



A survey of management practices that influence production and welfare of dairy cattle on family farms in southern Brazil

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ABSTRACT

A survey on dairy production in family dairy farms in the northwest of Santa Catarina, Brazil, was carried out to assess husbandry practices and elements of the living environment that may influence animal welfare and productivity. Three farm systems common in the region were compared: extensive, pasture-based, and semi-intensive. Data were collected through face-to-face interviews with farmers, followed by an inspection of the production environment and of dairy cows on 124 dairy farms. Some welfare and production problems were common to the 3 systems, mainly subclinical mastitis and tick infestations, which affected one-third of cows, deficiencies in the provision of drinking water and shade, and poor hygiene practices during milking. Some problems were specific to farming systems, such as lameness and hock injuries on the semi-intensive farms, and inadequate milking infrastructure and greater frequencies of cows with low body condition scores on extensive and pasture-based farms. A greater proportion of farms in the semi-intensive group had modern, herringbone-type milking parlors, applied the California Mastitis Test, and followed teat disinfection practices, and more pasture-based farms provided shade in the paddocks. The widespread use of pasture and adapted genotypes and individual identification of animals were positive aspects present in all systems. The absence of health and production records in more than half of the farms may prevent farmers from recognizing certain problems. Results of this survey may guide public policies aiming to improve milk productivity and quality with sustainable and low-cost production practices.

Key words: animal well-being, production system, stockmanship, farmer perception

INTRODUCTION

Brazil is the fifth largest milk-producing country in the world, producing 30.7 billion liters per year (FAO, 2012). Santa Catarina, located in the southern part of the country (which also includes the states of Rio Grande do Sul and Paraná, between 22°32'S and 33°41'S), is the fifth largest milk-producing state in Brazil (IBGE, 2009). Small family farms produce 80% of the milk in Brazil and 85% of the milk in the southern region, where the average herd size is estimated to be 24 cows (IBGE, 2009). In this paper, we use the term “family farm” as defined in the Item II of Article 4 of the Land Act, established by Law No. 4504 of November 30, 2004: “a farm that is directly and personally operated by the farmer and his family, to absorb their entire workforce, providing them with subsistence and social and economic progress, with a maximum area fixed for each region and type of operation, and occasionally worked with the help of others.” In Santa Catarina, this area corresponds to up to 72 ha. In Santa Catarina, an overall herd of 933,000 dairy cows produces 2.13×10^9 L, which represents 7.7% of Brazilian production (IBGE, 2009). To put these numbers in a global context, this amount of milk represents the equivalent of 13% of the milk production of New Zealand or 26% of that of Canada (FAO, 2012). Between 2005 and 2009, milk production in Santa Catarina increased, on average, by 9.5% per year (IBGE, 2009), which was explained by growth of the dairy herd and an increase in individual cow productivity (ICEPA, 2011). This growth has been pushed by government policies and extension programs aiming to modernize the dairy sector (Martinelli et al., 2010; Schneider and Niederle, 2010).

To gain and maintain access to competitive markets, the local industry will need to meet international quality standards. Together with “process attributes” such as traceability and safety aspects of the production system (Edwards, 2005) and environmental impact (Foley et al., 2011), animal welfare is increasingly becoming an issue in international policy and business operations. To direct the local industry, the Brazilian Ministry of Agriculture, Livestock and Food Supply established the

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“Permanent Technical Committee on Animal Welfare,” which will propose standards and technical recommendations of good practice for animal welfare (Brasil, 2011). To support these standards, it is necessary to identify the major limitations to animal welfare in the different production systems and regions of Brazil. Surveys carried out in different countries have provided important insights into current dairy management practices used by farmers (Kehoe et al., 2007; Fulwider et al., 2008; Vasseur et al., 2010), which have helped guide producers, researchers, and other stakeholders interested in promoting farm animal welfare. Similar surveys of the production systems found in Brazil may help identify the main problems restricting productivity and welfare of dairy cattle, as well as potentials for good welfare, which can be used to guide researchers, extensionists, and policymakers to establish priorities.

On-farm assessment of animal welfare can be based on the evaluation of the provision of resources and management, direct observation of the animals, and examination of farm records (Whay et al., 2003). Whereas inspection of the environment may indicate the potential for certain welfare conditions, the assessment of the animals’ health, body condition, and behavior can be used to infer the effects of housing and management on the welfare of these animals. Here, we report the results of a survey of dairy production on family dairy farms in the northwest of Santa Catarina, Brazil, considering 3 main farming systems of the region: extensive, pasture-based, and semi-intensive. The objectives were to assess the living environment and husbandry practices that may influence animal welfare and productivity; some aspects of the health, physical conditions, and behavior of cows; and the perceptions of the farmers regarding the main herd health problems.

MATERIALS AND METHODS

In total, 124 family farms distributed in 24 municipalities in the northwest region of Santa Catarina, Brazil, participated in this study. Three main groups of farms—extensive, pasture-based, and semi-intensive—were considered, following the characterization described by Balcão et al. (2012) for farms in the region. In short, the extensive group presents the lowest production per unit of input, lack of any specific pasture management, no perennial forage species, no specific strategy of supplementation, and generally deficient facilities for milk production. The pasture-based group is based on intensive pasture production with rotational management and often uses fertilization; this group has a supplementation strategy defined according to the periods of greatest food scarcity, but prioritizes pasture as a source of livestock feed, thus keeping supplementation

low. The semi-intensive group keeps cows on pasture during certain times of the day, but pasture is not the main source of feed; cows are housed indoors for a large proportion of the day, receiving silage and concentrate supplementation; feed is usually offered in a bunk alley with concrete flooring.

Extensionists, veterinarians, and agricultural technicians working for private or public extension bodies were asked to indicate 3 to 5 farms in total in their municipality, according to the production systems described here. Some farms were recruited using a snowball technique, whereby farmers who had agreed to participate were asked to recommend other farmers who would be willing to participate. Farmers were contacted directly by a member of the research team by telephone to make an appointment for a visit on a later occasion. Of all farmers approached, only 5 declined to participate.

Before the visit, the farmers were informed of the purpose of the study and were assured that their participation was voluntary and their identity would be kept confidential. The on-farm assessment took 0.5 d and included an hour-long interview and direct observation of the milking environment, milking routine, and dairy cows. Whenever available, production and health records were gathered from the farmer.

Interviews

Face-to-face interviews with the farmers were carried out using a questionnaire with multiple-choice and semi-closed questions to collect socioeconomic data and information regarding technical assistance, management, and husbandry practices. The first section of the interview covered data on the family, such as number, age, and education level of family members, number of years working in the dairy industry, and estimated percentage of income from dairy production, followed by farm characteristics such as pasture area, number of dairy cattle in each category (cows, heifers, and calves), and total milk production. In addition, questions were asked regarding frequency and type of extension and veterinary services received. The second part of the questionnaire referred to the management and husbandry practices used on the farm, with questions related to dry-off method (gradual or abrupt), location of veterinary procedures (milking parlor, feed bunk, or specific location), performance of California Mastitis Test (CMT; yes or no), most important disease (ticks, mastitis, tickborne diseases, reproductive problems, laminitis, calf diarrhea, or other), performance of postdipping (yes or no), recognition of all cows (yes or no), naming of cows (all, none, or some), and whether farmers believe that cows are able to feel pain (yes or

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