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Perception of the importance of human-animal Interactions on cattle flow and worker safety in Minnesota dairy farms

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ABSTRACT

Proper cattle-handling techniques (stockmanship) are important to ensure calm animals and a safe work environment for dairy workers on farm. The objectives of this study were to (1) assess Minnesota dairy herd owners' attitudes toward stockmanship, its perceived importance for cow comfort and worker health, and the establishment of calm cattle movement; and (2) identify current resources and methods of stockmanship training on Minnesota dairy farms. A stratified-random sample of Minnesota dairy farmers were contacted via mail to participate in a 28-question survey. One hundred eight bovine dairy producers participated. Most commonly, respondents learned their cattle handling skills from family members (42.6%) and 29.9% of producers had participated in previous stockmanship training. Producers thought that the skill of the human handler was the most important factor in establishing good cattle flow. Cattle-handling techniques was the third most common topic for new-employee orientation after training in milking parlor protocols and milking parlor disinfection. Time limitations and language barrier were considered serious challenges for worker training. Work-related injuries were responsible for lost work days in the previous year in 13.3% of dairy herds and 73.3% of those injuries occurred while working with cattle. Producers perceived that cattle-related injuries were predominantly the handler's fault: either because of not paying enough attention to the animal or due to poor cattle handling skills. Facility design was considered the least important for the occurrence of worker injuries. Although no causal inference can be made, herds that had workers who had previously participated in stockmanship training had a 810 ± 378 kg (mean \pm standard error of the mean) higher rolling herd average than those that did not, even after adjusting for herd size and bulk tank somatic cell count. However, 50% of respondents were not interested in attending future stockmanship training sessions. In conclusion, cattle

handling skills are considered important by Minnesota dairy producers to ensure worker safety and cow flow. Limited availability of time, language barrier, and a perceived lack of training materials were considered challenges during the training of workers on farms.

Key words: cattle, stockmanship, handling, work-related injury

INTRODUCTION

Dairy animals are handled on a daily basis. For example, cows are handled for health- or reproduction-related management practices or moved from their freestall to the milking parlor for milking several times per day. During that time, cows will react to stimuli from the handler and environment. Timing, positioning, speed, and direction of movement as well as sounds made or touch by the handler will affect the behavior of the cow. Therefore, the handler needs to be aware of the body signals (s)he sends to calmly and successfully move cows. Unfortunately this is not always the case and the majority of nonfatal worker injuries on dairy farms are due to interactions with cattle (McCurdy and Carroll, 2000; Román-Muñiz et al., 2006). Every year, approximately 30 people die of cattle- and horse-related deaths in the United States (Langley and Morrow, 2010).

Improper handling techniques and the application of too much or inappropriate pressure also stress cattle. Stress has been shown to impair the production performance and health of cows. The former may include an increased time to move cows into the milking parlor and impaired milk letdown and, therefore, reduced production (Bruckmaier and Blum, 1998; Breuer et al., 2000; Hemsworth et al., 2000). In addition, stressed cattle are more likely to try to escape and can slip, injuring themselves. These injuries can be costly in terms of veterinary care and the increased possibility of culling injured cows. Stressed cattle can also affect the animal handlers; livestock-related injuries account for the highest rate of work days lost (Thu et al., 1997; Douphrate et al., 2009).

All of this affects the farm's performance not only through loss in milk production and possibly injured

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animals, but also lost work days and increased health care costs. Therefore, the proper handling of cows is of great importance for the dairy industry. Low-stress handling or stockmanship is not only crucial to ensure animal welfare and optimal production but also to promote worker safety (Breuer et al., 2000; Hemsworth, 2003).

Phillips et al. (2009) captured the perceived importance of stockmanship on animal welfare and health in a survey administered to producers associated with the Australian beef and small ruminant production (Phillips et al., 2009). For survey respondents, stockmanship was considered the most important factor to ensure animal welfare in beef cattle production. But the survey did not include questions about employee health, training, or herd production parameters.

In addition, limited information exists about employee training in cattle handling and also where or how producers as well as their employees learn the appropriate cattle handling techniques. If the latter are taught on a farm by their employer, what are potential challenges for the educators while teaching cattle handling and which methods are used? Furthermore, quantitative information is sparse about the effect of low-stress handling techniques on production and cattle welfare or which areas or daily tasks are considered challenges for cattle handling for dairy producers. Additionally, no data exist on whether dairy farmers are even interested in learning more about low-stress handling practices.

To address this knowledge gap of the perceived importance of stockmanship to dairy farmers, our survey had 2 primary objectives: to (1) assess Minnesota dairy herd owners' attitudes toward stockmanship and its perceived importance for cow comfort, worker health, and establishment of calm cattle movement; and (2) identify current training practices of stockmanship training on Minnesota dairy farms.

MATERIALS AND METHODS

Survey Design

A 4-page, 28-question anonymous survey was designed to collect stockmanship training history of dairy herd owners, cattle-handling approaches, challenging production areas, worker injuries, and herd and owner demographics. The questions included Likert-scale, ranking, and closed answer options. In addition to the paper version of the survey, participants could choose to complete an online version of the survey. The survey was pretested on 2 dairy farmers and 3 bovine veterinarians. The study protocol was reviewed and considered exempt by the University of Minnesota Institutional Review Board (St. Paul).

A list of all dairy herds in Minnesota ($n = 3,876$) and their associated herd sizes was made available through the Minnesota Department of Agriculture. The list was split into 9 strata based on the herd size (<50, 50–99, 100–149, 150–199, 200–249, 250–299; 300–399, 400–499, and >500 cows). From each stratum, 75 herds were randomly selected. However, the upper strata (herd size ≥ 300) included very few herds and so all herds in those strata were contacted. The survey and a prepaid return envelope were sent to 620 producers twice, 1 mo apart.

Statistical Analysis

The data were analyzed in SAS (version 9.3; SAS Institute Inc., Cary, NC). The data were summarized with appropriate statistics, such as frequency statistics for categorical variables and median and 25th and 75th percentile or mean \pm standard error of the mean for continuous variables. The influence of previous stockmanship training on the rolling herd average was assessed with a general linear regression model (PROC GLM), which also included herd size (categorical) and bulk tank SCC (continuous) as fixed effects. Bulk tank SCC was forced into the model as it improved the fit of the model. Normality and homoscedasticity assumptions of the linear model were visually assessed. Associations between variables were analyzed using nonparametric statistics, such as the Fisher exact, Mann-Whitney U, or Kruskal-Wallis test. Missing values (i.e., unanswered questions) were not included in the final analysis. The significance level was set at $\alpha = 0.05$.

RESULTS

One hundred ten dairy producers returned surveys, which included 2 dairy goat producers and 4 surveys that were filled out online. The responses of the 2 goat producers were excluded from the subsequent analysis.

The overall response rate was 17.3% and ranged between 11.0 and 25.4% for the herd size strata. A higher response rate was observed in herds milking over 200 cows. Most respondents were male (73.6%), over 50 yr of age (60.4%), and held either a college or university degree (59.4%) or a high school diploma (34.9%). Almost all farms had at least 2 employees or workers (98.1%; median = 6; range = 1–35; Table 1).

Participants responded that they had learned cattle handling from a family member (42.6%), through trial and error (28.7%), or by observing cattle and people (18.5%). In particular producers of smaller herds (<100 milking cows) had learned their animal handling skills from family members (55.5%). None of the respondents said that watching videos had the greatest influence on how they moved or interacted with cattle (Table 2).

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