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How benchmarking motivates farmers to improve dairy calf management

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ABSTRACT

Dairy calves often receive inadequate colostrum for successful transfer of passive immunity and inadequate milk to achieve their potential for growth and avoid hunger, but little is known about what motivates farmers to improve calf management around these concerns. Our aim was to assess if and how access to benchmarking reports, providing data on calf performance and peer comparison, would change the ways in which farmers think about calves and their management. During our study, 18 dairy farmers in the lower Fraser Valley (British Columbia, Canada) each received 2 benchmark reports that conveyed information on transfer of immunity and calf growth for their own calves and for other farms in the region. Farmers were interviewed before and after receiving their benchmarking reports to gain an understanding of how they perceived access to information in the reports. We conducted qualitative analysis to identify major themes. Respondents generally saw having access to these data and peer comparisons favorably, in part because the reports provided evidence of how their calves were performing. Benchmarking encouraged farmers to make changes in their calf management by identifying areas needing attention and promoting discussion about best practices. We conclude that some management problems can be addressed by providing farmers better access to data that they can use to judge their success and inform changes.

Key words: animal welfare, extension, theory of planned behavior, attitude

INTRODUCTION

Understanding the role of information in identifying and improving management on farms is a key area of interest in animal welfare research. Research aimed at adoption of practices to reduce welfare risks on farms has indicated that a lack of information is a barrier.

For instance, Leach et al. (2010a) reported that welfare problems such as lameness are more likely to persist on dairy farms when farmers underestimate the extent of the problem within their herd. Similarly, Becker et al. (2013) found that farmers could underestimate the severity of pain in treating foot problems because they lack an understanding of how to assess pain in cows.

Dairy calves face several risks in the early weeks of their lives, including inadequate colostrum for transfer of passive immunity (Windeyer et al., 2014), and inadequate milk to achieve their potential for growth and avoid hunger (reviewed by Khan et al., 2011). The technical solutions to these problems are well known; what lacks is an understanding of the factors that limit adoption of these solutions on farms. Specifically, there is a lack of research on how farmers view these concerns and what motivates them to make decisions when it comes to managing their calves. Increasing farmer awareness and education on health-related practices, such as colostrum management, may encourage improvement in welfare outcomes for calves (Heinrichs and Kiernan, 1994; Kehoe et al., 2007; Beam et al., 2009). The provision of information can influence a person's attitude and behavior toward a phenomenon (as reviewed by Glasman and Albarracín, 2006). In addition to attitudes, understanding a person's beliefs about who may influence their decision-making and how much control they have in making decisions are key factors in understanding a person's motivation (Ajzen, 1991).

One way of providing information is through benchmarking. Benchmarking is the process of measuring performance using specific indicators and then comparing performance with that of peers with the intention of improving on those indicators (Fong et al., 1998). The key concept is to use data to identify performance gaps and drive improvements. Although often used to increase efficiency (Anderson and McAdam, 2004), benchmarking can also be used to motivate changes not directly linked with economic outcomes (Magd and Curry, 2003).

A previous study from our group evaluated benchmarking to improve lameness outcomes for mature dairy cows (Chapinal et al., 2013), but that study was retrospective, did not include controls, and assessed

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only biological outcomes (e.g., lameness). Another study compared calf mortality on 2 farms and suggested that the comparison of the underperformer with a high performer helped identify management and employee training not previously thought as pertinent to calf mortality (Khade and Metlen, 1996). In a companion paper to the current study (Atkinson et al., 2017), we showed how benchmarking calf growth and transfer of immunity resulted in some farms changing their management in ways that improved outcomes related to both measures. To our knowledge, no previous work has assessed the effect of benchmarking on farmer perceptions toward their animals and their motivation to improve.

The aim of the current study was to describe how benchmarking motivates farmers to make changes in calf management. We used a qualitative, interview-based approach to assess how access to benchmarking reports, providing data on transfer of immunity and growth, would change the ways in which farmers thought about calves and making changes in their management.

MATERIALS AND METHODS

This study was approved by the University of British Columbia Behavioral Research Ethics Board under # H14-03196. All participants provided written consent.

Study Design

This interview study was designed from a critical realist perspective that emphasized understanding the meaning that people attach to a phenomenon and the context within which this occurs (Manicas, 2006; Maxwell, 2012). For the current study, we were interested in understanding the phenomenon of farmer perspectives about factors related to the benchmarking process that motivated them to make changes in calf management, the specific context of our intervention study. Following the framework of Maxwell (2012), this approach allowed us to identify mechanisms within the situation (i.e., the benchmarking study) that cause a particular outcome (i.e., why farmers made changes). Specifically, we were interested in describing the mechanism(s) of change that motivated farmers to improve calf management based on the provision of information in the benchmark reports about their calves and those of their peers participating in the study.

We purposively recruited from 18 commercial dairy farms in the lower Fraser Valley of British Columbia that participated in a benchmark study (see Atkinson et al., 2017 for details concerning recruitment, biological measures and outcomes, and report delivery). We interviewed individuals responsible for calf care, includ-

ing farm owners, herd managers, and calf managers. Choosing these individuals allowed us to fulfill 2 criteria with sampling consistent with Maxwell (2012): (1) they can best help us answer our research question because they participated in the benchmark study, and (2) they were the individuals who could best speak about the calf management on each farm.

During the study, each farm received 2 reports 10 wk apart. These reports described serum total protein from calf blood samples and average daily gains (as estimated from heart-girth tapings) and information on management practices on all study farms. Reports provided data on the individual calves and graphically presented data to facilitate interpretation. Each report was presented by the herd veterinarian who used examples of other study findings (e.g., on the effects of increasing milk ration on calf growth) and props (e.g., a colostrometer for testing colostrum quality) to facilitate the discussion. Examples of the content found in these reports can be found at <https://figshare.com/s/7af49a9205a47ceb1363>.

Interview Guide, Data Collection, and Participants

We used the theory of planned behavior to develop the interview guide for semi-structured interviews. The theory of planned behavior constructs (attitudes, subjective norms, and perceived behavioral control) are key to understanding a person's motivation to perform a behavior (Ajzen, 1991). According to the theory of planned behavior, "attitudes" are positive or negative evaluations of a behavior, "subjective norms" are the perceived social expectation toward performing a behavior, and "perceived behavioral control" refers to perceived ease or difficulty toward performing a behavior (Ajzen, 1991). The theory of planned behavior has been used as a framework to provide structure for open-ended qualitative inquiries (Goh, 2009; Borges et al., 2014), including with dairy farmers and decision-making (Hötzel and Sneddon, 2013; Brennan et al., 2016). For our study, we developed questions for interviews that occurred before and after farmers received their benchmark reports. During the initial interviews, we asked farmers a series of open-ended questions and follow-up probes about calf management (How do you think your calf management is going?), how they felt about making decisions about their calves (How easy or difficult is it for you to make decisions about how you manage your calves?), how they felt about collecting data on their calves (Can you tell me about benefits or challenges you think there are with collecting data on your calves?), and how they felt about comparing their own farm performance against their peers (Who influences the way you manage your calves?). Farmers were

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