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Trading off animal welfare and production goals: Brazilian dairy farmers' perspectives on calf dehorning

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ABSTRACT

Dehorning of young calves is a routine management practice used on many dairy farms around the world. Dehorning is done to minimize injuries to stockpersons and other cattle. Most stakeholders not associated with the dairy industry frequently criticize this procedure, arguing that it is painful for the animal, which is supported by scientific evidence. Although research has shown that the pain associated with dehorning can be mitigated through the use of pharmacological tools, many farmers still routinely dehorn their calves without the use of pain mitigation. To elicit views regarding dehorning practices used on calves, including evaluating the importance of this procedure in the overall management of the herd, we conducted in-depth, semi-structured interviews with 37 farmers located in southern Brazil. Participants recognized dehorning as a required management practice but also identified it as a painful procedure, showing empathy for the animals. However, participants appeared to trade off production and welfare goals, frequently stating that high production was more important than the welfare of calves as justification for not using pain mitigation when dehorning. The lack of knowledge regarding means to mitigate pain associated with dehorning was identified as a primary barrier preventing the routine adoption of pain mitigation strategies. It was clear that advisors from public and private extension programs were the primary source of knowledge on dehorning. This work indicates the urgent need for extension efforts to include information on science based best practices targeted at dairy producers and dairy industry professionals advising producers regarding dehorning of dairy calves.

1. Introduction

Around the world, most dairy calves are dehorned within the first few months of life. This practice is recommended (AVMA, 2014) to ensure the safety of handlers and to reduce aggression among conspecifics (view also discussion in Knierim et al., 2015). However, increasing evidence suggests that the majority of people not involved in dairy production tend to reject practices they perceive to cause pain to animals (Vanhonacker et al., 2008; Fredriksen et al., 2011; Miele et al., 2011; Robbins et al., 2015).

Disbudding is the destruction of the cells of the horn bud (AVMA, 2014) and normally takes place when the horn bud is approximately 5–0 mm (Stafford and Mellor, 2005). In contrast, dehorning refers to the removal of the horns after they have formed and attachment to the skull has taken place, at approximately 8 weeks of age (AVMA, 2014). The most common procedures used to destroy the horn bud cells involve cauterization through hot or electric iron (Kling-Eveillard et al., 2009; Vasseur et al., 2010; Gottardo et al., 2011; Stock et al., 2013). Use of caustic paste to chemically destroy the horn tissue is less common (9% operations USDA, 2010), but is also painful (Stilwell et al., 2008). Around the world the usual method to disbud calves is the hot iron.

As it is well established that cautery disbudding is a painful procedure (reviewed by Stafford and Mellor, 2011), strategies have been developed to mitigate these effects. Local anaesthetics block the cornual nerve, reducing the pain at the moment of the procedure, but this does not address post operative pain (Faulkner and Weary, 2000). Regardless of method used to disbud, there is a growing body of evidence indicating that post operative analgesia (e.g. NSAIDs) can help control the pain in the hours following the procedure, particularly when used in association with local anaesthetics (Stafford and Mellor, 2011; Stock et al., 2013). Globally there is growing recognition amongst professional organizations

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that pain mitigation should be used when disbudding or dehorning (e.g. AVMA, 2014). In Brazil, the Federal Council of Veterinarians recommends that anesthesia be used when disbudding (up to 8 weeks of age) and, dehorning (up to 6 months of age). However, for animals greater than 6 months that are dehorning both a sedative and local anesthesia must be used (CFMV, 2008). Recommendations for organic production frequently vary from that of conventional systems; for example, in Brazil dehorning is not permitted by the organic production legislation, and disbudding is only permitted "when necessary", and must be done at an "appropriate age" to "reduce the painful process" (Brasil, 2011). Despite these scientific advances, the adoption of dehorning practices that incorporate pain mitigation remains slow within the farming communities around the world (USDA, 2010; Vasseur et al., 2010; Hötzel et al., 2014; Cozzi et al., 2015).

There has been a growing interest in understanding the views and knowledge of different stakeholders working within the dairy industry on dehorning practices (e.g., farmers: Gottardo et al., 2011; Wikman et al., 2013; Kling-Eveillard et al., 2015; veterinarians and dairy consultants: Hewson et al., 2007; Thomsen et al., 2012; Hötzel and Sneddon, 2013). These studies identified different factors associated with low adoption of dehorning practices that incorporate pain mitigation, including herd size, type of production, perceptions regarding cost, individual sensibility toward pain, and belief that farmers will neither adopt the practices nor would they pay for them.

The role of farm advisors in the promotion (or not) of proven best practices for on farm use has also received some interest. For instance, extension agents (e.g. agronomists, agricultural technicians and veterinarians) of southern Brazil believe that the pain associated with disbudding and dehorning is brief and of little consequence to calves, thus promoting the fact that pain mitigation is not necessary (Hötzel and Sneddon, 2013). Robbins et al. (2015), working with a wider group of primarily North American dairy industry stakeholders (dairy producers, veterinarians, students and researchers) also reported similar arguments by those arguing against the use of pain mitigation. These studies suggest that specific cultural and traditional factors may influence the knowledge, perceptions and views of stakeholders that underlie the decisions regarding dehorning. Therefore, the aims of this study were to firstly investigate the views of farmers in southern Brazil regarding dehorning dairy calves, including their preferred method of dehorning and the pain associated with this practice and, secondly, to provide insights into potential solutions that may increase the use of pain mitigation while dehorning.

2. Methodology

This study used a qualitative approach and consisted of in-depth interviews. Data collection was based on the methodology proposed by Corbin and Strauss (2007) and Minayo (2008). This research was approved by the Ethics Committee of Research with Human Beings of Federal University of Santa Catarina, Brazil (1828/2011).

Thirty-one farms were visited in 16 municipalities of the northwest and southeast of Santa Catarina (located between 25°57′41″S and 29°23′55″S), Brazil. Together, these two regions account for 79.3% of the milk produced in the state (ICEPA, 2014). Furthermore, Santa Catarina is the fastest growing dairy state in Brazil in the last 10 years (IBGE, 2006). Small family farms produce 80% of the milk in Brazil and 85% of the milk in the study region (IBGE, 2009). Following Article 4 of the Land Act established by Law no. 4504 as of November 30, 2004, farms in Santa Catarina up to 72 ha in area are considered "family farms". The last national census estimated the average herd size in the state at 24 cows (IBGE, 2009), which is supported by recent surveys (Costa et al., 2013; Hötzel et al., 2014). As discussed by Balcão et al. (in press), farmers in the region responded to the drive for modernization that began approximately five decades ago, resulting in changes focused primarily on management and infrastructure (e.g. dairy cows' feeding strategies, milking equipment, herd size and total milk production) but not farm size.

Recruitment was based on two criteria, with the same number of the farms in each group: (1) milk production was the main economic activity, and (2) existence of a fully functional system to supply drinking water to cows on pasture. The latter criterion was used to infer ongoing investment in dairy production and some concern for the welfare of cows.

Standard practice in qualitative research determines that an adequate number of interviews be undertaken such that no new information arises from additional interviews (Robson, 1993). In the present study, data saturation was reached at 37 interviews, which were undertaken on 14 farms with individual farmers (11 men and 9 women), 14 farms with the husband and wife together, and 3 farms with the husband and wife, some of their children and other family members. The farms were all family run, i.e. all labor was provided by immediate or closely related family members.

2.1. In-depth interviews

Participants were invited to respond to an open-ended, semi-structured interview script (Minayo, 2008). Initial questions covered demographic information. All subsequent questions sought to capture the farmer views and knowledge about dehorning and the reasons underlying these views, as well as their perceptions regarding the pain felt by calves. After 25 interviews it became apparent that, unless solicited, participants did not comment on possible strategies that could be used to mitigate the pain associated with dehorning. We therefore included an additional open-ended question specifically about this issue, where we invited participants to discuss the need for these methods and which methods they thought were available.

All interviews were done by the same interviewer (the first author) to ensure consistency, and were audio recorded and transcribed *verbatim* by the first author. Numbers were assigned to each participant and appear with each quotation. Quotes were translated to English by the first and last author. Analysis of the interviews was done according to the methodology proposed by Minayo (2008) and Corbin and Strauss (2007). Briefly, this involved the transcribed text being exhaustively read and coded into themes according to the key aspects of the interview script. After discussions the authors reached the final analysis.

3. Results

3.1. Participant and farm information

The dairy farms visited had been in operation on average 17 years (range 5–35 years), were on average 28 ha in size, and had on average 16 (range 8–36) lactating cows. On average 5 people lived on each farm (range 2–9), and the average age of the participants varied, with the adult women being on average 42 years old (range 25–60 years), and the adult men 47 years old (range 31–66 years). Approximately half of the farmers had 1–4 years of primary school education, whereas the other half had at least some high school education, one had an undergraduate degree and one a post graduate degree. Farmers were assisted by state funded extension agents (e.g. agronomists, agricultural technicians and veterinarians) and by consultants associated with the dairy industry.