J. Dairy Sci. 98:1–5
http://dx.doi.org/10.3168/jds.2015-9386

Cultural lag: A new challenge for mastitis control on dairy farms in the United States

R. J. Erskine,*[1] R. O. Martinez,† and G. A. Contreras*
*Department of Large Animal Clinical Sciences, and
†Julian Samora Research Institute, Michigan State University, East Lansing 48824

ABSTRACT

Recent changes in the US dairy industry include increases in herd size and the proportion of milk that is produced by large herds. These changes have been accompanied by an increased reliance on hired employees and an increasing role of immigrant labor to perform critical tasks such as milking cows. Thus, there is a growing need for training and education programs for dairy employees because many employees lack previous dairy experience and employee turnover rates are problematic on many farms. Although extension programs have played an important role in the education and support of dairy producers and allied professionals in attaining improved milk quality, dairy employees have limited access to educational programs. Additionally, metrics to assess employee learning are not validated and the ability to sustain work-related behavioral change has not been well described. In this article, we propose a model that may further our understanding of communication and cultural barriers between dairy managers and employees, based on a demonstration project in 12 Michigan dairy herds. As part of this demonstration, a pilot survey was tested to assess the management culture on dairy farms. Results from this survey found that only 23% of employees across all herds were able to meet with farm management on a regular basis, 36% of employees did not know somatic cell count goals for the farm for which they worked, and 71% of employees stated they primarily received training on milking protocols by other employees or that they learned on their own. Latino employees were more likely to not know farm goals or receive primary training on milking protocols from other employees or on their own compared with their English-speaking counterparts. The survey information, along with input from focus group discussions with participating dairy producers, veterinarians, and employees, suggests that extension needs to build capacity for on-farm training and education for employees to support their engagement within dairy operations.
Key words: extension education, employees, mastitis

INTRODUCTION

The US dairy industry has become increasingly dynamic as advances in nutrition, genetics, understanding of disease pathogenesis, and technologies associated with feeding, milking, reproduction, and labor efficiency have increased productivity (von Keyserlingk et al., 2013). This development also has driven a marked shift in herd demographics. Average herd size increased from 72 cows in 1996 to 121 cows in 2006, whereas the number of herds decreased from 130,980 to 75,140 during the same period (USDA-NAHMS, 2007). More remarkable has been the rapid intensification of the industry; farms with fewer than 100 cows accounted for 49% of the country's 9.7 million milk cows in 1992, but just 17% of the 9.2 million milk cows in 2012. In contrast, farms with at least 1,000 cows accounted for 49% of all cows in 2012, an increase from just 10% in 1992 (MacDonald and Newton, 2014). Additionally, 63% of the milk supply is produced by herds with more than 500 cows (von Keyserlingk et al., 2013). However, the percentage of herds with fewer than 100 cows decreased only marginally, from 83 to 77% (USDA-NAHMS, 2007).

As the diversity of herd size increases, dairy farms are also becoming increasingly diverse in terms of employment practices and organization (Jackson-Smith and Barham, 2001). Increasing numbers of Latino workers are employed in the dairy industry, which had previously hired relatively few foreign-born laborers (Jenkins et al., 2009). Recent reports have estimated that 41 to 50% of dairy farms depend on Spanish-speaking foreign labor, 50% of dairy farms employ immigrant labor, and 62% of milk comes from farms employing immigrant labor (Baker and Chappelle, 2012; von Keyserlingk et al., 2013). As the role of immigrant labor increases in the US dairy industry, cultural and communication barri-

Received January 27, 2015.
Accepted July 13, 2015.
[1]Corresponding author: erskine@msu.edu

ers complicate management–employee relationships as Spanish-speaking workers are increasingly seen in jobs traditionally held by individuals whose first language is English (Cross, 2006; Stack et al., 2006; Jenkins et al., 2009).

To address this potential cultural and language barrier, education, training, and translation tools have been developed by land-grant universities, consultants, and agricultural agencies to help farms owners manage the changing dairy workforce (Fuhrmann, 2002; Chase et al., 2006, Stack et al., 2006; Jenkins et al., 2009). However, these programs were developed from a management-directed perspective with minimal input from employees, and the effectiveness of employee training, or education programs, relative to farm protocols and productivity has not been evaluated for short- or long-term success. Additionally, many dairy managers are likely to have limited human resource knowledge and management experience and tend not to perceive themselves as employee trainers; this often leads to frustration with protocol drift and a sense that employees are not motivated to engage in the success of the farm beyond prescribed instructions. These and other workplace conditions can contribute to employee turnover, which has been attributed to relationships with management and coworkers and job duties (Billikopf and González, 2012). Taken together, these gaps in the nation's dairy farms constitute a form of cultural lag. That is, there is a gap between the human resource needs arising within the industry's labor force and the capacity of producers and managers to address them.

Although SCC continue to decrease among US dairy herds (USDA-NAHMS, 2013), variability among herds may be partly explained by poor protocol compliance (Fuhrmann, 2002; Brasier et al., 2006). We contend that ineffective training of employees and ensuing protocol drift may prevent some herds from attaining their milk quality goals. This is particularly relevant for mastitis control protocols, as Latino laborers are heavily concentrated in entry-level positions on dairy farms, roles that include milking, maintenance of housing, and administration of therapies such as intramammary infusions of antimicrobial drugs (Valentine, 2005; Stack et al., 2006).

To better define potential barriers to employee training and education and to seek methods to enhance engagement on the part of dairy employees, we describe preliminary findings from an assessment survey to determine the management culture on dairy farms relative to employee training and communication and knowledge of farm goals, and a novel approach for an on-farm education model for employees. These tools were validated on a proof-of-concept basis in a pilot demonstration in 12 herds in Michigan in the winter of 2013–2014.

METHODS

Approval for use of human subjects was attained by the Institutional Review Board of Michigan State University before the collection of assessment data. During the winter of 2013–2014, we visited 12 dairy herds in Michigan (range of 185 to 3,400 cows; median 670 cows) to perform an evaluation of mastitis control practices (milking procedures, hygiene and environment, herd protocols for infected cow management, and milking equipment) and to test a data collection instrument designed to describe the management culture on each farm, termed the Human Resource Survey (**HRS**). The instrument consisted of 16 questions concerning milk quality goals for the farm, communication and training opportunities, problem resolution, and the management style of the owners and managers of the farm. Subsequent to the evaluation and HRS, we identified 2 herd-specific opportunities for improvement that would serve as topics for employee education.

We piloted the instrument on each farm through face-to-face interviews with the owners or managers and, afterward, the employees. The objective was not only to obtain their responses to the items on the instrument but also to gain input on how to improve them for subsequent projects (e.g., identify questions in need of clarification or delete other questions that proved to be too difficult to comprehend). Employees on each farm who milked, moved cows to and from the parlor, maintained the housing for cows, or administered mastitis therapy were asked to respond to those questions asked of the managers but from their own perspective. To assure anonymity and inclusiveness and instill confidence to respond genuinely, we conducted the employee interview using a PowerPoint presentation and individual hand-held "clickers" (TurningPoint, Turning Technologies, Youngstown, OH). Questions were bilingual (English and Spanish) and were read aloud by a project investigator in the appropriate language; where needed, clarification for each question was offered. Responses to the instrument from each farm were processed and a qualitative comparison was made between overall herd manager responses and those of the employees. For questions that evaluated employee training or knowledge of herd SCC goals, a Fisher's exact test (2-tailed) was used to compare frequency of responses between Spanish-speaking and English-speaking employees.

Following the completion of the pilot demonstration, we conducted 5 focus group discussions with partici-