Lameness on Brazilian pasture based dairies – Part 2: Conversations with farmers and dairy consultants

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A B S T R A C T

A farmer or a dairy consultant's ability to identify and properly treat lame dairy cows is key to managing lameness on farms. However, this ability is dependent on their knowledge and perceptions regarding lameness. To date these topics are poorly understood in all dairy systems. To our knowledge, this is the first study that uses a qualitative approach to describe the perception of lameness in Brazilian pasture-based dairy farms. The aim of this study was firstly, to contextualize farmers and dairy consultants' culture and knowledge on the topic of lameness and, secondly, to understand how these factors may influence lameness management on the farms. In-depth face-to-face semi-structured interviews were done with participating farm owners (n = 21) and dairy consultants (n = 13). Thematic analyses of the interview content provided evidence that the dairy community's overarching culture around lameness acts as a barrier preventing positive actions targeting lameness control and prevention. The emerging themes identified indicate that lameness is a vague, ill-defined concept among both farmers and dairy consultants working in this region. There was a shared belief that pasture-based systems have a low risk for lameness. Furthermore, the prevailing culture for tackling lameness was reactive, particularly in the case of lame cows affected by physical trauma or environmental factors. Treatment was frequently delayed and the misuse of antibiotics was evident. Described community culture was rationalised via the cognitive dissonance and health belief models. We suggest that increased dialogue, including educational efforts within the community, may lead to increased sensitivity of risk perception of lameness within the community and in turn trigger appropriate diagnosis and treatment of lame cows.

1. Introduction

In the Brazilian state of Santa Catarina the dairy industry represents direct income to more than 50 thousand families, and contributes numerous additional direct and indirect jobs attached to the local industry (Mello and Ferrari, 2003; Dos Santos et al., 2006). On average herd size in this region is 27 cows, ranging from 5 to 105 cows, with pasture being the primary source of nutrition for the cows (Costa et al., 2013; Bonamigo et al., 2016; Balcão et al., 2017).

Lameness is one of the most important animal welfare and production concerns facing the dairy industry today (Huxley, 2013). This condition has been associated with reduced milk production, fertility and longevity (Archer et al., 2010; Danscher et al., 2010; Huxley, 2013). Some progress has been made regarding the identification and role of risk factors such as genotype, facility design, and management practices for different aetiologies but much remains unknown regarding this malady (Archer et al., 2010; Huxley, 2012, 2013). Knowledge deficits regarding lameness exist in the caregivers responsible for the cows, especially for pasture-based production systems, where it is perceived as much less of a problem (Barker et al., 2010; Fabian et al., 2014; Ranjbar et al., 2016).

Sound and updated scientific knowledge on aetiologies, risk factors and prevention strategies for lameness is essential, but futile if those who are primarily responsible for the care of the animals (e.g. farmer/owner, dairy consultant) remain unaware. Moreover, understanding and capabilities, as well as cultural, socioeconomic and environmental factors may also affect uptake of information. These latter factors are often overlooked and replaced by blanket practices, ineffective advice, erroneous actions, and inaction (Huijps et al., 2010; Kristensen and Jakobsen, 2011; Main and Mullan, 2012). Examples of how knowledge barriers affect the development, uptake, and success of lameness reduction strategies have been described (Leach et al., 2010a,b; Main

et al., 2012; Leach et al., 2013).

Any *ad hoc* strategies focused on improving health or lameness in southern Brazil must take into account potential barriers, particularly given the highly heterogeneous community that has access to limited resources, combined with a strong hermetic ethnography (Costa et al., 2013; Hötzel and Sneddon, 2013; Balcão et al., 2017). Therefore, the aims of this study were firstly, to contextualize farmers and dairy consultants' culture and knowledge on the topic of lameness and, secondly, to understand how these factors may influence lameness management on farms located in southern Brazil.

2. Material & methods

This study is part of a larger quantitative epidemiological project looking at risk factors for transition period diseases (Daros et al., 2017) and lameness in pasture-based dairy farms (Bran et al., 2018aa); it ties into the overarching project structure by gathering qualitative data through in-depth, semi structured, face-to-face interviews (see Part 1, Bran et al., 2018b, for survey summary).

The project was approved by the Ethics Committees on Research on Human (PP1237779) and Animals (PP00949) of the Federal University of Santa Catarina, Brazil and the University of British Columbia Animal Care committee (Protocol # A15-0082), Canada.

2.1. Study location

Santa Catarina is one of the three southern states of Brazil that together account for a third of the national production. Of the 89,469 farms in this region, 90.5% are small-scale family-run farms (IBGE, 2006; EPAGRI/CEPA, 2012). This study was carried out in the western area of the Santa Catarina state that comprises 21 municipalities, whose farms collectively produce 75% of the state's total.

2.2. Participants' selection

We adopted the framework described by Roller and Lavrakas (2015) where credibility, analysability, transparency, and usefulness were taken into consideration during the study design, analyses and presentation of results. Population representativeness was based on previous work in the area that highlighted the value of family farms and its characteristics (Dos Santos et al., 2006; Costa et al., 2013; Balcão et al., 2017). All participants (i.e. farmers and consultants) were chosen by convenience and interviewed in Brazilian Portuguese. The number of interviews for each group (farmers and consultants) was decided based on achieving 'data saturation'; data adequacy required to provide an in depth, diverse and rich account of the topic, with the study ending when no new information was obtained with the addition of participants (Morse, 1995; Smith, 2008).

We interviewed farmers who owned a family farm that integrated access to pasture in the production system and had between 24 to 41 lactating cows (see Item II of Article 4 of the Brazilian Land Act, established by Law No. 4504 of November 30, 2004 for the definition of family farm). Participants were identified with the aid of individuals from the dairy co-operatives, milk processors, agricultural representatives working and living within the region, the municipal city halls and the local office for rural research and extension (Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina - EPAGRI). An initial contact with these representatives allowed understanding which advisors had greater contact with the targeted type of farmer within each municipality. Using these contacts, we then identified potential family run dairy farms that met our desired characteristics. Following the initial set of interviews subsequent farmers were recruited using a snowball technique, whereby initial interviewees were asked to recommend peers in the immediate region. Once a network of contacts was established and a pool of farms for the overarching study (Daros et al., 2017; Bran et al., 2018aa) was identified (n = 53), the in-

depth interviews were scheduled and completed by the lead author. Saturation was reached after 21 farmers were interviewed from the pool of farmers available; this represented 7 of the 12 municipalities visited by the overarching project. Interviews started after the first 13 farms were visited to minimize biases related with operational challenges associated when projects such as this are initiated. Interviews lasted between 60 and 75 min and were completed at the same time that the quantitative data collection (see Bran et al., 2018aa) was underway to minimise the time demands placed on the farmer. Before the visit, farmers were informed of the specific study aims and were assured that their participation was voluntary and their identity would be kept confidential. Before initiating audio recording, written permission was obtained from all individuals present. All invited farmers agreed to be audio-recorded.

Farmer interviews were followed by interviews with dairy consultants (n = 13). The selected consultants were identified in the farmer interviews where the farmers were asked to identify any consultants currently working with them who were involved either directly or indirectly with the management of animal health, including lameness. The professionals interviewed were all accredited by their respective Brazilian professional bodies (e.g. Conselho Regional de Medicina Veterinária de Santa Catarina - CRMV-SC; Classificação Brasileira de Ocupações – CBO), and included animal husbandry technicians, agronomists, animal nutritionists, hoof trimmers or veterinarians. The average ratio of participating farmer to participating consultant was 1:2, ranging from 1:1 to 1:5. The consultants represented 11 of the 12 municipalities visited by the overarching project. Interviews were done outside working hours, either at the consultant' office or another meeting point. Written agreement from each consultant was obtained before audio recording was started. A demographic summary of interviewees by group is presented in Table 1, and a summary of the farm characteristics of the farms owned by the interviewed farmers in Table 2.

2.3. Interview structure

The first questions were used to build rapport with the person and included: a) for how long had they been farmers or consultants, b) how long had they lived and worked in the area, and c) in the case of the consultants could they describe their normal workday. This phase was followed by a series of open ended questions about: a) what were the key health concerns on their farm (farmers) or region (consultants), b) how had these concerns been solved or addressed on farm, c) had they sought information, attended a course or meeting to update their knowledge around cattle health and husbandry, and d) how would they characterize the service and relationship between farmer and consultant around animal health concerns on the farm? If the topic of lameness did not arise spontaneously, or when there was a need for additional information, the word 'lameness' was used to elicit the topic, with questions such as: a) Had they ever heard of or experienced a case of lameness on their farm (farmer) or in their region (consultant), b) what was the perceived magnitude of lameness on their farm (farmer) or in their region (consultants), c) what were their thoughts regarding lameness risk factors, d) how would they describe a lame cow, and e) of the lame cows identified, how did they treat them?. Participants were also requested to draw and explain any observed hoof lesions on farms and their diagnoses (see Supplementary information).

2.4. Qualitative data analysis

Data analysis was done using a thematic analysis approach, which provided a "rich and detailed, yet complex account of data" (Braun and Clarke, 2006). This type of analysis is not allied to any specific theoretical framework, thus providing a flexible approach that can be used to examine a variety of issues, thus going through and beyond researcher insights or expectations. The interviews were transcribed