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Use of on-farm emergency slaughter for dairy cows in British Columbia

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ABSTRACT

On-farm emergency slaughter (OFES), whereby inspection, stunning, and bleeding occur on the farm before the carcass is transported to a slaughterhouse, is permitted in some jurisdictions as a means to avoid inhumane transportation while salvaging meat from injured animals. However, OFES is controversial and its use for dairy cows has been little studied. Inspection documents for 812 dairy cows were examined to identify how OFES was used for dairy cows in British Columbia, Canada, over 16.5 mo. Producers used OFES for dairy cows aged 1 to 13 yr (median of 4 yr). Leg, hip, nerve, spinal, foot, and hind-end injuries or conditions (in that order) were the most common reasons for OFES, and some cases may have been a consequence of calving. Foot conditions were disproportionately common among cows 5 yr and older, and hind-end conditions were disproportionately common among cows 6 yr and older. Producers used OFES promptly after traumatic injury (within 1 d) for some cows, but OFES was delayed for others, sometimes until cows had been nonambulatory for 2 to 6 d. In some cases, OFES was used for nontraumatic chronic conditions, such as lameness and hind-end weakness, rather than traumatic injuries such as fractures and dislocated hips. Use of OFES appears to conform to the purpose of the program when used promptly after traumatic injuries, but clear guidelines are needed to avoid inappropriate use and delays that may prolong animal suffering.

Key words: dairy cow, emergency slaughter, culling decisions, humane transportation

INTRODUCTION

When farm animals become injured, managers must decide whether to treat, transport, euthanize, or, where permitted, use on-farm emergency slaughter (OFES). The OFES procedures—whereby inspection, stunning, and bleeding occur on the farm before the carcass is

transported to a slaughterhouse—are permitted in many jurisdictions, including the European Union and the Canadian provinces of Alberta, British Columbia, Manitoba, Ontario, and Saskatchewan; however, this is not the case in the United States. Regulations for OFES vary among jurisdictions; for example, regarding the training of participating veterinarians. However, most regulations and guidelines indicate that OFES is intended to avoid undue or additional suffering of an injured animal and to salvage meat.

Planned culling and transport of dairy cows has been studied (González et al., 2012; Compton et al., 2017), but little research has been done on the injuries, conditions, and underlying causes that lead to OFES. A few studies have monitored cattle (presumably beef and dairy) that underwent emergency slaughter at slaughterhouses and found that locomotor injuries are especially common (Večerek et al., 2003; Pistěková et al., 2004; Cullinane et al., 2010). More recently, Fusi et al. (2017) found that OFES on Italian dairy farms was used because of accidents, metabolic or digestive disorders, and calving problems.

In British Columbia, OFES is an option for dairy cows and other species. By regulation, an animal may undergo OFES if (1) it “is in a physical condition that precludes it from being transported to a slaughter establishment without undue suffering” or (2) if the animal “poses a high risk of significant injury to humans if it is transported to a slaughter establishment” (Government of British Columbia, 2014). According to OFES guidelines (BCMA, 2014a), producers who use OFES must confirm that the slaughterhouse can accept the carcass and then a veterinarian must confirm that the animal is fit for human consumption (i.e., no clinical sign of disease). The veterinarian completes an inspection document titled “Document for an Approved Emergency Slaughter on Farm” (BCMA, 2014b) with details about injury type, condition of the animal, and timing of the OFES procedure. A transporter with a Specified Risk Material permit then stuns the animal (using a firearm), bleeds it on the farm, and transports the carcass and inspection document to the slaughterhouse within 2 h. Slaughterhouse operators and meat inspectors then record final details on the document;

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these include time of arrival and whether the carcass is condemned based on postmortem inspection. Veterinarian and transporter fees are paid by the producer and the producer receives payment from the slaughterhouse for the carcass.

We analyzed OFES inspection documents (1) to establish the type of injuries or conditions that lead to OFES, (2) to assess whether OFES is being used for its intended purposes according to the regulation, and (3) to provide recommendations for improving OFES.

MATERIALS AND METHODS

Inspection documents were examined for cows that underwent OFES in British Columbia from January 1, 2014, to December 31, 2015. Data from the documents included (1) age, (2) reason for OFES, (3) history of the animal's condition, (4) results of clinical examination on the farm, (5) time of stunning, (6) time of bleeding, (7) time shipped, (8) time arrived at the establishment, (9) disposition, and (10) the reason for condemnation in cases where the carcass was condemned. All identifying details including farm, personal, and location names were redacted by government staff before the documents were released for research. Of the 1,041 documents received, a total of 229 documents were missing data and therefore were not included in data analysis. Specifically, 177 involved an earlier version of the inspection document that did not include information on carcass disposition and reason for condemnation, 31 contained illegible information, and 21 were either missing information, were duplicates of documents already analyzed, or pertained to male animals; this left 812 documents for dairy cows spanning the 16.5 mo from August 14, 2014, to December 31, 2015.

Descriptive statistics were generated for the age of the cows, the times elapsed from stunning to bleeding and to arrival at the slaughterhouse, and the reasons for carcass condemnation, where applicable. Documents generally recorded age as an integer (e.g., 4 yr) or fraction (e.g., 4.5 yr). Because fractions were not recorded for all animals, we used whatever integer was recorded to create age categories. For example, animals recorded as 1, 1.3, and 1.8 were put into age category 1.

Details written under results of the clinical examination were analyzed to classify each case as a leg, hip, nerve, spine, foot, or hind-end injury or condition. For example, fractured femurs and ruptured gastrocnemius muscles were classified as leg injuries. Pedal arthritis and foot abscesses were classified as foot conditions. Two additional groups were created, including cases with minimal description and rarely occurring injuries or conditions. Chi-squared tests were used to test for relationships between cow age group and injury type.

Additional written comments on the documents were analyzed thematically using document analysis (Bowen, 2009). To do this, comments were first characterized with a short definition or code (Charmaz, 2006). For example, the terms "recumbent," "down due to injury," and "down" were coded as nonambulatory cows. Codes were then analyzed to reveal features of how OFES was used.

RESULTS

Data from CanWest DHI (Guelph, Ontario, Canada) showed that 20,981 dairy cows were culled from dairy herds in British Columbia in 2015 (D. McKeen, CanWest DHI, personal communication). Therefore, the 631 animals that underwent OFES in 2015 represented about 3% of all dairy cows culled in the province.

Cow age ranged between 1 and 13 yr, with a median of 4 yr. Only 27 cases were recorded at age 1; the number rose steadily to age 5 (281 cases) and then dropped precipitously at ages 6 and older (91 cases). With the cows grouped for Chi-squared analysis (Table 1), 15% were aged 1 or 2 yr, 39% were 3 or 4 yr, 35% were 5 yr, and 11% were 6 yr or older. Data from CanWest DHI (D. McKeen, CanWest DHI, personal communication) were also used to calculate the age-specific OFES incidence for cows present and cows culled in 2015. For cows culled, approximately 6.8% of cows aged 5 yr underwent OFES, whereas the incidence for cows aged 1 to 4 yr and 6 yr and older ranged from 1.6 to 2.7%. For cows present (animals culled and remaining in 2015), the proportion that underwent OFES was 2.3% for cows aged 5 yr but less than 1% for other age groups.

Excluding OFES cases with minimal description or rarely occurring conditions, the reason for OFES varied somewhat with age (Table 1). Leg injuries were the most commonly recorded type of injury at all ages (Table 1), accounting for 33 to 48% of cases in each of the 4 age groups. Hip injury was the second most common in cows up to and including 5 yr. The percentage of foot conditions increased steadily with age, and hind-end conditions were most common in the oldest group. Chi-squared tests (excluding cases classified as minimal description and rarely occurring) showed an overall difference among age groups in injury type ($\chi^2 = 47.18$, $df = 15$, $P < 0.001$), with foot conditions (primarily lameness) disproportionately common among cows aged 5 yr and older ($\chi^2 = 21.7$, $df = 3$, $P < 0.001$) and hind-end conditions disproportionately common for cows aged 6 yr and older ($\chi^2 = 9.2$, $df = 3$, $P < 0.05$).

Documents reporting leg injuries (35% of total cases) included varying levels of detail about the specific injury. Some gave specifics, such as stifle injuries (44 of

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