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Enabling factors and constraints for the adoption of animal welfare-enhancing technologies among Finnish dairy farmers

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The restructuring of dairy farm production has resulted in enlarged unit sizes and production capacities on commercial farms in Finland. Concurrently, the livestock sector is facing high expectations and pressure to enhance farm animal welfare. Many dairy farms have invested in state-of-the-art technology, e.g. the proportion of milk milked by robots had risen 41% by 2019. Using a survey framework based on the constructs of the Theory of Planned Behavior (TPB), our aim was to explore which factors may limit farmers' willingness to adopt animal welfare-enhancing solutions. The decision to adopt a technology can be seen as a holistic issue that is affected by farmer attitudes, farm-specific constraints, and information provided by trusted sources. The financial situation of farms, appropriate technological devices, animal welfare, and human well-being should all be considered holistically. We utilize our exploratory survey sample as an indicator for discussing the current situation. The most critical constraints were related to financial issues, farmers' personal coping challenges, and device operation problems in the barn environment. To promote the adoption of new technologies, farmers require technical and other support from trusted groups and evidence on the functionality of the technology. The insights from this exploratory study highlight the importance of available resources; the most important deficiencies related to available resources were financial and personal capacity to cope with duties.

KEYWORDS

adoption of technology, animal husbandry, farm animal welfare, constraints, dairy farm, Finland, milk production

1 Introduction

The livestock sector is currently facing high public expectations and pressure to enhance farm animal welfare (EC, 2020; Kantar, 2020). The capacity of farms to respond to these expectations in combination with on-going financial challenges may contribute to diverse outcomes, such as decisions to develop and modernize the farm actively or to exit the production sector. This process concerns Finland at least, as restructuring of the livestock production sector has been rapid during the past years.

Humans may express behaviors to improve animal welfare based on both anthropocentric and altruistic attitudes. These motives can also influence farmers' decision-making and the costs and benefits that are associated with improving animal welfare (see Lusk and Norwood, 2011). Previous research has identified that dairy farmers may favor high-quality animal welfare solutions because of both use values related to internal and external pressures faced by the farmer and non-use values linked to factors such as animal freedom, ethical reasons, and building business-to-customer relationships (Owusu-Sekyere et al., 2021).

Milk production growth within the European Union is estimated to gradually decline, and the sector will need to adapt by implementing higher environmental standards during the forthcoming decade (EC, 2021). Although nearly half (48%) of the dairy farms in Finland have ceased production during the past decade, the total production volume has remained stable (Ruokatieto, 2021). Many remaining dairy farms have expanded their production capacities and invested in state-of-the-art technology. In many cases, farm size increases involve the adoption of new technologies (Nielsen, 2022). Adopting precision dairy technology may be assessed as a method for reducing labor demands (Gargiulo et al., 2018) or for improving labor efficiency, productivity, and sustainability (Dela Rue et al., 2020).

Technological progress and advances in information management may provide enabling conditions for monitoring and enhancing environmental sustainability and animal welfare in dairy production (Stygar et al., 2021). Life-long health monitoring, delivery of individual animal care, and optimization of environmental conditions may all be applied (Dawkins, 2021). Caja et al. (2016) noted that new technologies include automatically collected data related to animal physiological, production, and behavioral measurements, which would further ease observations related to animal health and welfare. A new dairy farm and engineering design has been proposed (van Weeghel et al., 2021), where animals are considered agents and provided with opportunities for animal agency and for using their capacities to control the environment. With this approach, good animal welfare could be reached, along with functioning of the whole system (van Weeghel et al., 2021).

In the case of Finnish dairy farms, increased productivity has mostly been attributed to advances in production and farm management technologies (Niskanen, 2020). According to Utriainen et al. (2019), medium and large dairy farms had high utilization rates of various on-farm sensor technologies. These were most commonly used to observe the physical properties and somatic cell counts of milk and cow activity. The highest sensor utilization was among users of the automatic milking system (AMS), as the sensors are provided with the AMS package. Technological change has modified and modernized the cattle housing environment. For example, the AMS was introduced in Finland around the turn of the millennium, after which the proportion of milk milked by robots rose 41% by 2019 (Manninen, 2020). In the same year, approximately one-third (32.3%) of the milk produced in the Nordic countries was milked by AMS. The share was highest in Norway (57.2%) and lowest in Sweden (23.5%) (Manninen, 2020). Cogato et al. (2021) estimated that globally, AMS farms are mainly located in Europe.

Related to animal welfare, most cows in Finland (70% in 2021) live in loose housing barns (Ruokatieto, 2022) in which they can move around freely. Although the proportion of grazing cattle farms has declined, most dairy farms (76% in 2021) still provide outdoor grazing or free movement options. Some specific animal welfare measures have been incentivized by a public animal welfare compensation scheme, which was received by over half (57%) of Finnish cattle farms in 2021 (Ruokatieto, 2022).

Technological solutions may prove useful in enhancing animal welfare. Hence, it is important to understand factors that may limit farmers' willingness to adopt welfare-enhancing solutions. A widely used approach to explain the adoption of novel practices is the reasoned action theory and its extension, the Theory of Planned Behavior (TPB) (Fishbein and Ajzen, 1977; Ajzen, 1991). TPB has previously been applied in studies related to dairy farmers (Bruijnis et al., 2013; Hall et al., 2019a, Hall et al., 2019b). TPB explains people's behavioral intentions, such as the intention to adopt a welfare-enhancing technology, by examining how individual's attitudes, subjective norms (e.g., peer-farmers' influence on individual behavior), and perceived behavioral control (e.g., financial or physical factors that constrain or enable the adoption of a behavior in practice) affect their intentions (Rehman et al., 2007).

Following TPB (Ajzen, 1991; Ajzen, 2002; Bruijnis et al., 2013), we propose that farmers are willing to apply animal welfare-improving technologies, but that their intentions may be constrained by a range of factors. These include the views of other dairy sector professionals, attitudes concerning technologies, resource-related factors that render it challenging for them to adopt the technologies, and their beliefs about farm animal welfare (Figure 1). Beliefs and constraints can be particularly important, as animal welfare is a sensitive issue that can divide people's opinions, and constraints can make it impossible to adopt a technology.

2 Methods

An online questionnaire was developed using TPB (Fishbein and Ajzen, 1977; Ajzen, 1991) as a guideline. This theory, extended with personal normative beliefs (Bruijnis et al., 2013), was chosen as a theoretical framework, since it considers several elements and assessments like attitudes, beliefs, perceived behavioral control, intended behavior, and self-reported behavior around a decision maker. The survey focused on the elements presented in Figure 1.

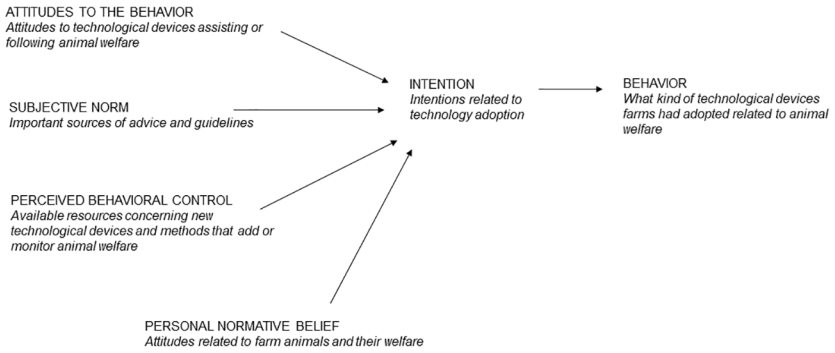

FIGURE 1
The presentation of the Theory of Planned Behavior (TPB) (Ajzen, 1991) and added personal normative beliefs (Bruijnis et al., 2013). The corresponding questions or assessments (italic text) in a dairy farm Internet survey in June–July 2021. The presentation of TPB has included the elements of schematic presentation of (Bruijnis et al. (2013), page 104), where personal normative beliefs has been added.

The questionnaire and the included questions were evaluated question by question in a workshop with several participants; two experts were representatives of ProAgria, the agricultural advisory office South Ostrobothnia, and two participants were research scientists from Natural Resources Institute Finland. In addition, the questions were assessed by a representative of a national dairy farm advisory office. The questionnaire was tested also by a researcher of Luke who was not involved in the project. Thus, the questionnaire was assessed both by the representatives of research, the experts who carry on practical advisory work on farms in the South Ostrobothnia district and by an expert who guided this work nationally.

The survey was launched on 18 June 2021 and closed at the end of July 2021. The survey was targeted at the pilot farms of three ongoing projects, totally 24 farms. In addition, the survey link was also distributed to farmers who had enrolled to receive a public online newsletter produced by ProAgria, the national agricultural advisory body in Finland. The newsletter was sent to 6000 e-mail addresses, of which the receivers of 25% opened the letter and 17% opened the survey link. We thus received 37 responses. The data were anonymized, and the research team did not have access to the personal data of respondents. Therefore, it is not possible to define the share of project pilot farms and other farms which received and answered via the online newsletter link. One of the projects focused on improving dairy calf viability, another focused on improving rumen health in dairy cows and the third project focused on piloting precision livestock farming technologies.

Because of the small sample size, the responses were examined and are presented here in a descriptive manner. The questions included in some of the domains are presented in Figures 2, 3. Fully agree and somewhat agree shares were added up and reported as the share of agree and correspondingly, fully disagree and somewhat disagree percentage shares were added up and reported as the disagree share. Background variables of the survey farm sample and Finnish dairy farms are compared in Table 1. Nearly all (92%) respondents were women, and most of them (81%) had a professional qualification in agriculture. The survey theme, animal welfare, is closely related to women's expertise, as tasks related to animal health and welfare are typically the responsibility of women on Finnish dairy farms (Vainio et al., 2007; Kallioniemi and Kymäläinen, 2012). This may explain the high proportion of female respondents. Most dairy farms in Finland are family farms, which are run by a couple. According to Agricultural Census 2020, the work force on dairy farms was 18 047 persons including 48% farmers and joint owners, 27% family members and 25% regular or temporary labor force (Official Statistics Finland, 2020).

Loose housing barns (warm 42%, cold 28%) were the most common barn type. On average, the respondents had 78 dairy cows and the average annual milk production was 9 112 kilograms per cow. Over half (58%) of the respondents had an automated milking system, followed by pipeline milking in a tie stall barn (25%), and a milking parlor (17%). The sample had a high proportion of female respondents, and the sample farms had also utilized AMS systems more and had more cows than dairy farms involved in the milk production record system in Finland (Table 1).

2.1 Attitudes towards the behavior

The attitudes towards the behavior related to elements of TPB were asked with the following instruction: "Assess the following items, which are related to new, animal welfare-enhancing technical devices and methods." The assessed items were: "The devices really help to improve animal welfare", "The devices provide reliable information", "The devices add to the meaningfulness of animal care", "Complexity (of the operating system) is an obstacle for implementation", "It is economically profitable to buy the devices" and "The operational problems of cattle barn environment are an obstacle for implementation." Each item was assessed with the options: "fully agree", "somewhat agree", "neither agree or disagree", "somewhat disagree" or "fully disagree.

2.2 Subjective norm

The question and assessed options concerning the subjective norm are presented in Figure 2.

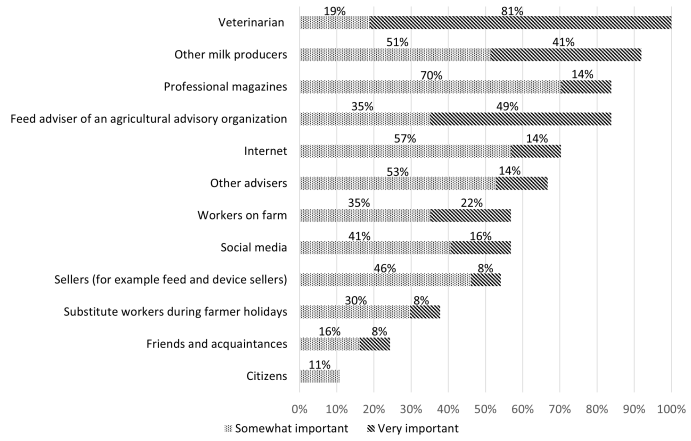

FIGURE 2
Subjective norm. The share of survey respondents who considered the views of specific actors as "very important" or "somewhat important". The posed question was: "The advice and guidelines are important to me, which are given by…?".

2.3 Perceived behavioral control

The perceived behavioral control was studied with the following instruction: "Assess the following items, which are related to new, animal welfare-enhancing technical devices and methods." The assessed items were: "Too little counselling and planning aid is available (for example, for system implementation)", "A lack of working time is a barrier to deployment", "The farm has too few financial resources to purchase new technology", "Too little unbiased information is available related to the property of the device (for example the options, the object of use and research)", "Too little information is available about the user experiences (for example about suitability, durability, compatibility)", "Problems related to coping are an obstacle to implementation" and "Too little advice and planning assistance is available (for example implementation)". Each item was assessed with the options: "fully agree", "somewhat agree", "neither agree or disagree", "somewhat disagree" or "fully disagree".

2.4 Personal normative belief

The question and assessed options concerning personal normative belief are presented in Figure 3.

2.5 Behavior and intention

The question about technologies and intentions was: "Have you purchased or are you going to purchase animal welfare automatically following or improving technology to the farm? (choose the best option from each line)". The answering options

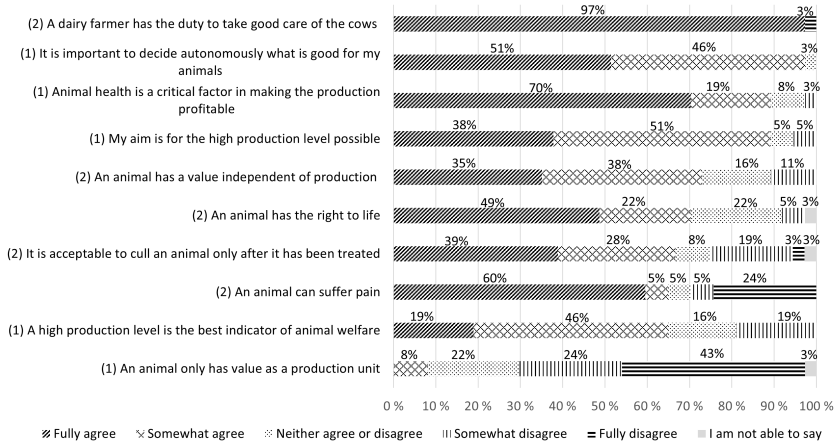

FIGURE 3
Personal normative beliefs. Assessments concerning value statements (indicators referring to (1) utility value and (2) intrinsic value statements) related to animal welfare. The question was: "Assess the following items related to farm animals and those welfare." The answering options were "Fully agree", "Somewhat agree", "Neither agree or disagree", "Somewhat disagree", "Fully disagree" and "I am not able to say".

TABLE 1 Background information of the survey sample farms and similar data for farms involved in the Finnish milk production record system.

Variable	Survey sample in 2021	The milk production record system farms[A]
Proportion of loose housing barns	70%	70%
Number of cows per farm	78 (range 19—220, SD 49)	54
Average milk production per year per cow	9 112 kg (range 30—12 500, SD 3 411)	10 073 kg
Proportion of automated milking system farms	58%	30%
Proportion of farms providing cows the option to graze or to move freely outside in a pen	62%	76%

[A]Data for dairy farms involved in the milk production record system in 2020. Ruokatieto, 2021.

were "yes, have been purchased", "have not, but our aim is to purchase", "have not, and we are not going to purchase" and "I am not able to say". The respondents assessed the following technological systems: a system for following bovine activity and movement, a control camera in an isolation or calving pen, a system measuring the quantity of feed eaten, a meter of milk quality (for example attached in a milking robot), a system measuring bovine feeding and ruminating times, a system measuring bovine body temperature, a system measuring bovine weight or fitness class, a control camera in a calf area or pen, a system indicating bovine lameness, and a system indicating bovine location (see the Supplementary Material).

3 Results

3.1 Elements of TPB; attitudes towards the behavior

The attitudes towards technological devices assisting or following animal welfare were positive, as most respondents fully or somewhat agreed (92%) with the statement "The devices really help to improve animal welfare". Similarly, 86% agreed with the item "The devices provide reliable information" and 86% agreed with the item "The devices add to the meaningfulness of animal care". The respondents disagreed most often with the item "Complexity (of the operating system) is an obstacle for implementation" (54% disagreed).

3.2 Subjective norm

Concerning important sources of advice, the guidelines provided by veterinarians were of the highest importance (Figure 2); all respondents assessed veterinarian views to be important or very important. The views of other milk producers were considered second-most important. These were followed by professional magazines (84% considered their advice to be very or somewhat important) and the feed advisers of an agricultural advisory organizations (84%).

3.3 Perceived behavioral control

Items related to resources concerning new technological devices and methods that added or monitored animal welfare were also assessed. The most important deficiencies related to available resources were financial (43% fully or somewhat agreed with the item "The farm has too few financial resources to purchase new technology") and personal capacity to cope with duties (41% correspondingly agreed with the item "Problems related to coping constrain the introduction". Over half of the respondents did not consider the availability of counselling and planning aid, working time, or system complexity as deficiencies, and they disagreed with the items "Too little counselling and planning aid is available (for example, for system implementation)", (57% disagreed), "A lack of working time is a barrier to deployment" (54% disagreed), and "Complexity is a barrier to deployment of operating systems" (54% disagreed).

3.4 Personal normative belief

The items regarding normative beliefs included two types of statements: (1) those relating to the utility gained by the farmer from animal production and (2) those relating to the intrinsic value of the animal and to altruistic motivations to treat the animals well (Figure 3). The respondents most commonly agreed with the items "A dairy farmer has the duty to take good care of the cows" (97% fully agreed), "It is important to decide autonomously what is good for my animals" (97% fully or somewhat agreed), "Animal health is a critical factor in making the production profitable (89% fully or somewhat agreed), "My aim is for the high production level possible" (89% fully or somewhat agreed), and "An animal has a value independent of production" (73% fully or somewhat agreed) (Figure 3). The item "An animal only has value as a production unit" was not widely supported.

3.5 Behavior and intention

Over half (70%) of the farms had a technical system for following bovine activity and movement, a control camera in an isolation or calving pen (65%), a system measuring the quantity of feed eaten (62%), a meter for milk quality (60%), and a system measuring bovine feeding and ruminating times (54%). Although intentions concerning technology adoption were rare, the most preferred were both related to control cameras; 16% of respondents were going to install a control camera in an isolation or calving pen and 11% were planning to install one in the calf area or pen.

4 Discussion

The sample of this study is not representative concerning Finnish dairy farms. Obviously, our sample contains responses from farms, which were participating in an ongoing research project as pilot farms. Despite this, our topic is interesting, and therefore we report and discuss the results of explorative study as a Brief Research Report. The principles of TPB were used as a framework for a survey to gather insights on the topic to guide further research.

Our exploratory survey suggests that attitudes concerning farm animal welfare and animal welfare-enhancing technology, important sources of advice, and lack of resources to adopt an animal welfare-enhancing technology are all key elements affecting technology adoption decisions. This suggests that such decisions can be seen as holistic issues including factors of existing attitudes, constraints, and trusted information sources. With increasing farm size and technological development, state-of-the-art technologies are becoming increasingly important in animal production. Technological solutions can help farmers to monitor animals and their welfare in more detail and to provide enhanced care for the animals. Hence, to guide farmers' investment decisions in a more sustainable direction, it is important to understand the factors leading to the adoption of technologies that enhance animal welfare.

TPB considers the enabling factors, constraints, and lack of resources (perceived behavioral control in the model) to be in the spotlight. Attitudes concerning technological devices and those with the potential to assist in animal welfare were generally positive in our exploratory sample, as nearly all participants agreed with the item indicating that technological devices really help to improve animal welfare, and devices were also assessed to produce reliable information. A qualitative study by Hartung et al. (2017), based on 21 farm visits in ten EU countries, also found farmer experiences concerning precision livestock farming (PLF) technologies to be mainly positive: technological systems enabled monitoring problems at a significantly earlier time and created transparency in the production. In addition, farmers in the Hartung et al. (2017) study considered that substituting personal interactions with farm animals with video cameras was not possible. In our exploratory survey, the lack of a counselling or planning aid, the system complexity of the devices, or lack of working time were not obstacles for the technology adaptation, while the study by Hartung et al. (2017) found that possibly weak maintenance service, device complexity, and insufficient practical information regarding system usage on farms were considered problematic.

Our study is related to animal welfare enhancing technologies of dairy farms. A question arises whether all technological solutions improve animal welfare. New technologies can have also negative consequences for the animals and can compromise animal welfare in a range of ways. For example, some technical solutions can be invasive, technical failures may occur, and devices may not be able to observe animals to the extent that humans can (Tuyttens et al., 2022). To maintain animal welfare, new animal management technologies should provide learning opportunities for animals (Lee et al., 2018), allowing them to somehow predict and control events in their living environments. With perceived cues, states of helplessness or hopelessness and stress arousal could be avoided according to the cognitive activation theory of stress (Lee et al., 2018).

New technology could be assessed by several criteria if the aim is to maintain animal welfare. Three factors are essential for evaluating the usefulness of smart farming for animal welfare (Dawkins, 2021): the definition of animal welfare, making high animal welfare standards a priority in a farming system, and the ability of smart farming to lead to real improvements in animal welfare on commercial farm circumstances. As a whole, Hartung et al. (2017) estimated that the PLF was potentially helpful in creating more sustainable, high animal welfare, and efficient animal production. Measurements can provide data on the physiology, position, and behavior of the animal and use sensors attached to the animal, interacting with the animal directly or remotely (Nielsen, 2022). In addition to sensors, smart or precision farming includes control mechanisms to make management decisions with or without human action (Dawkins, 2021). The farms in our exploratory survey had most often adopted devices related to following bovine activity and movement, a control camera in the isolation or calving pen, and a system measuring the quantity of feed eaten. Activity and movement, along with technology measuring the quantity of feed eaten, are factors connected to AMS systems, which were commonly in use by the survey respondent farms. This equipment mostly included sensors to measure animal-based variables, while fewer sensors were used for environmental parameters (Dawkins, 2021). In Australia, larger dairy farms (more than 500 cows) adopted precision technologies like automatic cup removers, automatic milk plant wash systems, electronic cow identification systems, and herd management software 2–5 times more often than smaller dairy farms did (Gargiulo et al., 2018). Dela Rue et al. (2020) reported that rotary dairies with automatic devices for cup removal, teat spraying, and drafting were associated with 43% higher labor efficiency and 15% higher milking efficiency counted as cows milked per hour. These dairy farms were compared to rotary dairies without the above-mentioned technologies.

As most (83%) of the Finnish dairy farms have made an agreement related to animal health care with a local veterinarian (Ruokatieto, 2021), an animal health plan and yearly health care visits are carried out at all the dairy farms involved. Therefore, it is unsurprising that all our survey respondents considered veterinarians to be the most important advisors for providing guidelines. Other dairy farmers, professional magazines, and the feed advisers from agricultural advisory organizations were also considered important sources of information. The survey respondents appreciated expertise, practical experience, the ability of the editorial offices of agricultural magazines to collect competent writers and handle actual topics, along with experts from agricultural advisory organizations, who visit farms making feeding plans and providing overall guidance. Naspetti et al. (2017) also observed that individual dairy farmer's beliefs were strongly influenced by leading colleagues, family members, and advisors. More generally, Herrera et al. (2019) observed a connection between the number of advisory contacts and innovation adoption, and the information sources used. In our

exploratory survey, Internet sources or social media were not assessed as important information sources. In other Finnish studies (Kauppinen et al., 2010; Kauppinen, 2013), veterinarians, and slaughterhouse/dairy and agricultural advisers were also the most influential actors of subjective norms and stakeholders that affected activities and understood and emphasized the importance of animal welfare. Moreover, the public in Finland also considered veterinarians to be the most reliable source of information concerning farm animal welfare (Kupsala et al., 2011).

The most critical resources (constraints) in our survey were related to financial issues, farmers' personal capacity to cope with duties, and device operation problems in the barn environment. The most important problem, lack of financial resources, was similar to that in the study by Hartung et al. (2017). In the current global situation, Finnish dairy farm profitability and their financial buffers for coping with challenging situations have deteriorated because of market developments arising from low national harvest levels and increasing costs, the latter especially because of the war in Ukraine (Tauriainen, 2022). Therefore, financial considerations may play a particularly important role in the near-future investments in technology.

Besides animal welfare and financial arguments, farmers' well-being at work may be an instrumental factor that affects the adoption of new animal welfare-improving technologies, as farmers' personal coping challenges were among the most critical resources (constraints) observed in our exploratory survey. A recent survey by the Finnish Farmers' Social Insurance Institution (Mela, 2023; sample N = 1 019) indicated that farmers' well-being at work has deteriorated during the past few years, mainly due to the difficult economic situation. Over a quarter (26%) of respondents had symptoms of depression and 44% reported stress symptoms. Mental health problems were more common on animal farms. Larger farm size and young age (under 40 years) were associated with stress symptoms. Animal welfare and farmers' coping challenges may both be considered sensitive topics. Kauppinen (2013) found that one of the "practical attitude objects" related to how farmers defined "improving animal welfare" was taking care of each farmer´s personal well-being, and other themes were related to the animals' living environment, animal health, and humane treatment. Workload as a work demand and loneliness as a lack of resources have been shown to form a path towards burnout and ill-health symptoms among dairy farmers (Kallioniemi et al., 2022). The link between animal welfare and human well-being has been highlighted also in the concept of "One Welfare" (Pinillos et al., 2016), which gathers the direct and indirect associations between animal welfare, human well-being, and "environmentally friendly animal-keeping systems" by providing an interdisciplinary concept to improve human, animal, and social welfare. Hence, human well-being should also be considered as a key element when attempting to adopt solutions improving animal welfare. In our exploratory survey, personal normative beliefs underlined the ethos of entrepreneurship and autonomy, as respondents agreed with the items indicating a farmer's duty to take care of their cows, the importance of deciding autonomously what is good for the cows, and animal health as a critical factor in making the production profitable.

The low number of observations is a limitation of our current study. Therefore, we have chosen to report and discuss the topic in a descriptive manner with this Brief Research Report. The questions regarding animal welfare, related attitudes, and technological devices may arise as contradictory reflections among dairy farmers. During the study period, agricultural input prices and interest rates were increasing. Mental health symptoms have been increasing during the past years, mainly due to the economic crisis. Societal discussion concerning animal welfare indicates that all stakeholders consider the topic important and want to support it, but it is challenging to find financial resources to improve the current situation through additional efforts when farming profitability is low.

Viable farming requires profitability in the long run. It is important for farmers that the technologies are robust and offer useful information. However, financial constraints and the perceived suitability of a technology to an individual farm's conditions may prevent the adoption of the new technology. Farmers require technical and support from trusted groups, such as advisors, and evidence on the functionality of the technology. Moreover, the price of some technologies, such as machine vision systems, may still be too high in many cases to permit an investment.

5 Future research

To further investigate the use of animal welfare-enhancing technologies, a study with a larger, representative sample would be necessary. Farm-level and user experiences, as well as risks and advantages of different technology devices would be important issues to study. The capability to share data between equipment made by different companies and the maintenance services of different dealers would be useful themes to examine.

In future studies it is important to plan the survey procedure carefully. Possibly the experiences from our earlier dairy farm survey (Kallioniemi et al., 2018) would be useful. The survey had two main themes and the questionnaire was first formulated within the project group (including five organizations, different disciplines). We received feed-back also from the steering group which directed the project (the group included different stakeholders from funders, research organizations etc.). Two dairy farms were visited, where we discussed the posed questions (e.g. comprehensibility, clarity). Dairy farmers were contacted also via their discussion website. Three voluntary dairy farmers commented on the questionnaire. We tried to schedule the survey at a convenient time, so our first mailing (including letter and paper questionnaires) was sent at the beginning of January. The widespread rural newspaper published a short text about the survey. Our potential respondents also received a reminder post card and again questionnaires in a post letter. With this procedure, responses were received from around half of the potential respondents over a three month period, and the final response rate was 47%. Perhaps the reasoned timing, only two main studied themes and the involvement of respondents to the development of the questionnaire were conducive elements. In practice, the project

time frames may pose problems to carrying out the described phases of a survey process.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements. The data were collected by using Webropol online survey software. Participating in the survey was voluntary. A privacy notice was presented, and an informed consent was obtained from each respondent before responding to the survey. The data were anonymized, and the research team did not have access to the personal data of respondents. According to (TENK, 2019, p. 61) guidelines, an ethical review (e.g., considering potential risks and harm that may be caused to research participants, their families and the researchers themselves due to the research or its results) by the Ethics Committee for Human Sciences (University of Turku, 2023) before data collection was not required for this survey, because the research design did not contain elements, mentioned in those guidelines, requiring ethical review.

Author contributions

MK: Formal analysis, Investigation, Methodology, Visualization, Writing – original draft. HK: Conceptualization, Formal analysis, Methodology, Supervision, Visualization, Writing – original draft. JN: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Visualization, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fanim.2024.1332525/full#supplementary-material

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