



IMPACT OF DEHORNING AND DISBUDDING ON THE WELL-BEING OF CALVES

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Dehorning and disbudding are relatively routine practices in cattle. This is mainly because polled animals are easier to handle and dehorning decreases the risk of injury to both people and other animals. Polled animals also require less space in the pen and at the feeder than horned animals. The most commonly used procedures today are **hot-iron disbudding**, **chemical disbudding** (through the application of a caustic paste), and **amputation dehorning**. Whilst disbudding is usually performed during the first 4 to 6 weeks of the animal's life, when the horn buds are between 5 and 10 mm long, dehorning is performed once the horn is formed.

DEHORNING AND DISBUDDING ARE PAINFUL PRACTICES

Although dehorning and disbudding are justified for handling reasons and even on animal welfare grounds, they are nevertheless undeniably painful practices.

Pain has been assessed using behavioural, physiological and production indicators. Deviation from normal behaviour is one of the single most important indicators of pain. However, physiological indicators can be particularly useful in prey species such as cattle that are considered stoic and are unlikely to show pronounced behavioural responses until injuries are severe.

Behavioural, physiological and production indicators of pain caused by dehorning and disbudding practices.

Behavioural indicators	Physiological and production indicators
Increased <ul style="list-style-type: none"> • Standing / lying events • Tail shaking • Head shaking • Ear flicking • Kicking • Scratching 	Increased <ul style="list-style-type: none"> • Plasma cortisol • Salivary cortisol • Heart rate • Respiratory rate
Decreased <ul style="list-style-type: none"> • Feeding and ruminating 	Decreased <ul style="list-style-type: none"> • Weight gain

Moreover, a higher incidence of self-grooming behaviour is observed during and immediately after hot-iron disbudding. In contrast, a lower incidence of self-grooming is observed after chemical disbudding and dehorning.

Although newborn animals have traditionally been thought to be less sensitive to pain than adults, this does not seem to be the case. In fact, animals of the so-called precocial species (i.e., those born in highly advanced stages of motor and sensory development, such as cattle) are capable of experiencing pain even before birth. Even if this capacity increases gradually, the evidence seems to suggest that ruminants are already highly sensitive to pain when only a few days old.

HOT-IRON DISBUDDING

Hot-iron disbudding causes pain-related behavioural changes both during and after the procedure. These changes last about 4 hours. Hot-iron disbudding damages the skin around the horn buds, leaving a relatively shallow wound.

“Dehorning is the term that may be applied to horn removal in cattle of all ages whilst disbudding refers to removal of the horn buds in calves up to around 2 months of age.”

CHEMICAL DISBUDDING

The response to chemical disbudding is different. The calf does not usually show signs of pain during the procedure. However, pain-related behavioural changes are observed after the procedure and can last up to 3 or 4 hours. Moreover, the paste can cause deep wounds in the treated animal and even in other animals as a consequence of physical contact between animals.

AMPUTATION DEHORNING

Amputation dehorning causes behavioural changes during the procedure and for 6 to 8 hours afterwards. Amputation affects the skin, bone and sometimes the frontal sinus, causing deeper and more extensive lesions.

MINIMISING OR MANAGING PAIN

If local anaesthesia and systemic analgesia are not available, hot-iron disbudding is preferable to chemical disbudding or dehorning. This is because the cortisol response in the hours following hot-iron disbudding is lower than the response to chemical disbudding and amputation dehorning, suggesting that hot-iron disbudding is less painful, at least in the short term, than the other techniques.

PLASMA CORTISOL CONCENTRATION

Cortisol is a glucocorticoid hormone produced by the adrenal gland and released in response to stress. Increased plasma cortisol concentrations have been observed in association with illness, trauma, fear and pain. Dehorning and disbudding are stressful and painful procedures and thus cause an increase in plasma cortisol concentration. Hot-iron disbudding causes a slight increase in the total plasma cortisol concentration, which peaks at 30 minutes and returns to pre-treatment levels 2 to 4 hours later. Chemical disbudding causes a rise in plasma cortisol concentrations within 1 hour of application of the caustic material, and the cortisol concentration returns to pre-treatment levels 4 to 24 hours later. Dehorning causes an immediate increase in plasma cortisol concentrations, which peak after about 30 minutes and return to pre-treatment levels 5 to 9 hours later.

Whenever possible, a combination of local anaesthesia and systemic analgesia using an NSAID (nonsteroidal anti-inflammatory drug) should be used. This will virtually eliminate all behavioural and hormonal changes indicative of acute pain caused by both dehorning and disbudding. Additionally, as calves may experience chronic pain for 24 to 48 hours after dehorning and disbudding, the possibility of extending the analgesic treatment should be considered.

EUROPEAN RECOMMENDATIONS

The current European legislation regarding minimum standards for the protection of calves (Directive 91/629/ECC) does not regulate dehorning or disbudding procedures. Nevertheless, in some countries it is now mandatory to provide pain relief during painful procedures. Moreover, according to the European Code of Recommendations for the Welfare of Cattle, disbudding should be performed before calves are two months old and ideally as soon as the horn bud is visible. It is strongly recommended that chemical disbudding not be used, and hot-iron disbudding should be carried out under local anaesthesia by a trained and competent stock-keeper. Dehorning should not be a routine procedure and the use of polled cattle must be considered as an alternative to dehorning in future.

SUMMARY

Dehorning and disbudding are painful practices that are routinely performed in cattle to facilitate handling. In order to reduce the pain caused by such procedures, a combination of local anaesthesia and systemic analgesia with an NSAID (nonsteroidal anti-inflammatory drug) is recommended.



Hot-iron disbudding applied to the horn bud to prevent horn growth ((picture courtesy of Iowa State University, USA).

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