Connecting farmer mental health with cow health and welfare on dairy farms using robotic milking systems

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Abstract

The objective of this exploratory, preliminary study was to survey dairy farmers using robotic milking systems to better understand their mental health and potential connections to their cow health and welfare. Only farms using robotic milking systems in Ontario, Canada were visited for collection of data on management practices, cow welfare, and milk production and quality. Those farmers also completed an online survey that included validated psychometric scales used to assess resilience, stress, anxiety, and depression; results from 28 farms were analysed. Thirty cows per farm (or 30% for herds > 100 milking cows) were scored for body condition (five-point scale: 1 = thin to 5 = over-conditioned) and lameness (five-point scale: 1 = sound to 5 = lame); cows with a Body Condition Score ≤ 2.5 and lameness score ≥ 4 were defined as under-conditioned and severely lame, respectively. Farmer stress was positively associated with severe lameness prevalence, was greater for females vs males, and was greater for those feeding manually vs using an automated feeder. Anxiety and depression were greater for females vs males, and for those working alone, feeding manually, and with lesser milk protein percentage. Anxiety was also positively associated with the prevalence of severe lameness. Resilience was greater for those with automated feeding systems, but tended to be negatively associated with milk yield per robot and positively associated with milk somatic cell count. This is the first study to identify associations between farmer well-being and cow lameness, udder health, and milk yield. With future research, we can better understand this relationship to improve the well-being of both agricultural animals and their caretakers.

Keywords: animal welfare, automation, dairy cow welfare, lameness, mental health, One Welfare

Introduction

Animal welfare has been ranked as the top management priority for Canadian dairy farmers (Bauman et al 2016). For some, the interest in animal welfare is tied to their inherent love of cows while, for others, it may be to improve production and efficiency, or to comply with animal care requirements. Regardless of their motivation, animal welfare is on farmers’ minds, along with many other sources of stress and anxiety. Not only is farming one of the most physically dangerous (Hounsome et al 2012) and mentally stressful occupations worldwide (Kerby 1992), but farmers also have higher rates of depression and related suicide compared with other occupational groups of similar socio-economic status (Gregoire 2002; Milner et al 2013). In a recent national survey of farmer mental health across Canada (Jones-Bitton et al 2019), it was reported that farmers have high levels of stress, anxiety, depression, and burn-out, which exceed that of other occupational groups and population norms. Additionally, farmers had lower emotional resilience than the norm. Therefore, those farmers may be more susceptible to the effects of chronic stress, such as physical and mental illness (Jones-Bitton et al 2019).

With ongoing challenges in the field of animal welfare, there is the added challenge of farmers experiencing high levels of stress and poor mental health. In fact, there may be a strong connection between farmer mental health and the welfare of their animals. This connection aligns with the ‘One Welfare’ approach (Pinillos et al 2016; Galindo et al 2017), related to ‘One Health.’ The One Welfare framework “describes the interrelationships between animal welfare, human well-being, and the physical and social environment” (Pinillos 2018). This approach may be particularly relevant in relationships between humans and domesticated animals. For example, farmers who were previously involved in animal welfare incidents have been reported to struggle with mental health-related problems, such as depression, alcoholism, social problems, and stress (Kelly et al 2011; Devitt et al 2014). Furthermore, farmers experiencing both economic and psychiatric problems have been demonstrated to be at the highest risk of being convicted of animal neglect (Andrade & Anneberg 2014). Animal hoarding is another example of poor animal welfare associ-