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## SPECIALTY SECTION

This article was submitted to  
Animal Welfare and Policy,  
a section of the journal  
Frontiers in Animal Science

RECEIVED 25 October 2022

ACCEPTED 15 November 2022

PUBLISHED 02 December 2022

## CITATION

Lundmark Hedman F,  
Rodriguez Ewerlöf I, Frössling J and  
Berg C (2022) Swedish dairy farmers'  
perceptions of animal  
welfare inspections.  
*Front. Anim. Sci.* 3:1079457.  
doi: 10.3389/fanim.2022.1079457

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# Swedish dairy farmers' perceptions of animal welfare inspections

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Farmers today must comply with animal welfare legislation and often one or more private standards. This makes the number of regulations quite comprehensive and the control arena more complex, with several different animal welfare inspections and audits taking place at farm level. This study investigated perceptions among dairy farmers in Sweden of the official animal welfare inspections and the private Arla and KRAV audits, both separately and in relation to each other, and examined associated factors that could potentially influence their perceptions. An electronic questionnaire was developed and answered by 216 Swedish dairy farmers during spring 2021. The respondents in general acknowledged the need for animal welfare inspections, but had rather diverse perceptions of the actual inspections and inspectors, reporting both positive and negative experiences. They reported more negative experiences of official and Arla inspections than of KRAV (organic farming) inspections and most did not believe that inspections had improved animal welfare on their farm. Most of the respondents called for better coordination between the different inspection types. Most farmers reported being very worried before an official or Arla inspection, which was related to their more negative perceptions of these inspections. Other factors associated with farmers' perception of the inspections were e.g., acceptance of a regulation, the perceived necessity of an inspection, satisfaction with the inspector's competence, manner, and behavior, perceived fairness of treatment, and whether non-compliances were recorded. The farmers perceived official inspections as more negative if the inspector was a young woman, if there was more than one inspector present, and if the inspection was not pre-announced. These findings indicate a need for objective and accurate communication regarding different animal welfare regulations and inspections. To achieve greater trust and lower concerns among farmers about animal welfare inspections, all stakeholders need to be involved in communication.

## KEYWORDS

compliance, control, experience, legislation, private standards

# 1 Introduction

Trust in legislation, standards, and the control systems is crucial for public confidence (Rushen et al., 2011). Relevant factors include how independent and trustworthy a control is and how compliance is measured, which differs between regulations (Lundmark et al., 2016; Lundmark Hedman et al., 2018). There are surprisingly few studies on farmers' experience of different animal welfare inspections and the increasingly complex control arena. For a regulation to be considered successfully implemented, three conditions need to be fulfilled (Lundquist, 1987): i) The inspected person must understand the regulations and requirements, including assessments and decisions made by the inspector; ii) the inspected person must have the ability to comply with the regulations, e.g., have the necessary knowledge and resources; and iii) the inspected person must have the will and honest intention to comply with the regulation. The level of compliance with Swedish legislation on animal welfare is sometimes reported to be unsatisfactory and needing improvement (Lundmark Hedman et al., 2018; Lundmark Hedman et al., 2021a; SBA, 2022). Danish farmers are reported to view official animal welfare control necessary but unfair (Anneberg et al., 2012), while Norwegian farmers believe that they have a moral duty to comply with the legislation and that most animal welfare inspectors act in an acceptable manner (Gezelius et al., 2022). Nevertheless, there are different perceptions among Norwegian farmers concerning what good animal welfare comprises, and negative experiences of animal welfare inspections are not uncommon (Gezelius et al., 2022). In a survey in Finland, farmers recognized the need for animal welfare inspections, but those who had experienced an inspection had a more negative attitude than those who had not (Väärikälä et al., 2018). However, farmers in that study had difficulties in distinguishing between different types of inspections carried out on-farm.

The development of private animal welfare standards marks a partial shift from state to private governance of animal welfare (Maciel, 2015). Private standards are not legally binding, but many farmers have to comply with them to get access to the market (Richards et al., 2013). In Sweden, all dairy farmers must comply with official welfare legislation (e.g., the Animal Welfare Act [2018:1192], the Animal Welfare Ordinance [2019:66], and the Swedish Board of Agriculture's regulations and general advice on keeping cattle on farms [SJVFS 2019:18]). The regional authorities (the 21 County Administrative Boards (CAB) in Sweden) have the task of checking compliance with the legislation. In addition, farmers who deliver milk to Sweden's largest dairy plant operator (Arla Foods) must comply with the private standard Arlagården<sup>®</sup>. Until 2020, advisors from the advisory service 'Växa Sweden' inspected the Arla farms as second-party auditors. However, in 2020 Arla revised Arlagården<sup>®</sup> and transferred the auditing system to a third-party audit company (Arla, 2022a). Swedish farmers delivering

milk to a non-Arla dairy plant usually need to comply with another private standard to which their dairy plant is affiliated, e.g., IP Seal of Quality or Norrgården<sup>®</sup>. Dairy farmers who deliver organic milk must comply with the Swedish organic standard, KRAV, and can choose between three different third-party audit companies engaged by KRAV for welfare inspections. In general, the private standards developed and used by dairy plants are mainly on the same level as the Swedish animal welfare legislation, i.e., relating to conventional milk, while KRAV is more of a niche product with some requirements exceeding the legislative level. Arla Foods has developed some additional requirements that partly exceed the legislative level. It has also introduced a questionnaire/database called Arlagården<sup>®</sup> Plus in 2018, where affiliated farmers enter results from standardized dairy cow welfare assessments (beside other questions regarding the farm), which they perform themselves four times a year. Since February 2020 the welfare assessments are an integrated part of the quality assurance program Arlagården<sup>®</sup> (Arla, 2022b). Until February 2020 affiliation with Arlagården<sup>®</sup> Plus resulted in a slightly better payment for the milk. However, this milk was not considered a niche product when sold in Swedish supermarkets. In previous studies, we have found that the requirements in the private standards and the legislation often overlap and that how compliance is measured differs between regulations setting the same requirements, i.e., the outcome differs depending on the regulation inspected (Lundmark et al., 2016; Lundmark Hedman et al., 2018). This can be perceived as confusing by farmers (Berg and Lundmark Hedman, 2020) and the control arena consisting of both official and private inspections can be quite complex.

The aim of this study was to investigate how farmers in Sweden experience the official animal welfare inspections, and the private Arla and KRAV audits, both separately and in relation to each other, and determine whether any associated factors potentially influence their perceptions.

## 2 Materials and methods

### 2.1 Questionnaire

An electronic questionnaire (see [Supplementary Material](#)) asking about dairy farmers' experiences and expectations related to animal welfare inspections from CAB, Arla, and KRAV was developed in the software program Netigate (version 8). Information about the project and a link to the questionnaire was first sent out in an electronic newsletter from Växa Sweden to farmers in March 2021, but this resulted in a very low number of respondents. In a second step, in April 2021 the three dairy advisory organizations in Sweden (Växa Sweden, Skånesemin, and Rådgivarna Sjuhärad) sent a specific email to dairy farmers about the project, with a link to the questionnaire. The questionnaire closed at the end of May 2021. The data

received were analyzed anonymously. The study and the questionnaire were approved by the Swedish Ethical Review Authority (reference number: Dnr. 2019-06370).

The questionnaire consisted of four parts. 1) Information and background on the respondents and their dairy farms, and thoughts on animal welfare and its importance; 2) respondents' views on undergoing CAB and private inspections; 3) respondents' experiences and expectations on animal welfare legislation and the official control; and 4) respondents' experiences and expectations on either Arlagården<sup>®</sup> or the KRAV standard and their inspections. Respondents were asked to answer questions about Arla or KRAV depending on which agency had made the most recent inspection. The questionnaire consisted of 105 questions in total, but respondents did not have to answer all questions. Farmers who had received an inspection more than three years in the past were asked about their expectations for the next inspection, while farmers who had had an inspection in the past three years were asked about their experiences of that inspection. The questions were mainly of the closed type. The respondents were asked to choose from a list of options or state their opinion on a five- or 10-point Likert Scale (e.g., 1 = fully disagree to 5 = fully agree). There were also some open-ended questions where the respondent could clarify the answer or express an opinion without being given any options to choose between.

## 2.2 Statistical analysis

### 2.2.1 Data preparation

Descriptive statistics and visualizations of the questionnaire responses were assessed to get an overview of the results. A decision was then made how to prepare the questionnaire data for further statistical analysis.

For the multiple-choice questions "Age (in relation to the respondent) and gender of the inspector/s", "What was the non-compliance about?", and "What did the inspection result in?", different combinations of responses were categorized into groups.

Responses to single-choice questions about age, education, physical and mental health, working experience, and whether the inspection was announced beforehand were grouped into fewer groups. Respondents stated in which of the 21 counties of Sweden their holding was located, and these responses were grouped into three larger regions (SE1 - East Sweden, SE2 - South Sweden, and SE3 - North Sweden), i.e., as in level 1 of the Nomenclature of Territorial Units for Statistics (NUTS). For various questions, the response "I do not remember" was removed and treated as missing in the statistical analysis, as was the response "Other/do not want to respond" to the question about gender of the respondent.

Questions with numerical graded responses (1-5) were either kept numerical or grouped ("1-2", "3", and "4-5"), depending on the statistical analysis. Some of these questions also had an "I do not know" option, which was removed and treated as missing during numerical analysis, but kept when the responses were grouped for other analyses.

The question about whether the respondent was worried before the inspection had different response options for the different inspections, either graded 1-11 (CAB and KRAV) or 1-5 (Arla). To make the responses comparable, the grading 1-11 was either converted to the numerical scale 1-5 or grouped into three larger groups.

### 2.2.2 Statistical tests and analyses

Spearman's correlation was used to calculate the correlation coefficient  $r$  between graded questions. The coefficient takes a value between -1 and 1, where -1 or 1 indicates a perfect correlation and 0 indicates no correlation. Pearson's chi-squared test or Fisher's exact test was used to investigate associations or differences between replies to categorical or categorized questions.

We tested how the farmers graded their perception of the different inspections based on their responses to questions about demographics, understanding and expectations of the inspections, inspector traits and fair treatment, and the outcomes of the inspections. The statistical approach was chosen based on the type of question and the available data. For groups of < 25 responses, no statistical analyses were carried out. Tests were also conducted on corresponding questions on CAB, Arla, and KRAV inspections, to investigate differences in the response distributions.

## 3 Results

Descriptive results and some results from statistical analyses are described in text and figures below, while [Tables S1 and S2](#) in Supplementary Material present more results from the statistical analyses.

### 3.1 Demographics and information about respondents

Of the dairy farmers who received a link to the questionnaire, 216 responded to some extent. Of these, 133 submitted complete answers, i.e., answered all intended questions. Dairy farmers from all 21 counties in Sweden participated.

Approximately two-thirds of respondents were male, while one third were female, and most were middle-aged, and most had long experience of working with dairy cows ([Table 1](#)).

TABLE 1 Descriptive information on respondents.

Factor		Respondents % (n)
Gender	Male	59 (128)
	Female	35 (76)
	Other	6 (12)
Age (years)	≤ 30	3 (8)
	31-40	20 (44)
	41-50	21 (46)
	51-60	40 (87)
	61-70	13 (29)
	> 70	1 (2)
Work experience (years)	1-9	10 (21)
	10-19	21 (42)
	20-29	24 (49)
	30-39	31 (62)
	> 40	13 (28)
Number of dairy cows	≤ 25	6 (13)
	26-50	17 (34)
	51-75	27 (54)
	76-100	12 (24)
	101-150	19 (38)
	151-300	14 (28)
	> 300	5 (11)

Around 78% (164/210) of the respondents had the dairy farm as their only source of income and 65% (137/210) had one or more employees. The respondents in general liked being dairy farmers, with 73% (149/204) answering 7-10 on a 10-point Likert Scale (mean 7.68). Approximately half (52%, 105/202) planned to continue with dairy cows, while 32% (65/202) stated that they were considering quitting and 8% (16/202) had decided to give up dairy farming (we do not know the reason for this decision, but some farmers may be retiring due to high age). Most farmers reported that their animal houses are in good or quite good condition (72%, 142/195), while 12% (23/195) assessed their houses as being in poor condition. Most farmers had loose-housed cows, either with robotic milking systems (48%, 97/202) or manually operated milking parlors (26%, 52/202). One-third of the farmers (31%, 62/202) kept cows in tie-stall systems.

Most of the farmers surveyed (58%, 106/183) delivered milk to Arla, while 20% (37/183) were affiliated to KRAV and hence were organic farmers. Only 2% stated that they were not affiliated to any private standard, and 24% were affiliated to another private agency/standard than Arla or KRAV. Most of the farmers (77%, 121/157) reported having received a CAB animal welfare inspection within the past three years. Of the Arla farmers, 83% (55/66) had received an Arlagården<sup>®</sup> inspection within the same period, while all KRAV farmers (25/25) had received an inspection during the past three years.

### 3.2 Respondents' general views on animal welfare, regulations, and compliance

In the respondents' opinion, the three most important factors for good animal welfare (in addition to basic aspects such as good health, feed, and water) were related to management, with 75% (147/195) stating the importance of rapid treatment of sick or injured cows, 73% (142/195) the importance of good animal care and management, and 38% (74/195) the importance of animals feeling safe with the caretakers. The fourth most important factor according to the responding farmers was summer pasture for the cows (26%, 50/195). Most farmers (78%, 145/187) believed that cows producing at a reasonably high level is a clear sign of good animal welfare.

Most of the respondents (76%, 140/184) believed that farmers who constantly violate animal welfare legislation destroy confidence in Swedish dairy production. The respondents had different views on the increased attention from consumers and the public regarding animal welfare; 35% (65/186) did not find the increased attention positive, while 25% (47/186) did and 40% (74/186) were indifferent to the attention.

Almost half of the respondents (48%, 91/189) stated that they would like to give higher priority to cow welfare, while 20% (39/189) would not, and 58% (107/186) claimed that they would make several animal welfare improvements if these were financially viable. The majority (83%, 157/188) agreed with the statement that 'it is not possible to achieve a good financial situation in the business if I do not have good animal welfare'. Approximately one-third of farmers (32%, 59/188) reported that pressure to reduce costs affects cow welfare, while 38% (69/188) did not.

The risk of getting a deduction in EU subsidies for violating the legislation seemed to be the main motivation for complying with the legislation, since 87% (143/163) of respondents agreed with this statement. Around 37% of farmers (57/157) thought it unreasonable that violating EU legislation risks a deduction in EU support, while 29% thought it reasonable (45/157). Regarding compliance, 77% (125/163) of the farmers stated that they comply with the legislation to avoid getting remarks from the CAB, 71% (117/163) that they comply with legislation in order to contribute to confidence in Swedish dairy production, and 69% (112/163) that they comply with legislation because they want their cows to be well.

The majority of the Arla farmers (93%, 64/69) stated that the main reason for complying with Arlagården<sup>®</sup> was that Arla demands this for all farmers delivering milk to them, while 87% (60/69) answered that they comply to avoid getting remarks from Arla inspectors. Other stated reasons were to ensure cow welfare (38%, 26/69) or to receive a better payment for milk (95%, 65/69). A majority of the organic farmers (84%, 21/25) answered that they comply with KRAV in order to get better

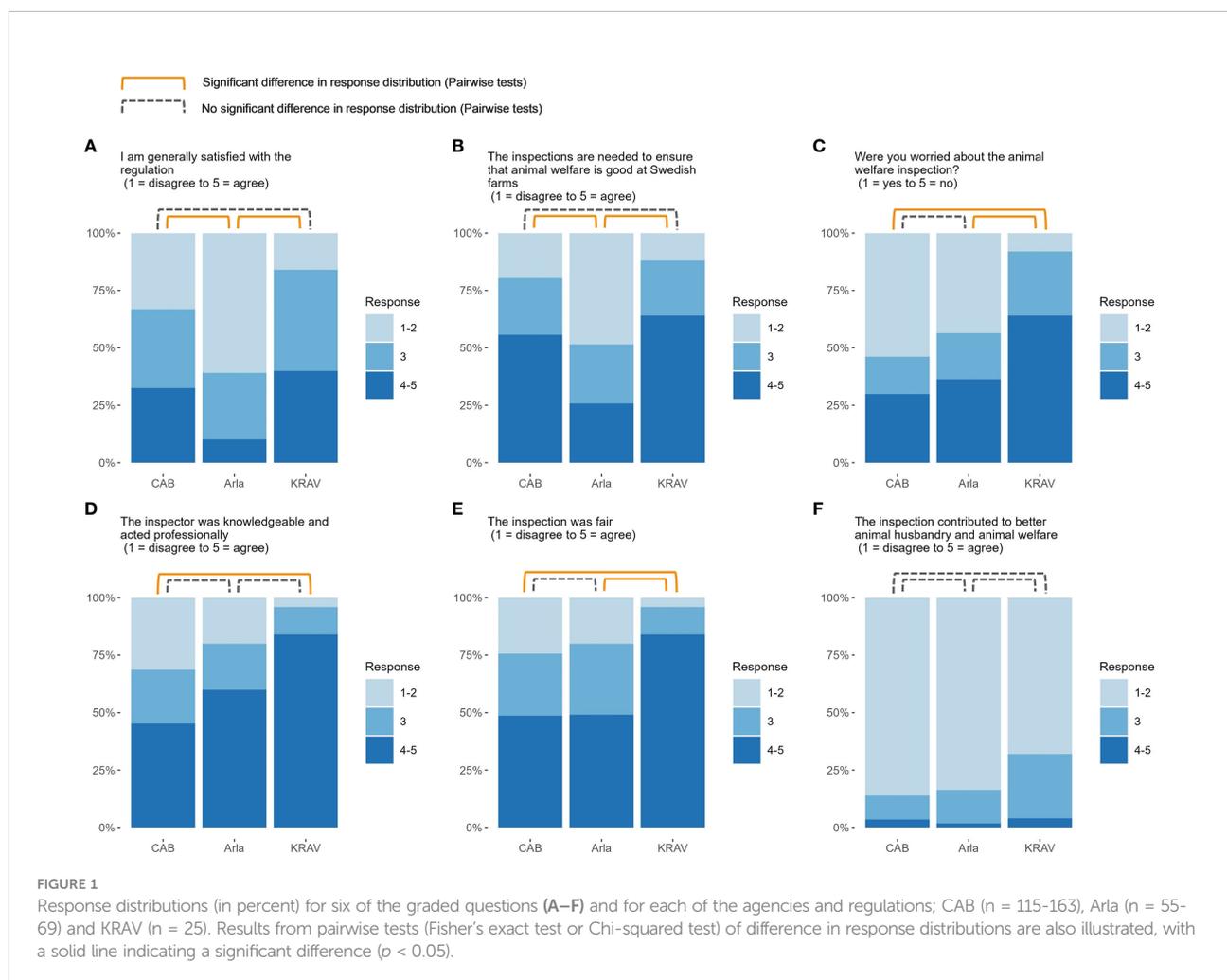
payment for the milk, 92% (23/25) comply because a serious entrepreneur must comply with regulations, 76% (19/25) comply in order to contribute to confidence in Swedish organic dairy production, and 52% (13/25) comply because they want their cows to have good welfare.

One-third of responding farmers (33%, 54/163) were generally satisfied with the animal welfare legislation, while the corresponding proportion for Arlagården<sup>®</sup> was 10% (7/69) and KRAV 40% (15/25). Another one-third of the farmers (33%, 54/163) were not satisfied with the legislation, compared with 61% (42/69) for Arlagården<sup>®</sup> and 16% (4/25) for KRAV. The responses to this and some other graded questions are shown in Figure 1. Satisfaction with Arla inspections was significantly lower than for CAB ( $p < 0.001$ ) and KRAV ( $p < 0.001$ ) (Figure 1A). Several farmers felt that all the regulations contain requirements that are complicated or difficult to comply with (legislation 44% [72/162]; Arlagården<sup>®</sup> 58% [40/69]; KRAV 68% [17/25]), and requirements that they do not consider beneficial for the welfare of animals in practice (legislation 50% [81/161]; Arlagården<sup>®</sup> 28% [19/68]; KRAV

64% [16/25]). Of the farmers who stated that some requirements in the legislation do not benefit animal welfare, 52% (42/81) mentioned the requirement on summer pasture. However, many farmers answered 'I do not know' to these questions, e.g., on whether the regulation contains requirements that are complicated or difficult to comply the proportion was: legislation 38% (61/162), Arlagården<sup>®</sup> 32% (22/69), and KRAV 16% (4/25).

### 3.3 Farmers' views on receiving inspections from several agencies

A majority of the farmers (65%, 110/168) were not satisfied with having both official and private animal welfare inspections, with only 7% (12/169) happy about the current situation. Thirteen percent (22/168) stated that it is necessary to have both official and private inspections, while 67% (113/168) did not see this as necessary. Of the farmers surveyed, 27% (45/168) reported finding it difficult to keep track of who comes to inspect



their business and why they do it, while 53% (89/168) find it easy. Almost half (47%, 79/169) reported being well-acquainted with the similarities and differences that exist in terms of requirements and assessments between the legislation and different private standards, while 13% (22/169) did not. There were different perceptions on whether the CAB and private inspectors make roughly the same assessments (i.e., reach the same finding in similar situations when applying the same requirements), with 39% (66/169) of the farmers stating that inspectors from different agencies do not make the same assessments and 33% (56/169) stating that they do. Most of the farmers (86%, 144/168) agreed with the statement that they would like better coordination between the various inspections.

Slightly more than half of the farmers surveyed (55%, 88/158) stated that official CAB inspections are necessary to ensure good animal welfare on farms in Sweden, while 20% (31/158) stated that CAB inspections are not needed to safeguard animal welfare. Of the Arla farmers, 26% (17/66) stated that the Arla inspections are needed to ensure animal welfare, while half (49%, 32/66) stated the opposite. Of the organic farmers, 64% (16/25) stated that KRAVs inspections are necessary to ensure animal welfare on organic dairy farms in Sweden, while 12% (3/25) stated the opposite (Figure 1B). The need for CAB and KRAV inspections to ensure animal welfare was rated significantly higher than the need for Arla inspections ( $p < 0.001$  and  $p = 0.001$ , respectively) (Figure 1B). A majority of the farmers (81%, 91/171) stated that, irrespective of agency, it is reasonable for an animal welfare inspection to take place at least every third year on a dairy farm.

The farmers were also asked about where they would turn for information about the animal welfare inspection (CAB or a private agency). Over half (56%, 92/165) stated that they would turn to another farmer in the first place in order to find out how the animal welfare inspections work, while 45% (75/165) would turn to the agency responsible for the inspection and 39% (65/165) would ask their vet.

### 3.4 Respondents' general views on inspector traits

Being knowledgeable about cows and dairy farming were seen as the most important characteristics of an animal welfare inspector (63%, 106/169). The second most important trait (39%, 66/169) was the inspector being easy to work with and able to make flexible assessments as long as the animals are doing well, while the third most important (37%, 62/169) was that the inspector makes uniform assessments between farms and shows understanding that minor deficiencies can arise. The inspector traits that seemed to be least important were: The inspector complies with the regulation (4%, 7/169); the inspector is confident in their assessment (2%, 4/169); the inspector is knowledgeable in the administrative procedures and processing

of cases/matters (1%, 2/169); and the inspector is good at listening (0%).

## 3.5 Perceptions of being inspected

The farmers' experiences from their latest inspection were rather diverse, with both positive and negative experiences (Figure 2). However, the respondents' experience of KRAV inspections were mainly positive. There was no significant difference between the perceptions of CAB and Arla inspections, while the KRAV inspections were rated significantly higher than both CAB ( $p < 0.001$ ) and Arla ( $p < 0.001$ ).

Farmers who were affiliated to other private standards were quite positive about their latest inspection, with 40% being positive (17/38) and 16% (6/38) having a more negative experience. More specifically, their mean experience on a scale from 1-5 was: IP Seal of Quality 3.0 ( $n = 6$ ), Norrgården<sup>®</sup> 3.7 ( $n = 13$ ), and Skånemejerier 3.0 ( $n = 12$ ).

How the farmers graded their perceptions of inspection types was not significantly correlated for CAB and Arla ( $p = 0.990$ ) or CAB and KRAV ( $p = 0.245$ ), i.e., farmers positive to one inspection could be negative to the other.

## 3.6 Factors associated with farmers' perceptions of an inspection

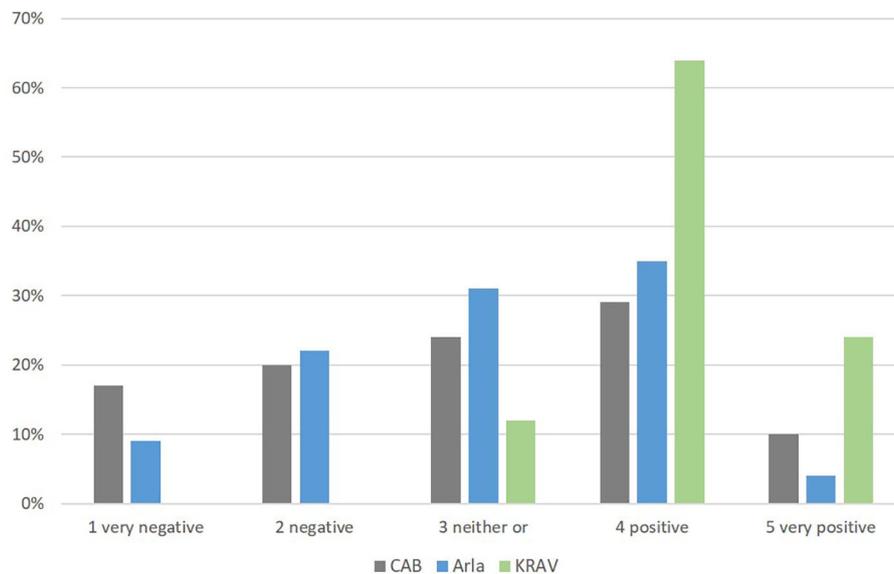
### 3.6.1 Demographics

Age, gender, region of residence, education level, working experience, and physical health status showed no association with how the farmers experienced their latest inspection, regardless of which agency performed the inspection. The only demographic factor that seemed to matter was the mental health and wellbeing of farmers for the CAB inspection, where farmers who indicated poorer mental health (19%, 39/205) perceived the inspection as a more negative experience ( $p = 0.026$ ). There was no association between mental health and experience of an Arla or KRAV inspection.

### 3.6.2 Understanding and expectation

For some questions, the responding farmers' understanding of the regulations and expectations before an inspection were associated or correlated with how the inspection was experienced. Satisfaction with the regulation, the feeling that it is easy to understand the requirements and comply with the regulation, and the perception that the inspections are necessary were correlated with how the inspection was experienced for both the CAB and Arla inspections (Figure 3).

The respondents generally reported being worried and concerned prior to the CAB (54%, 53/117) and Arla (43%, 24/55) inspections (Figure 1C). The main reason for being worried



**FIGURE 2**  
Dairy farmers' perception of their latest inspection from CAB (n = 121, mean value 2.9), Arla (n = 55, mean value 3.0), and KRAV (n = 25, mean value 4.1).

prior to a CAB inspection was the risk of financial consequences (i.e., expensive non-compliance corrections or deduction in EU subsidies), followed by the identity of inspector (i.e., a knowledgeable inspector or a zealous inspector searching for faults), the feeling of uncertainty regarding the inspection outcome, and the feeling of powerlessness (i.e., the inspectors have the power to make far-reaching decisions on the farmer's business). The main reasons for being worried prior to an Arla inspection were uncertainty regarding the outcome of the inspection and receiving a zealous inspector expecting everything to be perfect. Approximately one-third (30%, 35/117) of the farmers reported not being worried before the CAB inspection and 36% (20/55) not being worried before the Arla inspection. The respondents were less worried about receiving a KRAV inspection, with 64% (16/25) not worried and 8% (2/25) worried, which significantly differed both from CAB ( $p < 0.001$ ) and Arla ( $p = 0.006$ ) (Figure 1C). Being worried prior to an inspection was also significantly correlated with the more negative perception of an inspection from either CAB and Arla (Figure 3).

Approximately half of the farmers surveyed (53%, 62/118) did not make any special preparations before a CAB inspection, while the corresponding proportion for Arla was 24% (13/55), and KRAV 48% (12/55). Those that received an unannounced inspection could of course not make any preparations. Of the farmers that prepared, some made last-minute quick fixes on what they thought would be included in the inspection (CAB 27%, 32/118; Arla 58%, 32/55; KRAV 24%, 6/55), some searched for information about what the inspection would focus on (CAB

18%, 21/118; Arla 29%, 16/55; KRAV 8%, 2/55), and some examined old inspection reports (CAB 8%, 9/118; Arla 31%, 17/55; KRAV 16%, 4/55).

Whether the farmers had received an inspection during the past three years was not significantly associated with their understanding of the necessity of inspections (CAB:  $p = 0.359$ ,  $n = 147$ , Arla:  $p = 0.377$ ,  $n = 63$ ). This question was not relevant for KRAV farmers, as all had received a recent inspection. Most of the farmers who had not had any recent inspection from CAB or Arla expected the inspector to rate their animal husbandry as good (CAB: 77%, 27/35; Arla: 63%, 7/11). Of these respondents, 23% (8/35) believed that if they were inspected by CAB tomorrow the inspectors would find non-compliances, while none of the Arla farmers believed that non-compliances regarding animal welfare would be found in an Arla inspection. However, there seemed to be some uncertainty among the farmers on this question, since 23% (8/35) for CAB and 27% (3/11) for Arla did not know whether the inspector would find any non-compliances. Most farmers replied that they expected an inspector to give them hands-on advice and guidance on achieving compliance (CAB 85%, 133/157; Arla 77%, 51/66; KRAV 80%, 20/25).

### 3.6.3 Inspector traits and fair treatment

How a farmer perceived an inspector's competence, manner, behavior, and responsiveness was often correlated with how the inspections were experienced (Figure 3). The perception of being treated fairly was also correlated with the farmers' experience of an inspection (Figure 3). The farmers' responses to these

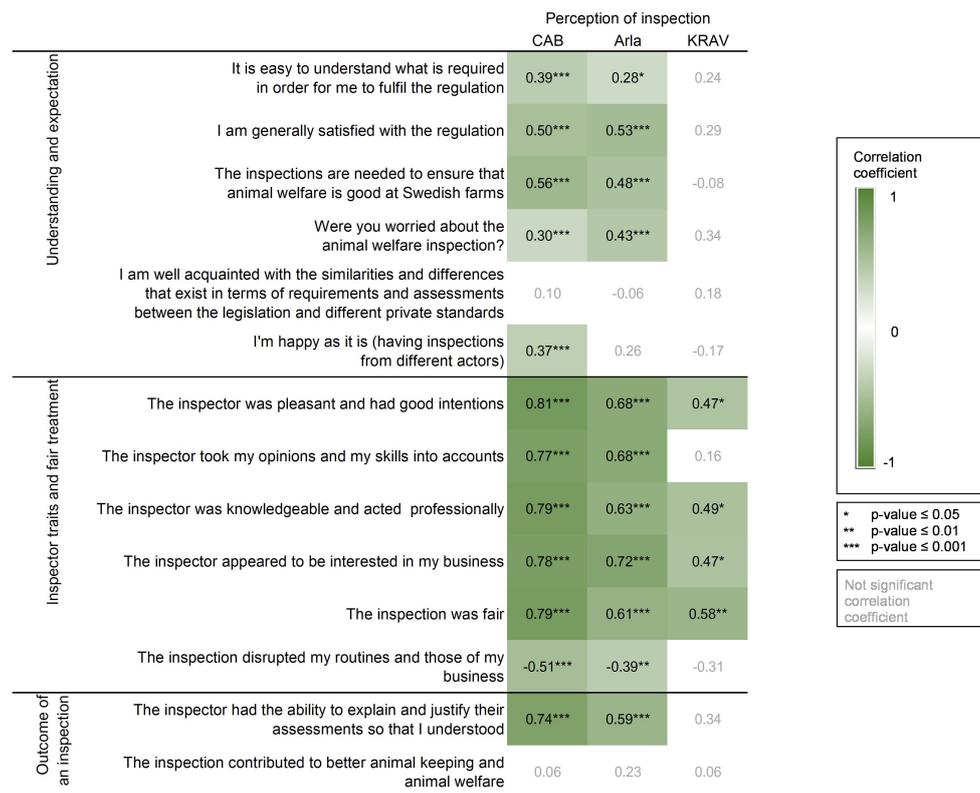


FIGURE 3

Correlation between graded questions (to the left) and farmers' perception of each type of inspection (CAB (n = 109-121, Arla (n = 49-55) and KRAV (n = 25)). The correlation coefficient  $r$  is shown in each cell and  $p$ -value intervals are indicated with stars. Non-significant coefficients have white background and gray text, while significant values are colored, with stronger color indicating a stronger correlation. Responses to all questions ranged from 1 = disagree to 5 = agree, except the question of whether the respondent was worried about the inspection (range 1 = yes to 5 = no).

statements did not differ significantly between the CAB and Arla inspections, but were often significantly higher for the KRAV inspections and inspectors. For example, the respondents graded the knowledge and professionalism of an inspector from KRAV significantly higher than an inspector from CAB ( $p = 0.002$ ) (Figure 1D). The perception of whether the inspection was fair or not differed significantly between KRAV and CAB ( $p = 0.005$ ) and between KRAV and Arla ( $p = 0.013$ ), where KRAV was rated fairer (Figure 1E).

Approximately half the farmers surveyed believed that the latest CAB (48%, 56/115) and Arla (49%, 27/55) inspection was fair. The corresponding proportion for KRAV was 84% (21/25). However, some of the farmers perceived the inspection as unfair (CAB: 24%, 28/115; Arla: 20%, 11/55; KRAV: 4%, 1/25) (Figure 1E). Of the farmers, 45% (52/115) replied that the CAB inspector was knowledgeable and acted professionally (Figure 1D), and 47% (64/115) replied that the CAB inspector had the ability to explain and justify their assessments. However, one-third of the farmers (32%, 36/115) did not agree with these two statements. Sixty percent (33/55) of the Arla farmers

perceived the Arla inspector as knowledgeable, while 20% (11/55) did not (Figure 1D) and 53% (29/55) replied that the Arla inspector had the ability to explain and justify their assessments while 12% (7/55) did not. Most of the responding organic farmers stated that the KRAV inspectors were competent and acted professionally (84%, 21/25) (Figure 1D), and could explain and justify their assessments (76%, 19/25).

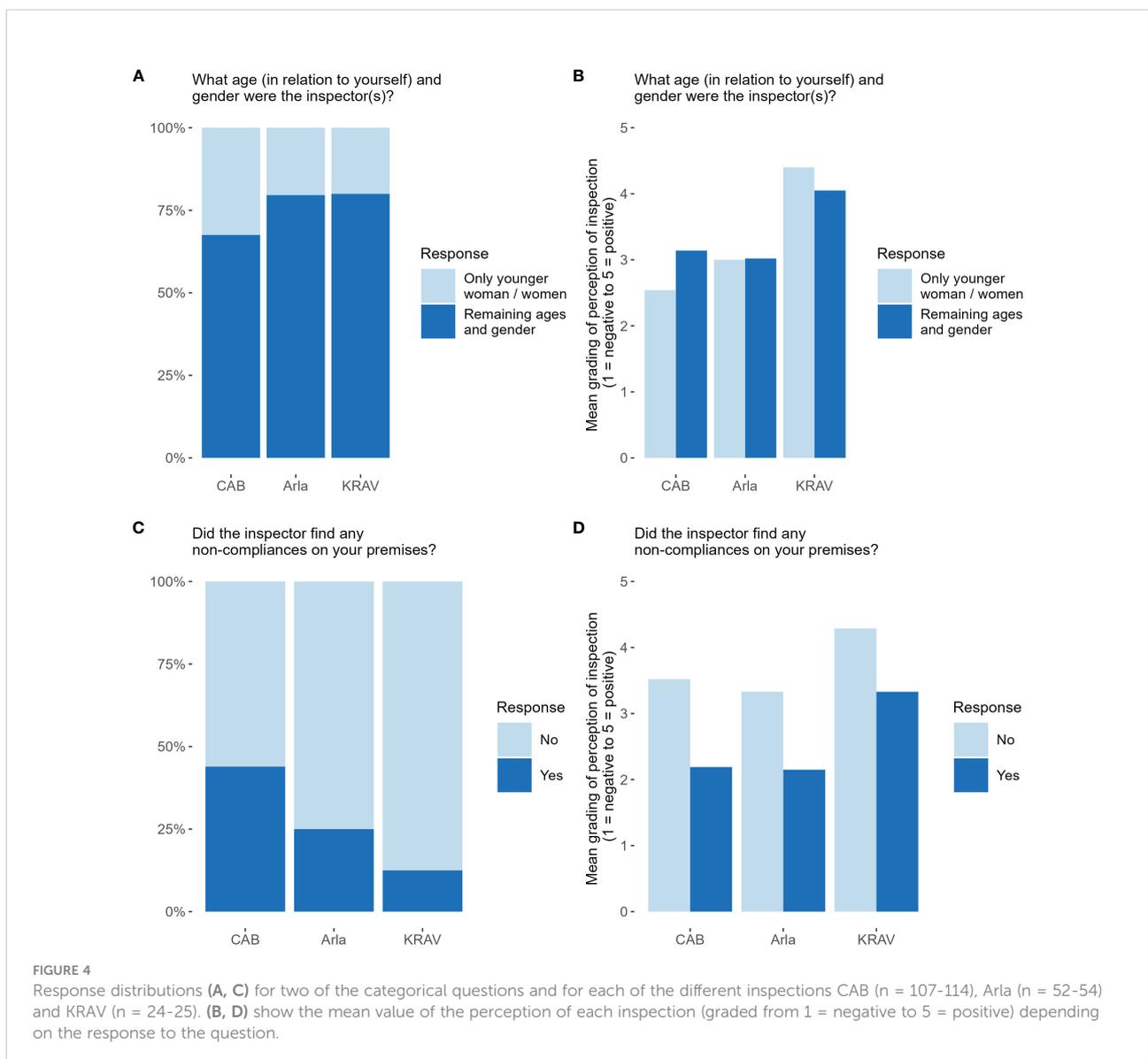
Around half of the farmers surveyed (48%, 55/115) perceived the CAB inspector as pleasant with good intentions, while 24% (28/115) did not. More than half the Arla farmers (62%, 34/55) perceived the Arla inspector as pleasant, while 19% (10/55) did not. A majority (88%, 22/25) perceived the KRAV inspector as pleasant, which was significantly higher than for CAB ( $p = 0.001$ ) and Arla ( $p = 0.028$ ) inspectors. One-third of the farmers (33%, 38/115) stated that the CAB inspector seemed to be interested in the farm business, while 41% (47/115) said that the inspector appeared not to be interested. A slightly larger proportion (41%, 23/55) stated that the Arla inspector appeared to be interested, while 29% (16/55) stated the opposite. Most farmers (80%, 20/25) perceived the KRAV inspector as

interested in their farming business, which was significantly higher than for CAB ( $p < 0.001$ ) and Arla ( $p = 0.004$ ) inspectors.

Approximately 25% of the inspections were conducted by a woman/women younger than the farmer, which was slightly more common for the CAB inspections (Figure 4A). How a farmer perceived a CAB inspection was significantly associated with gender and age of the inspector/s ( $p = 0.018$ ), but not for Arla or KRAV. The farmers (female or male) had a more negative perception of inspection if the CAB inspector was a younger woman (i.e., younger than the farmer) (Figure 4B). Of the CAB inspections carried out by younger woman/women, 50% (17/34) resulted in non-compliances and 50% did not. Of the CAB inspections carried out by inspectors of other gender and age, 40% (27/68) resulted in non-compliances and 60% did not. However, there was no significant difference between the outcomes

from the different inspectors ( $p = 0.322$ ,  $n = 102$ ). Younger female inspectors from Arla and KRAV did not report non-compliances to a greater extent than the other inspectors. In total, nine responses of “do not remember” were removed.

It was more common to have more than one inspector present at a CAB inspection than at an Arla inspection. More than one inspector (two inspectors 45% (55/121); three inspectors 7% (8/121)) carried out slightly more than half of the CAB inspections, while one inspector was present at 45% (55/121) of the CAB inspections. More than one inspector (two inspectors) was only present during three Arla inspections (5%, 3/55). All KRAV inspections were carried out by one inspector only. The number of inspectors present during a CAB inspection was significantly associated with how the farmers perceived the inspection, with more inspectors related to a more negative perception of the inspection ( $p = 0.007$ ).



The feeling that an inspection disrupted farm routines was correlated with the perception of both CAB and Arla inspections, where the correlation coefficient was negative, meaning that the perception of the inspection was more negative if the inspection was perceived as disturbing the routines (Figure 3). Approximately half replied that the latest CAB (53%, 61/115) and Arla (49%, 27/55) inspection had disrupted their routines, while only 20% (5/25) reported this for a KRAV inspection. Of the CAB inspections, 19% (23/120) were unannounced, 10% (12/120) were announced on the day the inspection took place, 52% (62/120) were announced the previous day, and 17% (20/120) were announced well in advance. All Arla inspections were announced beforehand, and only 8% (2/25) of the organic farmers received a KRAV inspection without prior announcement.

Whether an inspection was pre-announced was significantly associated with farmers' perceptions of the CAB inspections ( $p = 0.014$ ), with a more positive experience of the inspection if it was announced beforehand. The reason for the CAB inspection was also significantly associated with farmers' perceptions ( $p = 0.004$ ), and hence it mattered whether the inspection was a planned routine inspection initiated by the CAB, an inspection based on complaints from the public, or an extra inspection due to previous non-compliances, or if the reason was unclear to the respondent. The most common type of inspection was a planned routine inspection for CAB (71%, 83/117), Arla (91%, 50/55), and KRAV (92%, 23/25). For these inspections, the mean graded perception of the inspection was slightly higher than for inspections based on non-compliances or complaints. For some farmers (15%, 17/117), the inspection was due to a complaint to CAB that the farmer might have shortcomings in their animal husbandry system or management, and for two farmers the CAB inspection was an extra inspection due to previous non-compliances. Only one farmer had an extra inspection by Arla. Some farmers stated that they did not know the reason for the inspection (CAB 13%, 15/117; Arla 3%, 5/55; KRAV 4%, 1/25).

### 3.6.4 Outcome of an inspection

According to the respondents, all actors found non-compliances relating to animal welfare during some inspections (Figure 4C), and a significant association was found between the farmers' perceptions of all inspections and detection of non-compliance at the time of inspection (CAB:  $p < 0.001$ , Arla:  $p < 0.001$ , KRAV:  $p = 0.011$ ), i.e., farmers with non-compliances had a more negative experience of the inspection (Figure 4D). For the CAB inspection, farmers with non-compliances were also more likely to have been worried before the inspection ( $p = 0.044$ ,  $n = 107$ ). Of the responding farmers, 52% (25/48) stated that they had non-compliances found by CAB relating to the animal house and interior design, 50% (24/48) stated that they had non-compliances related to direct welfare and management of the animals, and 13% (6/48)

stated that non-compliances related to insufficient documentation. The corresponding values for Arla were: house and interior design 8% (1/13), animal welfare and management 62% (8/13), and documentation 15% (1/13). Type of non-compliance was not significantly associated with perception of the CAB inspection. However, respondents who had non-compliances related to both animal welfare and house and interior design rated the perception lower than others.

The most common way for both CAB and Arla to handle non-compliance was to make a note about it in an inspection report. None of the farmers had received any harsher sanction from Arla, but 24% (11/46) had received injunctions from the CAB, and 35% (16/46) reported a deduction in EU subsidies due to non-compliances in the past three years. None of the respondents had been subjected to decisions on seizure of animals or a ban on milk delivery. While the mean perception of inspection was lower when a farmer had had a deduction in EU subsidies, the type of sanction was not significantly associated with the perception. Some farmers stated that the agencies are too rapid in taking strict actions and sanctions when someone does not comply with the requirements (CAB: 31%, 48/157; Arla: 40%, 26/66; KRAV: 4%, 1/25), while other farmers disagreed (CAB: 26%, 41/157; Arla: 25%, 16/66; KRAV: 36%, 9/25). Several farmers stated that the agencies were neither too rapid nor too slow in this regard (CAB: 43%, 68/157; Arla: 36%, 24/66; KRAV: 60%, 15/25).

The perception of a CAB inspection was correlated with a feeling of having received advice on how to reach compliance if non-compliance was registered during the inspection ( $r = 0.61$ ,  $p < 0.001$ ). More farmers (52%, 24/46) reported not receiving any advice from the CAB inspector than receiving advice (28%, 13/46). Most farmers did not think that any inspection in general had led to an improvement in animal welfare on their farm (CAB: 87%, 99/115; Arla: 84%, 46/55; KRAV: 68%, 17/25), with no significant difference between the inspection types (Figure 1F). Only a few farmers perceived that the inspection had improved animal welfare (CAB: 3%, 4/115; Arla: 2%, 1/55; KRAV: 4%, 1/25). However, this was not significantly correlated with the perception of the inspection, i.e., a farmer could report a positive or negative experience regardless of whether the inspection was believed to improve animal welfare or not (Figure 3). Approximately half of the farmers (53%, 25/47) perceived that the written CAB inspection report did not reflect what had been said during the inspection, i.e., new non-compliances were perceived to be stated in the report, while 38% (18/47) stated that what was written in the report corresponded well with what was said during the inspection. This was significantly associated with the experience of the CAB inspections ( $p = 0.002$ ), where if the farmer thought that nothing new had been added in the written report than communicated orally during the visit, this was related to a more positive experience. The test was not relevant for Arla or KRAV farmers, due to the low number of responses. Farmers

stated that the written inspection report was clear and easy to understand (CAB: 56%, 64/115; Arla: 74%, 41/55; KRAV: 92%, 21/25), but there were some exceptions, especially for CAB reports (CAB: 27%, 31/115; Arla: 10%, 6/55; KRAV: 0%).

## 4 Discussion

### 4.1 Some dissatisfaction over the animal welfare inspections

In general, the Swedish dairy farmers participating in this study acknowledged the need for regular animal welfare inspections, but they had rather diverse perceptions of animal welfare inspections and inspectors, with both positive and negative perceptions that were not dependent on whether they had received an inspection or not. Väärikäälä et al. (2018) found that Finnish farmers who had undergone an inspection had a more negative attitude and that some had difficulties in distinguishing official animal welfare inspections from other types of official inspections. Our results indicate that some Swedish farmers also have trouble distinguishing between official and private animal welfare inspections. Several of the requirements are similar between the regulations but may be assessed differently, so the inspection outcome may differ (Lundmark et al., 2016; Lundmark Hedman et al., 2018). Only one-third of the farmers surveyed in this study thought that similar requirements had the same outcome when checked by inspectors from different agencies. Hence, it is not surprising that most of the farmers wanted better coordination between the official and private inspections.

The farmers were generally not happy about being inspected both by official and private agencies, but most considered it reasonable to have an animal welfare inspection at least every third year at farm level. The current aim in Swedish official welfare control is to inspect 10% of farmers with production animals each year (SBA, 2022). This implies an inspection frequency of approximately every tenth year for each farm, a frequency that most CABs fail to achieve (SBA, 2022). The private actors have much more frequent inspections, and without those it would be impossible to meet farmers' expectations on the interval between animal welfare inspections.

The present study was conducted in parallel to a similar study of Swedish trotting horse trainers (Lundmark Hedman et al., 2022). The dairy farmers in this study had in general a more negative attitude towards official CAB animal welfare inspections than Swedish trotting horse trainers during the same period. The trotting horse trainers had quite a positive perception of both the official CAB inspections and the private inspections carried out by the Swedish Trotting Association (STA), and were in particular satisfied with the STA inspections. The farmers in this study were not more satisfied with the private Arla inspections than with the CAB inspections.

However, it should be noted that Arlagården<sup>®</sup> and its inspection system and routines underwent substantial revision in 2020, which may have contributed to larger uncertainties and more negative feelings related to this. The farmers were more positive to KRAV inspections. The KRAV farmers stated that the inspectors found very few non-compliances concerning their animals, which could be a reason for the more positive attitude. In a previous study, we found that organic KRAV farmers had fewer non-compliances registered during official CAB inspections (Lundmark Hedman et al., 2018), which is in accordance with findings in the UK (KilBride et al., 2012; Clark et al., 2016). Martinez et al. (2007) found that people who volunteer to affiliate are more likely to comply with rules, so KRAV's voluntary affiliation may contribute to a more positive view on the inspections. Affiliation with Arlagården<sup>®</sup> is mandatory for farmers wanting to deliver milk to Arla Foods. Hubbard et al. (2007) found that some UK farmers perceive private standards as a *necessary evil*, i.e., an economic necessity rather than a choice, in order to get access to the market. In our study, the majority of Arla farmers stated that the main reason for following Arlagården<sup>®</sup> was that Arla demands this for farmers delivering milk to them.

### 4.2 Some dissatisfaction over the animal welfare regulations

Some farmers in our study were dissatisfied with the regulations (i.e., the legislation and Arlagården<sup>®</sup>), finding them complicated to comply with and unnecessary from an animal welfare perspective. Gezelius et al. (2022) found that most Norwegian farmers were satisfied with the legislation and felt that the legislation contributes to better animal welfare. However, some farmers found the Norwegian legislation to be complicated to overview, with unclear requirements. In our previous study on Swedish trotting horse trainers, we found that the trainers were quite satisfied with both the Swedish animal welfare legislation and the Trotter Health Standard (Lundmark Hedman et al., 2022). Several dairy farmers in the present study stated that the requirements in the legislation concerning summer pasture for cattle are particularly unnecessary, i.e., that the cows can be equally happy when kept indoors permanently. On the other hand, some farmers stated that summer pasture is one of the most important factors to achieve good animal welfare. Hence, opinion is divided among Swedish farmers concerning the benefits of pasture and if/how it should be regulated, as has also been evident in the agriculture-related media. Approximately half of all dairy farmers surveyed did not perceive that the CAB and Arla inspector could explain and justify their assessments in relation to the regulations. Hence, there is room for improvement in communication, especially as this was correlated to the experience of the inspection.

### 4.3 A feeling of uncertainty

The responses in this study reflect a feeling of uncertainty and worry among Swedish farmers in relation to the CAB and Arla inspections. Compared with trotting horse trainers (Lundmark Hedman et al., 2022), the dairy farmers in this study were much more worried prior to an inspection, felt that they had to prepare more before an inspection, were more uncertain about the requirements in the regulations, and were more unsure whether they would pass an inspection (i.e., would an inspection find non-compliances).

A contributing factor to the farmers' feeling of uncertainty and concern seemed to be the risk of economic consequences, either because non-compliances will be expensive to correct or because of a deduction in EU subsidies due to the cross-compliance legislation. Many farmers also stated that the risk of getting a deduction in EU subsidies for violating the legislation was their main motivation for complying with the legislation. Most dairy farmers surveyed had their farming business as their only financial income, which the trotting horse trainers in our previous study did not (Lundmark Hedman et al., 2022). Norwegian farmers also view economic consequences as an important motivating factor for compliance, but cite good animal welfare as the main reason for complying (Gezelius et al., 2022). Danish farmers have also been found to show concern about the risk of deductions in EU subsidies due to animal welfare inspections (Anneberg et al., 2012). In the present study, worrying before an inspection was correlated with how the inspection was perceived by the dairy farmer, i.e., the more anxious the farmer, the more negative the experience of inspection. Hence, it could be important to increase farmers' feeling of knowledge, compliance, predictability, and security, and it is probably important that authorities, private agencies and farmers' organizations collaborate on these issues.

Another contributor to uncertainty seemed to be that official CAB inspections can be carried out unannounced. Pre-announced inspection was associated with a more positive perception of the inspection, and several farmers felt that CAB, but also Arla, inspections disturbed the routines of the farm. Similarly, Väärrikälä et al. (2018) found that when an inspection was pre-announced, the farmer more often reported an open atmosphere and higher level of mutual understanding, while unannounced inspections were more often reported to disturb the routines on Finnish farms and violate farmers' legal protection. Gezelius et al. (2022) found that Norwegian farmers believed that announced inspections promote animal welfare more effectively than unannounced inspections. It has been found within other areas, e.g., working environment, that unannounced inspections can have some disadvantages (Johansson, 2006). For example, they generate negative reactions in the inspected person, which makes it more difficult to carry out a successful inspection. A pre-announced

inspection can be more efficient, and it can also be argued that pre-announcing it is a way of showing the inspected business respect, which in turn can lead to a more positive attitude of the inspected to the inspection. It may also improve compliance afterwards, because the inspected person feels obliged to give something back in exchange for the respect shown and possibility to influence the outcome (Johansson, 2006). In a previous study we found a higher risk of non-compliances on Swedish dairy farms when the CAB inspections were pre-announced (Lundmark Hedman et al., 2018). This may be related to the situations where the CAB chooses to announce, i.e., farms with a known and sometimes problematic history. It should be noted that EU Regulation No 2017/625 governing official controls of controls in the animal welfare area requires official animal welfare inspections to be made without prior notice, which means that this is not entirely a decision made by the CABs themselves.

We found that farmers' main source of information about animal welfare inspections was other farmers. According to our results, farmers may be worried before an inspection, have negative perceptions in relation to inspections, and have some difficulties distinguishing between the different types of inspections. Hence, the tendency to use each other as a source of information is understandable, but probably not the best way of being properly informed in order to prepare for a specific inspection. The trotting horse trainers in our previous study tended to consult the inspection agencies, i.e., CAB or STA, in order to get information regarding inspections (Lundmark Hedman et al., 2022).

### 4.4 Importance of inspection outcome

Unlike Swedish trotting horse trainers (Lundmark Hedman et al., 2022), but like Finnish farmers (Väärrikälä et al., 2018) and Norwegian farmers (Gezelius et al., 2022), Swedish dairy farmers' perception of inspection was associated with the outcome of the inspection. If non-compliances were recorded during an inspection, the farmer was more likely to experience the inspection as negative. Lääkkö-Roto and Nevas (2014) found that Finnish restaurant business operators with a more positive attitude to official inspections had fewer non-compliances in food hygiene. Cause and effect may be involved, but if having a positive attitude or experience of inspection is correlated with a higher level of compliance, it could be worth improving farmers' expectations and perceptions of inspections.

Another issue that differed strongly between Swedish trotting horse trainers and dairy farmers was the perception of the official CAB inspection report. More than half of all farmers surveyed perceived that the written CAB inspection report did not fully reflect what had been said during the inspection, while a majority of the trotting horse trainers felt that the report reflected the inspection and that no new non-compliances

were stated in the report (Lundmark Hedman et al., 2022). However, it was important for both the trainers and farmers that the written report reflected the inspection accurately, as this was associated with a more positive perception of the inspection. There are possibly other contributing factors to why the farmers more often experienced a discrepancy between what was said during the inspection and what was written in the report. One factor may be the level of anxiety during an inspection, since stress can affect a person's attention and memory, resulting in them focusing on central messages but not on messages perceived to be more peripheral (Kessels, 2003; Wessel et al., 2000).

Like Swedish trotting horse trainers (Lundmark Hedman et al., 2022), most dairy farmers did not consider the inspections to have improved animal welfare on their farm, possibly because they believed that the welfare level was sufficient already. Finnish (Väärikälä et al., 2018) and French (Viessier et al. 2021) farmers have similar views. However, Swedish trotting horse trainers had almost no non-compliances related to the horses' condition, and the study from France revealed that the legislation and checklists used for inspection only focused on resource-based measures. In the present study, non-compliances related to the animals' condition and management were commonly identified during the CAB and Arla inspections. Previous studies have shown that Swedish dairy farms can have problems with e.g., dirty animals (Lundmark Hedman et al., 2018; Lundmark Hedman et al., 2021a; SBA, 2022). Viessier et al. (2021) claim that more focus on animal-based indicators could improve farmers' engagement in the inspection results, lead to better compliance, and improve animal welfare on farms. However, non-compliance regarding dirty animals has been on the same high level for years in Sweden and has been the target of specific projects (SBA, 2022). Hence, an increased focus on this type of animal-based indicator and deficiency has not helped to improve the situation. Thus more research is needed to understand the underlying mechanisms motivating farmers to rectify insufficient animal welfare detected during an inspection.

## 4.5 Importance of inspector traits

Farmers' perceptions of the inspector's competence, manner, behaviour, and responsiveness were important for how the inspection was perceived. The farmers most valued inspectors being knowledgeable about cows and dairy farming, but their views on the inspector's level of competence varied (note that this is the farmers' perception; we do not know the exact background, education and training of the inspectors). One could argue that if a farmer had a bad perception of inspection, perhaps due to detection of non-compliances on the farm, they might recall the inspector as less competent or less nice. Gezelius et al. (2022) found that Norwegian farmers with non-compliances reported on their farms also questioned the

competence of the inspector regarding their actual production type. We know that if an inspected person perceives the inspector as competent, i.e., an expert, preferably already in the beginning of an inspection, this increases the likelihood of the inspected person taking action if non-compliances are discovered (Johansson, 2006). It is easier for an inspected person to respect and accept comments if the inspector gives the impression of being competent and has experience of the business type being inspected (Johansson, 2006). If the inspector is a woman, she needs to be much more competent than a man to be considered an expert (Carli, 2018). In this study, CAB inspections carried out by younger women were perceived as more negative, which is probably related to the power relations in society (Johansson, 2001) but should not be ignored or accepted. The inspections carried out by younger women resulted in reports of non-compliances to a slightly larger extent, but the difference was not significant. This could be one reason for the reaction of the farmers, as non-compliance was associated with a more negative experience. In future studies, it would be interesting to investigate whether this is because the younger women made stricter or more meticulous assessments and were less prone to indulgence, or due to pure coincidence.

The second most important trait was that the inspector is easy to work with and can make flexible assessments, while the third most important trait was that the inspector makes uniform assessments between farms. There is an obvious contradiction here, as it is not possible for an inspector to be both flexible and accept minor or major non-compliances because of conditions on a particular farm, and at the same time treat all farms in the same manner and make uniform, standardized decisions. Similarly, Anneberg and co-workers (2012) found that Danish farmers wanted objectivity and room for interpretation at the same time. Finnish farmers had a negative attitude to precise requirements (e.g., measuring centimeters), but also found the legislation difficult to interpret due to several abstract terms (Väärikälä et al., 2018). In previous studies in Sweden, we have found that farmers, horse owner organizations, and the government want more flexible requirements to be set by the Swedish Board of Agriculture, but at the same time want requirements that are predictable, easy to interpret, and enable uniform assessments (Lundmark Hedman et al., 2021b).

Perceptions of being treated fairly and being given good advice on measures needed to reach compliance were also correlated with the farmers' experience of an inspection (CAB or Arla). However, the current instruction at EU level is to clearly separate advisory tasks from official control tasks, to avoid an inspector assessing farming solutions that they themselves have recommended. Hence, farmers should get advice from independent consultants and not from inspectors or auditors, especially official inspectors.

The perception of being inspected by CAB was more negative if more than one inspector was present during the

inspection. The reason for sending two inspectors to a farm can vary, e.g., a less experienced inspector may accompany a more experienced inspector during training, or inspectors may work in pairs to increase inter-observer reliability and legal certainty, to make the inspection more efficient, or due to working environment issues (i.e. previous experience or other information of an increased risk of threats and unpleasant situations on a given farm) (Johansson, 2006). Hence, farmers may be negative to the presence of several inspectors, or CAB may send two inspectors to farms with a known problematic history of animal welfare problems or threats to inspectors. The CAB may be better at explaining why there is more than one inspector present when farmers want more uniform and effective inspections. We do not know the reason for inspections being carried out by several inspectors in this study.

#### 4.6 Respondents, study limitations, and dropout analysis

Only a minority of the farmers surveyed had received strict sanctions due to non-compliances but 24% of the respondents had received some injunctions. According to official statistics, approximately 16% of all CAB animal welfare inspections (all types of animals and business included) in the period 2018-2020 led to injunctions (SBA, 2022), so the proportion of farmers with injunctions in the study might be higher than the dairy farmer population in general. Moreover, 35% of the respondents in this study reported a reduction in EU subsidies as a result of non-compliances detected in animal welfare inspections, while a much lower proportion of all Swedish dairy farmers received such reductions between 2018-2020, with approximately 9% having a reduction in subsidies due to non-compliances related to cross-compliance and animal welfare, and an additional 5% for calf welfare specifically (SBA and personal communication, 2022). Hence, there is a risk that unsatisfied dairy farmers who do not have a positive perception of their latest inspection were overrepresented in our study. There is also a risk that the farmers did not distinguish between different types of CAB inspections. The CABs makes pure animal welfare inspections, but also specific cross-compliance inspections (which include more than animal welfare). Farmers having difficulties in distinguishing between different types of official inspections may have affected our results.

The response rate might have been higher if we had been given access to farmers' e-mail addresses, so we could have made direct contact with them and also sent out reminders. The response rate might also have been improved if we had been given access to farmers' postal addresses to send the questionnaire printed on paper to farmers who preferred this. One challenge with electronic questionnaires is the response rate (Siva Durga Prasad Nayak and Narayan, 2019), and online questionnaires may not be as appealing as sometimes believed

(Lefever et al., 2007). The questionnaire was also quite extensive, which could have had a deterrent effect.

## 5 Conclusions

The dairy farmers participating in this study had rather diverse perceptions of animal welfare inspections and inspectors, with both positive and negative experiences. In general, they had a more positive experience of KRAV than of CAB or Arlagården® inspections. However, most called for better coordination between the various inspections taking place on their farms. Several factors were related to the farmers' perception of the inspections, including the level of worry and concern before an inspection, satisfaction regarding the inspector's competence, manner and behavior, a perception of being treated fairly or not, whether non-compliances were recorded, the number and gender of inspectors, and whether the inspection was pre-announced or not. Different regulators and inspectors should consider these factors when deciding if changes are needed or if better information and communication is required. Farmers should also consider how their attitude may influence the working environment for animal welfare inspectors, and how this in turn influences communication and, indirectly, the outcome of inspections.

For a regulation to be considered successfully implemented, the inspected person must *understand* the regulation and assessment, *be able to* comply with the regulation, and have a *will* to comply with the regulation. While there was large variation in dairy farmers' perceptions of being inspected, the farmers in this study generally agreed on the necessity of animal welfare regulations and inspection and thus in many cases had a will to comply. However, our results indicate that understanding of the regulations and inspection assessments can be improved. There is thus a need for objective and accurate communication regarding different animal welfare regulations and inspections in Sweden, and probably also in other countries. To improve trust and lower concerns among farmers about animal welfare inspections, all stakeholders need to be involved in this communication.

## Data availability statement

Upon request, the data supporting the conclusions of this article is available from the corresponding author.

## Ethics statement

This study involved human participants and was approved by the Swedish Ethical Review Authority (reference number: Dnr 2019-06370). The participants provided their written informed consent to participate in this study.

## Author contributions

FLH, CB and JF: conceptualization and methodology. FLH and IRE: formal analysis. FLH and IRE: writing – original draft preparation. CB and JF: writing – review and editing. CB: funding acquisition. All authors contributed to the article and approved the submitted version.

## Funding

This research was funded by Formas, grant number 2017-01438

## Acknowledgments

The authors would like to thank Växa Sweden, Skånesemin, and Rådgivarna Sjuhärad for helping us distribute the link to the questionnaire to Swedish dairy farmers. We would also like to thank the dairy farmers who took the time to answer the questionnaire.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fanim.2022.1079457/full#supplementary-material>

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