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A survey of Australian dairy farmers to investigate animal welfare risks associated with increasing scale of production

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ABSTRACT

Although large herds (more than 500 cows) only represent 13% of Australian dairy farms, they represent more than 35% of the cows milked. A survey of Australian dairy farmers was conducted to assess relationships between herd size and known or proposed risk factors for adverse animal welfare outcomes in Australian dairy herds in relation to increasing scale of production. Responses from 863 Australian dairy farms (13% of Australian dairy farms) were received. Increasing herd size was associated with increases in stocking density, stock per labor unit, and grain fed per day—all of which could reasonably be hypothesized to increase the risk of adverse welfare outcomes unless carefully managed. However, increasing herd size was also associated with an increased likelihood of staff with formal and industry-based training qualifications. Herd size was not associated with reported increases in mastitis or lameness treatments. Some disease conditions, such as milk fever, gut problems, and down cows, were reported less in larger herds. Larger herds were more likely to have routine veterinary herd health visits, separate milking of the main herd and the sick herd, transition diets before calving, and written protocols for disease treatment. They were more likely to use monitoring systems such as electronic identification in the dairy, computerized records, daily milk yield or cell count monitoring, and pedometers or activity meters. Euthanasia methods were consistent between herds of varying sizes, and it was noted that less than 3% of farms make use of captive-bolt devices despite their effectiveness and ready availability. Increasing herd size was related to increased herd milking time, increased time away from the paddock, and increased distance walked. If the milking order of cows is consistent, this may result in reduced feed access for late-milking-order cows because of a difference in time away from the paddock. More than 95% of farmers believed that their cows were content most of the time, and cows were

reported as well behaved on more than 90% of farms. Although the potential animal welfare issues appear to be different between herd sizes, no evidence existed for a relationship between herd size and adverse welfare outcomes in terms of reported disease or cow contentment levels.

Key words: animal welfare, herd size, animal health, dairy farm

INTRODUCTION

Animal health and animal welfare are contributors to dairy production efficiency, as well as being important to the general public and dairy consumers. Increasing scale of production is a confirmed trend in most developed dairy industries (Lean et al., 2008; Verkerk and Hemsworth, 2010), including the Australian dairy industry, where dairy farms are predominantly outdoor, pasture-based systems. According to a national dairy-farmer survey conducted by Dairy Australia in early 2013, the average Australian herd size has increased 37% over the past 10 yr. Since 2004 the proportion of farms with herds milking in excess of 300 cows significantly increased from 17% in 2004 to 30% in 2013, and at the other end of the scale, small farms (<150 cows) now account for 26% of all farms compared with 35% in 2004. The trend toward larger farms looks set to continue, with 33% of farmers surveyed expecting to calve more cows in the following year (Dairy Australia, 2013a).

Increasing scale of production in extensive dairy systems can be associated with larger herd sizes, increased stocking densities, longer milking times, longer walking distances, and reduced ability to examine and treat cows individually. Factors such as these have the capacity to cause reduced welfare outcomes for dairy cows if not properly managed (Verkerk and Hemsworth, 2010). On the other hand, there are management aspects that may improve outcomes with economies of scale. It seems probable, although little objective data are available to support it, that larger enterprises are more likely to have more modern dairies that reduce milking time; they may be more likely to have infrastructure to electronically identify and monitor individual cows;

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they may be more likely to use professional advice and provide superior nutrition; and they may have greater capacity to provide staff training and general quality assurance systems.

Little has been published regarding animal welfare outcomes for cows in large Australian dairy herds.

A review of livestock disease threats associated with intensification of pastoral dairy farming (Lean et al., 2008) reported that although evidence exists that increased production increases the risk of mastitis and culling for udder health, the evidence to support an increased risk of most diseases was sparse, and indeed, diseases such as bloat and ketosis seem to have lower risk. The same report concludes that mineral nutrition of pasture-fed cattle is being better addressed, with gains in the control of milk fever, hypomagnesaemia, and trace-element deficiencies, but that lameness, anthelmintic resistance, and ruminal acidosis may be at increased risk with increasing scale of production.

Studies documenting affective state and naturalness are also sparse with regard to larger extensively managed dairy herds. It has been established that the amount of time a cow spends lying down and resting can substantially affect its comfort and welfare (Overton et al., 2002; Fisher et al., 2003). It seems logical that as herds increase in size, cows may experience reduced lying and resting times as milking time and the time taken to walk to and from the dairy increase—particularly in farms where loafing or feed pads are used (Botheras, 2006).

An agreed definition of “animal welfare” has been adopted by the World Organization for Animal Health and many other organizations worldwide (Fraser et al., 2013; OIE World Organization for Animal Health, 2014):

“Animal welfare means how an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear, and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment.”

To assess relationships between herd size and known or proposed risk factors for adverse animal welfare outcomes in Australian dairy herds, we designed a farmer survey with variables that included (1) animal indices of poor welfare (e.g., disease and lameness) and (2) strategies or policies that are known or hypothesized to

affect animal welfare (e.g., veterinary and nutritional practices, training, and technology to monitor cow behavior). It was proposed that a better understanding of these relationships will inform further efforts to mitigate and measure adverse welfare outcomes with increasing scale of production.

MATERIALS AND METHODS

Farm Sample

We aimed to survey Australian dairy farms via a combination of electronic and physical distribution. A physical survey with a link to an electronic version was included in the September 2014 edition of *The Australian Dairyfarmer* magazine—an industry publication that is distributed free of charge to all registered Australian dairy farmers. A link to an electronic survey was also sent by e-mail to a random sample of 1,000 farmers who had opted in to receiving communications from Dairy Australia Limited (the national Dairy Research and Development Corporation).

The survey was anonymous, and in the instructions we requested that only one survey per farm be submitted. This study was conducted with human research ethics approval from The University of Melbourne (Ethics identity 1141608 1).

Questionnaire

Data were collected from September to November 2014 by means of physical and electronic questionnaires that were returned in a reply paid envelope or submitted online via an electronic survey company. The questionnaire was anonymous and consisted of 28 closed-ended questions, some of which contained multiple parts. The first questions gathered information about farm location, herd size, physical area, level of milk production, grain feeding, dairy type, staffing levels, and qualifications.

Other questions were designed to collect information about risk factors for animal welfare outcomes that are (1) indicative of poor welfare (animal-based indices) or (2) strategies or policies that are known or hypothesized to affect animal welfare across the 3 overlapping quality-of-life domains of biological function, affective state, and naturalness. The survey included questions about reproduction, mastitis, and other diseases. Quantitative factors such as disease levels were recorded but also information about how such levels are monitored on farm. For example, having electronic identification and computerized records may allow for better monitoring of disease. In relation to how quickly cows with welfare needs are identified and treated, there were questions

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