J. Dairy Sci. 101:830–839
https://doi.org/10.3168/jds.2017-13143

Survey of disbudding practice on Czech dairy farms

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ABSTRACT

Disbudding is a routine practice in many dairy herds due to the effort to decrease the risk of injuries. Although the disbudding practice is regulated, it can vary among farms. The variation may be caused by many factors, such as herd size or type of breed, but also by farmers' perception of pain caused by disbudding. Hence, the aim of this study was to specify the disbudding practice on dairy farms in the Czech Republic and to assess these practices, including the use of pain mitigation medication, by breed, herd size, and sex of the disbudded calves. We analyzed data from 106 Czech dairy farms, which were collected by a trained interviewer at dairy meetings in 2014–2015. The farmers answered questions regarding the farm's basic characteristics, disbudding practice, and his/her attitude to the pain caused by disbudding. To test the influence of breed, herd size, and sex of disbudded calves on different variables, logistic regression models were used. Disbudding was performed in 92.5% of the surveyed farms; 63.3% of dairy calves were disbudded before 4 wk of age, and Czech Fleckvieh calves were 2.8 times more likely to be disbudded before 4 wk of age than Holstein calves. The hot-iron method was the most used method (69.4%). Calves were 4.5 times more likely to be disbudded by hot iron in herds where both heifers and bulls were disbudded than in herds where only heifers were disbudded. Most (>90%) surveyed farms did not use any pre- or post-procedure medication to mitigate the pain caused by disbudding. The disbudding procedure was performed mainly by farm personnel (94.9%), who were trained by a veterinarian or veterinary technician (46.9%) or by other farm personnel (37.8%) or were not trained (15.3%). Two-thirds of farmers observed behavioral changes in calves after disbudding. Most farmers estimated the pain caused by disbudding to be mild or moderate (20.4 or 45.9%, respectively) and 15.3% of farmers estimated it to be severe. Almost a quarter of interviewed farmers were unable to assess the duration of pain, 39.8% farmers estimated that the pain lasts only several minutes, and 20.4% estimated that the pain lasts up to 6 h. We detected a tendency that farmers of larger herds estimated pain duration to be shorter (odds ratio = 1.2). To improve calves' welfare, training is needed in disbudding practice, focusing on the advantage of pain mitigation.
Key words: calf, disbudding, farm management, welfare

INTRODUCTION

Disbudding involves the destruction of the cells of the horn bud (AVMA, 2014) and is defined as the removal of horns in calves up to 2 mo of age (Cozzi et al., 2015). Although it is not compulsory, it is routine practice in dairy cattle (81% of farms in the European Union; Cozzi et al., 2015) for several reasons: it decreases the risk of injury to humans during manipulation, it minimizes the risk of animals hurting each other (Gottardo et al., 2011; Cozzi et al., 2015), and it helps cattle adapt to contemporary housing facilities (ALCASDE, 2009; Stock et al., 2013).

The disbudding procedure is regulated by European Council Directive 98/58/EC (European Union, 1998) based on the Recommendation Concerning Cattle (Council of Europe Standing Committee, 1988) and by recommended guidelines in English-speaking countries; for example, The Code of Practice in Canada (Agriculture Canada, 1998) and guidelines from AVMA (2014) and AVA (2016). The practice, however, varies among countries (Misch et al., 2007; ALCASDE, 2009).

The most used method of disbudding is the hot-iron method; more than two-thirds of all calves in the European Union (**EU**; Cozzi et al., 2015), Canada (Vasseur et al., 2010), and the United States (USDA, 2008) are disbudded using this method. Use of caustic paste and mechanical methods of disbudding (scoop/tube) are

Received May 11, 2017.
Accepted September 2, 2017.
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less common, at 16.0 and 3.5%, respectively, in the EU (Cozzi et al., 2015). Disbudding is frequently performed by farm personnel (Gottardo et al., 2011; Cozzi et al., 2015) but, despite the fact that disbudding is a serious procedure, a low level of professional training on correct disbudding technique among farmers has been reported (26.8%; Gottardo et al., 2011).

Regardless of the method, disbudding is a painful and stressful procedure (Petrie et al., 1996; Hudson et al., 2008; Stafford and Mellor, 2011). Cautery disbudding may cause up to third-degree burns (Taschke and Folsch, 1997), caustic paste causes painful alkali burns, and mechanical dehorning is associated with large, bleeding head wounds. Disbudding is also accompanied by physiological stress responses; for example, cortisol release into the blood (Graf and Senn, 1999; Stafford and Mellor, 2005) and increased heart and respiratory rates (Grøndahl-Nielsen et al., 1999; Stewart et al., 2008) and can negatively affect growth (Bates et al., 2015). Behavioral responses, such as flicking, headjerks, rubbing, changing posture, and decrease in play behavior, can be observed after disbudding, all of which indicate impaired welfare of the calves (Stafford and Mellor, 2005; Vickers et al., 2005). Moreover, after disbudding, the calves show a negative judgement bias (Neave et al., 2013).

Therefore, strategies have been developed to mitigate the negative effects of disbudding. Most of the negative behavioral and physiological responses are reduced when local anesthetics or analgesics are administered (Stafford and Mellor, 2005). Use of this recommended medication, however, is very low: 20% of European farms use some kind of anaesthetic or analgesic (ALCASDE, 2009); in the United States, 12.4% use anesthesia and 1.8% analgesics (Fulwider et al., 2008); and in Canada, 44.7% use anesthesia and no analgesics (Vasseur et al., 2010). Despite scientific evidence, more than 40% of farmers consider the pain that accompanies disbudding to be moderate and last only few minutes (Hoe and Ruegg, 2006; Gottardo et al., 2011).

Previous research on farms (mean herd size <100 animals) showed that disbudding practices can be influenced by herd size and breed; however, the results are not consistent (Gottardo et al., 2011; Hokkanen et al., 2015). Another variable might be whether the farmer disbuds only heifers or both heifers and bulls, which has not been tested in previous studies. It is obvious that to increase calves' welfare, it is necessary to investigate different disbudding practices and potential for improvement. Therefore, the aim of this study was to evaluate disbudding practices on dairy farms in the Czech Republic and to assess these practices, including the use of pain alleviation medication by breed, herd size, and sex of the disbudded calves.

MATERIALS AND METHODS

Characteristics of Herds and Design of the Study and Questionnaire

Basic characteristics of dairy herds involved in the milk recording system in the Czech Republic are presented in Table 1. Representatives of 117 Czech dairy farms, representing 10.2% of all dairy farms in the Czech Republic were interviewed by a trained interviewer at dairy meetings in 2014 and 2015. We chose interviewing as a feasible alternative to a mailed questionnaire because the response rate is usually low for questionnaires; for example, 45% in Finland (Hokkanen et al., 2015), 67.3% in the United States (Caraviello et al., 2006), and 42.6% in Italy (Gottardo et al., 2011). All evaluated farms were enrolled in the milk recording system. The design of the questionnaire is presented in Table 2.

As some farmers may not want to admit mistakes or problems on their farms, some of the results reported

Table 1. Comparison of numerical characteristics of national farms, studied dairy farms, and studied farms by breed

		Study farms		
Item	National[1]	All farms	Czech Fleckvieh	Holstein
Dairy farms, no.	1,147	106	57	49
Cows, no.	356,594	43,187	20,071	23,116
Herd size,[2] no. of cows	311	407.4 ± 232.7	352.1 ± 183.6	471.8 ± 266.9
Milk production,[2] kg/cow per year	8,001	8,171.8 ± 1,527.3	6,992.1 ± 659.6	9,544.1 ± 1,010.0
Age at weaning of calves,[2] d	NA[3]	70.0 ± 16.4	71.4 ± 18.4	68.3 ± 13.8
Age at disbudding of calves,[2] d	NA	25.4 ± 17.3	22.6 ± 15.9	28.4 ± 18.3

[1]Animals included in Czech milk recording system; data from the Czech-Moravian Breeders' Corporation (Kvapilík et al., 2016).

[2]Mean values ± SD.

[3]Not available.