J. Dairy Sci. 101:1–11
https://doi.org/10.3168/jds.2017-13316

Is the profitability of Canadian tiestall farms associated with their performance on an animal welfare assessment?

M. Villettaz Robichaud,*[1] J. Rushen,† A. M. de Passillé,† E. Vasseur,‡ D. B. Haley,§ and D. Pellerin*
*Department of Animal Science, Université Laval, Québec, Québec, Canada, G1V 0A6
†UBC Dairy Education and Research Centre, University of British Columbia, Agassiz, British Columbia, Canada, V0M 1A2
‡Department of Animal Science, McGill University, Sainte-Anne-de-Bellevue, Québec, Canada, H9X 3V9
§Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, N1G 2W1

ABSTRACT

In order for dairy producers to comply with animal welfare recommendations, financial investments may be required. In Canada, a new dairy animal care assessment program is currently being implemented under the proAction Initiative to determine the extent to which certain aspects of the Code of Practice are being followed and to assess the care and well-being of dairy cattle on farm. The aim of the current study was to evaluate the association between meeting the proAction animal-based and the electric trainer placement criteria and certain aspects of productivity and profitability on tiestall dairy farms. The results of a previous on-farm cow comfort assessment conducted on 100 Canadian tiestall farms were used to simulate the results of a part of the proAction Animal Care assessment on these farms. Each farm's productivity and profitability data were retrieved from the regional dairy herd improvement associations. Univariable and multivariable linear regressions were used to evaluate the associations between meeting these proAction criteria and the farms' average yearly: corrected milk production, somatic cell count (SCC), calving interval, number of breedings/cow, culling rate, prevalence of cows in third or higher lactation, and margins per cow and per kilogram of quota calculated over replacement costs. The association between milk production and the proAction lameness criterion was moderated through an interaction with the milk production genetic index which resulted in an increase in milk production per year with increasing genetic index that was steeper in farms that met the proAction lameness criterion compared with farms that did not. Meeting the proAction body condition score criterion was associated with reduced SCC and meeting the proAction electric trainer placement criterion was associated with SCC through an interaction with the farms' average SCC genetic index. The increase in SCC with increasing SCC genetic index was milder in farms that met this criterion compared with farms that did not. Farms that met the proAction electric trainer placement criterion had 4.6% more cows in their third or greater lactation. These results suggest that some associations exist between the productivity of Canadian tiestall farms and meeting several parameters of the proAction Animal Care assessment. Meeting these criteria is unlikely to impose any economic burden to the dairy industry as a whole.
Key words: proAction Initiative, productivity, profitability, welfare, tiestall

INTRODUCTION

Good animal welfare practices have always been a priority for the majority of dairy producers because they respect their animals and because these practices promote good animal health and reassure consumers (McInerney, 1998; De Grassi, 2001). Over the last decades, mandatory legislation, voluntary guidelines, and farm assessment programs have been implemented to regulate and monitor animal welfare on farms (von Keyserlingk et al., 2012; Webster, 2012; Logue and Mayne, 2014). Farm animal welfare is multidimensional, and to monitor its many components as accurately as possible, most farm assessment programs such as Welfare Quality in Europe and Farmers Assuring Responsible Management (FARM) in the United States (Webster, 2012; National Milk Producers Federation, 2016) include animal-, resources-, and management-based measures (Rushen and De Passillé, 2009; Webster, 2012).

In Canada, the Code of Practice for the Care and Handling of Dairy Cattle establishes mandatory requirements and voluntary best practices for the care of dairy animals. The Animal Care portion of the proAction Initiative (DFC-NFACC, 2009; DFC-PLC, 2015) aims to determine the extent to which certain aspects of the Code of Practice are being followed and to assess the care, comfort, and well-being of dairy cattle

Received June 11, 2017.
Accepted November 3, 2017.
[1]Corresponding author: marianne.villettaz@gmail.com

on Canadian dairy farms. Benchmarks have been set for each of the animal-based measures included in this assessment to distinguish between farms that have acceptable practices and farms that need to take corrective actions (DFC-PLC, 2015). Because approximately 70% of Canadian dairy farms use tiestall housing for their lactating animals (AAFC, 2016a), the proAction assessment evaluates the welfare of cows in both loose and tied housing systems, with some specific parameters unique to each type of housing.

Economic arguments can play a role in the degree of compliance with animal welfare standards (Christensen et al., 2012). Sometimes, to comply with the standards, dairy producers are required to make financial investments. These investments may range from none (e.g., to stop tail docking) to very costly if, for example, modifications to the housing system are required. To encourage producers to meet and exceed the animal welfare benchmarks set by welfare assessments, it is essential to understand the links between the cows' well-being, assessed through animal welfare standards, and the farms' productivity and profitability. Some improvements to the animals' welfare (e.g., a reduction in the prevalence of lameness) may increase the farms' profits through reduced cost, increased productivity, or both (Willshire and Bell, 2009). Recently, Bouffard et al. (2017) found that meeting certain recommendations for stall dimensions was associated with reduced prevalence of leg and neck lesions and lameness, which is likely associated with improved production.

Currently, very little scientific information is available on the relationships between farm compliance with animal welfare standards and farm profitability, especially for tiestall dairy farms. The aim of this study was to evaluate potential economic effects of meeting or not some criteria of the Canadian proAction Animal Care assessment in tiestall farms by examining the relationships with milk production, milk quality, reproduction, longevity, and economic margins based on replacement costs. The study also aimed to determine the extent to which meeting one animal-based criteria of proAction was related to meeting other animal-based criteria.

MATERIALS AND METHODS

The institutional research ethics boards and animal care committees of the University of Guelph (Guelph, Ontario, Canada) and the Université Laval (Québec, Québec, Canada) approved all procedures.

Herd and Animal Selection

One hundred Canadian tiestall dairy farms were enrolled in the provinces of Ontario (n = 40) and Québec (n = 60) as part of a larger cow comfort study (Vasseur et al., 2015). Characteristics of the farms are shown in Table 1. Participation in the study was on a voluntary basis with the initial contact made through mailed letters by the research team or telephone calls by the farm's DHIA advisor. To be eligible to participate in the study, farms had to have a herd size of ≥40 Holstein dairy cows in lactation, milk twice a day, not provide outdoor access to lactating animals, have used their current housing system for at least 1 yr, have a mean milk production ≥7,000 kg per cow per year, and be enrolled in their regional DHIA programs (CanWest DHI in Ontario and Valacta Inc. in Québec). We also ensured that the sample of farms was representative of the province in terms of the cows′ longevity (measured by the percentage of cows in third or greater lactation and replacement rate; described in Vasseur et al., 2015). The selection process of the farms was not truly random because of these enrollment criteria. However, based on the average number of cows and average corrected yearly milk production, the final sample of farms enrolled was representative of tiestall farms found in the Canadian dairy industry. The average milk production for the farms enrolled in the current study was 9,160 kg and the Canadian DHI reported an average milk production for Holstein cows of 9,300 kg in 2015 (PLQ, 2016). Similarly, the average reported number of cows on Canadian tiestall farms was 58 cows compared with 65 for the farms included in this study (AAFC, 2016b). The average age at first calving, DIM at first breeding, calving interval, and other farms characteristics and productivity parameters evaluated are also similar to current industry averages based on the 2015 DHI reports (PLQ, 2016).

On each farm, 40 focal lactating cows were purposively selected for data collection. The sample of 40 cows per farm was based on the sample size calculation to obtain a reliable lying time estimate, which was the primary target measure for the cow comfort assessment study (Vasseur et al., 2012). The cows were selected to be between 10 and 120 DIM, and the selection reflected the proportion of primiparous and multiparous cows in lactation within the herd, when possible. If a farm did not have 40 milking cows between 10 and 120 DIM, the selection criteria was extended beyond 120 DIM until 40 cows were chosen.

Data Collection and Handling

Each farm was visited between January and December 2011 by a pair of trained observers. A total of 10 observers were trained to collect all the animal- and resource-based measures using strict standard scoring protocols, including written descriptions and pictures,