

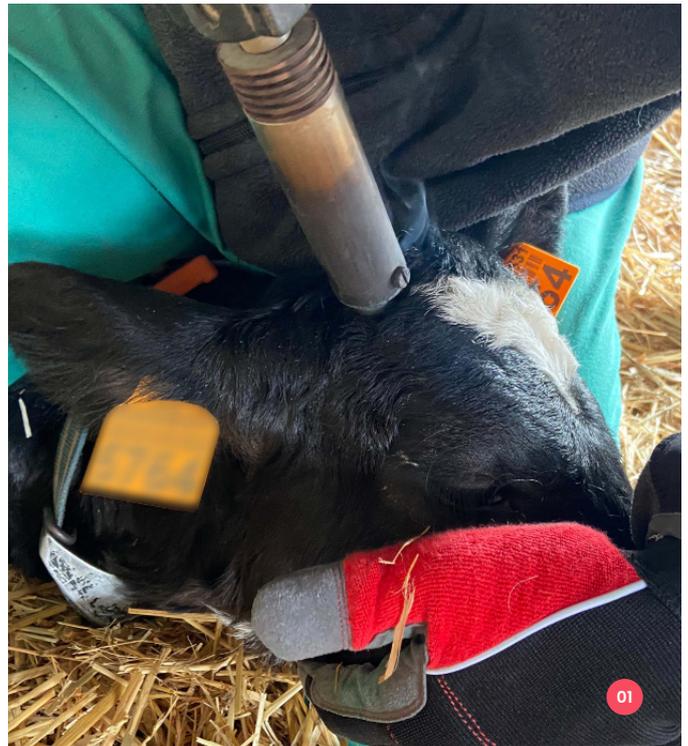


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#02

Calves dehorning: types of procedures and effects on animal welfare

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Dehorning is a common practice in cattle farms, especially, in dairy cattle. Dehorning is justified because it facilitates handling, reduce aggressive behaviours and prevent injuries to both people and other animals. Moreover, polled animals require less space in the pen and at the feeder than horned animals.

“Dehorning and disbudding are stressful and painful procedures, according to the increase in plasma cortisol.”

Painful procedures cause physiologic, productive and behavioural changes and leads to emotional changes. Pain is associated with negative affective states and depressive behaviours due to cognitive biases. For instance, calves can manifest conditioned aversion to the location where dehorning was performed because of pain.

Calves are born without horns. At 2 weeks of age the epithelial bud begins to grow,

and at 4 weeks of age it becomes harder, at this moment, it will be named bud horn. At 8 weeks of age, the horns become to attach to the frontal bone, and at 24-32 weeks the horn nucleus will go inside to the frontal sinus. This is the difference between disbudding and dehorning. If the procedure is performed earlier than 8 weeks old it will be named disbudding whereas if it takes place later, it will be named dehorning.

Disbudding is preferred to dehorning because it is less traumatic and painful, there is minor risk of infection, it is easier and the recovery is faster.

There are three main methods of dehorning: cauterization or hot-iron, chemical application and horn amputation. The most used procedures are hot-iron (Figure 1) and chemical disbudding (Figure 2). Cauterization and chemical disbudding are performed on horn buds while amputation is being performed on grown horns.

● MINIMISING OR MANAGING PAIN

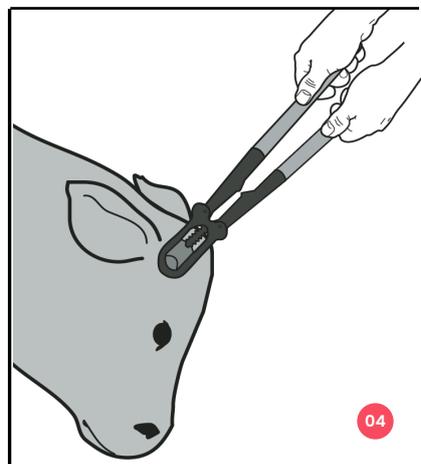
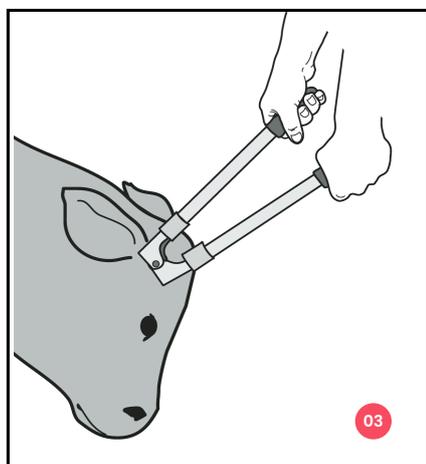
The current European legislation regarding minimum standards for the protection of cal-

ves (Directive 91/629/ECC) does not regulate dehorning procedures. The Recommendation Concerning Cattle adopted by Standing Committee on 21 October 1988 tells that the procedures in which animal experience considerable pain shall be carried out under local or general anaesthesia by a veterinary surgeon or any other person qualified in accordance with domestic legislation. Nevertheless, in some countries such as Denmark, The Netherlands, Slovenia and Sweden, it is mandatory to provide anaesthesia during painful procedures like dehorning.

It is recommended dehorning calves as soon as possible, when buds can be palpated (approximately at 3 - 4 old). Hot-iron disbudding is preferred to chemical disbudding and amputation dehorning. A combination of local anaesthesia and systemic analgesia using non-steroidal anti-inflammatory drugs (NSAIDs) should be used in order to minimize behavioural and hormonal changes that indicate acute pain. Moreover, animals can experience chronic pain for 24 - 48 hours after dehorning, so it is essential to consider enlarging analgesic treatment.

An alternative to dehorning is to select for polled calves. This is a fact in beef breeds as some studies show that the use of polled cattle is not linked to reduced production. But, to date there is not enough volume of polled breeding dairy cattle males with high yield genetics to ensure no consanguinity problems.

Table 1 shows a comparison between the three dehorning methods and the impact on animal welfare based mainly on behaviour, physiological (cortisol) and health indicators (injuries).



> **Image 01**
Cautery disbudding

> **Image 02**
Chemical disbudding using stick

> **Image 03**
Barnes dehorner

> **Image 04**
Keystone dehorner

● **TABLE 1: COMPARISON BETWEEN DIFFERENT TYPES OF DEHORNING**

	CAUTERY DISBUDDING	CHEMICAL DISBUDDING	AMPUTATION DEHORNING
Technique	Heat source application	Chemical caustic substance application	Surgical application to remove horns
Types	Heated bar: Electrically / By gas	Caustic paste with spatula (sodium hydroxide or calcium hydroxide) / Stick (potassium hydroxide)	Tools: Keystone dehorner / Barnes dehorner / Saw
	DURING THE PROCEDURE		
Behaviour alteration	Yes	No*	Yes
	AFTER THE PROCEDURE		
Behaviour alteration	4 hours	3 - 4 hours	6 - 8 hours
Cortisol concentration increase	From 30 min to 2 - 4 hours	From 1 hour to 4 - 24 hours	From 30 min to 5 - 9 hours
	INJURIES		
	Skin around buds horns (superficial injury)	Skin around buds horns, other parts of body and other animals from accidental burns (deep injuries and prolonged damage)	Skin, bone and frontal sinus (extensive and deep injury)

* During chemical disbudding there are few behaviour alterations, giving a false impression that is a non-painful procedure. It should be noted that the caustic paste is burning as long as the substance is in contact with the tissue.

Barnes dehorner is used in calves from 2 months to 1 year old. There are some different sizes to adapt the horn dimension. Keystone dehorner and saws are used in older animals with well-grown horns, from 1 year old. In these procedures, of the skin surrounding the horn must be removed to prevent regrowth.

● **KEY MESSAGES**

- Dehorning is a painful and stressful procedure.
- Anaesthesia and analgesia combination during the dehorning procedure minimizes behavioural and physiological changes which indicate pain.
- Hot-iron disbudding is preferred to chemical and amputation dehorning.
- The use of genetically selected polled cattle is an alternative to traditional dehorning.

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