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Comparison of online, hands-on, and a combined approach for teaching cautery disbudding technique to dairy producers

Charlotte B. Winder,* Stephen J. LeBlanc,* Derek B. Haley,* Kerry D. Lissemore,* M. Ann Godkin,† and Todd F. Duffield*[1]
*Department of Population Medicine, University of Guelph, Ontario, N1G 2W1, Canada
†Ontario Ministry of Agriculture, Food, and Rural Affairs, Elora, Ontario, N0B 1S0, Canada

ABSTRACT

The use of pain control for disbudding and dehorning is important from both an animal and industry perspective. Best practices include the use of local anesthetic, commonly given as a cornual nerve block (CNB), and a nonsteroidal anti-inflammatory drug. The proportion is decreasing, but many dairy producers do not use local anesthesia, perhaps in part due to lack of knowledge of the CNB technique. Although this skill is typically learned in person from a veterinarian, alternative methods may be useful. The objective of this trial was to determine if there were differences in the efficacy of online training (n = 23), hands-on training (n = 20), and a combined approach (n = 23) for teaching producers to successfully administer a CNB and disbud a calf. The primary outcome was block efficacy, defined as a lack of established pain behaviors during iron application. Secondary outcomes were background knowledge (assessed by a written quiz), CNB and disbudding technique (evaluated by rubric scoring), time taken, and self-confidence before and after evaluation. Associations between training group and outcome were assessed with logistic regression, ordered logistic regression, and Cox-proportional hazard models, with a random effect for workshop. Block efficacy was not different between training groups, with 91% successful in both combined and online groups, and 75% in the hands-on trained group. Online learners had poorer technical scores than hands-on trainees. The combined group was not different from hands-on. Time to block completion tended to be longer for the online group (62 ± 11 s), whereas time to disbudding completion was not different between hands-on (41 ± 5 s) or combined trainees (41 ± 5 s). The combined group had the highest pre-evaluation confidence score, and remained higher after evaluation than online but was not different than hands-on. Although we saw some statistical differences between groups, absolute differences were small and block efficacy was similar. This suggests online training can be a useful tool for motivated producers who lack access to hands-on training.
Key words: disbudding, online learning, welfare, calves

INTRODUCTION

Almost all dairy operations in North America perform disbudding or dehorning (Adams et al., 2015) to ensure the safety of caregivers and other animals (Stock et al., 2013). On 75% of farms these procedures are performed by the producer or farm staff, with the remainder using a veterinarian or veterinary technician (Winder et al., 2016). Cautery disbudding is used by 70 to 88% of dairy producers in North America (Vasseur et al., 2010; Adams et al., 2015; Winder et al., 2016).

Appropriate pain control for cautery disbudding involves the use of a local anesthetic, commonly given as a cornual nerve block (**CNB**) and a nonsteroidal anti-inflammatory drug (Stafford and Mellor, 2011; Stock et al., 2013). Whereas administration of these medications in some countries requires veterinary supervision, in the United States and Canada it is common for these medications to be prescribed by the herd veterinarian for on-farm use. In a 2014 sample taken by the US National Animal Health Monitoring System, less than one third of producers used pain control for disbudding or dehorning (Adams et al., 2015). In Canada, use of pain control for dehorning is a requirement of the mandatory and enforced pro*Action* Animal Care program, which began in September 2017 (Dairy Farmers of Canada, 2015). Although increasing industry pressure may be partly responsible for the apparent increase in use of local anesthetic in a recent survey in Ontario, 38% of dairy producers still do not use local anesthetic for these practices (Winder et al., 2016). Outside of program requirements, painful procedures are seen as a

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[1]Corresponding author: tduffiel@uoguelph.ca

key welfare issue for the dairy industry by stakeholders (Robbins et al., 2015; Ventura et al., 2015).

Whereas local anesthetic is inexpensive, application of a CNB does require technical training on location of landmarks and injection technique to be successful. Lack of knowledge of how to perform this technique may partially explain why some producers do not adopt this form of pain control. Producers' perceived ability to implement a change is a key element to the adoption new management strategies (Ritter et al., 2017). This skill is typically acquired in person from a veterinarian, but several demonstration videos also exist online. Although a more personal approach can be tailored to an individual producer's needs and be more likely to result in motivating change (Ritter et al., 2017), not all producers have access to or desire individual training. To effectively reach all remaining dairy producers who do not currently provide local anesthesia for disbudding or dehorning, multiple forms of education and outreach may be beneficial. Eighty-nine percent of Canadian dairy producers reported accessing information for dairy farming through online resources (2014 Canadian National Dairy Study; D. Kelton, University of Guelph, Guelph, Ontario, unpublished data). Providing resources regarding appropriate administration of pain control for disbudding may be useful as a sole means of education, or a preliminary step to accessing individualized training from a veterinarian.

Our research group developed an interactive, online training module to teach how to administer a CNB, as well as properly disbud a calf using a small diameter thermal disbudding iron (Portasol, Elmira, OR). In a trial of veterinary students who had no prior experience giving a CNB, the online module was surprisingly effective, such that 75% of participants trained only online were able to administer an effective CNB without help (Winder et al., 2017). However, this was numerically less effective than the hands-on trained group (100% success), and online-trained participants reported lower confidence and took more time to perform the technique (Winder et al., 2017).

The primary objective of the current study was to determine if an online training module was as effective as hands-on training for teaching dairy producers to successfully perform a CNB and disbud a dairy calf under 12 wk of age with a small diameter thermal disbudding iron (Portasol). Our hypothesis was that online-trained participants would be less successful compared with hands-on learning. A secondary objective was to determine if a combined approach of online and hands-on learning was more effective than hands-on training alone. We hypothesized that the combined approach would be more successful than hands-on training alone.

MATERIALS AND METHODS

Experimental methods were approved by both the University of Guelph Research Ethics Board's Certification of Ethical Acceptability of Research Involving Human Participants (REB#16–12–618) and by the University of Guelph Animal Care Services (AUP#3461). Calves in our study were housed on commercial farms as well as the University of Guelph Dairy Research and Innovation Center (Elora, Ontario, Canada). The study took place between January 2016 and January 2017.

Sample Size

Sample size was calculated with the primary outcome being CNB efficacy. Based on our similar trial with veterinary student participants (Winder et al., 2017), we estimated 70% success in the online-trained group and 95% success in the hands-on group, with a probability of type I error of 0.05 and power of 0.80. Thus, we aimed to recruit 50 participants, with 25 in the online group and 25 in the hands-on group.

Participants

Five 1-d workshops were conducted for this trial. Members of the Ontario Association of Bovine Practitioners (Elora, Ontario, Canada) were contacted via email to recruit veterinary clinics interested in hosting a workshop on a client's farm. Two workshops were completed in which participants were recruited by their herd veterinarian. Three additional workshops were held at the University of Guelph's research dairy, where participants were recruited through a dairy producer magazine advertisement. Participants did not have experience performing a cornual block, which was confirmed when contact was made to provide details of the workshop.

Demographic Information

When participants arrived to the workshop, they were asked to complete a short written survey consisting of 4 questions with free-text responses. Questions included (1) Are you the person responsible for disbudding/dehorning calves on your farm; (2) What method is currently being used to disbud/dehorn calves; (3) At what age range are calves disbudded/dehorned on your farm; and (4) Why did you choose to attend today's workshop?

Responses to the question on reasons for attending the workshop were read by the first author (CBW) iteratively and coded, which were then sorted into themes.