CATTLE STANDARDS AND GUIDELINES – DISBUDDING AND DEHORNING
DISCUSSION PAPER

Prepared by the Cattle Standards and Guidelines Writing Group, February 2013

ISSUES

The main issues are:

1) Welfare impacts of the disbudding and dehorning

2) Pain relief strategies and age limits before pain relief is required

3) Ability to perform the required task.

RATIONALE

The practice of removing horns in cattle is undertaken to improve animal welfare in the longer term and for operator safety during handling. There is an increased risk of injury, hide damage and bruising in horned cattle compared to polled cattle, particularly during handling, yarding and transport.


Based on certain assumptions, it is estimated that there are 52% horned, 47% polled and 1% scurred cattle in the national beef herd. To have an impact on replacing the practice of dehorning at a national level, strategies need to be developed with the active involvement of big breed associations such as Hereford, Brahman, and Santa Gertrudis etc.


Genetic selection for polled cattle is the most effective means to avoid the need for dehorning. However, the inheritance pattern of the polled or horned condition is relatively complex (see review by Prayaga 2007) and in some breeds (especially dairy breeds) the horned phenotype is prevalent which constrains the opportunity for genetic selection. Notwithstanding this, a new DNA test was made available in Australia in August 2010. This relatively inexpensive test ($33/test) enables beef producers to identify homozygous polled bulls with >90% accuracy in the breeds tested to date. Further testing needs to be conducted in dairy breeds. Further information can be found at http://www.beefcrc.com.au/PolledGeneMarkerTest.

The Majority of dairy animals have horns. Polled animals have always been occurring naturally in dairy (albeit rarely), however until recently the method of inheritance was uncertain and thought to be complex and related negatively to productivity. Recent scientific studies suggest it is a simple

Cattle disbudding and dehorning discussion paper public consultation 1.3.13

Page 1 of 20
dominant gene. At the moment however there is not a reliable or affordable test available (one has been developed in Germany and requires validation – however has yet to be published and the Beef CRC test has not been validated in Dairy breeds).

There has been a significant amount of work that has been done internationally in the last couple of years on the breeding of polled dairy cattle. In 2012 an AI company released the first semen available in Australia which will produce 100% polled offspring. The semen is from three polled dairy bulls that all have the same sire. Consequently, the options for mating the resultant heifer calves are currently limited if you wish to continue breeding for polled. There are more polled bulls available but not considered elite sires with other suitable production characteristics. The Australian Dairy Herd Improvement Scheme will add a code to their database for polled to allow recording of the genotype of polled animals.

Genetic selection is important for dairy farmers but they are over burdened with options when it comes to selecting sires based on traits for productivity (including fertility), animal health and welfare (mastitis, calving ease, longevity, etc) and marketing purposes (i.e. production of A2 milk), etc. The introduction of polled animals into the Australian dairy herd will be a slow process and will not result in any quick, large gains. However once there is a test and the ability to record poll status nationally, there should be further progress in the national dairy herd.

**RECOMMENDATIONS**

The writing group reviewed the reasons for cattle disbudding and dehorning and the methods used and agreed that the procedure is necessary for cattle husbandry. Circumstances will dictate the choice of method, no one method being ideal in all circumstances. All methods are associated with a degree of pain and from this point of view; no one method is markedly superior to others. Appropriate pain relief should be used.

The requirement for pain relief will practically prevent the practice at the age limit proposed (12 months) for commercial cattle enterprises because of the restrictions involved in applying pain relief. Effective drugs are available for cattle but the exact meaning of pain relief and the regimes of treatment to be applied have to be determined in the context of what is reasonable for the veterinary profession to deliver to cattle.

The maximum upper age limit to perform the procedure before mandating pain relief of six months or up to twelve months if at first yarning is recommended for the following reasons:

- **Desirable for cattle welfare** – an age limit will protect cattle welfare and reinforce the need to perform the procedure at an early age. Industry communications and extension campaigns aim to promote the recommended guidelines.

- **Feasible for industry to implement** – Performance of dehorning ‘at first yarning up to 12 months’ should allow all production systems (especially in the extensive areas) to perform necessary dehorning within the timeframe of the standard and sends a clear message for cattle welfare. For smaller operations where cattle are easily mustered the time limit is six months before dehorning is required. For most large scale cattle enterprises the
requirement for pain relief effectively prohibits the procedure beyond the specified age. There are concerns about the need to re-treat horn re-growth from ineffective disbudding/dehorning procedures performed on young cattle.

- Feasible for government to implement – Cattle dentition is an unhelpful guide to cattle age at less than one year old. Verification will have to rely upon measures other than dentition to establish age.

- Important for the cattle welfare regulatory framework. The current MCOP for Cattle recommends that “Dehorning without local anaesthesia should be confined to calves at their first muster and preferably to calves under the age of 6 months”. This recommendation must be preserved as a standard.

- The valid outcome sought is that dehorning is only performed where necessary, at an appropriate age and in a manner that minimises pain and distress. It was felt that the age limit will not cause an increase in pre-emptive dehorning or a decline in cattle welfare due to dehorning not being able to be performed if required.

A standard permitting the careful use of caustic for disbudding is recommended for the following reasons:

- Desirable for cattle welfare – The science and industry practice suggest that this technique can be performed with acceptable outcomes for the calf.

- Feasible for industry to implement – Performance of caustic disbudding as proposed will lead to effective disbudding with less stress than excision methods.

- Feasible for government to implement –. Verification will have to rely upon measures other than dentition to establish age e.g. records.

- Important for the cattle welfare regulatory framework. The current MCOP for Cattle recommends that caustic dehorning is not done.

- The valid outcome sought is that caustic dehorning is only performed where necessary, at an appropriate age and in a manner that minimises pain and distress and the chance of unintended side effects. Banning of this technique will lead to other methods of disbudding/dehorning being used which may have a higher impact on calf welfare.

The writing group recommends that the following acceptable standards be introduced into legislation and the following recommended guidelines to be published for industry consideration.
STANDARDS AND GUIDELINES PROPOSAL

OBJECTIVE

Disbudding and dehorning is done only when necessary and in a manner that minimises the risk to the welfare of cattle, particularly pain and distress.

STANDARDS

S6.1 A person dehorning cattle must have the relevant knowledge, experience and skills, or be under the direct supervision of a person who has the relevant knowledge, experience and skills.

S6.4 A person in charge must use pain relief when dehorning, unless cattle are:
   1) less than six months old; or
   2) less than 12 months old if at their first yarding and where the later age is approved in the jurisdiction.

S6.5 A person must consider the welfare of the calf when using caustic chemicals for disbudding, and must only use it if the calf:
   1) is less than fourteen days old; and
   2) can be segregated from its mother for four hours after treatment; and
   3) can be kept dry for 12 hours after treatment; and
   4) is not wet.

S6.6 A person must use appropriate tools and methods to dehorn cattle and disbud calves.

GUIDELINES

G6.1 Preference should be given for breeding of naturally polled cattle.

G6.2 Disbudding should be done in preference to dehorning.

G6.3 Hot-iron cautery should be used in preference to excision methods for disbudding calves.

G6.4 Calves should be disbudded or dehorned as young as possible.

G6.5 The hair around horn buds should be clipped before use of caustic chemicals for disbudding.

G6.6 Tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end.

G6.7 Horn regrowth or a scur that has a blunt horn end should not be dehorned or tipped.
NB This material relates to the surgical procedures and has been written to reflect a single chapter in the document.

G.8 Surgical procedures should only be done if there are no alternatives and the procedure results in either:

- life-time benefits to cattle welfare, or
- better herd management, or
- a reduced work health and safety risk.

G.9 Surgical procedures should be done with pain relief. Operators should seek advice on current pain minimisation strategies.

G.10 Surgical procedures should be planned with consideration to the health and age of cattle, weather, staff availability and facilities, including the use of temporary or permanent yards.

G.11 Good hygiene practices should be implemented in relation to facilities, hands, handling and instruments. Disinfectant should be used and changed frequently.

G.12 Effective but not excessive restraint should be used to minimise movement, and to enable the procedure to be done quickly and efficiently.

G.13 Equipment for restraining cattle should only be used:

- For the minimum time necessary and with the minimum restraint necessary, when it is suitable
- If it is in good working order.

G.14 Calves should be separated from their mothers for the shortest possible time unless they are to be hand-reared or weaned onto a solid diet.

G.15 Bleeding from surgical wounds should be minimised by selecting an appropriate method, preventing overheating of calves and allowing them to settle after mustering.

G.16 Infection should be minimised by avoiding muddy or dusty yards, and wet weather.

G.17 Surgical procedures should not be undertaken during extreme weather.

G.18 Cattle should be inspected regularly and with minimal disturbance for signs of post-operative complications during the healing process, and appropriate action taken.

Pain relief is defined as ‘the administration of drugs that reduce the intensity and duration of a pain response’.

The term ‘pain relief’ is used throughout this document to mean the reduction of behavioural and physiological responses by an animal to a painful stimulus to a level judged to be reasonable.
Drugs are the common means by which pain relief is achieved and they act in various ways on the peripheral and central nervous systems and may be applied topically or by injection. The range of drugs available for use in cattle and the effectiveness and duration of pain relief provided is often limited.

The assessment of pain is an inexact science. The types of pain and their perception are often not understood and are known to vary at different ages and between individuals. In considering the use of pain relief, cattle should be given the benefit of the doubt.

Where there is a requirement for pain relief, the procedure must be done by a veterinarian or under veterinary supervision for the use of analgesic drugs.

Supervision can be direct or indirect. See the glossary for more information.

**METHODS FOR DISBUDDING AND DEHORNING**

Horns develop from a separate centre of ossification (corium) within the skin tissue above the skull and appear before birth. Initially, they appear as easily palpated horn buds (5-10 mm long). At approximately 2 months of age, the horn fuses with the periosteum of the skull. This fusion extends into the frontal sinus of the skull as the horn gets larger (≥6 months). The extent of this fusion can vary as in the case of scurs which can appear as either rigid or loosely attached horns.

Disbudding involves the removal or destruction of the corium in young calves, typically ≤ 8 weeks of age or when the horn buds are ≤ 10 mm in length as shown below. Disbudding can be achieved through excision, cauterity, cryosurgery (freezing) or through the application of caustic agents. Of the recommended methods, excision is the most commonly applied practice for beef calves and cauterity is the preferred and most commonly applied practice for dairy calves.

Figure One: Young calf

---

1 Source MLA A guide to best practice husbandry in beef cattle - Branding, castrating and dehorning
Publication code:1740367855
Cattle disbudding and dehorning discussion paper public consultation 1.3.13
Dehorning involves the removal of the horn plus a significant amount of tissue (1 cm ring of skin) around the base of the horn as shown below. This is achieved using a variety of implements such as a dehorning knife, embryotomy wire, saws (hand and electric), guillotine shears and scoop dehorners. Of these, dehorning knife and scoop dehorners would be more commonly used in extensive beef operations in Australia. Dehorning often results in trauma to the frontal sinuses in older cattle and this in turn increases the risk of infection, excessive bleeding and prolonged wound healing.

Figure two: Older Calf

There is another dehorning practice known as “tipping” where the points of the horn (2 – 10 cm) are removed for market access reasons. Whilst the severity of tipping may be less than excision dehorning, its value with regard to reducing the incidence of bruising is negligible (Winks et al 1977). Furthermore, the horn continues to grow.

It is important that in the application of any method, the animal is effectively restrained to ensure efficacy and to minimize injury to the animal and operators. In older larger cattle however, this can be difficult to achieve. Furthermore, it is paramount that the operators performing the procedure should be competent and understand the welfare impacts of the procedure.

CATTLE WELFARE IMPLICATIONS

Dehorning, depending on the specific procedure, appears to be one of the most aversive procedures used on cattle, based on the magnitude of acute stress responses. It elicits a pain response with two phases, an immediate response to excision, peaking at about 0.5 to 1.0 h, and a lower but longer lasting response, 3 to 6 h after dehorning (Sylvester et al., 1998a, b; Sutherland et al., 2002).

---

2 Ibid
Cattle disbudding and dehorning discussion paper public consultation 1.3.13
Page 7 of 20
The overall impact of disbudding and dehorning in cattle has been determined using a range of physiological, behavioural and production measures (see reviews by Hayward 2002; Stafford and Mellor 2005). Collectively, these objective measures are informative but as emphasised by Stafford and Mellor (2005), subjective interpretation is still required when evaluating the acute and chronic impacts of disbudding and dehorning in terms of the animal’s affective state (ie. subjective experiences).

All surgical methods of dehorning appear to be similarly stressful. (Sylvester et al. 1998a, b) compared the cortisol responses of 5-6-month-old calves dehorned by scoop, guillotine shears, saw and embryotomy wire. All four methods provoked similar increased cortisol responses which lasted for 6 h. The cortisol responses in the first hour after dehorning were similar to those following ACTH injection, indicating that dehorning resulted in maximum cortisol concentrations during this period. The depth of scoop dehorning did not affect the cortisol response (McMeekan et al. 1997).

The paradigm of increasing welfare impacts related to age of operation is neither proven under on-farm husbandry situations nor well understood (pain and post-operation complications). Whilst there is some evidence that pain increases with age (Ting et al. 2005 burdizzo castration), there is no evidence that there exists a critical age or developmental threshold beyond which cattle experience unacceptable pain in response to a given stimulus.

Disbudding and dehorning causes pain and distress to the cattle and of these two methods the preferred method is disbudding. The relevant method should be done as early as possible. The overall level of pain experienced depends on a number of factors, notably the method used, age of the cattle and whether local anaesthesia or systemic pain relief was administered. Relative to excision methods in calves, cautery disbudding results in a lower and more short-lived cortisol response (2 h versus 7-9 h, Petrie et al 1996). This can be explained by the observation that cautery results in a smaller more superficial wound and the possibility that there is a reduced perception of pain at the wound due to destruction of nociceptors. The vigorous escape behaviors displayed during disbudding suggest that the cattle still experience significant pain (Graf and Senn 1999; Grondahl-Nielsen et al. 1999). There is also behavioral evidence to suggest that low-grade pain and discomfort may continue for up to 24 h after disbudding (Petrie et al. 1996).

The responses of calves to chemical disbudding cannot be assumed to be the same as hot-iron disbudding since the duration of the burns varies with each technique and the pain experienced may be different but overall the responses measured in calves are similar. Chemical disbudding has been considered to be more painful than heat cauterisation on the basis of differences in cortisol responses (Morrise et al 1995). However, the results of this single study should be treated with some caution as the comparison between techniques was undertaken in calves of different ages. It is believed that caustic disbudding does cause pain and Weary (2006) found that pain-related behaviours increased in calves that were dehorned with caustic paste versus those sham dehorned. More recently, subtle differences in behaviour were observed in calves subjected to thermal and caustic disbudding after administration of a sedative and/or local anaesthetic (Vickers et al. 2005). It was concluded that caustic paste causes pain, but that it is less than that caused by the hot iron, even when using local anaesthetic (Vickers et al. 2005).
Chemical or caustic disbudding has additional risks associated with the caustic chemical getting into eyes and other sensitive tissues when calves suck each other or nuzzle their dams, or when it rains. The hair around the horn bud should be clipped to ensure the paste adheres to the horn bud and is applied accurately. Petroleum jelly may be used around the treated area to minimise chemical spread. Segregation and keeping indoors will also help prevent caustic chemical causing damage to other areas of the calf or other cattle.

Following dehorning by excision, there is a sustained elevated cortisol response (up to 9 h) and change in key behaviours (up to 8 h) indicative of pain (increased head and tail shaking and lying and decreased grazing, rumination and affiliated behaviours). The significant trauma associated with dehorning in adult cattle increases the risk of infection and excessive blood loss and wounds may take 4-6 week or longer to fully heal (Loxton et al 1982). Although there is a lack of definitive measures of chronic pain in livestock, measures of productivity such as weight gain have been used in this context. In two Australian studies, there was a significant depression in weight gain in the 2-6 weeks after dehorning in steers aged from 4 – 30 months (Loxton et al 1982) or mature steers (Winks et al 1977). Importantly, Winks et al (1977) also reported that the loss in weight gain in the month after dehorning was directly related with size of the wound.

PAIN RELIEF AND MANAGEMENT AND AGE LIMITS BEFORE PAIN RELIEF IS REQUIRED

This subject has been reviewed in detail by Stafford and Mellor (2005). There are three basic pain relief strategies that have been investigated individually or in combination. These include the administration of:
- Sedatives
- Local anesthetics
- Non-steroidal anti-inflammatory drugs (NSAIDs).

Sedation using xylazine in calves had a minor effect on the cortisol response following dehorning (Stafford et al 2003). However, these authors showed that this response was virtually eliminated when xylazine was combined with the administration of local anesthetic (lignocaine). Stafford and Mellor (2005) found that excision dehorning stimulated a defined cortisol response with a rapid rise to a peak value within 30 min followed by a decline to a plateau which then declined to pre-treatment values after about 8 h. A cornual nerve block using lignocaine virtually eliminated the escape behaviour seen during disbudding and dehorning and reduced the plasma cortisol response to dehorning for about 2 h. Thereafter there was an increase in the plasma cortisol concentration, a delayed response, which lasted for about 6 h. They found that the cortisol response to cautery disbudding was significantly smaller than that of excision dehorning which infers that the latter was more painful.

Local anaesthetics are administered directly around the cornual nerve (nerve block) and/or in the surrounding tissue around the base of the horn (ring block). The process of administering local anaesthetics can be very difficult to achieve without effective head restraint. Sedation therefore offers additional benefits as it reduces the vigorous resistance displayed in calves during the administration of local anaesthetic (Stafford and Mellor 2005).
The administration of local anaesthetic prior to disbudding has been shown to transiently reduce the cortisol response (Petrie et al 1996) and reduce or abolish pain-related behaviours (Graf and Senn 1999; Grondahl-Nielsen et al 1999). Local anaesthesia has also been shown to be beneficial in blocking the acute pain during and immediately following excision dehorning but not the subsequent pain associated with the inflammatory response (Stafford and Mellor 2005). This occurs because the benefits of local anaesthetic are relatively short-lived (typically 2 h for lignocaine but longer in the case of bupivacaine) (Stafford and Mellor 2005). However, once the local anaesthetic wore off, pain-related behaviours and a marked cortisol response occurred. Thus, these local anaesthetic strategies merely delay the overall response of calves to dehorning, they do not reduce it. Other studies with caustic disbudding found local anaesthetic (given subcutaneously) did not appear to help in providing post-operative pain relief (Vickers et al 2005, Stilwell et al 2008). The use of a NSAID in addition to local anaesthetic was found by Stilwell et al (2009) to be effective in controlling pain.

NSAIDs such as ketoprofen have little effect on the acute cortisol response to dehorning but are beneficial in resolving the subsequent cortisol response associated with inflammation (McMeekan et al 1998). McMeekan et al (1998) also demonstrated that the administration of lignocaine and ketoprofen virtually eliminated the cortisol response to dehorning. Furthermore, the combination of all three pain relief agents (sedative + local anaesthetic + NSAID) was advocated by Faulkner and Weary (2000) to minimise pain and discomfort in calves undergoing cautery disbudding and further supported by Stafford and Mellor (2005). They found that a cornual nerve block using lignocaine combined with cauterizing the wound caused by excision dehorning, virtually eliminated the cortisol response as does combining a lignocaine block with the non-steroidal anti-inflammatory drug (NSAID) ketoprofen. When xylazine is combined with a cornual nerve block using lignocaine before dehorning, the cortisol response was virtually eliminated for about 3 h. When this regime was used before cautery disbudding and including a NSAID given before and after disbudding, the behavioural results suggested that pain may be alleviated for 24 h.

The studies reported above were conducted mostly on Bos Taurus calves less than 4 months of age. The impact of dehorning on the welfare of Bos indicus and tropically adapted calves and weaners aged between 3.5 and 10 months which are typical of northern Australian situations, and the method of pain relief was investigated by Sinclair (2012). The effect of a local anaesthetic nerve block and NSAID before dehorning gave plasma cortisol responses similar to Bos Taurus and the use of local anaesthesia reduced behavioural responses. For Bos indicus heifers aged 6 to 8.5 month the combination of local anaesthesia and NSAID was not as effective at alleviating pain and stress associated with amputation dehorning as with Bos Taurus.

Injection of local anaesthetic prior to amputation resulted in higher plasma cortisol levels than those dehorned without local anaesthetic. This indicated a marked and generalized stress response to handling and restraint required to give the cornual nerve block. These animals also lost more blood by arterial spray than those dehorned without local anaesthesia. Plasma cortisol might not be the most suitable indicator or pain, in particular in animals unaccustomed to handling. This study also showed that hot iron dehorning should not be used for Bos indicus and tropically adapted calves in northern Australian conditions.
Stafford and Mellor (2005) ranked some dehorning procedures with and without pain management in terms of severity based on the observed cortisol, behavioural and production (growth rate) responses. This was subsequently simplified by NAWAC (2005) and is shown below as a further simplified table.

Their main finding was that the cortisol response to cautery disbudding is significantly smaller than that to excision dehorning which infers that the latter is more painful. Cautery disbudding is preferable to excision dehorning, but for optimal pain relief, xylazine sedation, local anaesthesia and a NSAID should be used with both procedures.

Table 1 Relative Impact of some Dehorning / Disbudding procedures.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Control</th>
<th>Disbudding Caustic agents</th>
<th>Disbudding cautery</th>
<th>Dehorning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most severe</td>
<td>✔️</td>
<td>✔️ + cautery</td>
<td>✔️ + LA or S</td>
<td>✔️ + LA &amp; S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔️ + LA &amp; A or + LA &amp; cautery</td>
</tr>
<tr>
<td>Least severe</td>
<td>✔️</td>
<td>✔️ + LA</td>
<td>✔️ +LA-1</td>
<td>✔️ +LA-2</td>
</tr>
</tbody>
</table>

Modified from NAWAC 2005

- ✔️ - procedure with no pain relief
- ✔️ - procedure with pain relief
- LA – local anaesthetic
- LA-1 – LA to cornual nerve
- LA-2 – LA ring block around horn bud
- A – analgesic
- S – sedative

**ABILITY TO PERFORM THE REQUIRED TASK**

A person must have knowledge, experience and skills to perform a general husbandry task in a manner that minimises the risk to an animal’s welfare. This matter is regarded as highly important by the cattle industry. A level of assurance is sought commensurate with the degree of immediate welfare risk to the animal. Formal assessment of ability is not required.

Cattle in Australia are managed in environments that vary from extensive rangelands to intensively managed systems. In all cases the persons in charge of cattle are responsible for the welfare of the animals under their control. In achieving improved welfare outcomes envisaged by the standards, it is important that people responsible for animals have the necessary knowledge, experience and skills to undertake the various procedures and meet the requirements of the standards, in a manner that minimises the risk to cattle welfare. The relevant principles are:
The undertaking of any husbandry procedures required for planned herd management in a manner that reduces the impact of these procedures and minimises risks to cattle welfare.

- Handling facilities, equipment and procedures that minimise stress to the cattle
- Minimising the risk of pain, injury or disease
- Assessing the need to undertake any husbandry procedures that may result in significant short-term pain against alternative strategies for the long-term welfare of the cattle

Considerations include:

- Reducing the impact of mustering, handling and restraint
- Carrying out the procedures at the earliest practical age
- Knowledge of the appropriate age/size considerations for selection of method
- Ensuring that facilities and equipment are suitable
- Applying the method skillfully
- Applying other basic principles such as vaccinating cows and calves to protect against tetanus and other clostridial diseases
- Avoiding wet weather
- Maintaining clean hygienic practices
- Allowing the unweaned calves to mother up as soon as possible
- Releasing the cattle from the yards and onto feed and water as soon as possible
- Conducting regular post-castration inspections.

The most important elements to be considered are:

- Knowledge of the appropriate age/size considerations for selection of method
- Demonstrated manual skill
- Appropriate hygiene
- Appropriate instruments.

There are obvious animal welfare benefits associated with administration of pain relief (anesthesia and/or analgesia drugs) during dehorning. However, as emphasized by Stafford and Mellor (2005) these benefits must be balanced against the practicalities of administering pain relief. To achieve full efficacy, the combination of a local anesthetic and an NSAID should be administered 15–20 min prior to dehorning and this requires cattle to be handled twice. This in itself causes stress and is not always practical in larger extensive beef operations. Furthermore, if the process of administering local anesthetic (in the absence of sedation) invokes a significant and protracted stress response, this is recognised to diminish the welfare benefits of anesthesia. Management of chronic pain would require re-handling and re-administration of NSAIDs over an extended period of time. No drugs have been shown to reliably provide pain relief beyond eight hours in cattle. Finally, there is the issue of availability and use of anesthetics and analgesics. Agricultural and veterinary chemicals legislation requires registered veterinarians to administer these drugs and it is recognized that many cattle
producers have limited access to veterinarians particularly in Northern Australia. The costs of these drugs are another constraint to their wider use.

With respect to age limits, disbudding or dehorning should be conducted on calves as early as possible and before 2 months of age in the case of disbudding. Dehorning is more invasive and the severity is related to the size of the wound and this in turn is determined by the size of the horn and therefore cattle age. For dehorning, irrespective of age, pain relief should be administered on animal welfare grounds. The decision to apply pain relief in practice will be influenced by factors other than animal welfare.

**REVIEW OF NATIONAL POLICIES AND POSITIONS**

The Cattle MCOP states:

5.8 Dehorning

5.8.1 To minimise pain and injury all horned cattle should be dehorned as young as possible, preferably prior to weaning, and at a time to reduce fly worry. After dehorning, cattle should be inspected regularly for the first 10 days, and any infected wounds treated. In those situations where flies are a problem, a suitable fly repellent should be applied at the time of dehorning.

5.8.2 Dehorning domesticated cattle without local analgesics should be confined to animals at the first muster and preferably under 6 months of age. Older animals may be “tipped” (ends of horns removed without cutting into sensitive horn tissue) without anesthetic. Dehorning of cattle over 12 months of age is not recommended, and is illegal under some State and Territory legislation, unless undertaken by a veterinarian.

5.8.3 The recommended methods for dehorning of calves are by scoop dehorners, gouging knife or heat cautery, as soon as the horn buds are detectable. The method of choice must be able to remove all horn-growing tissue in one action with minimal damage to adjacent tissues.

5.8.4 Cattle must not be dehorned with corrosive chemicals.

5.8.5 Inward growing horns likely to penetrate or contact facial features should be trimmed appropriately.

5.8.6 On-farm quality assurance programs, feedlots, live cattle exporters and many markets are moving to favour polled cattle to minimise bruising and enhance cattle welfare.

The cattle MCOP does not in effect create a standard, despite the reference to other legislation in various states. Existing regulations poorly mandate the age at which veterinary intervention or the application of analgesia is required for dehorning. It is apparent that a standard for the provision of effective analgesia for cattle dehorning does not exist in all states and Territories. The preferred ages appear to vary from not specified to 6 or 12 months of age.

The **Australian Veterinary Association** (AVA) 8.4 Dehorning of cattle policy is to:
“support the practice of dehorning as a necessary cattle husbandry procedure to improve herd welfare, provided that:

- The procedure is performed by competent operators using an appropriate technique
- Cattle are dehorned as young as possible, preferably under six months of age
- Analgesia is used, where appropriate, to minimise pain and stress.

Tipping (rounding of the points) may be an acceptable alternative to dehorning in some circumstances.

The AVA opposes the use of topical caustic chemicals for dehorning.”

RSPCA Australia does not have a specific policy with respect to dehorning rather it is implicit within their policy on invasive husbandry procedures (RSPCA 2008).

4.6 Invasive husbandry procedures

“4.6.1 RSPCA Australia is opposed to any invasive animal husbandry procedure for which there is no established need, which only benefit the human handler of the animals concerned, or that is performed to overcome the adverse effects upon animals of the production system they are in.

4.6.2 If an invasive procedure is to be performed, it must be undertaken at the earliest age possible, be performed by an accredited operator and be accompanied by appropriate pain-relieving and/or pain-preventing products”.

RSPCA Australia Position paper B4 ‘Invasive farm animal husbandry procedures’ states:

6 Disbudding, dehorning and horn trimming

“Disbudding is the removal of the horn bud before it attaches to the animal’s skull, whereas dehorning is removal of the horn once it has attached to the skull. Horn trimming or tipping is the partial removal of the upper, insensitive part of an animal’s horn. Disbudding, dehorning or horn trimming of cattle, sheep and goats is performed in many parts of Australia to reduce the incidence of bruising and potential injury to other animals.

6.1 RSPCA Australia strongly supports the breeding of poll (hornless) animals to preclude the need for disbudding, dehorning or horn trimming.

6.2 It is unacceptable to disbud or dehorn an animal using caustic chemicals or tools such as axes and hammers.

6.3 Cattle

a. For young calves less than 8 weeks of age or before the horn bud attaches to the skull, acceptable methods of disbudding are:

- Hot iron (preferred method)
- Physical removal of the horn bud, using a dehorning knife.
The calf must be appropriately restrained (see 2.6). An anaesthetic and a pain-relief product are required. Appropriate precautions must be applied to avoid damage of the surrounding tissues, post-operative infection, and fly-strike.

b. For calves from 8 weeks to 6 months of age or after the horn bud attaches to the skull. Acceptable methods of dehorning are:

1. Dehorning knife at 2-3 months old

2. Scoop dehorner at 2-6 months old.

The animal must be appropriately restrained (see 2.6). Appropriate pre- and post-operative procedures, including pain relief and anaesthesia, must be applied as with younger calves.

c. Animals over 6 months of age must only have the upper, insensitive part of the horn tipped/trimmed, unless dehorning is under the direction of a veterinarian using pain relief and anaesthesia”.

**REVIEW OF INTERNATIONAL POLICIES AND POSITIONS**

These policies and position statements are included to provide a brief international context, while acknowledging that Australia’s cattle production systems may vary significantly from production systems, cattle breeds and climatic conditions in other countries.

The **New Zealand** Code of Welfare for Painful Husbandry Procedures (NAWAC 2005) states:

Minimum Standard No. 5 – Disbudding and Dehorning

(a) Animals with intact or “tipped” horns must be managed to minimise the risk of injury to other animals.

Disbudding

(b) When disbudding is performed, the following must apply:

(i) the method must be chosen and undertaken so as to minimize the pain and distress and other negative health consequences (e.g. infection) for the animal, and

(ii) if used, thermal cauterising equipment must be used in such a way as to minimise the risk of thermal injury to tissues other than the horn bud and adjacent skin, and

(iii) if used, caustic or chemical techniques of disbudding must only be used by personnel skilled with the procedure, and only used when injury to the animal beyond the horn bud, or to other animals, is minimized.

Dehorning

(c) When dehorning is performed, the following must apply:

(i) the method must be chosen and undertaken so as to minimise the pain and distress and other negative health consequences (e.g. infection) for the animal, and

(ii) dehorning without pain relief must be performed when animals are as young as possible, and not greater than nine months of age,

(iii) when dehorning an animal over the age of nine months, pain relief must be used.

In the **UK**, the Farm Animal Welfare Council (FAWC) recommended in a 1997 report on the welfare of dairy cattle:

Cattle disbudding and dehorning discussion paper public consultation 1.3.13

Page 15 of 20
- Non-veterinarians should be suitably trained and competent before carrying out disbudding. Please note: that their ability extends to administration of pain relief.
- If disbudding is necessary, the procedure should take place before calves are 2 months of age.
- The pain and stress which can be caused by chemical cauterisation mean that the method should not be used.
- Dehorning must be done only by a veterinary surgeon and only when deemed necessary. It should not be a routine procedure. The Veterinary Surgeons Act 1966 should be amended accordingly.
- If dehorning has to be done, pain control methods such as analgesics should be used in addition to local anaesthesia.
- Sufficient time should always be allowed for the anaesthetic to take effect before disbudding/dehorning.
- The relevant legislation must be reviewed and the maximum age at which disbudding can be performed by non-veterinarians should be stated. The calf must be no more than 2 months of age.

In lieu of official USA government policy, the American Veterinary Medical Association 2013 policy for dehorning states:

The AVMA recognizes that castration and dehorning of cattle are important for human and animal safety when cattle are used for agricultural purposes. Because castration and dehorning cause pain and discomfort, the AVMA recommends the use of procedures and practices that reduce or eliminate these effects. These include genetic selection when appropriate and use of approved or AMDUCA-permissible clinically effective medications whenever possible. Studies indicate that preoperative use of non-steroidal anti-inflammatory agents and local anesthetics reduces pain and distress associated with castration and dehorning.

- Both dehorning and castration should be done at the earliest age practicable.
- Disbudding is the preferred method of dehorning calves. Local anesthetic and non-steroidal anti-inflammatory drugs (NSAIDs) should be considered for other dehorning procedures.

Research leading to new or improved techniques that reduce or eliminate pain and distress associated with castration and dehorning, or development of viable alternates to castration and dehorning, is encouraged.
### DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>dehorning</td>
<td>The removal of attached horns.</td>
</tr>
<tr>
<td>direct supervision</td>
<td>A person (the supervised person) is acting under the direct supervision of another person (the supervisor) if the supervisor:</td>
</tr>
<tr>
<td></td>
<td>(a) provides instructions and guidance to the supervised person in relation to the subject activity; and</td>
</tr>
<tr>
<td></td>
<td>(b) oversees and evaluates the performance of the activity by the supervised person; and</td>
</tr>
<tr>
<td></td>
<td>(c) is contactable by the supervised person; and</td>
</tr>
<tr>
<td></td>
<td>(d) is supervising the person in accordance with paragraphs (a), (b) and (c) above; and</td>
</tr>
<tr>
<td></td>
<td>(e) is on the same premises as the supervised person while the subject activity is being undertaken; and</td>
</tr>
<tr>
<td></td>
<td>(f) is able to immediately render assistance to the supervised person, if required, at any time during which the subject activity is being undertaken.</td>
</tr>
<tr>
<td>disbudding</td>
<td>Removal of an area of skin including the horn bud in a young calf prior to solid attachment of the horn bud to the skull.</td>
</tr>
<tr>
<td>pain relief</td>
<td>The administration of drugs that reduce the intensity and duration of a pain response.</td>
</tr>
<tr>
<td>supervision</td>
<td>A person (the supervised person) is acting under the supervision of another person (the supervisor) if the supervisor:</td>
</tr>
<tr>
<td></td>
<td>(a) provides instructions and guidance to the supervised person in relation to the subject activity; and</td>
</tr>
<tr>
<td></td>
<td>(b) oversees and evaluates the performance of the activity by the supervised person; and</td>
</tr>
<tr>
<td></td>
<td>(c) is contactable by the supervised person.</td>
</tr>
<tr>
<td></td>
<td>See ‘direct supervision’</td>
</tr>
<tr>
<td>yarding</td>
<td>The process of putting cattle into a cattle yard.</td>
</tr>
</tbody>
</table>
REFERENCES

Australian Veterinary Association 8.4 Dehorning of cattle policy accessed on 5.1.13 at:


Sutherland, M.A., Mellor, D.J., Stafford, K.J., Gregory, N.G., Bruce, R.A. and Ward, R.N. (2002). Cortisol responses to dehorning of calves given a 5-h local anaesthetic regimen plus phenylbutazone, ketoprofen, or adrenocorticotropic hormone prior to dehorning. Research in Veterinary Science, 73, 115-123.


Weary D, Reducing pain due to caustic paste dehorning, University of British Columbia, Vol 6 No. 4

Cattle disbudding and dehorning discussion paper public consultation 1.3.13

Page 19 of 20