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Research Article

Attitude Characterization of Dairy Calves Handler's in Commercial Dairy Farms

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ABSTRACT

In dairy farms, the human-animal interaction is intense, especially with baby calves and the animal's response is linked to the handler's behaviour. Considering that attitude of calves' handlers can improve animal performance, this study aimed to characterize it in order to understand important gaps. One hundred handlers of commercial dairy farms located in Minas Gerais, São Paulo, and Parana were interviewed. The interview was conducted based on a semi-structured questionnaire applied by only one interviewer and directed to calves' handlers. The questionnaire was developed to collect data attitude of self-reports from people responsible for handling calves. Pearson's correlation between the cognitive, affective and behavioural components of the attitude of calves' handlers and the performance of calves during the milk-eweaning were very low. Nearly seven of ten respondents had a positive attitude about the statement "care with the prepartum cow may impact calf's performance preweaning". For 55% of the handlers, calves should receive more than two liters of colostrum in the first meal; however, for 39% of them, the volume should be higher. Only 28% of handlers disagree that a newborn calf should ingest colostrum directly from the dam. Almost six in ten handlers agree that a calf should be fed with dam's colostrum. Three in ten respondents do not agree with the statement "In the future, I would like to work in another sector". More than half (52%) agree that they know how to raise calves, with higher percentage observed for the largest farm's handlers. For some variables, the handler has a positive attitude, but in practice, the behaviour performed is not always the same. The behaviour of the calf's handler may have positive affective and cognitive components. All the handlers knew how to handle the animals or at least knew the importance of the main actions in dairy calves handling. However, the behavioural component is based on actions, differing attitude from behaviour. There is a strong need of training calves' handlers so their attitude and behaviour may be modulated to improve the efficiency of raising dairy calves.

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Summary

Our aim was to characterize the attitudes of dairy calves' handlers across dairy farms located in three different areas of Brazil and evaluate the relationship of that with animal performance. We found that the behavioural component stands out over some actions. For some variables, the handlers had a positive attitude, but in practice, the behaviour was not always the same. There is a strong need of training calves' handlers so their attitude and behaviour may be modulated to improve the efficiency of raising dairy calves.

Introduction

Dairy farming usually implies frequent and close contact between the handler and calves during procedures such as feeding, cleaning, and inspection. Differences on the individual management strategy, frequency of routines, such as animal health assessment or hygiene, as well as the personality of the farmers are directly related to the handler's behaviour [1]. These differences in interactions between handlers and animals might contribute for the variation in production, health, and reproduction [2]. The relationship between the stockperson behaviour and the animals' reactions have consisting findings on dairy cows [3].

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The use of negative tactile interactions such as hits, slaps and pushes had a positive association with avoiding handlers [4, 5]. According to De Passillé *et al.* (1996), calves may develop fear of their handlers due to aversive treatments, an attitude that can lead animals to reduce their feed intake, manifest diarrhea and consequently, present low performance [6]. Animals with fear of humans are more likely to experience acute stress condition when in their presence and in some situations suffer from chronic stress, which results in immunosuppression and triggers serious consequences on animal health [7]. On the other hand, the positive interactions, such as talking and gentle touching, were associated with reducing levels of fear from handlers [8].

Many studies simulate the positive and negative contact of the calves' handler and its consequences on animal performance [9-12]. However, very little is known about the attitudes and behaviours of the calves' handler. For example, it is well known that the success in the physiological process of transfer of passive immunity is critical for the health of the calf. However, the behaviour of the handler also plays an important role in this process. The human factor is responsible for identifying the quality of colostrum, offering it in the correct volume and time, as well contributing to have a colostrum with low bacterial count. Thus, handlers training in specific management practices only brings results when accompanied by a change in attitude and behaviour. Nonetheless, the attitudes and behaviors of stockpersons refer not only to the positive relationship with the animals, but also to personal and professional components, such as free time, appropriate knowledge, observational abilities and technical skills, the level of satisfaction with one's work and the level of training [13, 14].

According to Lam *et al.* (2011), the best management in dairy farms covers more than the dissemination of technical information of management practices; it also involves the perception of the problem and the change of attitude by the farmers and handlers [15]. The attitude of the handler can be influenced by the level of education, technical training and knowledge of the importance of the activity developed they are in charge of, besides the level of satisfaction with their work and remuneration [14]. Thus, it is necessary to recognize that the behavioural change of the handler towards the animal is not a simple task, since handlers usually present well established attitudes, beliefs and habits that correspond with their previous experiences and also from other handlers with whom they relate [7]. Attitude can be defined as "... a collection of cognitions, beliefs, opinions, and positive or negative facts"; the point of view of a person in relation to something; a subliminal predisposition of the person, resulting from previous experiences, cognition and affectivity, in determining their behavioural response to something" [16-18].

Thus, the attitude is linked to three components: the cognitive, which concerns the beliefs, facts and information about a particular object; the affective, which refers to the emotions or feelings directed to an object; and the behavioural one, which includes the posture in relation to a certain object [19]. The importance of studying the attitude lies in the fact that it can predict behaviours, which can be more easily measured, evaluated and judged [20]. The present study aimed to characterize the attitudes of dairy calves' handlers across dairy farms located in three different areas of Brazil and evaluate the relationship of that with animal performance.

Materials and Methods

A sample of 100 calves' handlers from properties located in the States of Minas Gerais, São Paulo and Parana, with a daily milk production of between 40 and 42,000 liters were interviewed. The interview was conducted based on a semi-structured questionnaire, applied by a single interviewer, and directed exclusively to the calf handler. On-site surveys to calf handlers assessed attitude criteria using Likert-type questions, as recommended by Ajzen and Fishbein (2005) [21]. Data collection took place between the months of July and November of 2013. The contact with these properties occurred through cooperatives and producer's association. Properties were classified according to their daily milk production in three classes: < 200L/d; 201 to 700L/d and > 700L/d. Data of weight gain during the preweaning phase was collected from farm annotation.

For the present study, it was decided to assume that the attitude would cover the opinions, beliefs, and values (way of thinking, judgment about a given object). The technique chosen to investigate attitude was the interview, associated with field observation. The questionnaire was developed based on information from the literature and field experiences to collect data attitude (cognitive, compartmental, and affective components) of self-reports from the person responsible for dairy calves' care and feeding. Ideas about attitude self-reports were mainly derived from questions about perception and opinion of important factors that may influence dairy calves raising. The attitude items were measured and ranked according to the interviewee's response on a five-point scale (Likert Scale), depending on their perception, ranging from 1 (strongly disagree) to 5 (strongly agree). Before starting the visits to the participating properties, the questionnaire was first applied to a group of 10 graduate students, which was able to improve it by deleting some questions and including others.

After that, questionnaire was used in a pilot sample (two properties) to verify if the questions covered all the desired content and if the vocabulary used was easy to understand. The data collected in this sample were used only for this purpose, being discarded after the validation of the questionnaire. After adjustments, the questionnaire was composed of 49 questions (Supplementary material). At the beginning of the interview, the real objective of the research was not presented to the interviewees, to avoid biased answers.

The attitude data were summarized using simple descriptive statements and grouped in figures, aiming a better presentation, comparison and analysis of results (Lopes *et al.*, 2007) [22]. In addition to the descriptive analysis, data were analysed following three steps. First, a principal component analysis (PCA) was conducted, with the immediate objective of verifying if there is a small number of the main components that is responsible for explaining a high proportion of the total variation associated with original data set. Second, a correlation analysis was done with the reduced database, to determine the association between the variables. Finally, a regression analysis was done with variables that correlated significantly ($P < 0.10$) with at least one of the indicators studied. Data were analysed using SPSS software (SPSS 12.0.1 for Windows, SPSS Inc. Chicago, IL, USA).

Results and Discussion

Almost 25% of the properties visited produced less than 200 liters of milk per day, 32% of properties between 201 and 700 liters and 44% more than 701 liters of milk per day. Regarding the volume of milk produced, the highest production class (> 700 L) accounted for 88% of all production related to the properties visited. More than half of the participants were from the State of Minas Gerais, followed by São Paulo and Paraná. However, with regard to daily milk production, 30.9% of the properties visited in Minas Gerais produce less than 200 L/d, while in the Paraná region only 3.5% of the properties were in this same production range. The tradition and experience of the producers in the production of milk can be translated by the time in which the farmers are in the activity. Most of the producers have been engaged in milk production for more than 15 years, with 24% of them working in livestock farming for more than 25 years, showing their experience. However, it has been found that in many properties the high age of the producer and the lack of an eminent successor are factors that limit long-term investments in the activity. A more detailed characterization of the dairies as regard to the dairy calves' production system may be accessed in Santos and Bittar (2015) [23].

Pearson's correlation between the cognitive, affective and behavioural components of the attitude of calves' handlers and the performance of calves preweaning were very low (Supplementary material). None of the cognitive components of the attitude presented statistically significant correlation with calves' performance ($P > 0.05$). However, some of the affective components, such as knowing all calves by name, not storing colostrum, don't worrying about the calves because they either will take

long time to return the investment or because there is no certainty about their future milk production, were significantly and negatively correlated to the calves' performance ($P < 0.05$). Most of the behavioural components were also significantly correlated to calves' performance, some positively (weighing calves regularly - $P < 0.001$), others negatively (pulling calves, low interaction of handlers with dairy owner - $P < 0.01$). However, even though correlation was significant for some of the parameters, it explains a small part of the calves' performance, which is affected by a myriad of factors such as adequate transfer of passive immunity, nutritional and sanitary management, among others. Nevertheless, attitude of calves' handler is of great interest and allow identification of the main problems in order to plan trainings and activity or protocols that may modulate the attitude and behaviour.

Around seven out of ten participating handlers had a positive attitude, regarding the variable "care of dry cows may reflect on the calves' performance". Some handlers disagree (15%) and strongly disagree with this statement (3%) (Figure 1). The highest percentage of disagreement was with handlers from farms with dairy production between 201 and 700L/d (32%). On the other hand, 85% of the handlers who work in higher production levels farms (> 700 L/d) agree that better dry cow's management results in better calf performance. Failure to care for the pregnant cow, especially during the last third of gestation, may compromise the development of the newborn and parturition, impair colostrum formation, and reduce the calf's ability to ingest colostrum in the first hours of life [24]. In addition, the prepartum cow housing, considering location, hygiene, and comfort, is critical to reduce the risk of microbial contamination and improve well-being for both the cow and calf [25].

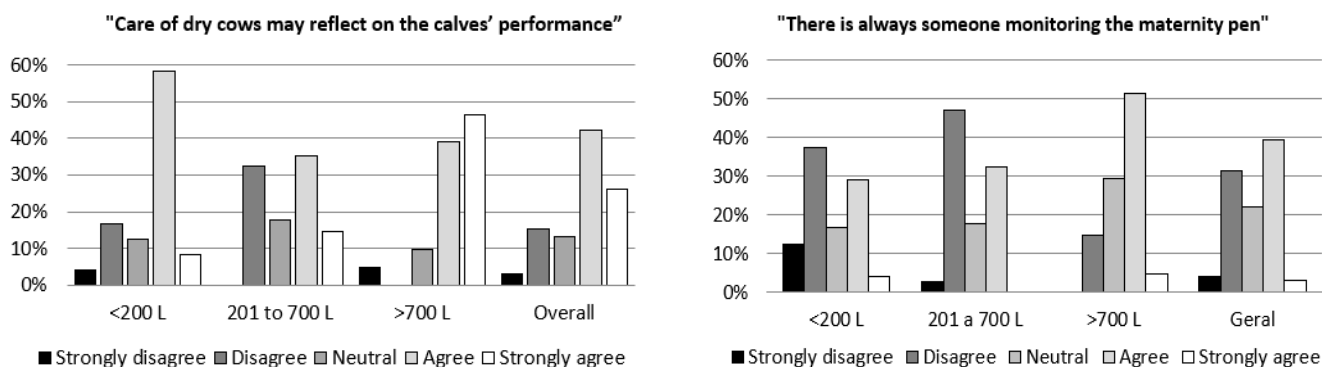


Figure 1: Attitude of calf's handlers towards prepartum cows, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

Therefore, whether by the cognitive, affective or behavioural component, the attitude of most handlers was positive. However, such care often does not happen on farm practices, since 14% of the maternity pens of these interviewed farms are in remote, making it difficult the observation or assistance when a cow is calving [23]. Even though most handlers agreed on the influence of dry cow management on calf's performance, 4 and 5% of handlers from systems producing less than 200 or more than 700L/d, respectively, disagree with that (Figure 1). The lack of knowledge of this important management practice can contribute to increase stillbirths and reduce animal performance [26].

Concerning the management of prepartum cows, 42% of handlers stated that there is always someone monitoring the maternity pen. On the other

hand, 35% of the interviewees disagree with this statement; most of them are from low and medium daily milk production farms (Figure 1). Since most of the handlers claimed to be aware of the importance of dry cow and care for newborn performance (Figure 1), two problems may be occurring. Probably the maternity pen is far from the office or the milking parlor, making it difficult when a calving cow needs assistance; or the total number handlers at the farm is below or fewer that needed for all the chores. Although ensuring the observation of cows in the maternity pens may be a responsibility of another handler (maternity cows' handler or farm manager), the perception of this practice by the calves' handlers demonstrates the knowledge and commitment of this action for the success of raising dairy calves. Solving a problem is only

possible when it is perceptible to people, otherwise they will feel incapable of solving it.

According to Vasseur *et al.*, (2010) in Canadian herds the visit to the maternity pen occurs three times throughout the day and only once at night; still, 7.8% of the properties use camera to monitor the occurrence of calf's birth in maternity stalls [25]. However, the authors state that these levels of observation are still insufficient to monitor the occurrence of calf's births, a fact that contributes to increase the number of calves that are stillborn or have failure of passive immune transfer (FPIT). In US herds, about 47.2% of the cows on the maternity pen are observed for 3 hours throughout the day and only 18.6% of the cows in the maternity unit are observed during the night [27]. Still, nine out of ten US cow handlers state that they should observe cows in the maternity pen for less than three hours. In Brazil, a survey conducted with 73 farms, most of them in Minas Gerais, reveal that in more than half of the property's handlers check the maternity pen 3 times or more during the day, while 36% never do that during the night.

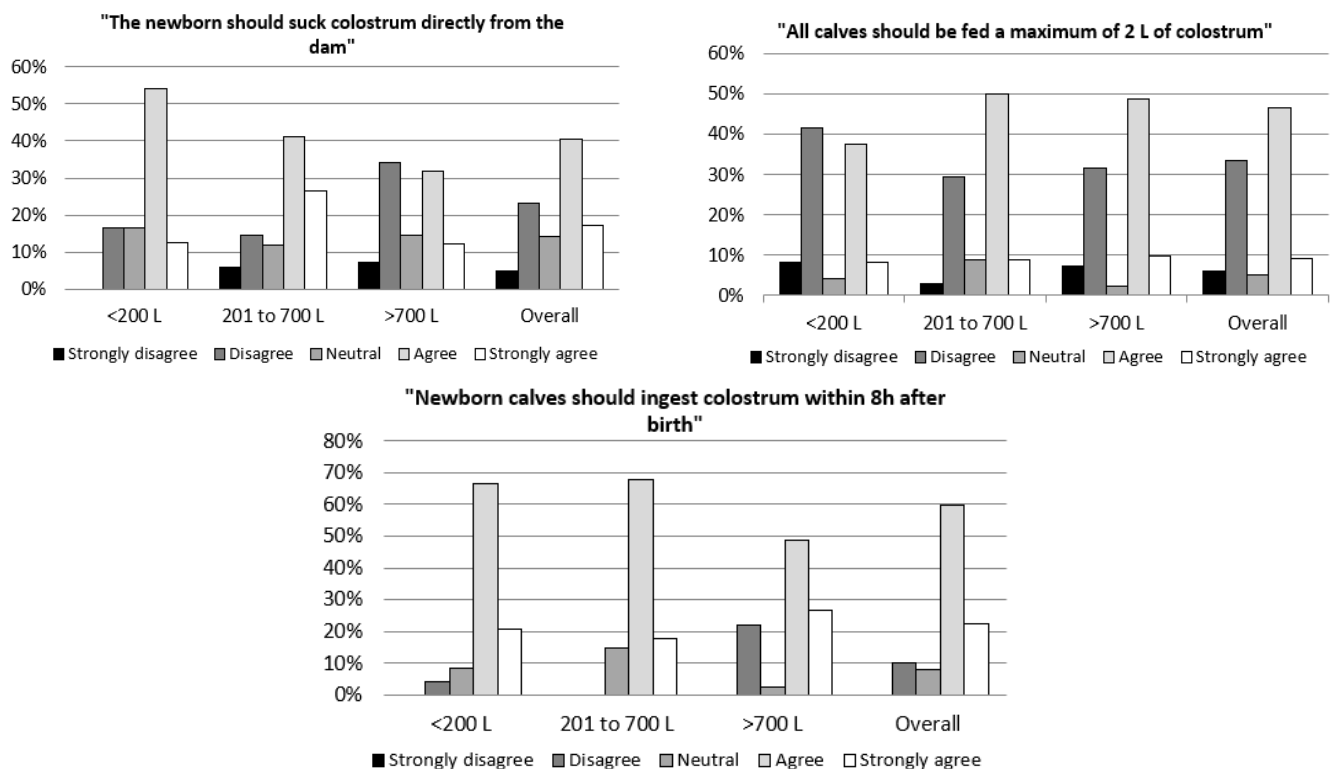


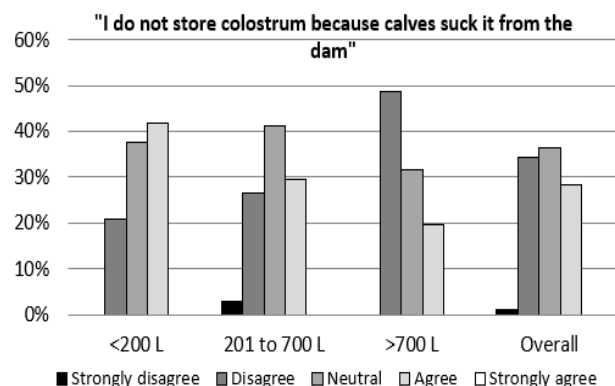
Figure 2: Attitude of the calves' handlers towards colostrum feeding, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

For 55% of handlers, newborn calves should receive a maximum of 2 liters of colostrum in the first meal and for 39% of them disagree with that (Figure 2). It is interesting to observe that in properties with daily production of 200 to 700L and over 700L, the percentages of handlers who agree with this assertion are higher, suggesting that they may be limiting the intake of immunoglobulins by the calves. On the other hand, the daily system with less than 200L presented a greater disagreement with this affirmation. However, 80% of those responsible for handling calves from these farms allow the calf to ingest colostrum directly from the dam (Figure 2). Nevertheless, as observed in a companion study, 51% of the most productive farms provide three or more liters of

colostrum to newborn calves [23]. Even with a positive attitude toward this practice, handlers from lower production farms present inappropriate behaviour, increasing the chances of FPIT. In the US, in only 6.3% of the dairy farms, the calf can suck colostrum directly from the dam and for those hand-fed the volume is lower than 2L in 12.6% of the operations [28]. Colostrum is the main source of antibodies and nutrients for the newborn calf, so the greater the volume ingested of the high-quality colostrum in the first 6 to 8 hours of life, the less is the chance of FPIT [24]. Indeed, the most recent recommendations are that calves receive at least 10% of the birth weight in high quality colostrum (>21% brix) during the first 6h of life [24].

Time for the first feeding is also an important factor that will affect passive transfer, and 82% of the handlers agree that colostrum ingestion should be performed within 8 hours of life (Figure 2). However, 22% of handlers who work in higher production farms disagreed with this, stating that it is necessary to feed colostrum in a shorter time. The cognitive component, which refers to the knowledge about something, contributed to a positive attitude of the handlers regarding this variable. However, in a previous study by Santos and Bittar (2015), only 56% and 12% of handlers provide colostrum to the calves before 8 hours of life when the calf was born during the day or the night, respectively [23]. In a more recent Brazilian survey with farms that focus on raising dairy calves (Azevedo *et al.* 2019), 89% of the farms feed colostrum to calves in 2h after birth, which is a recommendation of the Dairy Calf and Heifer Association (2016), but that only happens when the calf is born during the day [31, 32]. When the calf is born during the night, 12% is fed after 6h and 19% suck directly from the dam. These results characterize a cognitive dissonance; handlers know the importance of supplying colostrum as soon as possible after birth, even though they do not perform this action in practice, mainly during the night. Other factors, such as an unclear protocol for this routine or lack of tools, could be motivating them to do something other than what they think is right.

Further investigation of these aspects could help to reduce the occurrence of FTIP. Data from the USDA (2014) shows that in average calf's newborns receive colostrum in 3.6 hour after birth [28]. However,



Vasseur *et al.* (2010) report that 94.8% of calves in Canada receive colostrum within 6 hours of life, but these point out that this time to colostrum intake is in relation to the time the calf is found, which does not necessarily reflect the time of birth, and this interval (birth-feeding) may be longer [25]. Probably, the perception of the importance of this practice, as well as the dissemination of this information among those responsible for raising calves, is higher and more effective than in American and Canadian herds, resulting in better indexes.

The handlers were asked if they agree with the statement that a colostrum bank was not necessary since calves could suck from the dam (Figure 3). A bank of colostrum is an important alternative to maintain availability of high-quality colostrum, since there is a difference in volume and in concentration of immunoglobulin of the colostrum produced by cows [33]. Most of them responded in a neutral way (36%), but 35% said that a colostrum bank was necessary and another 28% disagreed (Figure 3). In properties with a production volume of more than 700L/d, 49% of the handlers agreed that there is a need to store colostrum. Indeed, the higher percentage of farms with colostrum bank (36%) was observed for those producers in the study of Santos and Bittar (2015) and on average only 26% of producers kept colostrum stored [23]. According to Kehoe *et al.* (2007), larger farms are more prone to store extra colostrum [34]. In addition, 73% of US farms maintain a colostrum bank, probably because of handlers training and/or the size of operation [28].

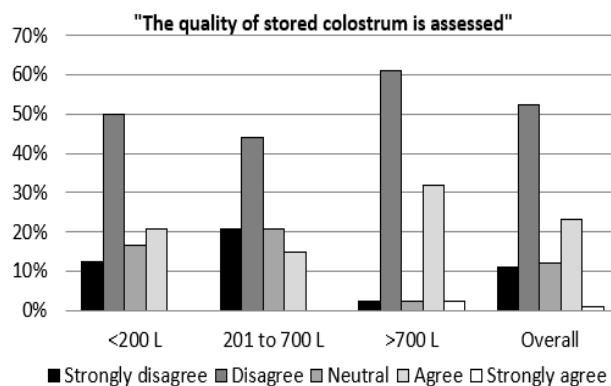


Figure 3: Attitude of the calves' handlers towards the colostrum bank management, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

In properties with colostrum bank, 11% and 53% of respondents strongly disagree and disagree with the statement "The quality of colostrum is assessed before storage" (Figure 3). On average, 53% of the handlers disagree with this statement, with higher percentage (61%) for properties producing more than 700L/d. On the other hand, on average only 24% agree that colostrum is evaluated before storage. In the companion study, only 11% of farms assessed the quality of colostrum before storage [23]. That is, despite having a positive attitude about the importance of evaluating colostrum quality, this does not happen in practice. More researches should be done to understand the factors related to this cognitive dissonance among handlers so that directed actions can be performed. Even worse, Vasseur *et al.* (2010) found that no producer interviewed evaluated the quality of colostrum stored and latter offered to the calves [25].

Regarding the amount of milk that calves should receive during the preweaned period, it was asked if 4L/d was enough. About half of the respondents agreed that 4L/d is enough to feed a dairy calf, 34% disagreed and 15% was neutral (Figure 4). Disagreement was higher for farms with higher daily milk production (46%). However, in only 41% of the largest farm's calves were fed more than 4L/d [23]. Possibly, the cognitive component that feeding more milk results healthier calves and improved weight gain, has contributed to such an attitude. This knowledge can be acquired empirically or even, due to the constant monitoring of technicians, which shows the importance of milk feeding on calves' performance. Limiting the volume of liquid diet for calves is a common practice done mostly to reduce raising costs, but also to improve concentrate intake. Canadian producers had similar behaviour, who even knowing the importance of feeding more milk increases animal performance, offered on average four liters fed twice daily [25]. A consultant in agreement with the producers or manager normally

decides on volume feeding, so even though the calves' handler may believe that more milk should be fed, there is no opportunity to change it.

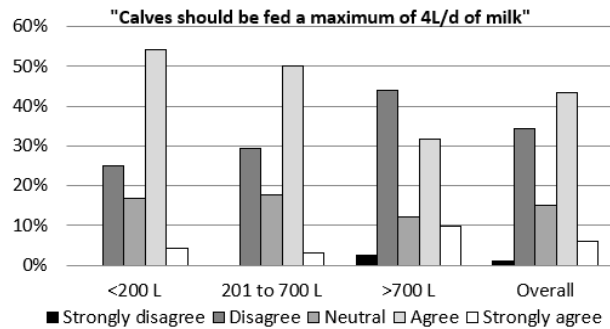


Figure 4: Attitude of the calves' handler towards the dairy calf feeding, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

The statement "I participate in the calf raising system planning with the consultant" may corroborate the finds discussed before. There was a

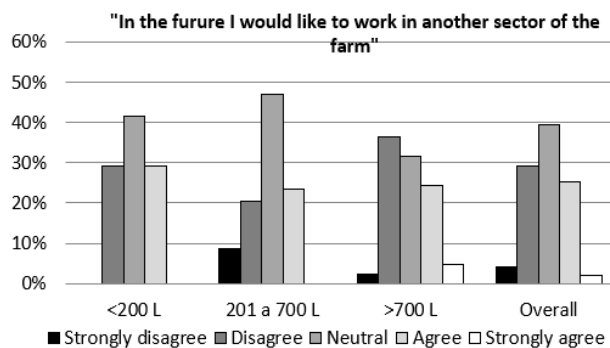
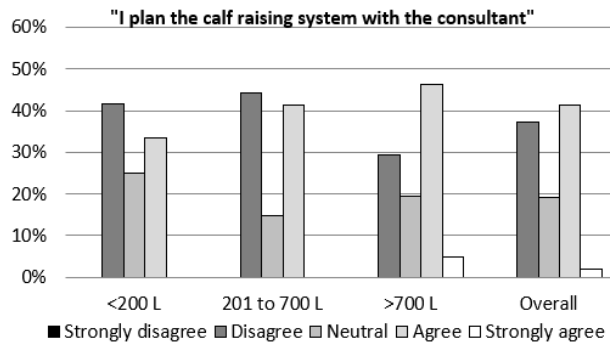
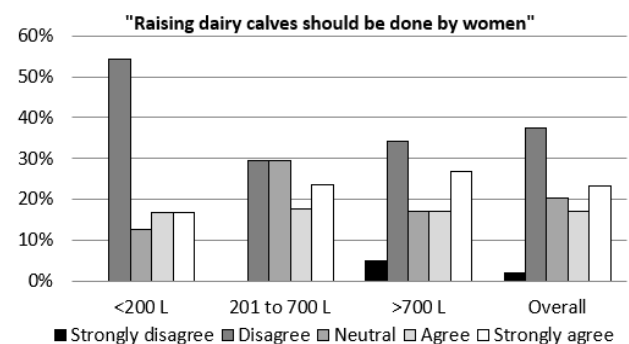
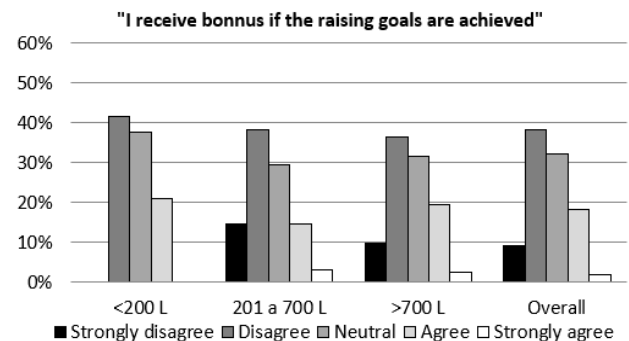


Figure 5: Attitude of the calves' handler towards the calf raising work, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

Maslow's theory is divided between primary needs, such as physiological and safety and secondary needs such as social, self-esteem, and personal fulfillment. For the employee to perform the daily work in a motivated way, it is necessary to provide all basic needs. Motivation may be an important factor in the decision of an employee to change jobs. Three out of ten interviewers disagree with the statement "In the future, I would like to work in another sector of the farm", but 27% want to change sector and 39% were neutral with the statement (Figure 5). It is possible that a higher percentage of respondents was satisfied with their work; however, they may have not agreed with the statement to avoid problems with the employer. Satisfaction, defined by this feeling

higher percentage of respondents that agreed with this statement (43%); however, 19% was neutral and 37% disagreed with that (Figure 5). In the properties with higher daily production, the perception of the involvement in planning the calf-raising system of the farm was greater (51%) than properties that produce up to 200L/d (33%), probably because these farms do not have a consultant. On properties with a production volume of more than 700L/d, about 30% of the handlers stated that they did not participate in decisions involving calf management. This low involvement of the caregiver may limit the consultant's understanding of the routine of the handlers and may be a factor that causes the caregiver to become unmotivated. According to Vergara (2000) under these conditions, the opportunity would be taken to generate in the calf handler the sensation of being part of that process, which increases the commitment to the activity [35]. Moreover, this feeling of participation in decisions increases employee commitment and involvement, which reduces absence rates and layoffs [36]. This fact contributes to the fulfillment of one of the basic needs, according to Maslow's motivation theory [37].



of happiness with the execution of daily tasks, can contribute to the success of the activity. In calf management the human-animal interaction is very close, therefore, the attitudes of the handlers can influence directly on the performance and animal welfare [38]. The stockperson-animal interaction (positive or negative) has been studied in many species, including preweaned dairy calves [2, 6, 39]. According to then, animals that have positive interaction with handlers feel safer; more relaxed, and allow manipulations more easily, while negative interactions generate fear and low animal welfare, accentuating chronic stress and consequently poor animal performance. It is a common sense

that a satisfied or happy handler will present a positive interaction with the calves.

Some production systems assign goals and share positive results with employees. When asked if that was the case, 20% of the handlers agreed, but 38% disagree and 9% strongly disagree that they receive some gratification if the goals are achieved (Figure 5). The attribution of a bonus is a stimulus, conditioning that can lead the individual to have greater motivation to accomplish something. However, according to Barbuto *et al.* (2004) for agriculture workers, when money is given as a motivational tool, it gives no more incentive than fun, reputation, or purpose [40]. Thus, the allocation of financial bonuses may lose the motivational aspect, and over time, employees consider this financial reward as an obligation of the company [41]. Thus, the financial bonus policy can be used sparingly and if this is not the only way to encourage employees to perform their tasks.

The results discussed above show that most of the handlers from farms with medium daily milk production (200 to 700L/d) do not plan the raising system with the consultant, are not gratified for the achievements and show greater interest to change jobs. These responses may be correlated since when the caregivers do not participate in decisions in their work sector and are not receiving bonuses for the achievements, they may increase dissatisfaction, which, together with the lack of training decreases the quality of their work. According to Fogari and Teixeira (2012), managers who feel that his or her opinion is not heard or has no chance of growth in the work environment, will certainly seek another job [42]. In contrast, in larger farms (>700 L/d), handlers are aware of the importance of feeding colostrum in time, store colostrum, and feeding the calves properly, do not want to find another job, even though they do not receive bonuses. The possibility of participating in the decision-making process ennobles the work and increases the percentage of satisfaction of the employee [43]. Providing what handlers need and have people committed to their work environment, can possibly reduce deficiencies and defects, lowering costs and raising the level of reliability in the system [42].

Interesting is that 40% of the respondents agreed or strongly agreed that women should perform activities related to raising dairy calves, while 39% disagreed or strongly disagreed, being 20% neutral on this matter (Figure 5). The higher percentage of disagreement was in small farms (<200L/d), where there is a higher percentage of calves suckling directly from the dam, so there is less interaction between handlers and calves. However, in systems with artificial feeding, where there is a greater human-animal interaction, the judgment that the calf management should be done by women, when men answered the questionnaire (92%), may be an indication that the attitude of these collaborators is not positive with calves or that they are not happy with the task they perform. This can generate aversive behaviors from the manipulator to the animal. When the person responsible for the raising sector was a female, 100% of the responses were agree and strongly agree with the statement; however, commented that more than the gender of the responsible person, the care, commitment, and interest will reflect on the performance of the animal. Lensink *et al.*, (2000) study the relationship between attitude and behaviour of the farmers in relation to the calves and it was observed that the frequency of gentle contacts was higher by female handlers [44]. Besides that, female handlers also had a more

positive conviction about the importance of the interaction with the calves and gave a better description of animals' behaviour.

Motivation and commitment may be increased by training of the handlers, which will also affect animals' performance. Most of the handlers agreed (48%) or strongly agreed (4%) with the statement "I have enough knowledge to raise calves", while 19% disagreed and 2% strongly disagreed (Figure 6). For more than 66% of the handlers from the largest farms (> 700L/d), knowledge about raising calves is enough, yet there is still a low efficiency as regard to this activity. Attitude of these handlers, such as agreeing that the calf should suck colostrum directly from the cow (44%), that only 2L of colostrum is enough for the newborn (59%), that colostrum is not evaluated before storing (63%), and that calves should be fed about 4L of milk daily (42%), suggests that there is a strong need of training. However, this belief may be discouraging producers and consultants in invest time and/or money in training, because they also believe that the handler has enough knowledge or because they know that the handler will be resistant to change the mindset.

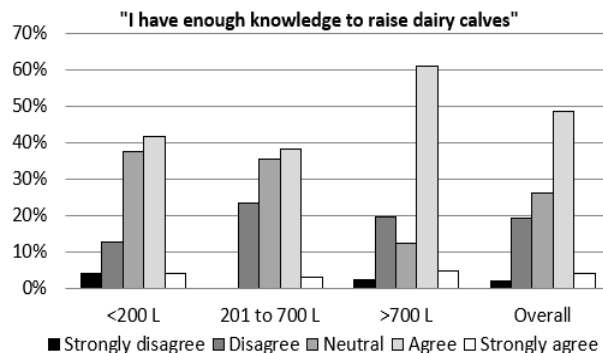


Figure 6: Attitude of the calves' handler towards the knowledge to raise dairy calves, according to the farm daily milk production (<200L, from 201 to 700L, > 700L).

Most attitudes studied make up the cognitive part of the attitude, which refers to the set of ideas, information, and beliefs that is hold about a given object or phenomenon [20]. Change in the attitude of actions that are developed almost exclusively by the cognitive component, should be carried out through training, lectures, field days and other ways to present technical knowledge about the object in discussion. Many discussions and research related to animal welfare are restricted only to facilities, environment, nutrition and sanitation, but it is always necessary to remember the importance of the human factor within the production system optimizing animal performance.

Conclusion

For some variables, the handlers had a positive attitude, but in practice, the behaviour is not always the same. Calves' handlers may have positive affective and cognitive components, that is, they have had previous experience of success with the practices or still, they know the technical importance of handling calves. However, the behavioural component stands out over some actions, leading them to a divergence between attitude and behaviour. There is a strong need of training calves' handlers so their attitude and behaviour may be modulated to improve the efficiency of raising dairy calves.

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