened and like I said, it's sort of an acceptance because you know, you've got to realise, like the pigs, like all life, the stuff that's happened, you can't do nothing about it. It's gone. That time's gone. […] So being with the animals, and they sort of, not directly, but sitting with them, in time, and letting, in a way, letting stuff go, just by being with them and stuff has helped me to not carry so much burden." (PP1)
	"I get up there and focusing on the animals makes me realise that actually, well, for me I realise that life is not that bad and I'm lucky to be here, you know, it's a beautiful place. […] I think it's just helped me become more satisfied with my lot because I was quite cross with this. This is an old racing injury and I realise now that the matter is the fact that I'm not going to get over it and they can't operate, I can still do things in the area that I enjoy with animals to a safe extent when able to." (PP3)
O5 – physical health	"They have also helped with my physical side of health. If I was walking through the High Street, it wouldn't take long before I was like… 'I need to take a break'. But when I'm on the farm because of how everything's set up, you don't necessarily realise how far you've walked. […] Because there's a job at hand you're not necessarily thinking about 'oh my legs aching'. Just thinking about what needs to be done. So that's helped because I'll push through barriers […] but a lot of the times the animals take priority, so I'm thinking of them, not my own issues." (PP10)
	"I would come here, if there weren't any animals because it gets me out of my flat. It gets me physically moving because in the summer I can do more walks when the grounds better." (PP3)

Table 7 *(continued)*

CMOc Elements	Participant Quotes
O6 – increased access to positive affect	"Yeah, I think because you are kind of like… you're at a place which is helping to… what's the word like make them better and recuperate them and you feel like you're part of the team helping them. And that feels… that's a good feeling, you know?" (PP7)
	"Because I enjoy it. I don't sleep the night before, I'm so excited to come here. It makes me happy." (PP4)
	"Maybe it feels a bit like animals are hoovers. They suck that emotion out of you, but it feels a bit like that sometimes." (PP1)
O7 – attentional focus away from stressors, improved emotion regulation (incl. urges to self-harm)	"But yeah, when you're here, you know that you're just… everything just sort of drifts away and it's just very calm and peaceful." (PP6)
	"If I've had a bad day, before I just used to really act on it and now since coming here as well, it's been... if you feel like having an outburst, it doesn't happen. It's weird, really. I think that's because I've become aware of others. I can't just go off and do this and [...]. I've learned to overcome it a bit. Or I might say 'oh I'm going home now. Going off early'." (PP5)
	"I don't harm myself anymore." (PP4)
O8 – reduced social anxiety	"Because before I would be really on edge around people. Whereas now I think, you know what, these guys taught me how to just be calm." (PP6)
	"Because I feel safe with the animals, I feel calmer and more relaxed so that I will then open up and speak to someone." (PP8)
O9 – increased sociability	"My relationships are better. I'm better with people. I can talk about my problems that I've never been able to." (PP4)
O10 – improved trust, connection, relationships	"Because we were focused on talking about the animals and I was building trust with the animals, I was then building trust with them because I felt like, oh, they're making sure I'm safe. […] Because I feel safe with the animals, I feel calmer and more relaxed so that I will then open up and speak to someone." (PP8)
O11 – reduced fear of rejection & connection	"When I first came here I didn't trust people. […] They were all so lovely. It took me months before I started to think 'OK, maybe these people are actually genuinely nice'. I just couldn't fathom it. […] I was just like […] 'What do they want? What are they gaining from it?'. It was just a constant battle in my brain. And eventually I just thought 'you know what? These people are nice. Nothing bad is going to happen. […] They're not trying to lure you into a false sense of security', […] which then started the whole OK, maybe the human race isn't so bad. Maybe you can start trusting some people." (PP6)

Table 8

Additional quotes in support of CMOc2

CMOc Elements	Participant Quotes
C2 – animals have (desired) human traits that foster connection	"But they have a bit of rivalry. It's not a rivalry as such. It's more, if you make a fuss of one, the other one gets jealous and then goes and flops it out over the other one. So you can't make fuss of them." (PP9)
	"That's another thing that people don't realise and you think, oh, they're just all sheep like? No, they're all individual sheep. They've all got a personality." (PP1)
	"Then you are trying to catch the donkeys because they're having a great time running around the farm. […] And they just look so proud. They have their head up high and they're like, look at us go." (PP6)
	"But yes, there's an unspoken connection with animals that I don't know if it's energies or what animals can sense human feelings. They can sense when we're angry. They can sense when we're scared. And when we're sad. They can sense all of that. Dogs, horses, pigs, cats. I don't know what it is, I don't know why, but they can sense emotions." (PP1)
	"You talk with them, you know, sometimes you can just be sitting with them and it's like they know how you're feeling, I don't know. They give off something." (PP7)
	"That's I think when you're working with other people and they're demanding things and they're judging you and how you're getting on with your job and but there's none of that with the animals. It's just come in. Do what you got to do. They will either like you or they don't." (PP10)
	"They are understanding. They join my pity parties if I have any, because you know, they know when you're upset and all that malarky. But they also come to you when you're happy and they know how to act. They understand, they understand." (PP8)
	"I think, oh, she knows where I'm coming from. I know where you're coming from that, that sort of thing. It's like I'm releasing my stuff to them. And they didn't give a damn really, but they're there and they're like. Yeah, yeah. You're not getting pushed away by them." (PP5)
	"I know they're not going to be looking at me, thinking things that I think people would think. And that they come up to you no matter what you look like, no matter what you're wearing, no matter what your mood is in, they're going to come up to you regardless, and they're going to love you anyway. And I'm like, thank you for that." (PP8)

Table 8 *(continued)*

CMOc Elements	Participant Quotes
M4 – relational re-learning	"The more they were helping me understand and whatnot with the animals, there would be laughs and talks, which then, because we were focused on talking about the animals and I was building trust with the animals with help that I was then building trust with them because I felt like, oh, they're making sure I'm safe. The safety, the trust, the love, the whole lot, it just all came into one." (PP8)
M7 – mentalising & identifying with the animals	"I think she's a little bit me as well. She snorts. I snort when I laugh. Loves the bed, loves her food, loves getting down and dirty and making a mess for people to clear up. It's just my specialty. But she just grabbed a part of me that none of the others did." (PP8)
O8 – reduced social anxiety	"They're not focusing on me. They're focused on the animals. As well as that which puts my mind at ease. I've now got to focus on the animals, I'm not thinking about anything else." (PP8)
O9 – increased sociability	"I go to this place has helped me become more social outside of my home because normally I'm at home, not in the bed, but I wish I was. Well, not when I'm here. I'll give them that." (PP8)
O10 – improved trust, connection, relationships	"They help me… I trust the animals here. I think that helps with the trust of the people who are here, because watching them guys help with the animals, knowing that they're all doing what they've got to do." (PP8)
O11 – reduced fear of rejection & connection	"Being with the goats puts you with people which then makes you think 'OK, maybe people aren't so bad and not everyone's out to get you'. And it helped me realise not everybody is awful, the whole human race isn't terrible." (PP6)
O12 – belonging & purpose	"I feel like I'm doing something good, especially when I do the chickens. I feel like I'm doing something good for someone else. You know, it's a sense of purpose." (PP2)
O13 – self-worth & confidence	"I think confidence, definitely. I was not very confident before I came here. But just being with the animals, you learn a lot about them and you get a bit more confident. With what you're doing and that routine, almost. And once you know what you're doing, if someone else comes along and they don't know what they're doing they can ask you, and then you feel good because you can, be like, 'You know what? Yeah, I actually do know what I'm doing'. And you know that you're doing it right. And you can then help them learn what it is. And then it helps them when it comes to their turn. And this all gives you that bit of confidence and boosts your self-esteem a little bit that yeah, you know what I can help you with this." (PP6)

Table 8 *(continued)*

CMOc Elements	Participant Quotes
O14 – maternal instincts	"People always told me when I was younger […] I've got no maternal instinct, but that wasn't really true. Because I love animals so much and I want to take care of them and protect them and so on. And that is a maternal instinct, isn't it? So, yeah, I don't think that's true, but here I've been able to express it here, whereas outside I couldn't. I had no means of expressing it." (PP2)
	"When I was younger, I had a miscarriage and that's why I took to Lily [lamb], because I was feeding her and it's that baby I never had." (PP4)
O15 – feeling acknowledged & validated	"I felt very happy to just sit there with him and it felt like quite a privilege, almost. Like he's got all this grass, got lots to do, but he still chose to spend his time to come over to me and just chill." (PP6)
O16 – authentic self-expression & non-judgmental acceptance	"I know they're not going to be looking at me, thinking things that I think people would think. And that they come up to you no matter what you look like, no matter what you're wearing, no matter what your mood is in, they're going to come up to you regardless, and they're going to love you anyway. And I'm like, thank you for that." (PP8)
O6 – increased access to positive affect	"Maybe it feels a bit like animals are hoovers. They suck that emotion out of you, but it feels a bit like that sometimes, like with the pigs, cause technically, like I said before, they might not understand human language. They can sense a feeling, but being around an animal that you've connected to, say it was dogs or cats, you know, if you've had a bad day, you split it up, you come back, you come to your dog who is just happy to see you, or the cat that comes up and that animal takes something or you give it some of your burden or it takes it. I don't know how else to describe it, but it's like you are unburdened with a small amount of emotion that maybe you couldn't deal with just by being around an animal that you're connected to. And like I said, I love the pigs very much. I've always loved pigs." (PP1)
	"At the moment I am downhill. My roller coasters on a slight depression mode and low mode and struggles and anxiety, and the whole lot. But coming here is one place where all of that disappears. Yeah, I am so happy. I wake up with a smile on my face. I'm getting ready. I'm always up on time. 7 o'clock, every Monday. Not a problem. Any other day I'm like 'arrhh'. But I'm up, I'm dressed, I'm waiting for an hour and a half for the taxi to arrive. I'm ready to get here." (PP8)

Table 8 *(continued)*

CMOc Elements	Participant Quotes
O6 – increased access to positive affect (*continued)*	"And I always feel, when the chickens […] nest underneath the hen house, when I find little chicks under there, I get silly and say things like 'we've got chicks, we've got chicks'. I get so excited about it." (PP2)
	"When you talk to your cat or pigs, you can get it all off your chest without feeling guilty or ashamed that you might put on yourself because of whatever's happened. [..] It's like a connection that happens when you bond with a farm animal […], it's a bond that allows you to unburden some weight, emotional weight or feelings." (PP1)
O17 – give compassion & care	"Yeah, so, they're not being neglected. I like that they're being cleaned and that they're going to have a fresh bed, they've got food. Even though you feed them, if they you give them another bowl, they look like they're starving. They're not. They are just greedy buggers. My pets are exactly the same. But it's knowing that they're going to be okay, they're going to be clean, they're going to be fresh, they've got a good home because this is their home. And if it was my home or your home, you wouldn't want it to be a mess or not cleaned or not changed and whatnot. So that that's how I look at it, if that makes sense." (PP8)
	"[…] but they do, they've helped me a lot. To sort of acceptance. You know, letting go, having a bit more empathy with other people, a bit more understanding." (PP1)
	"People think I make too much of a fuss about the animals, but I just do to them what I would want done for me. If I was a goose or a chicken." (PP2)
O18 – inspired by animals	"They have such a simple life, why can't I have a simple life like that? So, you make your life simpler in a way. That may be hard to understand but they have such a happy easy life. They just get fed, get lots of fuss, get fed, fuss, go to sleep, fed, fuss, fed fuss, go to sleep. And that is the easy life to have." (PP9)
	"If they don't understand what's going on and they're carrying on. So, you think I can be resilient too." (PP7)

Table 8 *(continued)*

CMOc Elements	Participant Quotes
O19 – food & life cycle	"I felt awful eating it. I was like 'oh my God, this poor baby.' But equally, I thought that he's had a really good life, and you know that they've had every treat imaginable. They've been rolling in mud and sunning it up, getting scratches, and they're probably having the best life that a pig can have. And I don't know if that just made it taste better." (PP6)
	"I'd be gutted if anything happened to one of the geese. I've had to learn to expect the chickens to expire. But I really would be gutted if anything happened to the geese. The same as I was when Tallulah died, she was the little sheep we had. And she was 14 years old." (PP2)
	"So instead of just being put to the side, 'you're not going to amount to anything'. They were brought here. And we raised them up." (PP10).

Table 9

Additional quotes in support of CMOc3

CMOc Elements	Participant Quotes
C1 – farm & its people as second home & family	"But as soon as you do it's almost like you feel at home here. It's very much like a homely feeling. You come here and you just know that it's almost an extended family. This is what this place is." (PP6)
	"The farm. It has a multi-layered effect." (PP1)
M9 – safe, accepting and supporting human environment	"Everybody… everyone's struggles, but everyone chips in together and we all help each other. It's also, they say it's like a family because exactly what family does, you know?" (PP6)
	"It's helped me understand why people do what people do. The people here don't get annoyed. There's no asking questions, or why are you judging what I'm doing? […] It's just, you've got a question? OK. Yeah. Let's see how I can help you sort of answer. […] I think communication is the biggest thing that makes this place work. Everybody talks to everyone and no one's shut out, no one's not in the loop. […] Everybody sort of talks to everyone." (PP6)
	"You do settle in really quick. You might feel 'oh it is a nitty gritty group, everyone is just doing their own thing'. But it's nothing like that. As soon as you walk in, it's like they've known you for ages." (PP9)

Table 9 *(continued)*

CMOc Elements	Participant Quotes
M9 – safe, accepting and supporting human environment (*continued*)	"It shows you the kind of person [*manager]* is, and the cats see her as their mum and it also… I think it symbolises her approach to everything. Rather than pushing people away if they don't work out, she gathers them in. And she does the same with the animals as well." (PP2)
M10 – opportunity to access dialogue	"Know that I've come here a few times, and I'm just in a really bad mood. And I walked through, and I'll just be like 'I'm going to the goats', and they're just like 'OK'. And they just leave me for, like, 20 minutes and then someone comes down and they're like 'you wanna talk?'. And if I don't wanna talk, then there's no judging. It's like OK, she needs a bit more time or they'll be like 'do you want someone to sit with you?' and you don't have to talk. You can just have someone sit with you or you can be on your own." (PP6)
O20 – hopefulness	"But the managers and the staff here […] and the volunteers, they are honestly wonderful. They're so helpful. And I know I've got everyone behind me. I'll get… I know I'll get through it because I've got a lot… I like to keep strong, and you need energy for doing things here as well. I'm very lucky that I can come here. And I've got their support, and I can be myself. Definitely." (PP7)
O1 – personal growth	"But the farm has helped me to sort of, I don't know, accept that some of those negative markers is what I've put on myself. So that's not something that every human has to have those markers. It's something I've put. So, then you sit there and go 'oh, well, you know, maybe you are alright'. And so, you're less judgmental on yourself." (PP1)
O8, O9, O10, O11 – relational growth, connectedness, confidence	"And it's also taught me to be not so insular, I think is a great word, because, like T [another farm participant], he likes to play Bird Bingo, and I'll sort of like, you know, yeah, OK. We'll have a go at that. It's taught me to work with lots of different people with different qualities and different wants and needs. So yes, I would come." (PP3)
	"I don't go out too much. Some of my friends, we sometimes meet up, but other than that I don't really go out too much. So this is sort of quite a big vital part of the week. Get out and socialise. Interact with people, not just hideaway and be a hermit, which isn't great." (PP6)

Table 9 *(continued)*

CMOc Elements	Participant Quotes
O8, O9, O10, O11 – relational growth, connectedness, confidence *(continued)*	"And yeah, and we have socials every month, once a month as well. […]. So that's really lovely." (PP7)
	"The only time I leave the house is when, well, when I need to go shopping and all that malarkey, but it's when I'm coming here. Or there's a social. And I know all the people. I know that there's going to be people I know and trust with me, which is why I go to the socials." (PP8)
O21 – community identity, togetherness, belonging	"I do need people as well. And yeah, it's just finding the right people, which is exactly what I've done, like coming here. Find the right people, find where you belong." (PP6)
O22 – cared for & needed	"Other people have come here and they've got very similar conditions to me. And it's been quite nice to sort of build like a little community around that because on days when having a really bad day, they understand and they get it and you can sort of sit there and talk to them about it. […] I come here and you think, OK, you know what this person gets it and it's just like a weight lifted off your shoulders cause you just think oh my God, I'm not going mad. You know, this is real. What you're going through is real and is happening. But equally, you sit there and have a rant about it and equally people have different ideas and things to help." (PP6)
	"People actually care about our wellbeing." (PP10)
O16 – authentic self-expression and non-judgmental acceptance	"Being able to be yourself. If you just want to take a bit of a break or sit down and cuddle an animal if your feeling, you know, you need that time out, then you can. And it's all right, you know, they're fine with that [laughs]. So, it's nice to be able to think that that's okay and you can come and be yourself." (PP7)
O4 – accepting adversity	"But the farm has helped me over time. Not directly to any specific trauma. But they've helped me to… The farm has sort of helped me to let some go. Also, the farm has helped me to process other things and accept some things. […] It's just by being here, and maybe helping others because they're having a bad day. The helping others and the family feel of this place has helped me shed some of the burden and some of the negativity." (PP1)

Table 9 *(continued)*

CMOc Elements	Participant Quotes
O6 – increased access to positive affect	"So you definitely can't leave here on a bad one. You leave here, I'll be in my car and I'll be singing away, especially on Fridays. We're doing some song that we've got to learn to play and then I'll end up singing all the way home." (PP5)
O7 – attentional focus away from stressors, improved emotion regulation	"It taught me different coping strategies to deal with it. There's windows, I know I'm safe in there. Equally, I still have that fear and it helped me, I don't think to overcome it, but to work through it, I think." (PP6)
O13 – self-worth & confidence	"I've got a pen and it works. But yeah, it sort of symbolises a lot more than I just made a pen. It symbolises a lot more to me than just being a pen. Which is really cool. And it's also sad. I've got it in my living room. Every time I look at it I feel really proud because I'm like, nice. I did that and I'm having a bad day and I'm just sat on the sofa. I've been having a panic attack or something. And my dog's there. And I can look at the pen and I'm like, no, you know what? I've done this before. I can do it again. Whatever it is I'm feeling right now, it's not the be all and end all and it will pass. And I know that because of that pen right there." (PP6)
O23 – employability	"It's all good like work skills, isn't it. And yeah, you can do certificates here as well. They put you through like awards. So that, yeah, that's a good thing because then if you go into like employment or, you know, got certificates, you can show, you know, and I've done an animal care award. I've done a food hygiene certificate for in the cafe as well." (PP7)
	"I even want to try and become a volunteer, unpaid volunteer here to move on to the next step." (PP1)

Chapter 7: Discussion and Critical Evaluation

Word count (excl. figure & references): 5732

This chapter will provide a summary of findings from the realist review and realist evaluation, which will be contextualised in relation to the current evidence base. The strengths and limitations of the projects and the approaches used are discussed. In light of the results, implications for clinical practice will be considered and suggestions will be made for future research.

This thesis employed realist methodology aimed at exploring and conceptualising how and why care farm animals may impact adults with mental health difficulties.

Summary of Findings

Realist Synthesis

The aim of the realist synthesis was to develop an initial programme theory (IPT) that begins to answer the question why and how care farm animals may impact adults with mental health difficulties. Synthesis of twelve papers formed an IPT consisting of two Context-Mechanism-Outcome configurations (CMOcs) with multiple mechanisms and outcomes and one summary outcome overarching the IPT, which was conceptualised as 'positive health, wellbeing and social changes'.

CMOc1 highlighted that if farm participants experienced animals as creating a calm, tranquil therapeutic environment for healing, then positive mental health and other outcomes can be facilitated (e.g., increased self-confidence), because of the following mechanisms: farm participants feel motivated to engage in animal-related activities they perceive as meaningful, they value the trust and responsibility they are given to take care of the animals and experience feelings of safety due to the animals.

CMOc2 highlighted that if farm participants experienced connections with the animals due to the animals presenting with desirable traits (e.g., they listen, mirror emotions), then similar and

additional positive mental health and other outcomes to CMOc1 can be empowered (e.g., re-learning about human relationships), because of the following mechanisms: farm participants feel safe, they experience the relationship with the animals as reciprocal and mutually beneficial and farm participants identify shared narratives with the animals.

Realist Evaluation

The aim of the realist evaluation was to test and refine the IPT created by the realist synthesis, however, focused on adults with a history of adverse life events instead. The ten interviews covered most of the same themes as presented in the IPT, but also expanded the theory with new information. The refined programme (RPT) theory consists of three CMOcs, as well as an additional overarching context ('peacefulness, calmness and tranquillity that motivates activity'), which in the IPT was C1 and an overarching mechanism ('feeling safe'), which in the IPT was M3. The new data also refined the IPT's overarching summary outcome to conceptualise 'personal mental health recovery', which includes the 'positive health, wellbeing and social changes' identified through both the realist review and evaluation (i.e., all individual outcomes).

Other key refinements were the addition of further mechanisms and outcomes for CMOc1 (e.g., 'focusing on the animals instead of humans', M3; ' enhanced social connectedness, growth and confidence', O8-11) related to how farm participants experience the animals as allowing them to forget the world outside the farm, as well as CMOc2 (e.g., 'communication with the animals', M6; 'perceptions of authenticity & non-judgmental acceptance', O16) relating to building positive connections with the farm animals. Moreover, the empirical work led to the addition of a third CMOc relating to the animals in the context of the wider farm environment, which farm participants perceive as a second home (e.g., 'safe, accepting and supportive human environment team, M9; 'experiences of being cared for and needed', O21).

Overall, the findings of both this realist synthesis and realist evaluation highlight the wide range of health, wellbeing and social factors care farm animals can positively affect in the lives of

individuals with mental health difficulties. This can support individuals' personal mental health recovery journeys. Many elements of both the IPT and RPT supported the use of attachment theory as an explanatory model for the impact care farm animals can have on adults with mental health difficulties and adverse life experiences.

The Refined Programme Theory in the Context of Existing Psychological Theory and Mental Health Recovery

Attachment Theory

The aim of this project was to enhance our understanding of the reasons why and mechanisms how care farm animals may impact adult mental health. Throughout the portfolio, Attachment Theory was explored as a promising explanatory model for the impact care farm animals can have on adults with mental health difficulties and adverse life experiences.

The RPT highlighted that care farm animals can provide a sense of calmness (overarching context) and safety (overarching mechanism) and that farm participants built close relationships with them (C2). The animals acted as a secure base from which farm participants could begin to re-explore and re-learn about the world and other people (M4-M8; O8-O11), provided unconditional positive regard (M5, O15-16) and supported the development of emotional self-regulation (O6-O7, O13, O17) (Bowlby, 1988; Mikulincer & Shaver, 2007; Pallini et al., 2018; Sroufe & Waters, 1977).

Evidence suggests that secure attachments may be associated with better functional outcomes from mental health difficulties, which can be seen as an area of recovery (Pearse et al., 2020). Furthermore, building meaningful relationships (i.e., attachments) is understood as key to mental health recovery (Berry & Drake, 2010).Therefore, attachment theory may provide a meaningful lens through which to consider mental health recovery. Secure attachments are also associated with better psychological and emotional wellbeing, as well as hope and resilience (van Bussel et al., 2023), all of which are elements of the CHIME framework, which is a framework for personal mental health recovery.

CHIME Framework

The CHIME framework for personal mental health recovery focuses not on individuals needing to remove clinical symptomatology but rather on recovering a life worth living (Liljedahl et al., 2023); this was reflected in the psychosocial rather than clinical language participants used in their interviews during the empirical project. The CHIME framework was developed by Leamy et al. (2011) based on a systematic review of 87 papers with the aim of creating a model of personal mental health recovery. Their synthesis suggested five core elements necessary for recovery from mental health difficulties: Connectedness, Hope and optimism about the future, Identity, Meaning and purpose in life, and Empowerment. To the authors' knowledge, the CHIME framework has not yet been applied to the context of care farms or care farm animals; however, on looking at the programme theory, it is evident that many of the explanatory statements may resonate with the recovery processes highlighted in the CHIME framework (see Figure 21).

For instance, the process ‘Connectedness’ is evident in the connection farm participants feel to the animals (C2) as well as the relational growth, connectedness and confidence they experience with other humans that they reported (O8-O11). It is also notable in some of the mechanisms, such as M6 (communication with the animals), M7 (mentalising and identifying with the animals) or M8 (perceiving the human-animal relationship as reciprocal), all of which are clear indications of the farm participants finding connection with the animals.

Additionally, participants spoke about hopefulness (O20) and feeling inspired by the animals’ lives and resilience (O18), which may be seen as factors related to ‘Hope and optimism about the future’.

For the recovery process ‘Identity’, several outcomes may apply, including O1 (growth as a person), O13 (increased self-worth and confidence) or O14 (feeling & expressing maternal instincts), which may all be seen as dimensions of farm participants' identity or their identity development. M1 (self-reflection) and M7 (identifying with the animals) may also be seen as identity-related drivers.

Figure 21

RPT elements that resonate with recovery processes from the CHIME framework

Connectedness:	**Hope & Optimism**	**Identity**	**Meaning & Purpose**	**Empowerment**
• Peer support & social groups • Relationships • Support from others • Community	• Belief in recovery • Motivation to change • Hope-inspiring relationships • Positive thinking & valuing effort • Having dreams and aspirations	• Rebuilding positive sense of identity • Overcoming stigma	• Meaning in mental health experience • Meaningful life and social roles • Meaningful life and social goals	• Personal responsibility • Control over life • Focusing upon strengths
'Connectedness' in the RPT: C2: Connection with animals C3: Farm & its people as a safe second home & family M6: Communicating with the animals M7: Mentalisation & identification with animals M8: Reciprocal relational dynamics with animal M9: Safe, accepting & supporting human environment O8-11: Relational growth, social connectedness & confidence O21: Community identity, togetherness & belonging	**'Hope & Optimism' in the RPT:** Attendance on the farm may be seen as 'motivation to change' and 'belief in recovery' in itself M1: Self-reflection (may trigger more positive thinking, e.g., O1, O3, O4, O6) O18: Inspiration by the animals' resilience & life about own recovery O20: Hopefulness	**'Identity' in the RPT:** M1: Self-reflection M5: Unconditional positive regard, relational worth & social validation (i.e., being meaningful to the animals) M7: Mentalisation & identification with animals O1: Personal growth O13: Enhanced self-worth & confidence O14: Activation & expression of maternal instincts Farm users' sense that 'it's okay not to be okay'.	**'Meaning & Purpose' in the RPT:** Attendance of the farm itself may be seen as meaningful; farm users experience the work with animals as meaningful (overarching context). M5: Unconditional positive regard, relational worth & social validation (i.e., being meaningful to the animals) O1 & O4: Personal growth allowing meaning-making of mental health & past adversity O12: Purpose & reason to get up & leave the home O22: Experience of being cared for & needed	**'Empowerment' in the RPT:** All mechanisms empower change & allow individuals to take some control over their life by engaging in chosen activities and interactions. M12: Valuing the trust & responsibility given to care for the animals O1: Personal growth (i.e., may allow focusing on strengths)

Note: Top row outlines titles and descriptors of the CHIME framework taken from Leamy et al., (2011); bottom row demonstrates the resonance between CHIME & this RPT

Moreover, the CHIME process 'Meaning and purpose in life' is evident when farm participants stated that working with the care farm animals gives them a reason to get up, leave the home and a purpose in life in general (O12). Their attendance on the care farm and engagement with the animals could in itself be interpreted as an aspect of the farm participants 'rebuilding their life', which may be seen as one of the elements feeding into the recovery process 'Meaning and purpose in life'.

Lastly, on considering the CHIME recovery process 'Empowerment', the authors consider whether all mechanisms could be interpreted through this process, as mechanisms in a programme theory are seen as the drivers, the 'how' and the 'why' that bring about the outcomes. Therefore, the identified mechanisms may be seen as empowering farm participants to engage in animal and non-animal related farm activities, social opportunities and, therefore, make the most of their time on the care farm, which ultimately allows for the identified individual and summary outcomes to take shape.

Post-Traumatic Growth

Building on attachment theory alongside recovery perspectives and the CHIME framework, the concept of post-traumatic growth (PTG) may be seen as an important aspect of the recovery process (Slade et al., 2019). PTG is the concept of growth and positive change following significant adversity, not due to the adversity itself, but rather the struggling and coping with it (Henson et al., 2021). Having secure attachments is associated with greater PTG as well as better recovery from adversity (Turunen et al., 2014). As with the CHIME framework, PTG has not yet been considered in relation to care farm animals and the farms themselves; however, trauma is a type of adverse life event and it appears that the concept of PTG shares features with the RPT. In their systematic review of 281 studies, Henson et al. (2021) identified a range of factors that may promote PTG, some of which were identified elements in the current programme theory. For instance, disclosing one's own experiences and receiving appropriate support is one of the factors identified by Henson et al.,

which feels applicable to farm participants' engagement with the care farm animals, as they feel able to talk to the animals (M6) and believe that they feel their emotions and accept them without judgment (C2). A sense of purpose (O12) and hope for the future (O20) were also identified as factors fostering PTG that arose in the RPT. Furthermore, coming to the farm in the first place was a significant step for many participants as prior to this they were withdrawn and felt and thought negatively about themselves, life and their future. Therefore, attending the farm and engaging with the animals there may be seen as 'growth action', a conscious step towards embracing life post-adversity and moving forwards alongside it (Anderson et al., 2015; Hobfoll et al., 2007).

Furthermore, in their PTG Inventory, Tedeschi and Calhoun (1996) highlight a number of potential positive outcomes that may be indicative of PTG and individuals' reconstruction of themselves, others and life post-adversity. This may be aptly summarised by a quote from participant 10, "I don't see myself as my old self anymore. It's like a different version of me, so it's more like getting used to and settling into the new me." Many of these positive post-adversity outcomes were also identified in the present RPT, such as, amongst others, appreciating each day (M2, mindfulness), improvements in relationships with others (M4, O8-11) or having compassion for others (O17). Moreover, 'establishing a new path in life' was another positive outcome identified by Tedeschi and Calhoun. Individuals coming to the farm in the first place to engage with the animals and other humans could be interpreted as individuals establishing a new path in their lives.

Recovery from Adversity

Attachment Theory, the CHIME framework of personal mental health recovery and related aspects of PTG are concepts that may be able to provide applicability of seeing care farm animals as an 'intervention' for individuals with mental health difficulties. This may be particularly relevant for individuals with a history of adverse life events, including trauma. With care farm animals providing a calm and safe environment (overarching context and mechanism), this is likely to facilitate individuals to engage more meaningfully with their surroundings (nature, animals and people) and

therefore, better process adverse past experiences (as per the concept of the window of tolerance, Siegel, 1999) and experience growth from them. Additionally, particularly for individuals with interpersonal adversities, care farm animals functioning as safe attachment figures may be helpful in tentatively establishing new and safe social relationships (M4, O8-O11).

Implications of Research

Theoretical implications

Our findings suggest that the RPT can combine and expand on the current evidence base by providing a more comprehensive and holistic understanding of the impact of care farm animals on adults with mental health difficulties. Combining data from a minimum of 50 care farms and nearly 600 participants, the RPT may be seen as initial evidence base through which the impact of care farm animals can began to be conceptualised and further research be expanding on.

Furthermore, the RPT indicates that the impact of care farm animals goes beyond diagnostic labels and clinical symptomology and may be better understood along a broader psychosocial spectrum and through concepts of mental health recovery. This is also in line with considering the impact of care farm (animals) through models of personal recovery, such as the CHIME framework, which puts a greater focus on individuals rebuilding their lives and redefining their identities over improvements in diagnostic features.

Attachment Theory has also been considered and seems relevant in providing an explanatory framework for the impact of care farm animals on adult mental health, with the possibility of the care farm animals functioning as a ‘secure base’ from which farm participants can re-explore themselves, relationships and the world (Bowlby, 1988).

Clinical Practice Implications & Recommendations

Currently, in the United Kingdom, care farms and engagement with care farm animals are not (yet) accessible through the National Health Service (NHS) or recommended in, e.g., National

Institute for Health and Care Excellence (NICE) guidance for mental health conditions. Instead, care farms are typically placed in the Voluntary, Community and Social Enterprise Sector (VCSE, aka 'third sector'), run by the local government, community agencies or by charities. However, referrals to care farms are often made via social prescribing schemes from health and social care professionals (Garside et al., 2020). The new insights in this portfolio may hopefully be able to inform health and social care providers and commissioners and influence their decisions in regard to the developments of care farms and the role that care farms and their animals can play in supporting mental health recovery. Clinical Psychologists could cooperate with commissioners, policymakers and care farms using their psychological knowledge to increase understanding regarding the impacts care farms and their animals can have on individuals' mental health (recovery) and, thus, maximise the output of care farm interventions. This could further help embed care farm (animal) interventions into mental health delivery.

Healthcare professionals, including Clinical Psychologists, as well as service users, would benefit from education around the existence and benefits of care farms and care farm animals, and accessibility to these spaces should be enhanced further via social prescribing schemes, but also be considered by practitioners as additional or alternative intervention pathways for those with mental health difficulties. As an addition to, e.g., psychological therapy, engaging with care farm animals may allow patients to test out some of the things discussed in therapy in the safe and supportive environment that the animals can offer, as well as the farm and its people overarchingly so.

Furthermore, it may be beneficial to consider care farm environments as part of the mental health recovery journey for individuals with a history of adverse life events more specifically. Such experiences can have a significant impact on individuals' lives, wellbeing and functioning (Carstensen et al., 2020; Smyth et al., 2008). Some individuals who experience trauma as a form of an adverse life event go on to develop post-traumatic stress disorder, for which psychological treatment can help alleviate clinical symptomatology such as nightmares or flashbacks associated with the

traumatic event (Bisson et al., 2013). However, particularly for more complex or long-standing traumas, or once these superficial symptoms are alleviated, individuals may often be left with continued altered core beliefs or schemas of, for instance, unhealthy relationships. As evidence in this project, engaging with care farm animals may allow farm participants to create new safe attachment bonds, which may be able to help shift such beliefs for some people over time as the exposure to and engagement with the animals on the farm may be able to allow farm participants to feel calm (overarching context) and safe (overarching mechanism) enough, and thus, be within their window of tolerance (Siegel, 1999) to challenge and adapt such beliefs. This may be particularly relevant for individuals who experienced interpersonal adversities or traumas where the care farm animals may be able to function as a secure base, which, when ready, may allow farm participants to tentatively establish new, safe and healthy social relationships with humans (M4, O8-O11), which may be mirrored through relationships with the animals (e.g., M8) and further encouraged through the safe familial environment care farms provide (CMOc3).

Building on this, safe attachments with the care farm animals may allow (traumatised) individuals to re-explore first the small, contained world of the care farm with its naturally occurring interactions and politics, to then expand to the world outside the care farm, which may allow them to reconnect with themselves and society as a whole. Consequently, clinicians such as Clinical Psychologists working with individuals with a history of adverse life events or trauma may wish to consider referring some of their patients to care farms, particularly those who may have a greater affinity for being in contact with nature and animals. Engaging with care farm (animals) alongside psychological (trauma) therapy may have the added benefit of the clinician knowing their patient engages with a safe environment that may allow them to test out some of the themes discussed in therapy sessions. Likewise, engaging with care farm (animals) after psychological therapy has ended may allow the patient to continue working on some of the theoretical processes learnt about in sessions, whilst also being in a safe environment to apply these practically.

Naturally, some people like animals more than others, and consequently, some people will benefit more from engaging with care farm animals than others; however, this applies to all interventions that are targeted to improve participants' wellbeing. A benefit of care farms as an environment for enhancing people's wellbeing is the breadth of available activities that farm participants may appreciate (Iancu et al., 2014), which of course, includes the animals, but may also include many other activities and tasks, such as horticulture, pottery or woodwork, as well as social interactions, thus, possibly increasing the number of individuals that may benefit from attending such a farm.

Critical Appraisal

Critical Appraisal of the Chosen Methodological Approach

A key strength of the research presented in this portfolio is the novelty of the methodological realist approach being used in relation to care farm animals. Realist reviews and evaluations are seen as particularly meaningful in improving understanding of rather novel interventions that may have a limited evidence base (Handley et al., 2024). The realist approach and subsequent programme theory presented in this portfolio is the first of its kind in the context of care farm animals, and thus, advances our understanding as to the impact care farm animals can have on people's mental health and wellbeing. A core feature of programme theories are the connections between the themes that arise from the data, thus, in this context providing a more in-depth understanding as to why and how care farm animals have the impact they do, thus differing from other qualitative approaches, such as thematic analysis or interpretative phenomenological analysis.

Key limitations of the chosen approach relate to the temporal constraints of the doctoral programme during which this thesis was produced. Typically, realist approaches encourage a theory-driven approach whereby, for example, the realist synthesis is tested and refined during the realist evaluation. Additionally, during a realist evaluation, the researcher and participant oscillate along a teacher-learner cycle (RAMESES, 2017) and data collection and analysis are meant to happen

simultaneously to support this (Rees et al., 2024). Practically, this means that information gained from, e.g., interviews should be consistently used to build the programme theory and be tested in subsequent interviews or throughout multiple rounds of interviews with the same participants. This was not practically possible during this project; however, to somewhat account for this, early coding and thematic information gleaned from the realist review were used to inform the interview schedule. Additionally, the primary researcher's notes taken after each interview meant the researcher was aware of key themes that had arisen, meaning it was possible to dynamically 'refine' these 'theories' during subsequent interviews by exploring them further through follow-up questions when a participant brought up the same theme or something similar.

What may have further enhanced the breadth and quality of both the initial and refined programme theory is a 'multi-method' approach to data collection. Given time constraints described above, this realist evaluation used one-to-one interviews only, however, Dada et al. (2023) and Hunter et al. (2022) propose the inclusion of non-academic material (e.g., social media content, newspaper articles) in the creation or refinement of realist programme theories, given that realist epistemology seeks to find an external reality filtered through e.g., human perception (Wong et al., 2014).

Critical Appraisal of the Realist Synthesis

The realist synthesis quality and publication standards (RAMESES II) were considered throughout this project (Wong et al., 2013; Wong et al., 2014, see for details Appendix J) and followed where possible, aside from the general methodological constraints outlined in the section above.

The realist synthesis found twelve papers, all of which described studies conducted in Western countries, primarily in Europe (four in Norway, three in the Netherlands and the USA each, one in Denmark and the United Kingdom each). This needs to be considered in regard to the generalisability of the IPT across the globe, as individuals from differing cultures, religions, or other

backgrounds may experience care farms and care farm animals substantially differently (Jegatheesan, 2015; Sinclair et al., 2022).

Another limitation is the variable quality of the research in the field, which is further compounded by the uncertainty regarding the realist quality assessment criteria (see Appendix B). Additionally, given the current scarcity of research in the field, the IPT created from the realist review should be considered incomplete and could be reviewed further if more work in this area is published.

At the same time, whilst some elements of the IPT arose less frequently than others, the IPT synthesised data from a minimum of 50 care farms and 586 participants and no discrepancies between reports were found. This suggests that, whilst incomplete, the IPT may provide a meaningful early foundation for further exploration that promises to increase in coherence and generalisability with further refinement.

To the authors' awareness, this realist review is also the first of its kind to synthesise the impact of care farm animals from the perspectives of farm participants and to create an IPT on the topic.

Critical Appraisal of the Realist Evaluation

The realist evaluation quality and reporting standards were considered throughout this project (Wong et al., 2017; Wong et al., 2016, see for details Appendix K) and followed where possible, aside from the general methodological constraints outlined above.

The realist evaluation was restricted in regard to the sample's representativeness: most identified as female, and everyone was of White ethnicity, although age was spread across the adult lifespan. This may restrict the generalisability of the programme theory, as it is possible that those with other gender identities or from other ethnic, cultural or religious backgrounds may have different perspectives on the benefits of care farm animals, as well as engaging with different

animals in the first place (Jegatheesan, 2015; Sinclair et al., 2022). Therefore, clinicians and researchers should not assume that care farm animals are beneficial for all farm participants and, instead, consider that individuals from different demographic contexts may not value care farm animals to the same degree or may be impacted by them differently.

A key strength of this realist evaluation is that it is the first to explore through in-depth interviews the mechanisms that may underlie the impact care farm animals can have. The two participating care farms differed substantially in their set-up and in regard to the animals living there; however, despite this, the findings were coherent. Interview output was strengthened through their in-situ nature, i.e., interviews having been conducted on the farms, and for some participants, in the company of the animals. This allowed the researcher to engage more directly in the participants lived experiences, providing context to the interview (e.g., seeing and touching the animals themselves). Additionally, conversations could be more spontaneous and open-ended through, e.g., memories and other experiences being triggered by environmental cues, such as a snorting pig (Arntson & Yoon, 2023).

Throughout the interviews, everyone spoke very highly of the care farms and care farm animals without anyone raising points of criticism, which may be a sign of social desirability bias influencing these reports (Bergen & Labonté, 2020). Care was taken to ensure participants felt able to be open (see detailed in chapter five), and participants were advised that there were no right or wrong answers, and that the researcher was interested purely in their personal experiences. In hindsight, this might have been further mitigated by the researcher specifically asking whether participants perceived any elements of the farm or animal environment as negative or less positive. At the same time, positive-only reports have been reported in other care farm studies too (Iancu et al., 2014) and may be a true reflection of participants' experiences. In this study, many participants have attended the care farms for a number of years, such as one participant who had been attending for more than ten years. Furthermore, many participants used to attend the farm for one

day a week but spoke about having taken such benefit that they increased their attendance to two days a week. Moreover, no inconsistencies were noted within each participant's reports or between participants' reports (Bergen & Labonté, 2020). Further research in the field will be helpful to substantiate the findings.

Critical Appraisal of the Field of Care Farm Animal Research

A consideration in terms of the generalisability of the RPT and as a criticism for the research field of care farm (animals) is the Western-based nature of the existing research base. Most research on Green Care interventions, including care farms has been conducted in Europe, with some research in other Western countries such as the USA, but very limited research has been conducted towards the applicability of these interventions outside of Western countries (Haubenhofer et al., 2010; Social Farms & Gardens & Thrive, 2021). As highlighted above, individuals from different backgrounds may perceive green care interventions differently, so care should be taken when applying Western-based models to other countries without further research justifying their applicability.

Nonetheless, particularly in the Western world, care farms as a therapeutic concept and focus of research have undoubtedly been developing over the years, increasing in popularity for their target populations and evidence base. Whilst the appreciation of animal-assisted therapy has long been in the eye of clinicians, service users and researchers, it appears that the research focusing on a combination of both, i.e., care farm animals as a type of 'intervention' on care farms has received rather little attention, particularly from the perspective of farm participants themselves. This is evidenced by the relatively few studies included in the realist synthesis (twelve), the earliest being published in 2010, and the even fewer studies having focused on care farm animals specifically (two).

This was noticeable throughout the screening process of the realist synthesis: a substantial number of studies focusing on care farms were identified, many of which described the care farm as

having animals. Despite this, the majority of these studies were excluded from this synthesis due to not describing the impact the animals have on individuals' mental health. It stands to wonder why some of the studies focusing on care farm animals specifically describe the animals as being so significantly impactful, when other studies about care farms hardly or not at all mention the animals. Particularly as some evidence suggests that a farm would be 'miserable' without the animals, even if participants do not want to work with the animals (Steigen et al., 2022) or that farms with animals may be perceived as more meaningful than those without (Granerud & Eriksson, 2014); Hassink et al. (2017) even described the animals as 'the fabric of the care farm' (p.8). One potential explanation for this may be that the qualitative information gathered in most studies did not inquire specifically about the animals, so it is possible that participants felt less inclined to discuss their impact on them. Secondly, more participants may have talked about the impact of the animals, however, as the animals form a part of the farm, their impact may be difficult to separate from the impact of the farm itself, which was also found in this realist evaluation and formed the basis of the third CMOc, which focused on the animals in the context of the farm. Furthermore, many studies discuss the healing impact of the farm environment itself without specifying individual elements, thus likely including the animals as a factor without specifically naming them. Thirdly, depending on the focus of the qualitative enquiry, authors may have selected less animal-related quotes, thus making the farms and their impact appear less focused on animals than they may be in reality. Given this discrepancy, explorations into the impact of different elements of care farms and which elements are most impactful for whom should warrant further research.

Future Research

To further refine and test the RPT and the applicability of attachment theory, the CHIME framework or PTG to the context of care farm animals, more high-quality empirical research needs to be conducted, as well as research including participants from a wider range of demographic backgrounds to test whether and how the RPT applies to other populations (e.g., transgender or

Black people) with mental health difficulties, particularly as some populations may be more likely to experience challenges with their mental health than others (e.g., Bignall et al., 2019).

Care farms cover many different activities and tasks, frequently including animals, and every farm participant will feel more or less connected with different elements of the farm. To increase the effectiveness of care farms and clarify the importance of animals, further research should explore the impact of these different elements on farm participants and which elements are most impactful for whom and why. This may help streamline referrals to care farms and connect healthcare service users with services (in this case, farms) that may be more likely to target their particular needs. Given the resonance with the CHIME framework for personal mental health recovery, it would be interesting to examine these differences in farm engagement through measurement with a validated recovery measure, such as the Recovering Quality of Life questionnaire (ReQoL, Keetharuth et al., 2018).

Referring healthcare service users to care farms may be able to reduce pressure on healthcare services, particularly where care farms may be well placed to provide lower level but longer-term support (e.g., for individuals who experienced adverse life events or trauma whose mental health has been substantially affected but who do not necessarily present with symptoms of PTSD). However, this, as well as whether this would be cost-effective for healthcare services, has not yet been researched.

Building on this point, given the safe and supportive familial environment care farms are identified to be (see CMOc3), it would be meaningful to research whether employing professionals with a mental health background (e.g., Clinical Psychologists) on care farms through an integrated care approach may be cost-effective and beneficial for farm participants. Evidence does suggest that incorporating animals into therapy can enhance its effect (Marr et al., 2000). Attending a care farm whilst engaging in therapy on the farm may allow the practitioner to be more engaged with the farm participants' experiences (Arntson & Yoon, 2023) and allow the service user to, for instance, test out

beliefs of theories discussed in therapy in a safe environment. The psychological practitioner might also be able to directly involve the farm animals as co-therapists, which can furthermore prove beneficial in testing beliefs or increasing confidence and other wellbeing factors (Koukourikos et al., 2019), or in creating a safer space to allow the client to share difficult experiences (Schneider & Harley, 2006), although this does not yet seem to have been tested with care farm animals. Moreover, psychological professionals may be able to support their clients to reflect more consciously on the (positive) wellbeing and lifestyle changes that engagement with the farm (animals) can bring about, such as helping farm participants reflect on their beliefs about human relationships and how these may be mirrored in animals, which may increase the long-term effectiveness of the interventions. Additionally, psychological professionals present on a care farm may be able to better support farm participants in crisis or safeguarding situations (British Psychological Society, 2022; Saini et al., 2020) as well as support carers, friends or family members of farm participants, thus providing more holistic and patient-centred care. However, the authors were not able to find existing research evaluating the presence of psychological professionals on care farms; thus, the benefits and cost-effectiveness of this for the healthcare system and farm participants are recommended to be researched further.

Conclusion

This thesis portfolio examined the impact care farm animals can have on adults with mental health difficulties, such as experiences of adverse life events, and provides a unique contribution to the field. The RPT indicates that care farm animals can impact a wide range of health, wellbeing and social factors that can combine to support individuals' personal mental health recovery journey beyond improving clinical symptomology. The findings also indicate support for the use of Attachment Theory as an explanatory model for the impact of care farm animals. Therefore, care farm animal interventions may be helpful for a range of people with a variety of mental health difficulties and other needs and may be perceived through Attachment Theory or models of mental

health recovery, such as the CHIME framework. The portfolio recognises that care farm animals are one of the many elements of care farms that will require further research before they may be able to find a recognised role in the support and treatment of mental health or social difficulties.

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Appendices

Appendix A

Author Guidelines for Health & Place

About the journal

Aims and scope

Health & Place is an interdisciplinary journal dedicated to the study of the role of place in understanding health and health care.

Recent years have seen closer links evolving between health geography, medical sociology, health policy, public health and epidemiology, amongst other disciplines. The journal reflects these convergences, which emphasise differences in health and health-related experiences between places, the social, cultural and political processes shaping the contexts for health, the health-related experience of healthcare provision, the development of health care for places, and the innovative methodologies and theories underpinning the study of these issues.

The journal publishes original research articles, short communications, opinion papers and reviews relevant to any aspects of health where place is a central theme in the research. It brings together contributors from geography, sociology, social policy, population health science, public health and other related disciplines. The journal also welcomes proposals for special issues - please visit our Special Issues Proposal page to find out more information.

We welcome research that offers comparative perspectives on the difference that place makes to the incidence of ill-health, the structuring of health-related behaviour, the provision and use of health services, and the development of health policy. We are interested in submissions informed by a theoretical framework, that inform policy and practice, and of general interest to an international readership.

At a time when the role of place is increasingly recognised as being crucial to enhancing population health and reducing health inequity, *Health & Place* provides a forum for summarizing developments and reporting on the latest research findings. The journal seeks to maintain the highest standards of peer-reviewed excellence, as well as to provide a forum for interdisciplinary debate on the connections between health and place.

Article types

Articles should normally be 4000-6000 words long (excluding figures, tables and references), although articles longer than 6000 words will be accepted on an occasional basis, if the topic demands this length of treatment. Authors are responsible for ensuring that all manuscripts (whether original or revised) are accurately typed before final submission. Manuscripts will be returned to the author with a set of instructions if they are not submitted according to our style.

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The Opinion Paper section exists for the expression of opinion and as a forum for debate (1000-2000 words).

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This journal follows a double anonymized review process. Your submission will initially be assessed by our editors to determine suitability for publication in this journal. If your submission is deemed suitable, it will typically be sent to a minimum of two reviewers for an independent expert assessment of the scientific quality. The decision as to whether your article is accepted or rejected will be taken by our editors. Authors who wish to appeal the editorial decision for their manuscript

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All authors should have made substantial contributions to all of the following:

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2. Drafting the article or revising it critically for important intellectual content.
3. Final approval of the version to be submitted.

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- Only in exceptional circumstances will the journal editor consider the addition, deletion or rearrangement of authors post acceptance.
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- gender
- race
- ethnicity
- culture
- sexual orientation
- disability or health condition

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No assumptions should be made about the beliefs of readers and writing should be free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions.

These guidelines are meant as a point of reference to help you identify appropriate language but are by no means exhaustive or definitive.

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There is no single, universally agreed-upon set of guidelines for defining sex and gender. We offer the following guidance:

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- Definitions of sex and/or gender applied should be explicitly stated to enhance the precision, rigor and reproducibility of the research and to avoid ambiguity or conflation of terms and the constructs to which they refer.

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- Gender generally refers to socially constructed roles, behaviors and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society.

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Appendix B

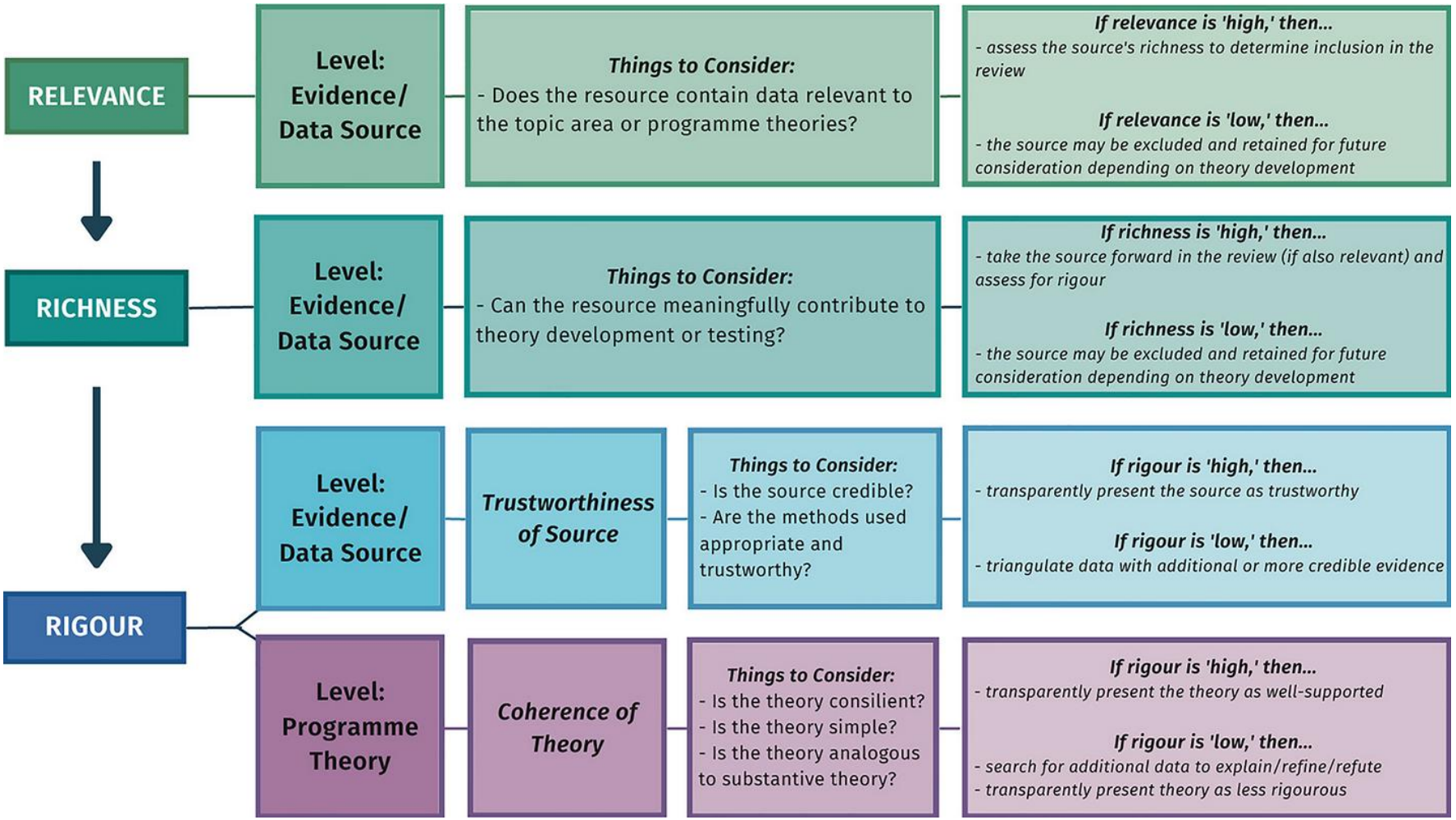
Realist Synthesis Evidence Appraisal Criteria, Process of its Application and Outcomes

The RAMESES (Realist And Meta-narrative Evidence Syntheses: Evolving Standards) projects provide guidance and standards for realist research projects (https://www.ramesesproject.org/), including some guidance on the quality assessments for realist reviews, which differ from those of more traditional literature reviews. For instance, the focus of quality assessment lies more on the relevant data points within a piece of research than the methodology of the research itself (Dada et al., 2023). Three concepts are applied in considering the data available: relevance, richness and rigour. Relevance considers whether a point of data can add to the theory-building or testing process, and its assessment may be similar to the exclusion and inclusion criteria used in traditional systematic reviews. Richness considers how valuable data is in terms of contributing to the programme theory. Rigour is an assessment of the credibility or trustworthiness of the method that was used to generate the data in question (Dada et al., 2023; Wong et al., 2014). Rigour is also assessed in relation to the coherence of the programme theory created, which may be done in regard to its explanatory strength compared to previous theories. Thagard (1989) explained a theory as more coherent if it was simple, explained a greater range of evidence and was in line with existing theories on the topic.

Guidance on how to define and apply these concepts remains unclear and differs across the literature. Dada et al. (2023) provide a diagram that may be used to aid the assessment and reporting of the three R's (see Figure B.1). For the purpose of this review, the three R's will be assessed in the following manner.

Figure B.1

Considerations for applying relevance, richness and rigour in realist reviews. Taken from Dada et al. (2023, p. 509)



Conceptualisation of the Three R's

Relevance will be assessed through the inclusion and exclusion criteria typical for a traditional systematic review, which was described as an appropriate way to interpret relevance (Dada et al., 2023; Hunter et al., 2022).

As the assessment of richness remains not well defined, possibly due to being a more recent concept (Booth et al., 2013), the current authors will use the subsequent four-point scale based on descriptions by Dada et al. (2023) alongside a consideration of how many relevant quotes were in each of the articles:

> 0 = no data of value, 1 = limited data of value, may be found in other articles, but adds to the evidence base, 2 = some data of value, 3 = lots of data of value

Given the uncertainties that remain in the field of quality assessment for realist reviews, particularly around rigour, Dada et al. (2023) suggest that instead of using prescriptive traditional assessment tools that aren't in line with realist methodology, researchers should use their own knowledge to judge a study's and data's rigour and document this transparently. This may be done through the design of individualised tools or guiding questions that may be based on traditional checklists. Based on these suggestions, and as uncertainties remain regarding how to best assess rigour in realist reviews, a combined approach was chosen. Firstly, a standard critical appraisal tool for qualitative studies was used to gather methodological quality information. The appraisal tool created by the Oxford Centre for Evidence-Based Medicine (2020, CEBM) was used for this purpose to gather information for the rigour assessment (see Table B.1 for an example of this). CEBM was selected as it has a long history of conducting research and considering its quality (see their website, https://www.cebm.ox.ac.uk/). Additionally, CEBM provides a quality assessment tool specific to qualitative research that outlines what to look for and where to likely find information to answer each question, thus not only being easier to use but also likely reducing interpretation bias and increasing comparability of outputs.

Table B.1

Example of information gathered via the CEBM quality assessment tool for Thieleman et al. (2022)

CEBM Questions	Rating Options: Yes – No - Unclear
Rationale for research: Does the paper describe an important clinical problem and is the question clearly formulated?	Yes - The purpose of this study was to investigate how bereaved individuals experience a grief-specific care farm and the perceived effects of the visit on their lives
Was a qualitative approach appropriate?	Yes – investigation of individuals' experiences
Was the sampling strategy appropriate for the approach?	Yes – anyone who visited the farm for the relevant reasons in the study timeframe
What were the data collection methods?	Yes – survey with open-ended questions
How were data analysed and how were these checked?	Yes – content analysis with elements of interpretations – themes were generated by one author and reviewed by other authors; they only included themes that came up in at least 10% of responses
Is the researcher's position described?	No
Do the results make sense?	Yes – themes/ concepts presented appear credible and answer the research question; however, quotes were not linked to specific participants
Are the conclusions drawn justified by the results?	Yes – the analysis/ results explain why people behave in the way they do; data fits the existing knowledge base; discussion & conclusions draw on specific examples; no 'so what' recommendations were offered
Are the finding transferable to other clinical settings?	Yes – sample had a good age range; also range of reasons of losses and persons that were lost; further descriptions provided regarding participants' income, previous exposure to farm animals, and time since loss. The sample was predominantly female.

Alongside other information from each study, this information was then applied to the three-point rating scale created by Morton et al. (2021, supplementary file 3) for their realist review, see Table B.2. This approach was chosen to best combine the variations in rigour descriptions that are found in the literature, such as that by Wong et al. (2014), who state that rigour assesses the quality of the methodology of the study, 'whether or not the method used to generate a particular

piece of data is credible and trustworthy' (p.35), and that by Dada et al. (2023), who discuss that the data itself, rather than the study, should be assessed for rigour.

Table B.2

Rigour assessment guidance taken from Morton et al. (2021)

Useful Questions	Is this data likely to be biased? Is it dealt with critically? Is it from a real-world example or theoretical speculation? Was the data gathered in some depth over time or in a quick "snapshot"? Is it safe to generalise from this data?
Low Rating	A low rating might mean data appear uncritically treated and at a high risk of bias (e.g. from a promotional article for a service) or simply descriptive and superficial in its reporting of basic facts from an intervention programme (e.g. from a short news article).
Medium Rating	A medium rating might mean data appears with some attempt at critical evaluation and is from a real-world example, but is limited in scope and generalisability, or in depth and detail.
High Rating	A high rating might mean data is of good depth and detail and is from a critical evaluation of at least one real-world example, gathered over a sustained period using a range of robust measures and an appropriate sample of participants.

The assessment scale from Morton et al. (2021) was interpreted along six criteria in regard to the study and relevant data points: depth and detail, longitudinal assessment, critical evaluation of the data and whether data is from a real-world example or theoretical, robustness of measures used and appropriateness of sample. Each category was interpreted along a traffic light scale: green, orange, red, except for two categories that only had a green and red rating (see Table B.3). The amalgamation of those fed into an overall rigour rating of high, medium or low.

Table B.3

Rigour assessment details per criteria and for the overall rigour rating, interpreted based on the rigour assessment guidance from Morton et al. (2021)

Criteria	Description
Detail and Depth	green = study's primary focus is on animals, theme/ extensive discussion about animals, author interpretations & relevant quotes
	orange = study's primary focus is not mainly on animals, but has themes or extensive discussion about them and author interpretations & relevant quotes
	red = study's primary focus is not animals, no overarching themes or extensive discussion about animals, some to no relevant quotes and only or mainly author interpretations
Longitudinal	green = more than one time-point
	red = only one time-point
Critical evaluation	green = names data analysis methodology, immersion into data through transcripts being read multiple times, authors' deliberated the process of analysis and/ or results together (e.g., Greenhalgh & Taylor, 1997)
	orange = not meeting one of the criteria for a green rating
	red = not meeting 2+ of the criteria for a green rating
Real-world example	green = yes
	red = no
Robustness of measures	green = interview or focus group are semi-structured (Adhabi & Anozie, 2017); for surveys to be purposeful, include open-ended questions & be piloted (Robinson & Leonard, 2024)
	orange = semi-structured interview or focus group or in-depth survey but with influencing factor possibly reducing output quality (e.g., time delay between intervention & data collection)
	red = interviews/ focus groups are not semi-structured, too few participants, open-comment boxes in surveys are limited or questions lead

Table B.3 (*continued)*

Criteria	Description
Appropriateness of sample (i.e., is the sample in line with population under investigation in the synthesis)	green = adults (16+) attending the care farm primarily due to their mental health orange = like green, but additional influencing factors like unemployment or substance use are present in the sample red = not adult age range, not attend care farm primarily due to mental health
Overall robustness rating	High = 0-1 red, 0-1 orange, 4+ green Medium = 0-2 red, 0-2 orange, 3+ green Low = 3+ red, 3+ orange, 2 or less green

Assessment of the Three R's

It is important to note that a level of implicit bias remains when considering realist review quality assessments, as the concepts are not well defined. This also makes comparability of quality assessments difficult, as the review by Dada et al. (2023) demonstrates that many authors don't define the three R's or how they assess for them well if at all. Additionally, Dada et al. (2023) report on different ways different authors have interpreted and conceptualised the three R's, henceforth, making comparability even more difficult. This will remain a problem until the three concepts and their assessment will become defined and their definitions accepted in the literature.

Furthermore, the rigour assessment considers whether relevant data points may be biased. All data may be biased in as much as participants who decided to partake in the studies may differ from those who decided not to in regard to how much they benefit from the interventions, are reflective, and are willing to discuss their thoughts and feelings. As this is a general consideration inherent to much research, this will not be considered as 'bias' in the rigour assessment but is important to remain aware of in considering the coherence and generalisability of the IPT.

The three R's were considered during full-text screening of reports. 169 articles were assessed for eligibility and relevance using the inclusion and exclusion criteria defined. 12 articles remained to be assessed for richness and rigour; given the scarcity of data on the topic, these assessments did not lead to exclusions of further articles; instead, they were reported transparently, and their impact was discussed alongside the theory coherence rigour assessment. Additionally, given the tight inclusion and exclusion criteria used for the relevance assessment, the authors did not expect a richness rating of 0, despite relevant quotes per study ranging from none to twenty. See Table B.4 for outcomes of the richness and rigour assessment and Table B.5 for details of the rigour assessment.

Table B.4

Richness and rigour assessment outcomes

Authors & Year	Richness Rating (0-3)	Rigour Rating (low to high)
Cacciatore et al., 2020	3	medium
Ellingsen-Dalskau et al., 2016	1	medium
Gorman & Cacciatore, 2023	3	medium
Granerud & Eriksson, 2014	2	low
Hassink et al., 2010	1	low
Iancu et al., 2014	1	medium
Leck et al., 2015	1	medium
Pedersen et al., 2012	3	high
Poulsen et al., 2020	1	high
Schreuder et al., 2014	1	medium
Steigen et al., 2022	2	medium
Thieleman et al., 2022	3	medium

On gathering information for the rigour assessment through the CEBM, a few points are worth noting. There seemed to be a general variation regarding how study participants were sampled and based on what criteria, alongside variations in the descriptions of the participants, where some studies only mentioned age or gender. Most studies used semi-structured interviews to gather data. Analysis approaches varied, and the depth in which they were described did so too, thus, it is unclear whether some studies' quality was reduced, e.g., as authors either didn't mention the shared discussion of data outputs or whether this didn't happen in the first place. The results provided generally made sense and were in line with the research questions of the individual studies; however, most studies were poor at tracking quotes back to participants or their demographic characteristics. The conclusions drawn seemed generally in line with existing theories and expectations, but recommendations for practice were hardly made by authors. Transferability and generalisability of data varied according to potential methodological flaws and a lack of variation in participants. Overall, methodological qualities vary between studies, as would be expected.

Programme Theory Coherence Assessment

In considering the coherence and generalisability of the IPT created, as suggested by Dada et al. (2023) to be important, it becomes clear that as with assessing the three R's on a data level, guidance on how to assess theory coherence in realist reviews is limited. However, Dada et al. (2023) propose that the rigour of the programme theory should also be assessed, suggesting using criteria by Thagard (1989), namely, whether a theory can explain the data and does so better than previous theories, is simple making few assumptions, and is in line with existing credible evidence.

To the authors' awareness, the current IPT is the first one to amalgamate evidence as to the mental health benefits of care farm animals; prior to this, evidence was available in the form of theories that lacked empirical substantiation in the field. Therefore, the IPT creates an improved understanding of the topic.

As to the point of simplicity with few assumptions, it is unclear how this is defined. The IPT created is a synthesis of information gathered from twelve studies, and relevant data between studies was not contradictory. However, in the spirit of transparency, some of the elements of CMOcs arose less frequently than would have been anticipated. Therefore, a level of assumption remains as to how the data was put in relation to one another in the CMOcs and the IPT.

This is likely related to most of the studies not having had a central focus on care farm animals, thus, these studies presented fewer data points related to these animals to be able to be included in this synthesis (as can be noted from the richness assessment above). This may not be a reflection of these data points not having been observed or not being observable, but possibly rather a consequence of a differential focus of investigation.

Theory coherence may have been enhanced by only including studies with richness ratings of 2 or 3, however, given that this is the first IPT on the topic and the scarcity of the existing data overall, the authors prioritised breadth of data over frequency. This decision was also made considering that none of the data that arose appeared ‘unusual’ or was ‘unexpected’, i.e., all data was felt to be analogous to our existing understanding of mental health and what may affect it, albeit in different contexts, such as that a sense of connection may improve people’s mental health (e.g., Haslam et al., 2022) or that engagement in meaningful activity provides a purpose (e.g., Hooker et al., 2020).

Table B.5

Details of rigour assessment along the six criteria and overall rigour rating

Author & Year	Depth & detail?	Longi-tudinal?	Critical evaluation?	Real-world example?	Robust Measures?	Appropriate sample?	Rigour rating
Cacciatore et al., 2020	Primary focus is not animals, Animal-related theme, 10 relevant quotes & many author interpretations	No	Thematic Analysis, Doesn't specify data immersion or data deliberation between authors	Yes	Semi-structured interviews (21)	Yes	Medium
Ellingsen-Dalskau et al., 2016	Primary focus is not animals, Animal-related theme, 1 relevant quote & some author interpretations	No	Modified version of systematic text condensation, Data immersion & data deliberation between author are specified	Yes	Semi-structured interviews (10)	Influencing factor of unemployment	Medium
Gorman & Cacciatore, 2023	Primary focus is on animals Animal-related themes 16 relevant quotes & many author interpretations	No	Thematic analysis, Doesn't specify data immersion or data deliberation between authors	Yes	Survey (120) developed based on criteria & tested on selected participants	Yes	Medium
Granerud & Eriksson, 2014	Primary focus is not animals Animal-related theme 4 relevant quotes & some author interpretations	No	Inspired by grounded theory, Data immersion is specified, Doesn't specify data deliberation between authors	Yes	Semi-structured interviews (20), some participants are former farm attendees	Influencing factor of drug addictions (for some participants) & unemployment	Low
Hassink et al., 2010	Primary focus is not animals No animal-related theme 0 relevant quotes (author interpretations only)	No	Analysis approach unclear, Doesn't specify data immersion, Data deliberation between authors is specified	Yes	Semi-structured interviews (16)	Yes	Low
Iancu et al., 2014	Primary focus is not animals No animal-related theme 1 relevant quote & some author interpretations	No	Doesn't specify analysis approach, Data immersion & data deliberation between authors is specified	Yes	Semi-structured interviews (14)	Yes	Medium

Table B.5 *(continued)*

Author & Year	Depth & detail?	Longi-tudinal?	Critical evaluation?	Real-world example?	Robust Measures?	Appropriate sample?	Rigour rating
Leck et al., 2015	Primary focus is not animals No animal-related theme 1 relevant quote & some author interpretations	Yes – across 2 time-points	Discourse & thematic analysis techniques, Doesn't specify data immersion or data deliberation between authors	Yes	Survey at 2 time points (216 & 137 respondents) & semi-structured interviews (33)	Influencing factor of drug addictions (for some participants)	Medium
Pedersen et al., 2012	Primary focus is on animals Animal-related themes 16 relevant quotes & many author interpretations	No	Modified version of systematic text condensation, Data immersion & data deliberation between author are specified	Yes	Semi-structured interviews (8) but one year after the intervention	Yes	High
Poulsen et al., 2020	Primary focus is not animals No animal-related theme 0 relevant quotes (author interpretations only)	Yes – across 3-4 time points	Interpretative phenomenological analysis, Data immersion & data deliberation between author are specified	Yes	28 participants across 20 semi-structured interviews & 9 focus groups	Influencing factor of refugee status of participants & unemployment	High
Schreuder et al., 2014	Primary focus is not animals No animal-related theme 2 relevant quotes & some author interpretations	No	Interpretative phenomenological analysis, Data immersion & data deliberation between author are specified	Yes	Semi-structured interviews (9)	Yes	Medium
Steigen et al., 2022	Primary focus is not animals No animal-related theme 5 relevant quotes & many author interpretations	Yes – across 1-4 time-points	Qualitative content analysis, Data immersion is specified, Doesn't specify data deliberation between authors	Yes	9 participants across 20 semi-structured interviews	Influencing factor of unemployment/ out of school (for some participants)	Medium
Thieleman et al., 2022	Primary focus is not animals No animal-related theme but extensive relevant discussions 20 relevant quotes & author interpretations	No	Content analysis & qualitative content analysis, Doesn't specify data immersion, Data deliberation between authors is specified	Yes	Survey (115) developed based on criteria & tested on selected participants	Yes	Medium

Appendix C

Interview Participant Information Sheet

Interview Participant Information Sheet

You And Your Care Farm Animals: Exploring How They Benefit You

You have been approached by your care farm because they think you might be interested in taking part in this research. This study explores why and how care farm animals impact people who have experienced adverse life events or trauma. It is important to understand why this study is being done and what your participation would involve. Please read carefully through the below information and do not hesitate to contact me if you have any questions. My contact details are at the bottom of this form.

1. What is this study about and why is it being done?

This study aims to better understand why care farm animals may have a positive impact on humans who have experienced adverse life events or trauma. Despite many people loving animals and greatly enjoying their company little scientific knowledge exists as to *why* animals have this effect on humans. It is important that a better understanding of this is established, as this can support the development of animal-assisted interventions for people who have experienced adverse life events (or other mental health difficulties). For some people, animal-assisted interventions can seem preferable over traditional talking therapy for various reasons and whilst we know *that* animal-assisted interventions are beneficial for humans, we need to better understand *why* so that they can be standardised and offered more frequently.

2. What would taking part involve?

If you are considering taking part in this study, you have the opportunity to contact the researcher to discuss any questions or concerns that you may have (see contact details at the end of this form).

Please also note that you can request the interview schedule (i.e., the questions that will be asked in the interview) if you wish; you can do so any time before or after agreeing to take part in the study.

If you would like to take part, you will be asked to complete three short pre-interview forms (either digitally or on paper; all digital elements of this study will be conducted via the survey platform 'Jisc') that will take no longer than 10 minutes to complete. This will include a very brief eligibility questionnaire; if based on this you are eligible to take part you will be asked to complete a consent form and an information gathering questionnaire. You may ask care farm staff or others to assist you in completing these, if required. Then, the researcher will contact you to arrange a date for a face-to-face interview which will happen on the premises of the care farm that you regularly visit. The interview will last approximately one hour to 1.5 hours, and you can ask the interviewer for a break, if required. If you and the care farm are in agreement, the interview will happen in the company of your preferred care farm animal and can involve an activity, such as taking the animal for a walk. The interview will be audio recorded and you might be asked to wear a little microphone. The researcher might also take some notes throughout.

Photo elicitation: Just prior to the interview, you have the option to take a photograph of an animal-related aspect of the care farm that carries the greatest meaning for you. It cannot include humans in a way that they may be identifiable. If you wish to do this, then discussing why you've taken the photograph you have may lead into the start of the interview. This is an optional element of your participation in the study. If your photograph should be included in the write-up and publication of the study you have the option to be credited for this in any way you like (e.g., full name, initials, first/last name only, pseudonym).

Interview questions: The interview is 'semi-structured'. This means that the researcher has a set of questions they would like to ask, but that based on your answers they may also ask further questions not noted in the previously defined set of questions. During the interview, you will be asked questions about how you relate to your preferred care farm animal or other care farm

animals, as well as how they may or may not have helped you in managing the adverse life event(s) you have experienced. *Please note, that* y*ou will not directly be asked to talk about your adverse life experiences*. We want to find out why and how you benefit from the company of and interactions with care farm animals in relation to your adverse life experiences, so some possible questions might be: "*What words would you use to describe how you feel when you are with the care farm animals?*" or "*Do you feel the care farm animals have helped you manage the adverse life events you've experienced differently?*" If you are unsure about what you might be asked in the interview, please contact the researcher and they can provide you with the set of interview questions, but please be aware that given the 'semi-structured' nature of the interview it is not possible to fully predict what questions you may be asked. *Please be reassured that if during an interview you do not wish to answer a question you can advise the researcher of this, and they will move to the next question.* Please also note that you can request for a care farm staff member to be present for some or all of the interview if required, however, they will not be able to speak for you but only be present for your comfort.

3. Who can take part in the study?

Inclusion criteria:

- You have to be at least 18 years old.
- You have to identify as having experienced one or multiple adverse life events or trauma at any point in your life. *A trauma or adverse life event might be anything that you have experienced that has been highly upsetting and that has stayed with you emotionally and/ or has led to some changes to your life or to your feelings about yourself, others and/ or your life.*
- You have to currently be regularly visiting a care farm where you are accessing an animal-related intervention or support in relation to the above adverse life experience(s) and feel

able to reflect on this intervention/ support.

Animal related intervention/ support could be defined as: "*any intervention that intentionally includes or incorporates animals as part of a therapeutic or ameliorative process or milieu"* (Kruger & Serpell, 2010, p.36). This could involve working with a farm animal, taking care of them or their surroundings or purely enjoying their company, as well as anything in between.

4. What are possible benefits of taking part?

For your participation, you will be compensated with a £10 Amazon voucher. Otherwise, there are no specific identified benefits that you may gain from taking part in this study aside from knowing that you have helped the development of this area of research and intervention.

5. What are possible risks or disadvantages of taking part?

It is important that you are aware of potential ways that this study could impact you before agreeing to take part. Whilst you will not directly be asked to talk about the adverse life event(s) you have experienced, we will ask you to consider the impact of care farm animals on these experiences. It is possible that during or after the interview you may experience distressing thoughts, feelings or memories about these or other things you have experienced. If this should happen during the interview and you feel distressed, please let the interviewer know so that this can be discussed. They may suggest a break or termination of the interview. If you should feel distressed at any point after the interview, please seek further support from the care farm staff, talk to your GP or you can contact the Samaritans, who are a confidential 24/7 listening service on 116 123. We would like to emphasise that it is important you don't feel you have to be alone when you are in distress.

Whilst for the purpose of this study your identity will remain anonymous, if the researcher felt that you or someone else was at imminent risk of any form of harm it is their duty of care to take necessary actions and speak to appropriate others to ensure everyone's safety as much as possible.

'Appropriate others' may be the care farm managers, a crisis team or safeguarding teams. In most cases, the researcher will discuss this with you before speaking with others.

If you are unsure whether partaking in the study could be too distressing for you, then please re-consider your interest or discuss your concerns with the care farm staff.

6. What happens with the information that is collected about me?

The audio recording of the interview will be transferred onto a secure location as soon as possible after the interview. The interview will be transcribed whereby your name will be replaced with a participant ID, e.g., 'participant 1' or a fake name. All other possible identifiable information will also be removed (e.g., names of people or places you might refer to). You are given the opportunity to review the transcript of the interview before it is analysed. The recording will be deleted as soon as the transcription is completed. In further analysis, write-up and potential publication of the study your unique participant ID will be used, which means your identity will remain protected. There will be one password protected document also stored in a secure location which will link all participants IDs to their names. This is important in case of withdrawal (see next question). All information will be dealt with in compliance with the UK's Data Protection Act (Gov.uk, 2018).

7. Do I have to take part in this study? What if I change my mind?

Participation in this study is entirely voluntary. Whether you take part or not will not affect the support or engagement you receive from the care farm you regularly visit. If you have agreed to take part but change your mind, you can do this at any time. This means, you can change your mind and withdraw from the study before, during or after the interview. After completion of the interview (or after review of the transcript; see point 8 below) you have the opportunity to withdraw for four weeks; after the four weeks have passed you will no longer be able to withdraw your data as it will already have been analysed. If you would like to withdraw you can contact the researcher asking to do so verbally or via the contact details at the end of this form. You will not have to give any reason

for wanting to withdraw. If you decide to withdraw, any information held about you (e.g., the interview recording or transcription) will be deleted.

8. Will I be told about the results of the study?

Unfortunately, it won't be possible to provide information about your individual results. However, if you wish, after completion of the study, you can be emailed a summary of the results. You can request this when you sign the consent form.

You will also have the opportunity to review the transcript of your interview. *This is optional*. The purpose of this would be for you to be able to remove anything that upon reading it you decide you no longer want to be included, as well as to add clarity to points, if you wish to do so. You will be offered this at the end of the interview, and you can request this for up to two weeks after the date of your interview via the researcher's contact details. If you decide to review your transcript you can request a digital or printed copy; printed copies will be passed on through the care farm. After receipt of the transcript, you will have three weeks to review this and provide commentary. You can return your commentary via email or on paper (via the care farm). If three weeks have passed and the researcher has not heard back from you they will assume that you do not wish to make adaptations to your transcript.

9. Is there anything else I should know?

If you would like further information about this study, please contact the researcher via the below contact details. If you would like to make a complaint or have a concern about this study, you can also contact the researcher via the below contact details. Please note that ethical approval for this research has been sought and gained through the University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Committee. If you would like to make a complaint or have a concern about this study and would like to speak to someone unrelated to this study, you can contact Professor Sian Coker via s.coker@uea.ac.uk.

10. I would like to take part – what's next?

Please ensure you have read this participant information sheet carefully, understood everything and been in contact with the researcher, if needed.

If you would like to take part, you can complete the pre-interview forms either digitally or on paper.

Digital completion: If you'd like to complete them digitally, please scan the below QR code or enter the URL into the search bar of your web browser. This will bring you to a page where you can find a digital copy of the participant information sheet you have just read. If you consent to continue you will be directed to a brief eligibility questionnaire. If you meet the criteria required for participation in this study you will be directed to a digital consent form, which includes some points that you have to agree to in order to be able to take part, and some optional points too. Once you've agreed to all required parts you will be directed once more to a brief information gathering questionnaire. The researcher will be made aware once you've completed this and will soon after be in touch to further discuss your participation and arrange a mutually convenient date for the interview.

Paper copy completion: If you prefer to complete the pre-interview forms on paper, please ask the manager at your care farm for these. They will provide you with the brief eligibility questionnaire, which includes a box for you to tick that allows the care farm to pass your contact details to the researcher. This form will be stored safely in a locked filing cabinet on the care farm. Once the researcher has received a scan of this form and you meet eligibility criteria, they will get in contact to arrange a mutually convenient date for the interview. On the day of the interview, you will be asked to complete the consent form and the information gathering questionnaire (both on paper).

URL: https://app.onlinesurveys.jisc.ac.uk/s/uea/care-farm-animals-interview-participants

QR code:

If at any point you should have any questions, please do not hesitate to contact the researcher via the contact details below.

Thank you for your interest in this study.

Jessica Fath

Norwich Medical School

Faculty of Medicine and Health Sciences

University of East Anglia

NORWICH

NR4 7TJ

j.fath@uea.ac.uk

Project supervisor: Dr Bonnie Teague (b.teague@uea.ac.uk).

Appendix D

Interview Participant Eligibility Questionnaire

Eligibility Questionnaire - Interview Participants

Please note that the questions below are required to be answered to determine whether you are eligible to take part in this study.

1. **What is your age range? ***

   ☐ Under 18 ☐ 18 to 24 ☐ 25 to 34

   ☐ 35 to 44 ☐ 45 to 54 ☐ 55 to 64

   ☐ 65 to 74 ☐ 75 or older

2. **Do you self-identify to have experienced one or multiple adverse life events or trauma at any point in your life? ***

   A trauma or adverse life event might be anything that you have experienced that has been highly upsetting and that has stayed with you emotionally and/ or has led to some changes to your life or to your feelings about yourself, others and/ or your life.

   ☐ Yes

   ☐ No

3. **Are you currently accessing an animal-related intervention/ support on this care farm in relation to the adverse life event(s) or trauma you've experienced? ***

   Animal related intervention/ support could be defined as: "any intervention that intentionally includes or incorporates animals as part of a therapeutic or ameliorative process or milieu" (Kruger & Serpell, 2010, p.36). This could involve working with a farm animal, taking care of them or their surroundings or purely enjoying their company, as well as anything in between.

   ☐ Yes

   ☐ No

4. **Do you feel able and safe to reflect on your experiences with animal-assisted interventions/ support in relation to the adverse life event(s) or trauma you have experienced during a 1:1 interview? ***

   (please note: you will not be asked to talk about the adverse life event(s) or trauma you have experienced).

   ☐ Yes

   ☐ No

Consent to contact: do you agree for the care farm to pass your name and contact details to the researcher so that they may contact you to discuss the next steps of your participation in this research? Please note that if you do not agree you will not be able to participate in this study.

☐ Yes

☐ No

Name: _____

Email address: _____

Appendix E

Interview Participant Consent Form

Interview Participant - Consent Form

If you would like to participate in this research, it is important that you read and sign this consent form. Please note that the below consent form includes some points that you have to agree to in order to be able to take part, and some optional points too. The required points are marked with an asterisk *.

1. I confirm that I have read and understood the information sheet for the above study. ☐ *

2. I understand the possible risks of taking part. I understand that I will not directly be asked about the adverse life events I have experienced, but that the nature of the interview and study topic might bring up thoughts, feelings or memories related to this. I understand what I can do if participation in the study should distress me. ☐ *

3. I understand that if the researcher felt concerned about my imminent safety or the imminent safety of others, it is their duty of care to take necessary actions and contact other authorities to ensure everyone's safety as much as possible. I understand that in most cases the researcher will aim to discuss this with me before talking to necessary others. ☐ *

4. I understand that my participation is voluntary and that I am free to withdraw within four weeks after completion of the interview or receipt of the transcript without giving any reason and that in this case, my data will be removed from the study and destroyed. ☐ *

5. I understand that the interview will be audio recorded. ☐ *

6. I understand that my data will be protected and anonymised and that only the researcher and her supervisors will have access to information linking my data to my identity. If the study

should be published, I understand that the publication will not contain any information that could identify me. ☐ *

7. I have had the opportunity to discuss my involvement or any questions with the researcher, and had my questions answered satisfactorily. ☐ *

8. I agree that other researchers may access my anonymised data (i.e., the interview transcriptions and anonymised demographic information) and use it for other research purposes and publications. This helps research progress faster as it avoids for the same research to be repeated unnecessarily. It can also allow for research to be verified and for its results to be combined with other similar studies, and thus, make findings more robust. (**optional**) ☐

9. I would like to be sent a summary of the final results of the study. (**optional**) ☐

   If you ticked this box, please provide an email address below:

   _____

* Name of Participant: _____

* Date: _____

Appendix F

Information Gathering Questionnaire

Additional Information Gathering - Interview Participants

We would like to gather some demographics data and other relevant information about you and your experiences at the care farm and with the animals to get a better idea of who is partaking in this study. Most of these questions are voluntary, so you can skip those that you don't want to answer. Please note that the required questions are marked with an *.

Demographics Data

1. **What gender do you identify with?**

☐ Female ☐ Trans-female

☐ Male ☐ Trans-male

☐ Non-binary ☐ Other

2. **What is your ethnicity?**

☐ White British or Other White

☐ Black British or Other Black

☐ British Asian or Other Asian

☐ Any other Mixed / Multiple ethnic background

☐ Any other ethnic background

3. **Geographic Living Status**

☐ Urban ☐ Sub-urban ☐ Rural

4. **Do you have a pet at home? If so, what type of pet and how many? If you like you can share a little bit about them here.**

<u>Information about your experiences</u>

1. **Aside from attending the care farm, are you currently receiving any treatment or support for the adverse life event(s) or trauma you have experienced?**

   ☐ Yes

   ☐ No

2. **Have you previously received any treatment or support for the adverse life event(s) or trauma you have experienced?**

   ☐ Yes

   ☐ No

If you would like to give information in regard to the above two question about current or past treatment/ support that you have received you can do so in this box.

Care Farm and Animal-Related Information

1. **Which care farm are you regularly visiting at the moment? ***

2. **Can you briefly describe what the animal-related intervention/ support that you engage with on this care farm involves? ***

3. **How often do you receive this animal-related intervention/ support at the care farm? ***

4. **How long have you received this animal-related intervention/ support at the care farm for? ***

5. **Is there an animal that you feel you have particularly bonded with on the care farm? If so, can you tell us a little bit about this animal?**

Appendix G

Participant Debrief

Participant Debrief

You And Your Care Farm Animals: Exploring How They Benefit You

Thank you for your participation in this study exploring the mechanisms through which care farm animals impact humans with a history of adverse life events. We appreciate that participation can cause distress for some people.

If you should feel distressed following your participation in this study, please don't feel that you have to be alone with this and know that support is available. If you feel comfortable doing so, you can also speak to your friends or family for support, as well as care farm staff.

You can also access the following for further support:

- Speak to your GP.
- If you need more urgent support you can contact the NHS helpline 111 option 2.
- Contact the Samaritans – they are a 24/7 confidential listening service – you can call them via 116 123.
- SANE offer email and phone support. You can call them on 0300 304 7000 between 4pm and 10pm every day of the year, and even ask for a call back; you can email them via support@sane.org.uk.

Thank you for your participation in this study.

If you should have any questions about this research project, you can contact the primary researcher Jessica Fath (j.fath@uea.ac.uk). Alternatively, you can contact the project supervisor Dr Bonnie Teague (b.teague@uea.ac.uk).

If you would like to make a complaint or have a concern about this study and would like to speak to someone unrelated to this study, you can contact Professor Sian Coker via s.coker@uea.ac.uk.

The study received ethical approval from the University of East Anglia Faculty of Medicine and Health Sciences Research Ethics Committee.

Kind regards,

Jessica Fath

Appendix H

Ethics Approvals

Original ethics application ETH2324-0011 for which approval was granted on 29th November 2023.

University of East Anglia

University of East Anglia
Norwich Research Park
Norwich. NR4 7TJ

Email: ethicsmonitor@uea.ac.uk
Web: www.uea.ac.uk

Study title: Understanding the mechanisms through which care farm animals impact humans with a history of trauma – creating a programme theory using a realist evaluation approach lay study title: You and your care farm animals: exploring how they benefit you

Application ID: ETH2324-0011

Dear Jessica,

Your application was considered on 29th November 2023 by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee).

The decision is: **approved**.

You are therefore able to start your project subject to any other necessary approvals being given.

If your study involves NHS staff and facilities, you will require Health Research Authority (HRA) governance approval before you can start this project (even though you did not require NHS-REC ethics approval). Please consult the HRA webpage about the application required, which is submitted through the IRAS system.

This approval will expire on **25th September 2025**.

Please note that your project is granted ethics approval only for the length of time identified above. Any extension to a project must obtain ethics approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) before continuing.

This ethics approval is granted under the condition that all procedures are performed by a trained and competent person.

It is a requirement of this ethics approval that you should report any adverse events which occur during your project to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) as soon as possible. An adverse event is one which was not anticipated in the research design, and which could potentially cause risk or harm to the participants or the researcher, or which reveals potential risks in the treatment under evaluation. For research involving animals, it may be the unintended death of an animal after trapping or carrying out a procedure.

Any amendments to your submitted project in terms of design, sample, data collection, focus etc. should be notified to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) in advance to ensure ethical compliance. If the amendments are substantial a new application may be required.

Approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) should not be taken as evidence that your study is compliant with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018. If you need guidance on how to make your study UK GDPR compliant, please contact the UEA Data Protection Officer (dataprotection@uea.ac.uk).

Please can you send your report once your project is completed to the FMH S-REC (fmh.ethics@uea.ac.uk).

I would like to wish you every success with your project.

On behalf of the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee)

Yours sincerely,

Dr Paul Linsley

Ethics amendment ETH2324-1318 for which approval was granted on 19th January 2024.

University of East Anglia
Norwich Research Park
Norwich. NR4 7TJ

Email: ethicsmonitor@uea.ac.uk
Web: www.uea.ac.uk

Study title: Understanding the mechanisms through which care farm animals impact humans with a history of trauma – creating a programme theory using a realist evaluation approach lay study title: You and your care farm animals: exploring how they benefit you

Application ID: ETH2324-1318 (significant amendments)

Dear Jessica,

Your application was considered on 19th January 2024 by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee).

The decision is: **approved**.

You are therefore able to start your project subject to any other necessary approvals being given.

If your study involves NHS staff and facilities, you will require Health Research Authority (HRA) governance approval before you can start this project (even though you did not require NHS-REC ethics approval). Please consult the HRA webpage about the application required, which is submitted through the IRAS system.

This approval will expire on **25th September 2025**.

Please note that your project is granted ethics approval only for the length of time identified above. Any extension to a project must obtain ethics approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) before continuing.

This ethics approval is granted under the condition that all procedures are performed by a trained and competent person.

It is a requirement of this ethics approval that you should report any adverse events which occur during your project to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) as soon as possible. An adverse event is one which was not anticipated in the research design, and which could potentially cause risk or harm to the participants or the researcher, or which reveals potential risks in the treatment under evaluation. For research involving animals, it may be the unintended death of an animal after trapping or carrying out a procedure.

Any amendments to your submitted project in terms of design, sample, data collection, focus etc. should be notified to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) in advance to ensure ethical compliance. If the amendments are substantial a new application may be required.

Approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) should not be taken as evidence that your study is compliant with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018. If you need guidance on how to make your study UK GDPR compliant, please contact the UEA Data Protection Officer (dataprotection@uea.ac.uk).

Please can you send your report once your project is completed to the FMH S-REC (fmh.ethics@uea.ac.uk).

I would like to wish you every success with your project.

On behalf of the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee)

Yours sincerely,

Dr Paul Linsley

Appendix I

Reflexive Journal Excerpts

Below are a few excerpts from my reflexive journal written at different time points: after an initial visit of farm two, after my first interview, after my fourth and fifth interview (on farm 1, conducted on the same day), after my sixth and seventh interview (on farm 2, conducted on the same day), a brief reflection after completion of all ten interviews, reflections on the analysis process and on using the reflexive journal. Also, see an example of the summary notes I took after each interview to note the main points that stood out to me.

Reflections after having visited farm 2 for the first time:

> *Seeing farm 2 today was great; everyone was so friendly, and luckily, the weather was perfect. I'm so excited to get started with this project and come back here to learn more about the atmosphere of the farm and the animals. And how big is Flora! Can she even still see with those ears flopping into her face?! More practically, I need to think about what [manager name] said about the animals 'just' being one part of the farm and not overfocusing on them. This feels tricky, as obviously my topic is the animals, and I don't mean to dismiss the other aspects of the farm, but equally, maybe I am putting too much focus on the animals by only exploring their impact rather than the impact of the farm as a whole? Equally, the project needs* a *focus, plus I love animals… I wonder if the end product of the project will show anyway that everyone sees the animals as one of the many helpful aspects of the farm? I guess I'm not saying they are THE most important aspect, but only one? I need to think about how to discuss this next time with [manager name] so that he feels I've heard his concern.*

Reflections after my first interview

PP1 didn't have any suggestions on what I could do or ask differently and said he actually enjoyed the conversation as it helped him reflect on the reason why he benefits from the farm and the animals so much. It was quite funny to listen to him talk about how much he loves the pigs dearly, and then how this love turns into his love and appreciation for when the pigs on the farm turn into bacon and sausages once or twice a year. I guess maybe that's just a different way of benefitting from the animals and a true appreciation of the life cycle of all beings?

Reflections after interviews four and five

Farm 1 has such a lovely atmosphere. Literally, feels like a family. Everyone was sharing lunch and being so kind and supportive of each other; some chatter, but also some silences; it just felt so comfortable. Anyway, it was lovely that they invited me to have lunch with them, which in a way felt like I was able to see another side of the farm aside from the animals and the obvious and the interviews with my participants. On top of that, I was welcomed after the second interview to stay for a bit longer and join a board game, again, such a familiar and supportive and welcoming atmosphere. More in relation to my project, what I did notice from today's interviews (and the previous two, really) is that participants really appreciate the farm as a whole. I guess [manager name] has approached these particular individuals as she felt they might for one, be willing and able to participate in this study, but also as they must have some affinity to the animals (I'm sure they have farm participants who do not feel so connected to the animals), but even with these participants describing such a close connection to the animals and how they benefit from this, I could also really hear what [manager of farm 2] said to me last summer, namely, that the animals are just one of the elements that make the farm great and helpful. That really hit home today, I think. I'll have to think about and talk to my supervisor about how to make sense of that in my final analysis

and write-up. Whilst the focus of my thesis is of course the animals, it would be wrong to dismiss this impression that seems to be forming so clearly?

Reflections after interviews six and seven

I really thought I loved the atmosphere on farm 1, but now having been 'back' on farm 2 and this time, properly engaged with some farm participants, this really is something. How can the 'feeling' of the two farms be so different? I mean, as far as I can tell from the two interviews on farm 2 today, the content about the animals etc. is going to be roughly the same and maybe everything participants will say is roughly the same, but why do the farms 'feel' so differently then? Both give off a sense of family and welcoming, but in really different ways that I can't even describe. Farm 1 is so much smaller with less people and less animals… how do the farm participants differ? Or is it the sense that farm 2, through being so much bigger and more open spaced… is that a sense of freedom that I *feel because of the environment itself and its spaceyness? I wonder if this difference that* I *feel will come out at all in the data… how would I even notice that? And would it be because of* my *feelings of the farm or because the farms are actually different? If it's my feelings, how can I protect the analysis from that?*

Also, I loved how participant six talked about the goats and named all of them as if they were her friends. I guess maybe she does see them as her friends?!

Interview summary notes written down shortly after interview 10

- *Being needed – the crash broke him and he felt he couldn't do anything, but the animals give him a sense that he still can do things and even can be needed*
- *Not just about making animals happy, but also sense that focus on animals helps distract from the rest of the rubbish stuff ?*

- *Areas that animals have helped: self-worth, not being judged, doing things that thought wouldn't be able to do anymore*
- *Focus on the animals instead of other rubbish going on, push through own limitations and worries by prioritising the animals*
- *Physical health improvements on the farm also help outside of the farm*
- *Dragonfly – standing for new beginnings, but also at the farm the dragonfly he saw that was missing its back end, but still going about life and resonates with him as he's struggling inside but going about life AND then the frog that somehow survived the lawn mower unscathed, like PP10 did also survive his crash when he feels he shouldn't have! Is this identification with the animals here? Or is this something else ?*

Reflections after all interviews

Two main reflections: animals are amazing. Love them! And secondly, care farms are amazing, people take SO much from them. And, like [manager of farm 2] said last year, every single participant has literally said that the animals are super important to them, but they are ultimately just one element of the farm. I'll miss not being able to go back to the farms to soak up more of the atmosphere! There is so much untapped power on these farms; how are we as society not making more use of this?

Reflections on the analysis process

Below are two reflective excerpts written during the analysis process, namely one excerpt written after I'd turned the codes into CMOcs, and one written after I'd recognised the benefits of writing out the CMOc statements and looking back at the quotes as a way of enhancing the analysis and output.

Coming towards the end of coding, I felt excited to move into the analysis stage and to start to create my CMOcs that would become the (refined) programme theory. On having written

every code on a sticky note and thinking about the connections, I hadn't realised how difficult this process would be. Despite previous merging of codes, many codes and connections still felt to be overlapping and it felt difficult to create CMOcs that were distinct from each other. I spent a lot of time looking at the big piece of paper filled with sticky notes and shuffling the sticky notes around, drawing and erasing arrows. I then looked at examples of programme theories in other realist evaluation research and found one where the diagram of their programme theory is presented in an outward circle (i.e., context in the centre, mechanisms as first lines around and outcomes on the outside). This felt meaningful as a way to conceptualise my own data and helped me draw out my first sets of CMOcs. These were then discussed in supervision, where we reflected together on the different themes and connections, bouncing thoughts off each other, rearranging some connections, merging some codes and consequently renaming some Cs, Ms, and Os. It felt that the process of shared discussion and reflection about the data was the most meaningful way to make sense of the data, as it allowed for our thought processes to bounce off each other and build on each other. This collaborative reflexivity is suggested as an important element of qualitative research by Olmos-Vega et al. (2022).

Once the final three CMOcs had been created, I wrote them out into statements to ensure that the diagrammatic connections created made sense. I phrased the CMOcs as 'if… then… because…' (Leeuw, 2003) with the 'if' representing the context, the 'then' the outcome and the 'because' the mechanisms. Through this process, I recognised some errors in my phrasing and sense-making, such as how 'maternal feelings' could be an outcome of the context of 'animals having desired human traits'. Through also looking back at the quotes, I was able to make sense of such errors and either rectify them by removing the elements, merging them with other, more relevant ones or re-writing the statements so that they were in line with participants' quotes. This part of the process felt satisfactory as I experienced it as the final steps of sensemaking of the data and looking at the refined programme theory, I felt that the

contents and connections were both meaningful and coherent and overall, reflective of the data I had gathered and thus, hopefully reflective of the farm participants' experiences.

Learning from using the reflexive journal (written during the portfolio write-up process)

I have always valued the learning that I can take from written or verbal reflections, but despite this, thinking back to the start of the thesis project, I felt some resistance to keeping a reflexive journal. This was possibly because it felt like there was so much to do for this project, so spending time writing a journal about the process felt like an extra task, when usually, when I write reflections, this happens in moments of my choice. In hindsight, I am very pleased that I was disciplined enough to (mostly) keep to writing a reflective journal, and that I noted down at least a few sentences at most points during the project, because I think it helped my process of making sense of the project itself as well as its data and all the processes involved in it.

I believe keeping a reflexive journal has also improved my interview skills and helped to frame my perspectives for every next interview. Whilst I didn't adapt the interview schedule based on an interview, writing reflections afterwards meant I was more aware of occurring themes, which I was able to notice better during subsequent interviews and thus, explore further. Whilst given the time restricted nature of the DClinPsy thesis, I wasn't able to fully follow proposed guidance for realist interviews (i.e., conduct multiple rounds of interviews with the same people using previously acquired data to influence subsequent interviews, RAMESES, 2017), keeping the journal meant that I was to some degree able to 'refine' or 'test' themes that had stood out and explore them further in follow-up questions, given that I knew they had been mentioned previously, and might thus, be relevant for hypothesis building and the programme theory.

Appendix J

Quality and Publication Standards for Realist Synthesis

Quality and publication standards for realist syntheses were designed by the RAMESES project (Realist And Meta-narrative Evidence Syntheses: Evolving Standards, https://www.ramesesproject.org/).

Realist Synthesis Quality Standards

The realist synthesis quality standards suggest considering the quality of a realist synthesis along eight standards (Wong et al., 2014, pp. 31-36). These standards were considered during the planning, execution, analysis and write-up of the empirical project. Table J.1 outlines the eight quality standards, their description and how these were or weren't met or considered.

Table J.1

Realist synthesis quality standards as outlined by (Wong et al., 2014, pp. 31-36) and how these were reported in this realist synthesis. Unless otherwise stated, references to specific sections refer to chapter two

Quality Standard	Description	How standards were considered/ applied
1. The research problem	The topic is appropriate for a realist approach, and the research question is constructed suitably for a realist review.	Animal-assisted activities on care farms may be seen as a healthcare 'intervention'; a better understanding of the mechanisms driving change in these interventions will be helpful for the development of this programme and related (healthcare) policies; the research question was constructed considering the generative causation underpinning realist principles.
2. Understanding & applying the underpinning principles of realist reviews	The review demonstrates understanding & application of realist philosophy; realist logic underpins the analysis.	See description of realist principles in 'Methods'.

Table J.1 *(continued)*

Quality Standard	Description	How standards were considered/ applied
3. Focusing the review	The review question is sufficiently & appropriately focused.	The review was purposefully focused on care farm animals as one particular 'intervention' on care farms as a way of enhancing our understanding of particular aspects of care farms better, rather than aiming to begin by understanding such a multifaceted intervention in itself. The review was further streamlined by focusing on adults and the impact of the animals on them from farm participants' perspective.
4. Constructing & refining a realist programme theory	An initial programme theory is identified and developed.	See introduction – no current programme theory exists on care farm animals.
5. Developing a search strategy	Data found via the search strategy is able to develop, refine or test a programme theory.	Given the temporal constraints of the doctoral programme during which this thesis was conducted, it was not possible to conduct multiple rounds of searches and explore multiple types of sources (e.g., social media content) on the topic to further establish/ enhance/ create an initial programme theory; however, the search strategy used was able to identify relevant data for a programme theory.
6. Selection & appraisal of documents	Ensuring that selected material contains material with sufficient rigour; sources need to allow the reviewer to make sense of the topic area and to develop/refine/test a programme theory.	All reports were assessed for relevance, richness and rigour in line with recommendations by Dada et al. (2023) and Wong et al. (2014), see Appendix B for details. Given the scarcity of data on the topic, no reports were excluded on rigour and richness. All sources were able to add to some degree to the programme theory.
7. Data extraction	Data extraction processes capture necessary data to enable a realist review.	Any data that clearly referenced the impact of care farm animals was extracted. Data was not extracted if it did not clearly reference the impact to be related to the care farm animals or only referenced activities with them. Data extracted was comprehensive enough to form CMOcs and an initial programme theory.
8. Reporting	The synthesis is reported using the guidelines by Wong et al. (2013).	See Table J.2, which outlines how the publication guidelines for realist syntheses were considered and met.

Realist Synthesis Publication Standards

Publication standards also exist for realist syntheses. Table J.2 is a summary of these standards recommended by Wong et al. (2013, p. 4), and a description regarding how they were reported in this realist synthesis. It is the authors' belief that all reporting standards were met through qualitative reflection.

Table J.2

Realist synthesis publication standards as outlined by Wong et al. (2013, p. 4) and how these were reported in this realist synthesis in chapter two. Unless otherwise stated, references to specific sections refer to chapter two

	Article Section	Description	Reported in document?
1.	Title	Name document as a realist synthesis in the title.	Yes
2.	Abstract	To include brief detail on: study's background; review question; search strategy; methods of selection, appraisal, analysis and synthesis of sources; main results; implications	Yes
3.	Introduction – Rationale for review	Explain why review is needed and what it may contribute.	Yes – rationale for review is outlined throughout introduction
4.	Introduction – Objectives and focus of review	State objectives of review/ review question; define and give rationale for focus of review.	Yes – stated at end of introduction
5.	Methods – Changes in the review process	Describe & justify changes made to initially planned review processes.	No – this was not described as the evaluation was conducted as initially designed
6.	Methods – Rationale for using realist synthesis	Explain why a realist synthesis approach was most appropriate.	Yes – stated under 'Methods – Design'

Table J.2 *(continued)*

	Article Section	Description	Reported in document?
7.	Method – Scoping the literature	Describe & justify initial process of exploratory scoping of literature.	Yes – outlined throughout the introduction and 'Methods – Step 1'
8.	Method – Searching processes	Provide rationale for how iterative searches were done; details on sources accessed for information; for electronic databases should provide: name, search terms, dates, last date searched.	Yes – see 'Methods – Step 1-5'
9.	Method – Selection & appraisal of documents	Explain & justify inclusion & exclusion criteria used; outline quality assessment used.	Yes – see 'Methods – Step 3-4'
10.	Method – Data extraction	Describe, explain & justify which data was extracted.	Yes – see 'Methods – Step 4'
11.	Method – Analysis & synthesis processes	Describe analysis & synthesis in detail.	Yes – see 'Methods – Step 5'
12.	Results – Document flow diagram	Consider using flow diagram to report number of documents assessed for eligibility and included; provide reasons for exclusion & source of origin of documents.	Yes – see 'Methods – Step 3'
13.	Results – Document characteristics	Describe characteristics of included documents.	Yes – see Table 1 in 'Results'
14.	Results – Main findings	Present key findings with specific focus on theory building & testing.	Yes – see 'Results'
15.	Discussion – Summary of findings	Summarise main findings considering evaluation questions, purpose, programme theory and intended audience.	Yes – see 'Discussion' section

Table J.2 *(continued)*

Article Section	Description	Reported in document?
16. Discussion – Strengths, limitations & future research directions	Discuss strengths & limitations considering all steps of the evaluation process and trustworthiness of the explanatory insights emerged; future direction of the programme.	Yes – see 'Discussion' section
17. Discussion – Comparison with existing literature	If appropriate, compare and contrast findings to existing literature.	As appropriate – existing data is limited; findings were discussed in light of some other existing theories that may explain why and how animals may be able to have positive impacts on humans.
18. Discussion – Conclusion & Recommendations	List main implications in context of other relevant literature; if appropriate, offer recommendations for policy/practice.	Yes – see 'Discussion – Implications for policy and practice'
19. Discussion – Funding	If relevant, state funding source & role played by funder and conflicts of interest.	Yes – reported after the 'Discussion'

Appendix K

Quality and Reporting Standards for Realist Evaluation

Quality and reporting standards for realist evaluations were designed by the RAMESES project (https://www.ramesesproject.org/).

Realist Evaluation Quality Standards

The realist evaluation quality standards suggest considering the quality of a realist evaluation along eight standards (Wong et al., 2017, pp. 21-29). These quality standards were considered during the planning, execution, analysis and write-up of the empirical project. However, given the temporal constraints of this Doctorate in Clinical Psychology programme, meeting some of these quality standards was not possible and thus needed to be adapted. Table K.1 outlines the eight quality and reporting standards, their description and how these were or weren't met or considered.

Table K.1

Realist evaluation quality standards as outlined by Wong et al. (2017, pp. 21-29) and how these were reported in this realist evaluation. Unless otherwise stated, references to specific sections refer to chapter four

Quality Standard	Description	How standards were considered/ applied
1. Evaluation purpose	Realist evaluation approach is appropriate; evaluation questions are framed in line with realist evaluation methodology.	A clear evaluation purpose was stated in the form of a research question and explanations regarding the literature gap that this evaluation will (begin to) fill (see introduction); in 'Methods', justification for why this approach was used is provided; the research question is phrased in line with realist evaluation methodology.
2. Understanding & applying realist principles of generative causation in realist evaluations	A realist principle of generative causation is applied.	Generative causation refers to CMOcs and how their elements influence each other; results were presented in this manner.

Table K.1 *(continued)*

Quality Standard	Description	How standards were considered/ applied
3. Constructing and refining a realist programme theory	An initial programme theory is identified or refined.	The evaluation was used to refine an initial programme theory; however, given temporal limitations, only one type of data was used (i.e., interview data). Discussion of findings in regard to applicability in different contexts (e.g., mental health recovery) are presented. Implications of the refined programme theory are outlined.
4. Evaluation design	Evaluation design is justified and described; ethical clearance was obtained if required.	Ethical clearance was acquired. Given temporal limitations, the evaluation consisted of one stage only instead of multiple rounds of theory refinement. The evaluation was conducted as originally planned.
5. Data collection methods	The methods chosen are suitable for gathering data needed in a realist evaluation.	Interviews were the chosen data collection method, and the required data was obtained through them. Enough data was gathered to test and refine all elements of the initial programme theory. However, given temporal constraints, only one round of interviews was used to collect data to refine the initial programme theory, i.e., data could not be triangulated. Also, data collection was not 'multi-method' as data was only acquired through interviews; this was also related to temporal constraints. Consequently, these factors are limitations to the design and coherence of the refined programme theory.
6. Sample recruitment strategy	Participants can provide sufficient data for a realist evaluation.	Purposive sampling methods were used, impacting the representativeness of the sample. There was only one stage of interviews, which did not allow for multiple rounds of theory refinement, given temporal constraints. The sample was not diverse in regard to gender or ethnicity, but had a good age range. Participants provided sufficient and relevant data during interviews to allow for the initial programme theory to be refined.
7. Data analysis	The analysis is retroductive and in line with the realist principle of generative causation. A realist logic of analysis is applied to develop/ refine the programme theory.	The principles of generative causation and retroduction were inherent to the analysis of data. The initial programme theory was tested and refined; the elements that were not refined were highlighted in blue in the refined programme theory diagram. Interrelated CMOcs were created and outlined. The iterative retroductive nature of the analysis is further detailed in chapter five (extended methodology) under 'analysis process'.

Table K.1 *(continued)*

Quality Standard	Description	How standards were considered/ applied
8. Reporting	The evaluation is reported using the guidelines by Wong et al. (2016). Findings and implications are clear and reported in line with realist assumptions.	See Table K.2, which outlines how the reporting guidelines for realist evaluations were considered and met. Findings are clearly reported and follow from the data and analysis. Implications are outlined and recommendations for further research are made. The report considers how the mechanisms and outcomes are specific to the contexts they are triggered by and considers (see discussion) how the findings may or may not apply to other groups.

Realist Evaluation Reporting Standards

Reporting standards also exist for realist evaluations. Table K.2 is a summary of the reporting standards recommended by Wong et al. (2016, pp. 4-5), and a description regarding how they were reported in this realist evaluation. It is the authors' belief that all reporting standards were met.

Table K.2

Realist evaluation reporting standards, as outlined by Wong et al. (2016, pp. 4-5) and how these were reported in this realist evaluation. Unless otherwise stated, references to specific sections refer to chapter four

	Article Section	Description	Reported in document?
1.	Title	Name the document as a realist evaluation in the title.	Yes
2.	Abstract	To include brief detail on: programme under evaluation, programme setting, purpose of evaluation, evaluation question & objectives, evaluation strategy, data collection, documentation, analysis methods, key findings, conclusions – if required brief detail about participants & sampling process – needs to be sufficiently detailed so that its clear a realist evaluation was used & a programme theory was developed/ refined.	Yes

Table K.2 *(continued)*

	Article Section	Description	Reported in document?
3.	Introduction – Rationale for Evaluation	Explain the purpose of the evaluation & implications for its focus & design.	Yes – under 'research question' at the end of introduction, the purpose & implication are stated (i.e., to better understand the impact of care farm animals on adults with a history of adverse life events).
4.	Introduction – Programme theory	Describe the initial programme theory underpinning the programme.	Yes – presented as a diagram in the introduction.
5.	Introduction - Evaluation questions, objectives, focus	State evaluation question & objective; also, whether & how a programme theory was used to define the scope & focus of the evaluation.	Yes – see under 'research question' at the end of the introduction.
6.	Introduction – Ethical approval	Detail the ethical approval gained.	Yes – presented under 'Methods - Ethics'.
7.	Methods – Rationale for using realist evaluation	Explain why this approach was chosen & (if relevant) adapted.	Yes – stated under 'Methods – Research Design'.
8.	Methods – Environment surrounding the evaluation	Describe the environment in which the evaluation took place.	Yes – across the paper, the environment 'care farm' is clearly stated repeatedly; under 'Methods – Participants', more details about the participating care farms are also provided.
9.	Methods – Describe programme under evaluation	Provide details about the programme under evaluation.	Yes – see 'Methods – Participants' for details about the participating care farms & the animal-related activities offered.
10.	Methods – Describe & justify evaluation design	Description & justification of the design that was planned, what was done and why.	No – this was not described as the evaluation was conducted as initially designed.

Table K.2 *(continued)*

	Article Section	Description	Reported in document?
11.	Methods – Data collection methods	Describe & justify data collection methods; also, how they fed into developing or refining the programme theory; describe steps taken to enhance trustworthiness of data collection & documentation	Yes – interview details & justification are described under 'Methods'; the 'Methods - Analysis' section in chapter four and the extended analysis process description in chapter five (additional methodology) outline how the data collected was used to refine the programme theory. Research integrity was maintained by, e.g., manually checking transcripts for accuracy or validating codes/themes/CMOcs with other authors (see 'Methods- Analysis').
12.	Methods – Recruitment process & sampling strategy	Describe how recruitment was done & how the sample contributed to the development/ refinement of the programme theory.	Yes – outlined under 'Methods - Participants'; further details in chapter five (additional methodology).
13.	Methods – Data analysis	Describe in detail how the data was analysed.	Yes - outlined under 'Methods - Analysis; further details in chapter five (additional methodology).
14.	Results – Details of participants	Report who took part in the evaluation, details of the data they provided and how this was used to develop/ refine the programme theory.	Yes – outlined under 'Methods – Participants'.
15.	Results – Main findings	Key findings, linking them to contexts, mechanisms and outcomes and how they were used to refine the programme theory.	Yes – see 'Results' section.
16.	Discussion – Summary of findings	Summarise main findings considering evaluation questions, purpose, programme theory and intended audience.	Yes – see first few paragraphs of the 'Discussion' section, including diagram of the full refined programme theory.
17.	Discussion – Strengths, limitations, future directions	Discuss strengths & limitations considering all steps of the evaluation process and trustworthiness of the explanatory insights emerged; future direction of the programme; implications.	Yes – see 'Discussion' section; only some limitations, strengths and implications could be named in the main paper (chapter four); further details around these can be found in chapter seven (critical appraisal and discussion).

Table K.2 *(continued)*

	Article Section	Description	Reported in document?
18.	Discussion – Comparison with existing literature	If appropriate, compare and contrast findings to existing literature and similar programmes.	As appropriate – existing data is limited; findings were briefly discussed in reference to mental health recovery perspectives and attachment theory. Further references of the findings to existing literature can be found in chapter seven (critical appraisal and discussion).
19.	Discussion – Conclusion & recommendations	List main conclusions; if appropriate, provide recommendations	Yes – see 'Discussions – Implication & Conclusion'.
20.	Discussion – Funding & conflict of interest	If relevant, state funding source & role played by funder and conflicts of interest.	Yes – reported after the 'Discussion'.