ANIMAL WELFARE

(PAINFUL HUSBANDRY PROCEDURES)

CODE OF WELFARE 2005

REPORT

A. INTRODUCTION

1. The draft Animal Welfare (Painful Husbandry Procedures) Code of Welfare 2005, the Code, has been developed by the National Animal Welfare Advisory Committee (NAWAC), pursuant to the Animal Welfare Act 1999 (the Act). This report accompanies the Code recommended by NAWAC to the Minister as required by section 74 of the Act. The report notes:
   (a) the reasons for the Committee's recommendations;
   (b) the nature of any significant differences of opinion about the Code, or any provision of it, that have been shown by the submissions; and
   (c) the nature of any significant differences of opinion about the Code, or any provision of it, that have occurred within the Committee.

   In providing this report, NAWAC notes that it fully considered all submissions it received, reviewed relevant scientific literature, and that there was lengthy debate among committee members on many points. This report is not required to, and does not attempt to, show every detail of the analysis and discussions that took place.

2. Castration and dehorning legislation in the Animals Protection Act 1960 was saved in the Animal Welfare Act 1999. Section 201 of the latter Act makes it an offence for any person to (a) castrate, any bovine animal, sheep, goat or pig, over the age of 9 months, unless performed under veterinary supervision; and (b), except for veterinarians, for any person to dehorn, or cause an animal to be dehorned, over the age of 20 months unless pain is prevented. Section 202 limited these provisions, initially to 3 years after commencement of Act (subsequently amended to include a further 2 years), or to where a Code of Welfare issued since the commencement of the Act addressed castration and dehorning. The draft Animal Welfare (Painful Husbandry Procedures) Code of Welfare, the Code, has thus been developed by the National Animal Welfare Advisory Committee (NAWAC), pursuant to the provisions of the Animal Welfare Act 1999 (the Act).

3. The Animal Welfare Advisory Committee (AWAC) Codes of Recommendations and Minimum Standards for the Welfare of Sheep and Dairy Cattle address castration and dehorning. Information refers mainly to the age at which the procedure is performed and the technique used. In addition, Horses (castration must be performed by a veterinary surgeon), and Dogs (neutering is recommended for all animals not intended for breeding and shall be performed by a veterinarian) Codes mention castration. The Animal Welfare (Pigs) Code of Welfare has provision relating to castration (if surgical castration is carried out, it should be performed as early as management practice will allow, if over 7 days of age it must only be carried out by a veterinarian, and after four weeks of age analgesics should be used) and tail docking (if performed it must be done before 8 days of age using clippers, a searing iron, knife or other instrument that severs the tail immediately). Finally, the Animal Welfare (Layer Hens) Code of Welfare has standards for beak trimming (where undertaken it must be within 10 days of hatching; there must be precise control over the amount of beak removed; and it may be undertaken at other times to control cannibalism; the amount that can be removed depends on the age of the birds; and it must only be carried out by trained operators) and recommendations on procedures used to restrict flight.

B. CODE PREPARATION AND PUBLIC SUBMISSIONS

4. The Painful Husbandry Procedures Code of Welfare was drafted on behalf of the Animal Welfare Group of the Ministry of Agriculture and Forestry (MAF). The draft Code, along with the standard preface, introduction and appendices, contained sections dealing with general principles, minimising the pain and distress, castration and shortening of the scrotum, tail-docking, disbudding and dehorning, and operator training, stockmanship and facilities. Representatives of those likely to be affected by the Code were invited to comment on the draft Code before public notification.

5. NAWAC considered the Code to ensure that it complied with the purposes of the Act, was written clearly so as to be readily understood, and that representatives of those likely to be affected by it had been consulted. The Code was publicly notified on [date] by notices in the major newspapers in Auckland, Wellington, Christchurch and Dunedin. In addition it was sent to all major libraries and to specific interested groups. NAWAC wishes to point out that it does not make any final decisions on the draft Code until it has received public submissions. The Code is required to be publicly consulted and to make up its mind prior to this consultation would have meant that NAWAC was not following due process, by acting in a biased and predetermined manner.

6. A total of 18 submissions was received during the public submission process. The more general aspects they addressed included mulesing, the justification for undertaking painful procedures, whether the procedures are significant, evidence for NAWAC's stances, switch removal of dairy cows, high tension bands for castration, and the age limits for the procedures without pain relief. All submissions (including a number of late submissions) have been read in their entirety and taken into

account. Appendix 1 is a Summary of the Public Submissions. Note several issues raised in the submissions were relevant to more than one part of the Code. In this Report, such issues have been addressed on the first occasion they are raised and not repeated subsequently. However, all have been addressed and have been summarised in the Appendix.

C. SCOPE

Background information

7. Painful husbandry procedures include any procedure, or modification to an animal, carried out with or without instruments which involves physical interference with the sensitive soft tissue or bone structure of an animal and is carried out for non-therapeutic reasons.[1] Many such procedures cause pain (the noxious feeling experienced when tissue is damaged) and distress and can have negative affects as gauged by other indices of animal welfare, including productivity. The avoidance, alleviation or minimisation of pain is vital to animal welfare, and to enhancing the biology of the animal, especially growth and the immune system. Equally, failure to undertake some of these procedures can, in some but not all circumstances, lead to an increased risk of compromises to animal health and welfare. In different countries some of the procedures are banned (e.g. tail docking of cows), some are restricted to very young animals when anaesthesia is not used (e.g. tail docking of lambs), and some are only allowed if performed using pain relief (e.g. disbudding).

8. The draft Code is to cover all procedures (as defined above) undertaken as part of normal farm husbandry which cause significant pain and distress. Initially necessitated by the legislation dealing with castration and dehorning described above, it became apparent that there are many other potential procedures carried out on animals to facilitate their husbandry. These include, but are not limited to, tail docking, ear tagging and marking (notching), tattooing, implanting of electronic identification devices, branding (freeze and hot), antler removal, breech mulesing, pizzle dropping and jowling (mulesing of the skin around the pizzle and below the ears), supernumerary teat removal, teeth clipping and grinding, nose ringing, tusk trimming, beak trimming, dubbing, desnooding, declawing, toe removal, devoicing, pinioning, de-winging, obstetric suturing (to reduce the risk of vaginal prolapse), and vasectomy. NAWAC notes that some of these procedures (e.g. ear tagging) would not be expected to produce significant pain and distress. However, by making them subject to the Code's general provisions, it is an opportunity for the animal-based industries to consider the necessity to undertake them. Furthermore, it is an opportunity for public comment through the submission process. Given the legislative timeframe, procedure-specific standards and recommendations are limited, in the first instance, to castration and dehorning (including disbudding) in any bovine, sheep, or goat. In addition tail docking is included since (1) in sheep tail docking is usually undertaken at the time of castration, and (2) the practice is routinely undertaken in large numbers of some farm animals. These procedures are

the commonly accepted, or routine pastoral farm husbandry animal practices.* Although other procedures may be significant in terms of the health and welfare of the animals, their use is either limited to particular industries (consequently better addressed in relevant codes), or relatively uncommon. The draft Code therefore has two components: (1) general principles and minimising pain and distress, which apply to any painful husbandry procedure, and (2) recommendations and standards relating to specific painful husbandry procedures, namely castration, tail docking, and disbudding and dehorning. While the Code does not specifically address all procedures, all are subject to the provisions of the Code's general principles.

9. In addition to the consideration of procedures to be included, thought was given to the possibility that such a code might exaggerate the animal welfare issues, particularly amongst the general public. Such exaggerated concern does not do justice to the complex reasons and attitudes used to justify such practices. Nor does it acknowledge the fact that farmers or stock handlers do not like causing pain to animals, but the procedures are undertaken for justifiable and necessary reasons. NAWAC accepts that the farming community is responsible and diligent regarding animal welfare, and that such procedures are not undertaken lightly but regarded as necessary for efficient livestock management. Furthermore, operators routinely seek to minimise pain and distress, within the constraints of what it is both practicable and economic. (Some of the procedures were presumably originally devised with the objective of minimising the pain inflicted, principally by completing the operation as quickly as possible.) However, it is also appreciated that while many farmers themselves instigate changes in husbandry procedures to enhance animal welfare, in some situations legislation is also required to induce change. Furthermore, NAWAC is of the opinion that these procedures are significant (i.e. painful) and have to be dealt with. While the Code's primary purpose is in setting standards and recommendations for undertaking procedures within New Zealand, NAWAC is also aware of the importance of the Code for those marketing New Zealand's primary produce internationally. Consequently, recommendations which represent common sense to experienced stock handlers are nevertheless still included.

10. The name of the Code was similarly discussed with several options rejected. These included Mutilations (a term used internationally but rejected as it does not distinguish between prophylactic and aesthetic operations); Non-significant Surgical Procedures (though non-significant in terms of the Act, they are significant for the animal); Anatomical Modifications (neglects the significance of pain); and others reflecting elective surgeries, humane tissue removal, and non-veterinary surgical procedures. Thought was given to restricting the Code to ruminants or ungulates although this would exclude pigs and alpaca.† Finally, NAWAC notes

* Note that velvet antler removal falls outside the provisions of section 201 of the Act (it can only be undertaken by a veterinarian or under veterinary supervision), and is being addressed through the separate Code of Welfare currently being developed by the deer industry.

† The order artiodactyl contains pigs (Suiformes), camels (Tylopoda), and deer, sheep, cattle, antelopes etc (Ruminantia). Ungulates are hoofed animals not necessarily closely related e.g. horses, cattle, deer, tapirs etc.

that these procedures are part of animal husbandry (the art or skill of farming) and included the term husbandry in the title to further distinguish them from similar procedures undertaken on animals for aesthetic or cosmetic reasons. NAWAC notes that some animals on farms (e.g. dogs and horses) do not primarily produce food and fibre. Similarly, there are some non-traditional species which are farmed for specific products (e.g. horses from which urine is collected for pharmaceuticals). While NAWAC does not intend to ensure that the current Code extends to include all such animals, it wishes to point out that the principles developed in relation to the present Code, will likely be relevant to such animals. On this basis, the name Painful Husbandry Procedures was selected.

11. The issue of how this Code fits in with other codes of welfare was addressed by NAWAC. It is envisaged that subsequent codes (e.g. dairy cattle, sheep) will refer to the current Code, rather than replace it. Although this means operators may have to refer to more than one code, NAWAC notes that this will be common as separate codes are developed for the animal, its transport, or emergency slaughter etc. The more important issue will be getting the information out to the industries.

12. NAWAC also discussed use of the terms "harm" and "stress." It was noted that some stress can be acceptable, and even beneficial, and that the terms "discomfort, pain and distress" were considered to more accurately reflect the scope of the Code.

13. The draft Code only refers to castration of male animals. Spaying (removal of the ovaries) of female cattle, sheep, goats or pigs is rarely undertaken for husbandry reasons in New Zealand.[‡] Furthermore, it is considered a significant surgical procedure to be performed by a veterinarian or under veterinary supervision. Some animals (e.g. pigs when markets require heavier animals, or when it is desirable to modify the behaviour of bulls) may be "castrated" by immunisation against some of the hormones regulating the control of testes. Known as immunocastration, the technique does not involve physical interference or removal of tissue and is not subject to consideration in this Code. Finally, while some sheep (e.g. Merino, Dorset Horn and Drysdales) have horns, they are not usually removed for prophylactic reasons, though they may sometimes need to be modified for health reasons (e.g. when the horn shape means growth is directed into the eye or skull).

Related issues raised in the submissions and NAWAC's responses

Mulesing

14. Mulesing was not specifically addressed in the draft Code, and consequently there were some responses to its absence. On the one hand, it was acknowledged that mulesing is practiced on a proportion of the Merino flock suggesting it should be included. Furthermore, consideration would have to be given to Minimum Standard 2 which would have directly affected the practice (there is currently no practical

[‡] Spaying of cattle is practiced in some very extensive farming operations in Australia where preventing the stress of pregnancy, calving and lactation allows cows to survive and achieve marketable live weights.

means of providing pain relief). On the other hand, there was support for separate development of standards for mulesing, and not detailing them in a general code likely to have a wide audience. This position reflected the perceived risk that the practice would have on the New Zealand farming industry as a whole. Furthermore, the Merino industry consider the requirements of the draft Code to be inconsistent with their agreed strategy of moving away from mulesing (it should cease by 31st December 2005, and must cease by 2010), and are even detrimental to it. In line with this stance, all reference to mulesing should be removed from the draft Code. The practice would remain covered by section 7.1 of the *Code of Recommendations and Minimum Standards for the Welfare of Sheep*.

15. Mulesing, the practice of surgically removing breech skin around the anus of Merino sheep to reduce the incidence of flystrike, was initially included in the draft Code of Welfare. However, NAWAC decided to develop separate standards for mulesing for later addition to the present Code of Welfare. The reasons for this stance were related to:

    - the additional work compromising NAWAC's ability to meet the legislative requirement to complete the present Code before 31 December 2005;
    - NAWAC's need to come to a better understanding of the costs and benefits of the practice and its consequences for animal welfare and the management of flystrike;
    - the apparent lack of suitable alternative methods of managing the risk of flystrike, or at least their practical implementation within the farming community;
    - the possibility that interim standards and recommendations regarding the practice may hinder and even forestall the fine wool industry's strategy of farming without mulesing (which in itself would make such a code redundant); and
    - the possibility of innovative non-surgical methods of mulesing sheep currently being developed in Australia.

    NAWAC noted that the relevant New Zealand industries are taking steps to cease surgical mulesing (voluntarily from 31 December 2005 and the practice must cease by 2010), and that these steps are not dependent on the development of innovative non-surgical methods. Although NAWAC has taken the above stance, the Committee is currently developing standards and recommendations, and has taken measures to familiarise itself with the issues. In the meantime, mulesing will continue to be covered by section 7.1 of the *Code of Recommendations and Minimum Standards for the Welfare of Sheep.* These guidelines prohibit chemical mulesing; and only allow surgical mulesing on Merino or Merino-dominant animals farmed in extensive situations where there is high risk of flystrike and where there are no other effective flystrike preventative measures; and the procedure must be carried out by competent operators using clean sharp shears and removing no more skin than is necessary.

Significant surgical procedures

16. One submission described criteria for a significant surgical procedure, namely encompassing one or more of the following: significant pain; entry into a body cavity; invasion of the periosteum; significant loss of tissue or loss of significant tissue; the potential, if performed inadequately, to seriously impact on an animal's welfare and/or function. According to these criteria, castration, tail docking, dehorning and disbudding are significant surgical procedures. It was also pointed out that such procedures in other species either would be illegal, or are strictly controlled (i.e. velvet antler removal).

17. The definition of a significant surgical procedure was noted. NAWAC concurs – the procedures described are not insignificant, due care and attention must be used in undertaking them and pain relief is indicated. Furthermore, they are important enough to justify a code of welfare defining how the practices should be undertaken and signalling a progression towards higher standards of welfare. NAWAC notes the confusion between the terms significant, restricted and controlled surgical procedures, and has made reference to these terms, specifying that the Code does not cover significant surgical procedures including those deemed as controlled or restricted, as defined by the Act.

Consultation and dialogue

18. The process of consultation between NAWAC and affected parties was raised with a request that NAWAC's policy is reviewed with a view to ensuring true dialogue occurs, facilitating code development. A related issue was a request for the provision of information (references to the scientific literature) upon which the standards and recommendations are based. This was especially important where standards differ from current legislation and practices.

19. NAWAC has carefully considered the issues of demonstrating evidence for its stances, and of consultation and dialogue. The Code was developed from an extensive review of the scientific literature developed as a Commentary (the "Background information" sections in this Report, plus relevant material from the AWAC Codes and from other countries). Making the Commentary more widely available was not possible due to the tight legislative timeframe available for the present Code's completion. With the development of future codes NAWAC will consider making such commentaries available. NAWAC wishes to point out that it has carefully considered every point raised in both the pre-consultation and public consultation submissions and considers that raising the same points again, as inevitably occurs with oral presentations, is not required. While NAWAC has directed the Code Facilitator to consult and discuss specific issues with some submitters, it points out that a more substantive dialogue process, which is not NAWAC's normal policy, would have to extend to all submitters.

D. GENERAL PRINCIPLES UNDERLYING THE JUSTIFICATION FOR UNDERTAKING PAINFUL HUSBANDRY PRACTICES

Background information

20. Farm animals may be subject to a variety of husbandry practices undertaken in different species for different reasons. These include to:

    - minimise the risk of injury to animals and humans, particularly for those animals kept at higher stocking rates or handled frequently (e.g. dehorning),
    - enable animals to be more easily and safely managed (e.g. dehorning, castration),
    - prevent carcass damage such as skin cuts or bruising (e.g. dehorning),
    - enhance carcass quality or composition (e.g. castration),
    - minimise conditions leading to risk of flystrike (e.g. mulesing, tail docking),
    - allow other husbandry practices (e.g. shearing) to be undertaken more quickly and efficiently (e.g. tail docking, castration),
    - aid in identification (e.g. ear marking or notching), or to
    - harvest products (e.g. velvet antler removal).

    Other, sometimes essentially similar procedures may also be undertaken (e.g. hoof paring or "foot-rotting"). However, these are not routinely undertaken as preventative or prophylactic measures on large numbers of animals but in response to individual animals' particular state of, or predisposition to, ill-health or injury.

21. Most of these farm animal husbandry procedures involve trauma to sensitive and significant tissue such as muscle, tendon, bones, nerves and blood vessels. Consequently, the procedures can cause acute pain and distress. They are usually routinely performed without anaesthesia and analgesia. It is important to note that there are several potential types of compromises to animal welfare, not all of which are significant. Firstly, the procedures involve handling and restraint which can involve some stress, as well as the potential for harm to the animal (e.g. if facilities are inadequate). Secondly, the acute pain associated with the procedure itself. And finally, chronic pain and distress during the post-operative period, along with the potential for altered function. Animals cope with changes in their environments (including stressors) by adapting their physiology (e.g. via changes in blood hormones and the immune system) and behaviour in order to cope. Such changes can thus reflect normal responses to changes in the environment, and processes such as healing, as well as pain and distress. Note that in describing pain, the terms acute and chronic can be used in slightly different ways. Acute pain refers to the immediate and short-lived response to injury and, depending on the procedure, may be severe. Chronic pain is that which persists for a long time, and includes less severe or low level pain associated with the injury and healing, as well as that which may occur after the wound has healed. The chronic responses should be added to the acute responses when considering the affects of different procedures on animal health and welfare.

22. With respect to each specific procedure, the following questions were asked:

    (a) Is it necessary to perform the procedure?
        i. What are the anticipated benefits of the modification?

ii. Does the modification achieve the desired benefits?
iii. Does the modification benefit a significant proportion of the treated animals?
iv. How significant are the benefits, i.e. how pressing is the need to make the modification?
v. Can the same benefits be achieved in other (less invasive) ways?

(b) What harms are caused by the procedure?
i. Does the procedure cause transient, short-term harm, such as pain and distress, when it is carried out?
ii. Does the procedure cause longer-lasting harm, such as pain and distress, during recovery from it?
iii. Does the procedure itself cause harms that persist beyond recovery from the procedure, such as persistent adverse behavioural or functional changes?
iv. What are the magnitudes of such transient, longer-lasting and/or persistent harms: how bad are they?
v. Are there effective ways of reducing any such significant harms?
vi. In what proportion of animals do such harms occur to a significant extent?

(c) Do the benefits of the procedure outweigh the harms?
i. Does the act and the modification cause greater harms to the animals (individuals and groups) than they prevent?
ii. Are there sufficient indirect benefits (e.g. commercial, educational, recreational, scientific, social) to offset the harms done by the procedure itself and the associated anatomical modification to individuals or groups?

23. In answering the above questions, it is important to acknowledge the difficulties in assessing and determining pain and distress in animals. For example, behaviour indicative of pain can vary when different tissues are damaged or when the same tissue is damaged in different ways.[2] For example tail docking with a rubber ring may produce abnormal postures and restlessness, surgical tail removal may produce a minimum of movement presumably to spare pain, while tail removal with a hot iron can result in less movement but more vocalization. The expression of pain-related behaviour may not only reflect pain itself, but also incapacitation, the recovery process, irritation or survival traits rather than pain itself.[3] It is also important to remember that physiological and behavioural measurements may be poorly correlated with pain perception which has an emotional component. Furthermore, no one measure can give a reliable indication of pain, and there are differences between some of these measures. For example, some hormone concentrations (and by inference pain) are less in animals dehorned and the wound cauterised than dehorned alone. However, by also considering the behaviour of the animals the former procedure is ranked as more painful than the latter.[4] Nevertheless, all such measures are important in determining the response of the animal, and in comparing the relative merits of different techniques.

24. Since the procedures are painful, their use requires justification. In many instances routine husbandry procedures are essential for the future well-being of the animal,

the viability of the farming system, or the quality of the product. However, in some situations such as when lambs are slaughtered prior to when flystrike becomes a problem or before muscle is tainted with flavours associated with sexual maturity, animals may not require tail docking and/or castration. It is therefore important that operators carefully consider whether or not it is necessary to always undertake these procedures on all of their animals.

25. It is noted that such procedures are often undertaken to protect animals from some harms (e.g. to reduce the risk of flystrike). Accordingly in some circumstances there is a degree of risk to animal welfare of not undertaking these practices, and any proposed changes to current practice should therefore be considered carefully. This is especially so when the procedures, the farm systems, and the animals have been traditionally employed for long periods of time and the practices are entrenched in individuals' beliefs and attitudes. In such situations, individuals could be encouraged to make changes slowly (e.g. undertake on-farm trials on a proportion of stock), or industry groups encouraged to research such changes on their behalf.

26. NAWAC considered a number of more philosophical issues relating to undertaking painful husbandry practices on farm animals.

- Firstly, should all of the benefits and costs (i.e. harms, which might include monetary costs) be used to weigh up whether a procedure is justifiable? For example, among the advantages of castrating lambs is that they are easier to muster in autumn. Does this benefit legitimately add weight to the primary reason for castration? The commonly accepted stance that benefits should outweigh the costs suggests that all advantages and disadvantages should be included in justifying a procedure. NAWAC believes that justification for a procedure should be on a case-by-case basis with, in the first instance the welfare benefits of carrying out a procedure weighed up against the welfare negatives of not carrying it out. Furthermore, more pressing reasons for a procedure have more weight than lesser reasons, especially where any compromises to the animal welfare are great.

- Secondly, NAWAC notes that procedures may bring different sorts of benefits. Some procedures are undertaken primarily for the benefit of the animals, some for the practicalities and/or economics of the farming system, and others are in response to consumer preferences. NAWAC believes that as farming is important for several reasons, including the value of agriculture to the national economy, it is not appropriate to value any one reason over another. NAWAC is also mindful of the requirements to alter an animal thereby making its keeping in an extensive environment possible such that it can enjoy the benefits of that environment. Nevertheless, it is necessary to continually consider the welfare of the animal and ask whether the justification for treating animals in certain ways can legitimately be drawn from practical and economic considerations since

harms of a certain degree and kind should not be inflicted upon an animal.[§] NAWAC has taken the stance of considering the animal first, then considering economic and practical aspects etc, in justifying the cost to the animal.

- Thirdly, is it possible to distinguish between treating all animals routinely and limiting procedures to only those that display characteristics necessitating painful husbandry procedures? For example, tail-biting in pigs (the main reason for taildocking) often cannot be predicted, meaning usually that all animals must be treated. NAWAC notes that while it would be preferable to treat only problem animals, in practice this would be difficult to implement. Similarly, it would not be appropriate to dehorn an animal only after it has identified itself by causing injury to humans or others animals.

Consequently, NAWAC has taken the stance that the following principles should be used to guide actions:

(i) All the costs and benefits should be included in a cost-benefit analysis, regardless of whether they are to the animal, the farm system, or the product.

(ii) Justification for a particular procedure should be on a case-by-case basis with, in the first instance, the welfare benefits of carrying out a procedure weighed up against the welfare costs of not carrying it out.

(iii) Justification for a particular procedure should take into account good practice, scientific knowledge and available technology.

(iv) Consideration should be given to the predictability of the outcomes of undertaking (or of not undertaking) a procedure.

(v) Consideration should be given to whether or not a negative outcome is easily and practically treatable, and the degree of compromise to the animal, farm management and carcass attributes it involves.

(vi) Where possible, procedures should only be carried out on those individuals that require it.

(vii) Where pain and distress caused to animals is too great to bear, economic and practical considerations should not override the interests of animals.

27. The approach which NAWAC has adopted is summarised as:
    - If a particular husbandry procedure is painful it should not be undertaken if the issue it addresses can be resolved or managed in other less invasive ways.

[§] See NAWAC GUIDELINE 02: Dealing with practices which might be inconsistent with the spirit of the Animal Welfare Act.

- If a particular painful husbandry procedure has to be undertaken, then owners or persons in charge of animals have to consider
    - the best method,
    - the optimal age for the animal, and
    - ways of minimising any harms associated with the procedure, including
        - the use of pain relief, and
        - limiting the procedure to a veterinarian if the harm is extensive and can only be reasonably minimised in that way.

While adopting this approach, NAWAC believes that painful husbandry procedures should be looked upon as transitional management practices. While such procedures may be seen as necessary at present, operators and farm industries are encouraged to develop management systems and breeding programmes which do not require them to be performed routinely. Breeding programmes, management systems, and technologies (e.g. polled cattle, short-tailed sheep) should be developed and used so that painful husbandry procedures can phased out in the future.

Related issues raised in the submissions and NAWAC's responses

Balancing costs and benefits

28. The formidable task of balancing the welfare, economic and practical considerations relating to the procedures was acknowledged in one submission. The formidable nature of this task was evident in the range of beliefs expressed regarding what factors should be used to justify undertaking painful procedures. One stance was that only those procedures which result in clear welfare benefits for the animal could be used as justification (in other words, economic motives provide no justification). Another position was that benefits to the farming system (including human safety and profitability), and the product (thus the consumer), must also be included. This stance was further extended by the need to consider the practical and economic characteristics of New Zealand's extensive and pastoral industries in an increasing global environment.

29. Appropriate justifications for a procedure were discussed at some length by NAWAC. In addition to the reasons set out above, two further aspects were noted. The first was that it is irrelevant who the beneficiary is, what is important is the degree of compromise to the animal reflecting both scientific knowledge and good practice. The second was that the ethical theory underpinning animal welfare was utilitarianism (simply, the benefits must outweigh the harms) – humans are using animals for a purpose and that purpose has to be included when balancing all the benefits against all the harms. Furthermore, this is inferred in the Act which in referring to moves to prevent or alleviate "unreasonable and unnecessary" pain, suffering or distress, indicates that reasonable or necessary pain or distress is allowable. NAWAC takes the terms "reasonable and necessary" to mean within the context of the purpose for which the animal is kept. While accepting that first

consideration should be given to the welfare of the animal, non-animal welfare benefits also provide legitimate justification.

Animal welfare and emotions

30. The Code refers to "unpleasant emotional experiences" in describing the responses to the procedures. This stance was challenged on the presumption that there is no scientific evidence supporting the view that animals undergo emotional experiences as would commonly be accepted from a human perspective. Moreover, while it is accepted that animals undergo emotional experiences, the common understanding of the term is anthropomorphic and thus has no place in the Code.

31. There is much common and scientific evidence indicating that animals experience emotions. While NAWAC appreciates there are different meanings of the term "emotional," and that one of its uses is quite narrow (i.e. perhaps somewhat akin to irrational and hysterical), to differentiate between such uses is not required and somewhat pedantic. It is also noted that pain in humans and other animals has been internationally defined as "[a]n unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is always subjective. … [P]ain is that experience we associate with actual or potential tissue damage. It is unquestionably a sensation in a part or parts of the body, but it is also always unpleasant and therefore also an emotional experience." [5]

Demonstrating the justification for a procedure

32. Minimum Standard 1 refers to the justification for painful procedures, and the associated Recommended Best Practice required that a justification should be able to be provided. Two submissions pointed out that the recommendation was "vague and doesn't indicate who is able to require it."

33. On reflection, while NAWAC wanted operators to more formally address the need to undertake a procedure, the Committee considers that providing a justification would be inappropriate (who could require it, how would it be undertaken, etc). Furthermore, NAWAC also notes that operators and farmers, and farm industry groups, will continue to look for alternatives, especially systems which do not require painful husbandry procedures to be undertaken at all.

E. MINIMISING THE PAIN AND DISTRESS

Background information[6]

34. Since most of these husbandry procedures are painful, consideration must be given to methods of minimising any harms, or to reduce the risk of harm. These may range from careful mustering and handling (to reduce the impact of additional distress contributing to any pain and distress caused by the procedure), to undertaking the procedure at the least harmful age, to using the most appropriate

technique (considered in later sections), to the administration of effective pain relief and prophylactic health treatments, and post-operative care.

Is there an optimal age for undertaking painful husbandry practices?

35. While it is generally believed that painful husbandry procedures are best performed on young animals, the rationale for this is not entirely clear. It could be due to:
    - a belief that younger animals do not experience pain the same as do older animals, possibly because the expression of pain may differ with age[7];
    - some evidence that healing is slightly quicker in younger animals[8];
    - the greater ease with which younger animals can be physically handled and manipulated compared with older animals;
    - their smaller size may mean less sensitive tissue is interfered with and consequently pain is less, healing faster and infections rarer;
    - less specialised anatomical developments (e.g. sinuses invading horns); and/or
    - the possibility of fewer post-operative complications (e.g. phantom limb pains are less prevalent in children when the amputation is undertaken at a young age).

36. While newborns experience pain from a very early age, changes in the degree of pain perception with age are poorly understood. A number of experiments have looked at the effect of age on the pain responses.

    - Piglets showed a stronger and longer lasting response to castration at 7-8 weeks of age than did preweaned animals less than 20 days of age. In a separate study, preweaned piglets responded strongly to castration regardless of whether it was performed at 3, 10 or 17 days of age.[9]

    - In perhaps the most comprehensive study, calves castrated with a Burdizzo (without anaesthetic or analgesic) at 1.5 months of age displayed lower cortisol concentrations, reduced acute phase proteins (a measure of inflammation), reduced scrotal swelling and scrotal temperature (a measure of inflammation) compared with those castrated at 5.5 months. Animals castrated at 2.5 and 3.5 months tended to be intermediate in many of the parameters measured. However, suppression of the immune system which occurs with castration was not affected by age. The authors concluded that, by inference, less pain is associated with castration at 1.5 compared with 5.5 months.[10]

    - Recently, a new technique involving brain electrical responses to castration in lambs has been used to show that the noxious stimuli of castration are less immediately after birth and rises during the subsequent 7-10 days and that the noxiousness apparently decreases somewhat after about two weeks. These observations indicate developmental changes are occurring in the animal.[11] Whether this is likely to be true for animals other than sheep is unknown, though it is likely to be the case in other ungulates.

37. A further aspect of the question of performing painful procedures at certain ages is the possibility that pain inflicted at certain stages of an animal's development may

have profound consequences on the future experiences of pain.[12] For example, abnormal surgical pain at a critical stage of life (e.g. shortly after birth) might sensitise (or desensitise) the animal to any, or certain types of, pain it might subsequently experience. Although yet to be fully researched, especially in farm animals, it does highlight the fact that there are aspects of understanding pain which are unknown.

38. NAWAC acknowledged the difficulty in setting an upper limit for the age at which procedures are best undertaken, and what the limits are, without pain relief. This is primarily because there (is) are generally no clearly discernible ages (or age) which could guide regulations. NAWAC therefore considered the following options with respect to setting limits to castration (the first procedure reviewed) without pain relief.

- Base an upper age limit on the detrimental acute and chronic effects of the procedure for the animal. However, animals of all ages experience pain and there is currently little evidence to suggest that the pain response varies markedly at any particular age as animals mature.

- Puberty (the onset of the ability to reproduce) could be used as a limit if it was associated with relevant anatomical developments. For example, vascularisation and innervation associated with pubertal development might predispose the animals to significant post-operative complications and/or more intense pain and discomfort. However, pubertal development occurs over an extended period (e.g. rapid testicular growth occurs between 2 and 6 months of age in the ram[13]). It is not known if post-pubertal castration is associated with greater risk to animal health and welfare than pre-pubertal or pubertal castration independently of either age or live weight. Finally, the age at which an animal reaches puberty varies with genotype, nutrition, liveweight, season, and species (bull 6-12 months, ram 4-12 months, boar 4-8 months, buck goat 4-12 months, and stag 14 months) making selection of a particular age for each species somewhat arbitrary.

- Set an arbitrary limit with respect to the pain the animal might experience, but one which is founded on the practical aspects of undertaking the procedure. For example, a 2-3 month lambing or calving spread, plus another month to perform the procedures on a property, would mean animals could be castrated before 4 months of age. Such a timeframe would effectively mean that animals on extensive properties would be castrated at the earliest time they were mustered and yarded. However, the range of birth dates and the feasibility of undertaking the procedures on large properties, particularly those exposed to variable weather patterns and necessity to undertake other farm operations at that time also have to be considered. Such an approach could also apply to other procedures (e.g. tail docking) where developmental changes are not as clearly defined as those associated with puberty.

- Set an apparently arbitrary upper limit (e.g. 9 months as in the current legislation) on the basis that older animals require interference with more tissue and thus result in more pain and bring greater risks of post-operative complications.

- Setting limits based entirely on the practical limitations of the technique to be used (e.g. rubber ring use is limited by the size of the scrotum and testes over which it can be placed, surgical techniques by the ability to handle and restrain the animal).

NAWAC is confident that animals experience pain at any age, and that the pain associated with procedures such as castration and dehorning is significant. Traditionally, the use of a veterinarian, and by inference pain relief, has only been deemed mandatory beyond a certain age. NAWAC wants to see the use of pain relief become routine where animals experience significant pain. In choosing 6 months (and subsequently 9 months in the case of dehorning) as a general limit to procedures without pain relief, NAWAC is signalling its wishes for greater use of pain relief rather than aligning the practice with any physiological marker of pain perception. Additionally, undertaking such procedures in younger animals implies less distress because the animal can be more easily handled and the procedure completed more quickly and efficiently, and that less sensitive tissue is involved with less risk of complications. By and large, as the amount of tissue damaged increases with age, then the bigger the injury and the larger the pain. The 6 month age (and 9 months with dehorning) is arbitrary with respect to the animal experiencing pain, but it is not arbitrary with respect to practical and economic aspects. It has been chosen with the spread in lambing and calving dates in mind, and the associated welfare implications of mustering very young animals, especially on extensive properties. In adopting this approach, NAWAC is confident, overall, that restricting procedures without pain relief to younger animals does not result in more pain and distress than that which might occur if the procedures were carried out at an older age.

39. A further related issue is whether one can justify undertaking a procedure at a certain age, if it could have been done less harmfully at another age? And if one does choose to do so, is there an onus to use pain relief? As mentioned above, the circumstances in which the procedure is undertaken, and the degree of animal welfare insult involved must be considered. For example, if the additional pain at a certain age is minor compared with an optimal age, then the circumstances (e.g. difficulty in mustering young stock on extensive farms) would carry more weight. However, if the additional pain is great, then more weight must be given to using pain relief. Similarly, if a less painful technique (e.g. cautery disbudding, rubber ring castration) could have been adopted at a younger age, then pain relief should be used when more painful techniques (e.g. amputation dehorning, surgical and band castration) are used in older animals.

Multiple procedures

40. In some farming systems, a number of painful husbandry procedures are performed at the same time. For example, lambs are usually ear-marked, tail-docked and if they are males, castrated in one operation. Similarly, piglets may be ear notched, castrated and have their teeth clipped within a few days of birth. NAWAC discussed whether certain procedures are best performed together or on separate occasions? In terms of the acute pain response, does the most invasive procedure dominate or do additional procedures produce additive increases in pain and distress? These issues have apparently yet to be fully examined scientifically, though for some there are some indications that the main procedures do result in additive increases in responses indicative of pain.

    However, in addition to the acute pain response, it is noted that mustering, yarding and handling, are significant aspects of husbandry procedures, imposing their own stress especially where there is risk of temporary and permanent separation of dam and off-spring. Undertaking such procedures on different occasions would undoubtedly be highly impractical in many farming systems. Also, as healing can take up to four or more weeks, the time for an animal to recover would be additive (possibly constraining productivity) if procedures were undertaken on separate occasions. Finally, any move towards performing procedures separately would mean the animals would be older when subsequent operations were undertaken, in contrast to the recommendation that animals are treated young. For these reasons, NAWAC does not consider that painful husbandry procedures should be necessarily undertaken on separate occasions, but undertaken on the same occasion where undertaking them separately would increase the cost to the animal and the farm system.

41. It is also possible that there is a maximal level of pain an animal can perceive, beyond which the animal is unable to perceive, or react to, any further noxious stimuli. While at present there is no method for determining this, it should be noted that any procedure producing maximal pain is likely to be significant enough to warrant the use of pain relief, or use of alternative less harmful procedures.

Use of pain relief to ease the acute response

42. Many studies have confirmed that local anaesthetics[**] or analgesics[††] can reduce pain-related behaviour in farm animal species (though knowledge and experience are still being accumulated). There are several different classes of analgesics with different attributes.[‡‡] Local anaesthetics are cheap but short acting, morphine-like drugs are also cheap but less effective in ruminants and alpha-2 adrenoreceptor agonists are effective but also cause sedation. Probably the most effective analgesics are the non-steroidal anti-inflammatory drugs, though the cost of some is high.[14]

[**] Drugs injected near nerves which provide blockade for as long as the local anaesthetic lasts.
[††] Drugs administered to the muscle or blood which circulate and have general affects and which tend to last longer than local anaesthetics.
[‡‡] Apart from this paragraph, no attempt has been made to compare or describe different analgesics and local anaesthetics, either in background material or in the draft Code.

43. Pain relieving drugs are classified as Prescription Animal Remedies. Local anaesthetics are included in Class I, to be used only under the authority or prescription of a veterinarian. An Operational Procedure (veterinarian-endorsed instructions for authorised non-veterinary personnel to administer medicines) may be required for Class I drugs and is required for Class II drugs where repeat prescriptions are provided for ongoing management following an initial consultation.

44. However, with the exception of velvet antler removal in deer, and to a lesser extent disbudding in calves, pain relief is not routinely used in farming. This is presumably for a variety of scientific, veterinary, practical, safety, economic and social reasons each of which needs to be addressed. Among these are:

- Availability: The range of drugs available for use in food producing animals is relatively small.

- Efficacy: Drug formulations have to be effective in reducing the pain in the animal (rather than merely easing human consciences). Indices of effectiveness would include reductions in the amount of pain experienced and/or its duration. Account has to be taken of any significant variations in efficacy related to species, formulation, methods, and circumstances in which they are used. It is also necessary to remember that analgesic use may only result in a reduction in pain rather than its complete elimination, and that the administration of pain relief, along with the restraint required to do so, may be a source of additional discomfort. Some methods of pain relief are thought to be relatively stressful – e.g. injection of anaesthetic into the tail of lambs for tail docking is believed to be more distressing than tail docking.[15]

- Safety: It is possible that the more widespread use of drugs in farm animals may reveal adverse side effects not described as part of drug development or clinical use.

- Practicality of use: In what circumstances will they be used and will this impose constraints on their use and effectiveness? Will the extra handling etc required by the use of pain relief result in the procedure taking longer, increase the chances of complications such as infections, and thus more discomforting for the animal and the handler? There is an expectation that more practical and economic methods of drug administration will be developed (e.g. high-pressure needleless guns).

- Tradition and experience: There may be a lack of knowledge about the use of pain relief in farm animals, and the circumstances and knowledge and skill of those administering the drugs may reduce their effectiveness.

- Economics: Cost is an important consideration in individual animals, especially those whose value is relatively low, e.g. sheep compared with cattle. The drugs themselves can be relatively inexpensive – pain relief for pigs would cost $3-$5

per animal. To treat beef calves[16] with local anaesthetic and assuming twice the labour costs equates to an additional $1.28 per head, compared with $0.28 per calf without any pain relief. Local anaesthetic and analgesic, assuming 2.5 times the labour cost, would mean an additional $5.17 an animal. Veterinary involvement would add significant costs – an additional $12.18 per calf, not only for labour but also travel as many farms are some distance from veterinary practices. The question of the availability of veterinarians is also significant, both nationally and within certain districts, especially if pain relief was to be more widely used.

- Regulatory issues: Many pain relieving drugs are Prescription Animal Remedies and may only be used under the instruction of a veterinarian or under veterinary prescription. A significant consideration is the training required to enable lay persons to administer local anaesthetics or analgesics, and the addressing of legal obstacles to this. For example, the relationship between owners and veterinarians may not extend to contractors, necessitating consideration of legal obstacles to having contractors administer pain relief. The National Velvetting Standards Body (NVSB) administers a training and certification programme for the removal of velvet antler from deer based on a Code of Practice which includes using local anaesthetic to prevent pain and minimise distress. The programme is approved under the Agricultural Compounds and Veterinary Medicines Act (1997) and endorsed by NAWAC.

- Residues: Although some pain relieving drugs (lignocaine and xylazine) have been implicated as carcinogenic, the link is tenuous and the risk very low.[17] Animal exposure to the drugs is brief and often limited to single occasions, whereas carcinogens are usually associated with constant exposure. It should also be noted, though, that with the exception of velvet antler removal, most of the routine husbandry procedures would be expected to be undertaken relatively early, and only once, in an animal's productive life, and well before most products would be "harvested".

- Equitable distribution of costs and benefits: On the face of it, a requirement for operators to use Prescription Animal Remedy pain relief when undertaking routine painful husbandry procedures is a cost to the farming industry and a benefit to the veterinary and pharmaceutical industries. The fair distribution of these costs and benefits has yet to be addressed; perhaps society's position will depend on further research and experience with pain relief, and on changes to regulations that make it easier and cheaper for the farming community to use pain relief.

- Societal expectations: The whole subject of providing pain relief to farm animals has to be considered in light of some of the pervading influences affecting what society takes to be acceptable. While there may be an expectation that pain relief becomes routine based on an ideal of the best urban companion animal practices, there is much diversity in society. Indeed, the use of post-operative relief in companion[18] and even experimental[19] animals is far from

routine. While such factors as cost, effectiveness, availability, skills and knowledge, undoubtedly contribute, as well as stoic attitudes among some animals (and their owners), society may not yet be prepared to require mandatory pain relief for animals (or people for that matter). This could be due to either a failure to recognise that the pain is significant and can be alleviated, or, and perhaps more likely, that the interests of the animals are not sufficient to warrant its use.[20] What is clear is that the interests of animals are becoming more significant with the emergence of the concept of animal welfare in the 1970s.[21]

45. There are therefore many aspects which must be considered before pain relief becomes a standard practice. For example, who should have access to pain relieving drugs, when should they be used, how should use be monitored and by whom? One way of working through some of these issues is to learn from the experiences of the medical community regarding the wider, less controlled use of prescription pain relief. NAWAC proposes gathering a number of parties together to discuss the wider use of pain relieving drugs within agriculture. These might include representatives of farming industries and producer groups, animal science and animal welfare organizations, the Police, NAWAC, New Zealand Veterinary Association, New Zealand Medical Association, and the Agricultural Compounds and Veterinary Medicines Group etc.

46. While NAWAC would like to see the greater use of pain relief, it believes that in order to do so it cannot be restricted to veterinarians, as it is in some countries. In taking this position, NAWAC notes that there are several possibilities including:
    - veterinary supervision or accreditation,
    - prescription use on the knowledge that the veterinarian knows the operator and knows that she/he is trained and competent,
    - trained and dedicated contractors,
    - trained farmers/operators, and
    - local farmer/veterinarian arrangements.

    It is noted that there are industry models which could be used in this respect e.g. velvet antler removal in New Zealand, pregnancy scanning contractors, and porcine somatotrophin use in the Australian pig industry. In considering these possible options, NAWAC is mindful that some procedures are often undertaken in remote regions, difficult terrain and using temporary facilities and are dependent on the weather. In recommending a move towards greater use of pain relief, NAWAC is mindful of the potential of the farming community to develop its own knowledge and expertise, and notes that this will require time. For example, the use of well-trained and skilled technicians to undertake artificial insemination is now well accepted, whereas when it was first mooted some sections of the community were outraged. In wishing to see greater routine use of pain relief, NAWAC would like animal industries to consider the merits of accredited operators, much like the National Velvetting Standards Body system.

47. NAWAC gave considerable thought to the practical and economic constraints to the more routine use of pain relief. At one level, use could be made mandatory

depending on suitable drugs being readily available commercially. At another level, there is a need to consider the practical and economic constraints. Incorporating such concepts into standards was difficult, especially when availability, practicality and economic factors vary between operators and farm systems.

48. In view of the issues affecting use of pain relief for husbandry procedures in farm animals, NAWAC has adopted the following stances:

- There should be a move towards reducing pain and distress, at least for those procedures causing significant and long lasting pain and distress, with pain-relieving drugs. This position reflects consideration of how farm animals should be treated in the context of their particular circumstances, the development of farm practices, and benefits for humans, rather than comparison with other groups of animals such as companion and experimental animals.

- However, at present NAWAC is not confident that local anaesthetics and pain relief are available for all painful husbandry procedures, that they are safe, that the necessary regulatory and veterinary supports exists and that it is always economically viable to do so.

- NAWAC is committed to seeing incremental improvement in the use of pain relief, and therefore accepts that a reduction in pain is better than nothing. However, this has to be tempered with the costs and practicalities of administering pain relief such that only slight improvements in pain relief may not be worth pursuing. NAWAC therefore does not see imposing stringent standards for all procedures as being beneficial at this stage, given the practical, economic and regulatory issues that need to be addressed. It also notes that changes are being made and there is a gradual evolution towards the routine use of pain relief with the support of industry and regulatory involvement (e.g. velvet antler removal and disbudding). With this Code, further development is promoted with the mandatory use of pain relief for certain procedures over 6 months (castration and tailing of lambs) and 9 months (dehorning) of age and the recommendation that pain relief is used in younger animals.

- In undertaking a harm-benefit analysis in order to justify the need for pain relief, NAWAC accepts that practical aspects (handling, training etc) can be added to the analysis. It expects that many of these aspects will be "ironed out" as operators gain confidence in the value of using pain relief and experience with overcoming the practical constraints to its widespread use.

- NAWAC is aware of some more stringent international developments in the use of pain relief in animals (e.g. the UK Farm Animal Welfare Council), but is nevertheless committed to reaching its own view based on the importance of agriculture, and the specific and often distinctive circumstances of farming in this country.

49. In determining the circumstances when pain relief should be used, NAWAC has adopted the following guidelines.
Pain relief should be used where:

- it is available and effective (generally the purview of the scientific and veterinary professions),
- it is economically and practicably feasible to do so (generally the purview of the farming industry),
- when pain is of a significant magnitude and/or duration,
- when alternative, less painful procedures are available but are not used, and
- it significantly reduces the duration and/or intensity of the pain caused by the procedure.

NAWAC notes that operators have a variety of means of minimising pain including undertaking the procedure at an optimum age for the welfare of the animal, and/or using the least harmful method or technique. NAWAC welcomes the trend towards less noxious methods being used when pain relief is not used (for example, disbudding calves rather than dehorning older cattle).

50. NAWAC has therefore settled on the following principles:
(1) Operators should work to achieve the best degree of pain relief possible within the specific constraints of their farming system, including economics. It is NAWAC's role to determine what those constraints are and sees some as being significant (e.g. the impracticality of mustering extensive livestock at a certain ages) and some as less significant (e.g. the lack of good handling facilities).
(2) There should be a move to make incremental improvements in relieving the amount of pain and distress caused to animals by husbandry procedures.
(3) Where no pain relief is administered, methods of achieving the same outcome which cause less pain and distress should be used (e.g. cautery disbudding in preference to amputation dehorning).
(4) Pain relieving drugs (local anaesthetics and/or analgesics) should be administered when it is practicable, economic and safe to do so, providing appropriate regulatory frameworks can be developed to encourage and support their use. Where pain relief is less than optimal, but effective at the lower level, it is better than nothing.
(5) Further additional strategies should include combining other pain relieving approaches to provide greater pain relief (e.g. local anaesthetic before and cautery of the wounds after amputation dehorning, or the use of sedatives or tranquillizers with local anaesthetics or analgesics).
(6) Pain relief must be provided for procedures where the pain is most significant. NAWAC will therefore consider making pain relief mandatory for certain procedures (e.g. dehorning) where the pain and distress is significant and there are alternative, less noxious procedures (e.g. disbudding).

51. NAWAC also considered whether undertaking painful husbandry procedures without providing effective pain relief contravened the Act. The Act requires that procedures are performed in such a manner that animals do not suffer unreasonable or unnecessary pain or distress. This could be interpreted as requiring that Section 73 of the Act would need to be invoked. The mandatory use of pain relief represents

a huge change for practices in many farming systems. NAWAC is thus mindful of the need to phase in such changes, which in some cases will require appropriate attitudinal changes by society. It is also acknowledged that until such attitudes become the societal norm, many of the current practices of undertaking procedures without pain relief are not necessarily poor practices. Until such a time that society accepts the greater use of pain relief and that the infrastructure is in place to support this stance, the minimum standards and recommendations meet the obligations of the Act.

Healing

52. Wound healing involves repair and regeneration of the damaged tissue. In the initial part of the process bleeding is controlled and a seal forms over the wound. Over subsequent days as healing progresses, new tissue grows across the wound to replace the initial seal which is removed along with any tissue around the wound which may have been damaged by crushing or bruising. Healing is completed when the new tissue strengthens into scar tissue. The rate of healing is fastest when the amount of tissue damaged is small, when the edges of the wound sit closely together, when the wound is clean (without dirt or bacterial contamination), and when bleeding is minimal. The rate of healing can also be affected by age, disease, and malnutrition.[22]

53. Healing has been relatively less well studied in comparison with the acute pain effects of undertaking the procedures. There are a number of reports though. For example, healing is enhanced in sheep when the tail is docked longer, at least when it is removed surgically.[23] Rubber ring methods of castration and tail docking have been associated with localised infections in two studies in calves, whereas no infections were noted in one study in lambs.[24] The rate of wound healing in calves varied with the technique used, being fastest with surgical castration, intermediate with rubber ring and high tension band methods, and slowest with clamp castration.[25] Complications in healing have been noted in one study using high tension bands to castrate older cattle.[26] Finally, it has been suggested that healing from rubber ring castration and tail-docking may occur slightly quicker in younger lambs (0-7 days compared with 21-30 days old).[27]

Longer-term responses

54. Short-term or acute pain associated with amputation can be brief or last for a number of days. However, this period may be followed by longer-term post-operative changes, some of which may also be painful. Whereas acute pain does not outlast the healing process, chronic pain, when present, can persist beyond the expected healing time. Unfortunately, this subject has not been well researched in farm animals although there are three types of potential risks.

55. The first risk is that of chronic or long term pain associated with the procedure. There are a number of forms of chronic pain and/or irritation due to injury including: causalgia (prolonged, intense, spontaneous and sometimes debilitating pain which feels hot); neuroma (distorted nerve regrowth which can be sensitive to pressure); neuritis (spreading pain involving inflammation of a nerve); somatic pain

(pain stemming from injury of the nerves leaving the spinal cord); stump pain (painful sensations in the remaining area in any of the above forms) and phantom pain (painful sensations apparently located in the amputated body part).[28] Although neuromas, for example, have been identified in the stumps of tail docked sheep and pigs[29] it is not really known if chronic pain is an animal welfare issue following tissue amputation in livestock. In humans, the earlier in life an amputation is performed, the less likely it is that phantom pains will be experienced,[30] suggesting amputations might best be carried out in younger animals.

56. The second risk is that of the procedure predisposing an animal to some other physiological compromise. For example, short-tailed docked sheep are more prone to rectal prolapse[31] (presumably because tail amputation has interfered with the rectal muscles). Similarly, mulesed and short-tail docked sheep are more prone to cancer of the perineal or tail region[32] (presumably because the skin has been bared, stretched and is less protected from sunlight). Finally, lambs castrated soon after birth may sleep because of the pain, reducing opportunities to suck and thereby obtain colostrum.

57. The third risk is the alteration to the animal's behaviour as a result of the loss or modification to a body part. For example, tail docked animals may be unable to use their tails to deter flies, to signal their moods, or to protect their urogenital regions; castrated animals are unable to breed; and the social hierarchy of dehorned animals may change. While many possible chronic long-term affects have not been extensively studied in farm livestock, it is likely that there will be some degree of compromised, as well as enhanced, welfare.

58. While healing and longer-term responses have been included where possible, NAWAC is mindful that this Code focuses mostly on physical pain. Furthermore, the importance of other forms of pain or distress such as emotional responses (e.g. fear, anxiety, social isolation etc) [33] should not be overlooked because of a lack of information.

Related issues raised in the submissions and NAWAC's responses

Age limits without pain relief

59. The age limits for undertaking procedures without pain relief, and without being undertaken by a veterinarian, drew varied responses (both in this section and in the subsequent procedure-specific sections of the Code). On the one hand, submissions pointed out that animals could feel pain at any age and thus required pain relief. On the other hand, the present statutory age limits for dehorning and castration were seen as good practice and should remain. Part of this stance related to specific practices occurring in extensive farm systems. Additionally, there was some confusion over the requirements for pain relief in the period between 6 and 9 months.

60. The rationale for upper and lower age limits for the procedures was the subject of considerable discussion. The lower age limit was relatively straightforward, though

it had complications. It was reasonably accepted that procedures should not be undertaken immediately after birth if it jeopardises the survival of the newborn animal. It was acknowledged that the newborn animals may possibly be less sensitive to pain in the hours immediately after birth (though additional research is required to support this). NAWAC also noted that in some intensive situations, particularly when the animals are well habituated to human presence and handling, such procedures may be less distressful. However, in most extensive farming systems, where there is risk of harm (e.g. mismothering and inadequate colostrum uptake), painful husbandry procedures should not be undertaken on very young animals.

61. As discussed above, the upper age limit was more complex. Firstly, the need to set a limit was taken from the present legislation which presumably derives from a need to restrict procedures in older animals because of the risk of slower healing and greater infections, difficulty in restraining them and thus resulting in greater distress. Secondly, as described above, there were no clear biological reasons for an appropriate limit (the procedures are painful at any age, and there are few anatomical developments which could be used as a practical guide, with the possible exception of growth of horns). Thirdly, practical limits (e.g. time of weaning, younger animals are easier to restrain) were considered but such an approach provides little guidance in the face of the wide range of practical systems, and differences in operator skill and expertise. NAWAC thus took the approach of choosing an arbitrary age which signals both its wish to see procedures performed on animals as young as practicable, and the greater use of pain relief.

62. The draft Code proposed two age limits for several procedures, a 6 month maximum for undertaking castration, tail docking of sheep, and disbudding and dehorning without pain relief, and a 9-month limit for undertaking them unless performed by or under the supervision of a veterinarian. The rationale for this was that the procedures are associated with increased risk in older animals, and that that risk includes factors other than pain. However, the submissions indicated that the 6 & 9 month limits were confusing and consequently NAWAC has moved to make a standard 6 month limit for castration, taildocking (sheep only), and 9 months for disbudding and dehorning, without pain relief. The rationale included the fact that since pain relief was required after 6 months of age, a veterinarian would be involved in some capacity anyway. NAWAC accepts that there is now no upper age limit on undertaking these procedures, but is confident that the involvement of veterinarians will ensure high standards of animal welfare are maintained.

63. NAWAC is aware of two beef cattle systems which would not presently conform to the earlier proposed six month age limit with respect to dehorning. The first system is established in a significant part of the South Island high country where large numbers of beef cattle are farmed. In these situations, calves may be born in November-January but only routinely mustered through the yards twice a year, once for marking in the autumn and once for weaning in the spring. Mustering itself is a significant and costly exercise given the low stocking densities in parts of this country. In Hereford X Angus cattle, horn eruption may be delayed with farmers

preferring to dehorn calves after eruption rather than disbud all animals earlier. In animals not well habituated to handling, the stress of dehorning is considered to be little more than disbudding, especially since the procedure is undertaken quickly. While most calves would be dehorned less than 6 months of age, some would not, thereby necessitating earlier mustering to ensure compliance with the draft Code. The vagaries of climate, spread in calving dates, and the need to balance farm management priorities mean earlier mustering is not always possible. The only real alternative would be the use of pain relief, or managing the animals with horns. NAWAC notes that a small proportion of animals (i.e. those developing horns after 9 months of age) may well have to be managed in this way, but considers imposing such a requirement on a larger proportion of animas in one section of the farming community at this time would be a significant hindrance. For these reasons, the 6-month age limit on dehorning without pain relief proposed in the draft Code was changed to 9 months. The second system is where bulls are castrated at older ages in order to realise the growth benefits of entire animals before the drawback of behavioural maturation. NAWAC is of the opinion that pain relief should be provided in this latter situation, because a less invasive procedure could have been undertaken at a younger age.

64. As the rationale for the age limit is arbitrary, the question of whether there is evidence for a 6 month limit resulting in enhanced welfare compared with 9 months (the previous limit for some of these procedures without pain relief) was also addressed. Little objective information exists as to differences in handling stress, acute pain, healing, and post-operative complications. It is, however, likely that there are greater risks associated with the interference of more tissue by virtue of the greater size of older animals.

The duration of pain without pain relief

65. A twelve hour limit of pain without pain relief also drew comments ranging from it being too long and that no animal should have to endure marked pain and distress for such a period, to why was it reduced from the 24 hour period in an earlier draft of the Code? It was also pointed out that such a standard would compromise the present practice of mulesing.

66. NAWAC initially intended requiring effective pain relief at the time a procedure was performed where the intensity and duration of pain are such that they are likely to result in alteration to the animal's normal behaviour and physiology, indicating marked discomfort, pain or distress, for more than 12 hours. (The commonly used indicators of pain and distress are markedly reduced by 8-9 hours after most procedures.) This stance was intended to distinguish between the more routine procedures (e.g. castration, dehorning, etc) and those regarded as more extreme (i.e. mulesing). (Note that NAWAC cannot prohibit a surgical procedure, prohibitions can only be made by the Act. However, standards can be drafted to restrict an activity, thereby having a similar effect to a prohibition.) The 12 hour limit (24 hours in an earlier draft) was based on scientific measures, some of which would not be accessible to owners and operators, especially when the 12 hour limit was

likely to fall during darkness in many situations. As mulesing is being dealt with separately, this minimum standard has been removed.

67. The recommendation that pain relief should be used within particular practical and economic constraints was an issue in several submissions. Responses ranged from suggesting it should be a minimum standard, to recommending pain relief independently of whether it was economically and practically viable, to the problem of interpreting the meaning of availability (to the industry or to the operator). Also alluded to were issues relating to the use of pain relief by lay persons and contractors.

Practical considerations

68. In this section, and elsewhere in the Code, recommendations were made, which if uncritically followed, would undoubtedly question NAWAC's credibility. These dealt with issues such as checking for signs of post-operative complications and taking appropriate remedial action; undertaking the procedures in young animals; and observing appropriate standards of cleanliness and hygiene. At best they could be seen as impractical, at worst as detrimental to animal welfare. Not surprisingly, they were addressed in a number of submissions.

69. NAWAC accepts that in many farming situations, implementing these sorts of recommendations depends on factors as diverse as the degree to which the stock are habituated to handling, the risk of disturbance adding to pain and distress, especially permanent disruption of the bond between dam and offspring, as well any spread in ages within a mob, flock or herd of animals, availability of facilities, and the physical environment and weather. Nevertheless, these recommendations are important for ensuring animal welfare and should be followed where it is both practical and appropriate to do so. A related section has been added to the Code highlighting that experience and good stockmanship should be used to determine the most appropriate actions. In making these changes, NAWAC was mindful that the alternatives of (1) prefacing such recommendations with "where practical" or (2) deleting reference to the practices, might be seen to encourage laissez-faire attitudes, or not be seen to address critical areas in the care of animals.

Future developments

70. The aim of moving towards greater use of pain relief in routine painful husbandry procedures is tempered by a number of factors influencing how far and how fast practices can evolve. Pain relief can be incorporated in some practices relatively quickly (e.g. disbudding), in some it will take time to develop practicable methods (e.g. castration), and in others the benefits of pain relief may not outweigh the costs of providing it (e.g. tail docking). While the ideal situation is a substantial reduction in pain associated with all procedures, NAWAC wishes to move towards this situation ensuring that training, safety, practical, economic and regulatory constraints are overcome without compromising the industries' viability. Similarly, while complete pain relief is an ideal, there is much to be learned (e.g. pain itself

may have some important benefits such as initiating body responses that promote healing; adverse reactions to drugs may only become apparent with their more widespread use). NAWAC thus wishes to see pain relief incorporated gradually, beginning with those situations where pain and distress are most severe and most easily alleviated. NAWAC is confident that by signalling a desire to see greater pain relief, the industries will respond by developing economical and practicable means of administering pain relief and that greater use will result in the costs being reduced. NAWAC is confident that the farming industries will address this and notes that some are ready to support such an undertaking.

71. The draft Code included a number of statements in bold. These referred to: moves to minimise pain with husbandry procedures with a 6 month age limit on undertaking procedures, unless using pain relief; the use of pain relief becoming a more accepted practice when undertaking painful husbandry procedures; concern that the use of high tension latex bands for castration causes severe pain and can be associated with poor healing in older animals; and the use of, and options for, making pain relief mandatory at some future as yet unspecified time for disbudding and dehorning. The intention of this approach was first and foremost to signal the issues and options, so that readers were aware of the direction NAWAC intended to take and could comment. The majority of these statements have now been removed. However, NAWAC considers it opportune to further signal to those involved with undertaking painful husbandry procedures the direction it wishes to take in minimising pain and distress. Therefore there is a statement setting out NAWAC's support and encouragement for continued efforts towards minimising the pain and distress associated with the husbandry procedures described in this Code. This includes the wider use of pain relief when undertaking painful husbandry procedures. However, there are a number of issues, many beyond NAWAC's statutory functions, which need to be taken into consideration. These include: (1) the wider availability, safety and efficacy of pain relieving drugs; (2) practical and economic aspects determining the use of pain relieving drugs; (3) attitudes and expectations towards minimising pain associated with painful husbandry procedures, and the equitable distribution of the costs and benefits of doing so; and (4) the regulatory environment required to support the use of restricted drugs. NAWAC is of the opinion that until these issues are explored and resolved in accordance with good practice, scientific knowledge and available technology, it would be imprudent to implement widespread changes. The Committee will instead interact with the farming, veterinary and related pharmaceutical industries, as well as the regulatory agencies, in order to aid the development of strategies for improving animal welfare within the practical, economic, safety and social constraints it has identified. NAWAC is gathering information on these issues, and any other related matters, and wishes to review this aspect of the Code within 5 years of its issue. At that time consideration will be given to making pain relief mandatory, within defined periods, for a wider range of husbandry procedures and circumstances.

72. The alternative approach, introducing regulations to make pain relief mandatory either immediately or within a defined period, was considered but rejected for the

reasons described above, and because at present, for many husbandry procedures, good practice is not associated with pain relief. NAWAC was also aware that any move to introduce regulations now, or within a defined period, would necessitate invoking section 73 of the Act (minimum standards and recommendations which do not fully meet the obligations of the Act). NAWAC contends that, as discussed above, the minimum standards and recommendations currently meet the obligations of the Act, and to suggest otherwise would be counterproductive, invoking criticism which would likely significantly compromise the continued minimisation of pain and distress.

73. Although NAWAC has not made the use of pain relief mandatory for all painful procedures, it has made significant changes which it regards as evolution towards that position. The current legislation permits castration to be undertaken up until the age of 9 months unless performed by or under the supervision of a veterinarian. Similarly, dehorning without anaesthetic sufficient to prevent the animal feeling pain is allowed until over 20 months of age. In addition, NAWAC has imposed a 6 month limit on tail docking sheep without pain relief, and has made the use of pain relief a Recommended Best Practice for castration, disbudding and dehorning. Although these are significant changes NAWAC is confident that those involved with farming animals will adapt and move forward towards greater and equitable use of pain relief.

F. CASTRATION AND SHORTENING OF THE SCROTUM (CRYPTORCHID)

Background information[34]

74. Testes have a number of functions relating to reproduction, growth (entire animals typically grow faster and to heavier weights, have more muscle and less fat, but their meat can have an unwanted male taint), and behaviour (castrated animals are typically more docile and easier to handle). Castration is therefore used to reduce aggression and facilitate handling. Castration is also used to achieve quality carcass and meat composition and consistency through preventing the check in growth which can occur during puberty, and achieve growth rate uniformity and minimise undesirable meat odours, flavours and oily meat. Additional advantages of castration, depending on animals and circumstances, include ease of management practices such as shearing, and the prevention of indiscriminate breeding. The disadvantages of castration are that it is painful, there is risk of infection, it can check growth rates and animals can grow more slowly and become fatter.

75. There are a number of systems where castration is not required. For example, most boars are left entire, as are animals in bull-beef systems developed in New Zealand and characterised by ease of handling. There are also a number of more intensive systems that result in reduced aggressive behaviour in entire males and therefore negate the need to castrate. [35] Meat animals can be slaughtered before carcass

flavours and odours appear (e.g. lambs killed prior to when they reach puberty in autumn). This is especially so when they have been born early in the season and are thus able to reach mature slaughter weights before the onset of seasonal puberty compared with normal spring-born animals. Finally, some farm species, such as deer, are usually left entire.

Castration methods

76. There are several main methods routinely used to castrate farm animals.

- Application of a conventional rubber ring around the scrotum above the testes. Blood supply to the testes and scrotum is cut off and the testes and scrotum shrivel up and fall off within 6-8 weeks. The technique is straightforward and easily performed. There is anecdotal evidence that when rubber rings are used on well grown or older animals (perhaps greater than 4 months of age), they are not able to effectively constrict blood flow leading to swelling and associated pain.

- Application of a tight or high tension specialised latex band around the scrotum above the testes using a mechanical applicator. Blood supply to the testicles and scrotum is cut off and the testes and scrotum shrivel up and fall off within 4-6 weeks.

- Application of a conventional rubber ring around the scrotum below the testes resulting in the testes being held against the abdominal wall. (Although technically not castration – the testes are not removed – shortening the scrotum is also used to achieve some of the purposes of castration.) Blood supply to the scrotum below the rubber ring is cut off and that part of the scrotal sack shrivels up and falls off within 6-8 weeks. Body heat is transferred to the testes inhibiting sperm production and this results in nearly all animals becoming infertile. Testicular hormone production is largely unaffected, the animals grow well and are lean, and they behave as do entire males. The method is known as shortening the scrotum, short-scrotum, or, more commonly, rendering the animal a "cryptorchid." The technique is straightforward and easily performed. Although there is some risk of the animals contracting tetanus as a wound forms, it is usually managed by vaccination. As far as is known, short-scrotum castration is mostly used in sheep - the rationale amongst farmers for using the short-scrotum method included better growth than wethers (54%), carcass leanness (20%), infertility (15%), cleaner (14%), easier management, fewer hassles (12%) and easier crutching (12%).[36] Since entire and cryptorchid animals have similar growth characteristics and carcass composition, it would appear that the main reason for the procedure is to remove the need to keep the scrotum (or purse) clean and make shearing etc easier to perform. Infertility (and presumably a reduced risk of brucellosis) would be a lesser advantage when ram lambs are not able to be contained. Shortening the scrotum is apparently also used in cattle when meat schedules for steers are more favourable than for bulls. In those situations, shortening of the scrotum

(and other methods of castration) is (are) perhaps more likely to be performed at an older age, when the animal has realised the growth benefits of remaining entire, rather than as a younger calf.

- Crushing the spermatic cords with an emasculator (bloodless castrator or Burdizzo) through the neck of the scrotum; the spermatic cord contains testicular nerves and associated blood vessels. Each spermatic cord is crushed separately such that the crush lines do not overlap, thereby preserving blood flow to the scrotum. The testes atrophy over the following few weeks. The scrotum is not normally damaged except for bruising at the site of crushing. The technique requires some skill and is sometimes used in combination with the rubber ring method. It is not always successful in terms of castrating the animal, and is only rarely used in New Zealand. The Code does not specifically deal with the combined rubber ring and Burdizzo methods of castration since at the ages animals are usually castrated at in New Zealand, it is an unnecessary complication.

- Surgical castration where the scrotum is opened with a sharp instrument and the spermatic cords severed by drawing the testes out, by using an emasculator to clamp and cut them, or by scraping and then cutting the cords. There is risk of haemorrhage, intestinal prolapse and subsequent infection. This technique perhaps reflects historical husbandry practices common before the advent of the rubber ring.

High tension bands for castrating

77. The technique of applying high tension latex bands to the scrotum to castrate animals is relatively new in New Zealand. The Callicrate Bander[37] and the Eze Bloodless Castrator [38] can be used to castrate older animals (20-21 month old bulls in one US study[39]) since the size of the scrotum is not the limiting feature it is with conventional rubber ring castration. By delaying the time of castration, the growth benefits of being entire can be realised before the drawbacks of behavioural maturation. (They have also successfully been used to remove the infected scrotum of surgically castrated steers,[40] and can be used on cull stud animals i.e. mature bulls that have not been sold or are regarded as inferior.) The manufacturers of the Callicrate bander recommend banding when the animals are approximately 340 kg (around 12 months of age), though they note that some producers band at a lesser weight, and that the bander can be used on a full grown bull, with perhaps more than a million animals castrated worldwide using the technique a year.[41] In New Zealand, high tension bands are apparently most commonly used when the animals are 6-8 months old.

78. The application of high tension bands reputedly provides analgesia and is thus suitable for a variety of operations.[42] In comparison to more traditional methods of castration, there has been relatively little research into the implications of high tension bands for the welfare of the animals. Interpreting what results have been presented is further complicated by the technique with which bands are compared.

When young animals are castrated, a rubber ring is perhaps the most appropriate comparison. For older animals, surgical castration is more appropriate.

79. In 3-month old calves, high tension bands resulted in increased cortisol secretion, which was prevented by the administration of local anaesthetic. These results indicate that band castration is acutely painful and distressing.[43] Although the magnitude of these responses to bands were, overall, of the same order as with castration by rubber ring, they occurred earlier after band application, involved immediate maximal pain responses and were higher during that earlier period. In addition, the behaviour of calves castrated with bands indicated severe pain – they lay on the ground with their hind legs extended, a posture not seen with rubber rings.[44] Healing rates were similar in both ring and band castrated calves. In a subsequent review, the authors noted that the initial pain caused by the band was greater than that caused by the ring, but the integrated cortisol responses were similar.[45] Healing rates were similar in band and ring castrated animals.

80. A study of lambs used small rubber rings to block the nervous activity from the testes and scrotum more quickly (and although not discussed by the authors, it is presumed they would result in greater tension). In this study, 5-6 day old lambs were both castrated and tail docked.[46] Lambs treated with the smaller rings displayed behaviours indicative of pain earlier after application, but these behaviours also declined earlier. However, the behaviours differed in that lateral lying predominated with small rings (and it was of the most severe type in the first 12 mins), and ventral lying predominated with standard rings. There were no statistically significant differences in the peak cortisol concentrations[47], although the total cortisol secreted appeared to be less with smaller rings.[48] The authors of the original lamb study were of the opinion that small rings produced more severe pain but for a shorter period, and that overall acute pain suffered was probably not reduced.

81. The use of bands to castrate older animals has been described in two cattle studies. In the first, [49] 20-21 month old beef bulls were either surgically (with local anaesthetic) or band castrated and compared with intact animals. Both groups had elevated cortisol concentrations approximately 2 min after castration (which is not particularly informative in view of the short time after castration), but the elevations were more marked in the surgically castrated animals. Healing in both groups was apparently uneventful as all animals passed inspection for meat wholesomeness when the animals were slaughtered 36 days after castration. In the second experiment,[50] 8 and 14 month old bulls were similarly castrated either surgically or with a band with both groups receiving local anaesthetic. Castrated animals spent less time grazing (especially those surgically castrated) but showed no differences in the amount of time spent lying or walking. The authors concluded that banding did not appear to adversely affect animal behaviour after castration with the animals exhibiting only minimal changes in behaviour. However, healing was severely compromised in 14 month old bulls in one experiment, but not in another when the animals were 8 months old. Large wounds developed above the bands within 7 days which developed into open wounds up to 10cm in diameter. After the scrotum was

lost, the wounds remained and took several weeks to heal. The investigators suggested the technique is not suitable for older animals. There are additional unpublished studies. The first[51] reports that cortisol levels are 36% higher in band castrated cattle compared with those not castrated, and signs of discomfort (foreleg stamping, and in one animal rolling on ground and moaning) in a proportion (6/15) animals. It was concluded that from a behavioural standpoint, banding appears to cause relatively little discomfort in some but not all animals. Note that there is little information on details such as age of the animals, blood sampling frequency or the behavioural observations in that study. The second study[52] reported significantly greater indicators of stress (kicking, tail swishing, lying down stretched out and immobile etc) in surgically castrated compared with banded animals. This was evident immediately after castration, and persisted for up to 6 weeks possibly due in part to irritation from flies attracted to open wounds. Again, the conclusion was that welfare was less compromised in animals castrated with the bands compared with surgery.

82. Although the manufacturer's instructions state that the band should be positioned on the testicular cords as close to the testicles and as far from the abdomen as possible, this may be difficult in large animals with a lot of tissue. Nevertheless, it is apparent that tight bands are being used increasingly in New Zealand, as well as overseas, partly because they are seen to induce "minimal discomfort" to bulls with no interruption to daily weight gains, and the devices are "robust, simple and quick to use."[53]

83. However, the high pressure caused by the bands (as much as 260 Newtons compared with perhaps 100 Newtons with a conventional rubber ring) is assumed to cause significant pain. Since high tension bands result in animals experiencing additional acute pain, compared with castration by conventional rubber rings, NAWAC is of the opinion that the latter are a less noxious alternative. Therefore, high tension bands must only be used with local anaesthetic at any age.

84. NAWAC is aware of the possibility that high tension bands may also be used for procedures other than castration. With the exception of velvet antler removal in deer,[54] little research has been undertaken using the device for other procedures. However, NAWAC is concerned that the bands generate high tension and thus have the potential to cause significant pain. While possibly not used for dehorning, tails could conceivably be removed with high tension bands and cautionary information has been included in the Code.

Castration practices

85. The prevalence of, and age at castration on New Zealand farms is:

- 74% for bull calves – 85% with rubber rings and 14% surgically. The average age at rubber ring castration was 2.2 months compared with 4.3 months for surgical (54% <3 months and 39% > 3 months). Local anaesthetic was used by 3% of farmers, and 3% employed veterinarians.[55]

- 39% of male lambs are left entire. Of the remainder, 41% are subject to shortening of the scrotum or cryptorchidism, with 20% fully castrated.[56] Few lambs are castrated younger than 2 weeks of age, the majority (87%) between 2 and 6 weeks of age, with the remainder older than 6 weeks.[57]

- Apparently goats are not routinely castrated. However, there may be occasions when they are, e.g. for management reasons. As entire kids grow faster than those castrated, the procedure is often delayed, and can be staged over several months in a herd to ensure growth rates are maximised.[58] Goats farmed for their fibre may also be castrated when they are to be kept for several years. When the procedure is performed, it is usually undertaken using rubber rings when the animals are young (equivalent to castrating sheep). The behaviour of the animals after castration is more like that displayed by calves than lambs, and cortisol responses are somewhat lower than in lambs.[59]

86. While most animals are castrated early in life, the procedure can be performed in some, mainly cattle, after puberty. There are anecdotal reports of the practice of "bullifying" animals by "proud-cutting" or castrating them after puberty, as weaners or even yearlings. This practice is apparently undertaken to capitalise on the higher growth rates of bulls. However, while age of castration can affect meat quality (e.g. fatness), it may be difficult to retain the liveweight advantage of bulls after castration.[60] Other studies have suggested there is little or no weight gain advantage of surgically castrating bulls after puberty compared with earlier castration, since castration itself checks growth.[61] The banding method of castration did not prevent the slow growth rates seen after surgical castration in one New Zealand study, [62] though not in another.[63]

The effects of castration

87. The acute effects of castration have been well documented in the scientific literature. Depending on the method used and the age and species of animals they may include:

- changes in the animal's behaviour such as increased licking of the scrotum, turning the head to the hindquarters, alternate lifting of the hind legs, abnormal postures, frequent standing up and lying down, rolling, kicking and stamping or inactivity.

- increases in plasma cortisol concentrations (frequently associated with pain) for several hours (typically for about 3 hours in lambs with a rubber ring and 8 hours following surgical removal).

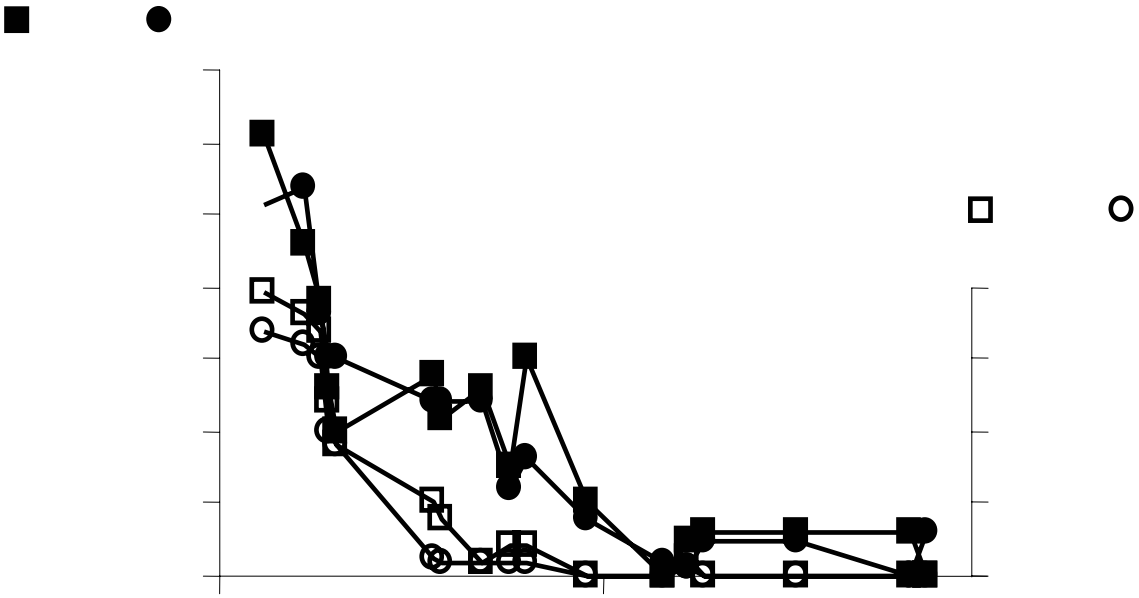
- increases in blood pressure and heart rate (e.g. lasting for about 3 hours in lambs both castrated and tail docked[64]), which are additional signs of distress.

- some suppression of immune function, for example for at least 1-3 days in calves.[65]

- reduced feed intake and growth rates for varying periods.[66] (Note that the use of weight gain to assess pain is difficult since castration removes sources of hormones such as testosterone known to influence growth.)

- and sometimes causes vocalization.

88. In contrast, the chronic effects of castration have been less well documented. Healing can take significant periods of time (up to at least 42-51 days after rubber ring castration of calves[67]) depending on the method used and the age of the animals. For example, healing of calves was fastest after surgical methods of castration[68], and most prolonged in older animals using high tension bands or rings.[69] (Note that the comparison in healing times between methods is slightly confounded by the fact that rubber ring and band methods tend to keep the scrotum attached thereby prolonging the time at which healing can occur.) The progression of healing after castration in calves in one experiment[70] is shown below:



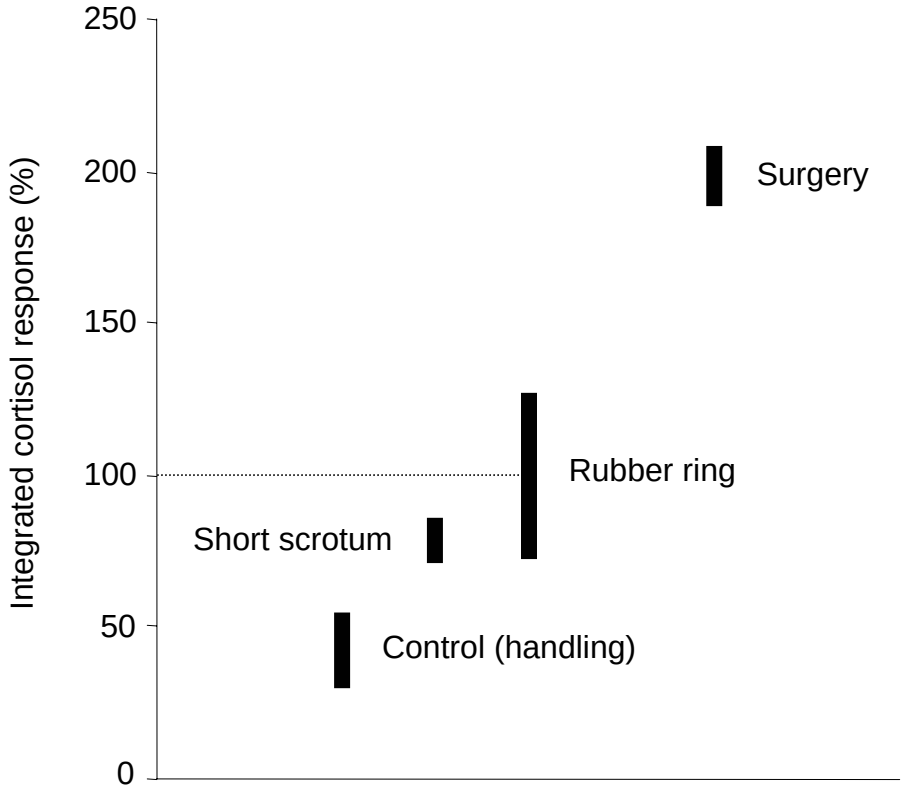
As with the calves shown above, healing took several weeks in lambs castrated with rubber rings (or with rubber rings and a clamp). At two weeks the scrotum was nearly always dry and necrotic, it had started to detach from the abdominal wall by 3 weeks, and healing was well advanced by 6 weeks after castration.[71]

In contrast to the acute pain associated with castration, pain during the healing phase has been less well studied. There is also the question of how much pain is experienced – low levels are evident, and in some cases the animal may experience

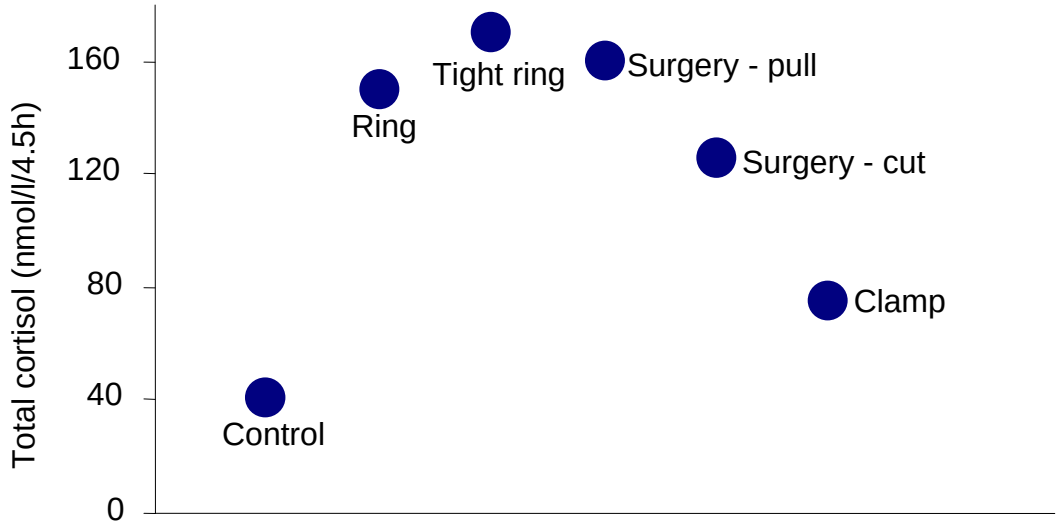
mild irritation rather than pain. Finally, there are the chronic effects of castration such as lack of sexual motivation, changes in growth rates and body composition.

Ranking of methods

89. The various methods of castrating animals have different advantages and disadvantages and it is difficult to make definitive comparisons. However, the acute responses to different methods used without pain relief, can be ranked by comparing the profiles of the hormone cortisol (and by inference pain).The first of the following figures has been derived from lambs by comparing how different methods compare with the standard method of castration and tail docking with rubber rings (assigned a value of 100%).[72].



The second figure has been derived form work on castrating calves, again without anaesthetic, and is a measure of the cortisol secreted over 4.5 hours after each procedure.[73]



While these figures give an indication of the stress and pain responses, it is important to remember that they are only an indication. For example, consideration of pain-related behaviour may produce slightly different rankings. However, it is reasonable to draw the following conclusions about castration:

- in lambs, in the absence of pain relief, surgical methods are very much worse than other techniques;
- pulling the testes (surgery-pull above, as well as some surgery-cut animals) risks damage to abdominal structures which are furthermore unaffected by local anaesthetic given into the testes and/or scrotum;
- rubber rings also reduce the possibility of septicaemia and, in restricting blood flow, prolong the effectiveness of local anaesthetic administered into the testes and scrotum;
- pain can be reduced with local anaesthetic.

Minimising the pain and distress

90. The pain, distress and risks associated with castration should be minimised by giving consideration to the following additional factors:
    - only performing the operation in clean paddock or yard areas,
    - avoiding wet weather,
    - maintaining clean hygienic practices
    - completing the procedure and allowing young stock to mother up well before darkness.

    While some codes recommend dipping non-surgical devices and even rubber rings in dilute antiseptic before application, NAWAC is not aware that this has been shown to be a beneficial practice. Furthermore, the practice may be akin to annealing, whereby it actually protects harmful organisms leading to an increase in, rather than minimising, the risks associated with castration.

Related issue raised in the submissions and NAWAC's response

High tension bands

91. A significant difference between NAWAC's stance regarding the pain associated with using high tension bands for castration, and the stance of those using them, particularly within the beef industry, as well as information reviewed from the scientific literature, was expressed in a number of submissions. This extended to using the results of a MAF Operational Research Report to question NAWAC's position, and suggesting rubber rings and high tension bands should not be distinguished. In contrast, since NAWAC had expressed concern over the use of high tension bands, and since there are less invasive alternatives, bands should not be permitted.

92. The difficulty in both interpreting the results of experiments involving high tension bands, and determining a rightful stance towards high tension bands is understandable. The studies noted above all have their flaws or limitations. These include inappropriate comparisons (different procedures produce different behavioural indicators of pain and distress therefore comparisons based on behaviour alone are insufficient), lack of statistical comparisons, reliance on unpublished observations and data, insufficient attention to both physiological and behavioural indices of pain and distress, etc. NAWAC also acknowledges that this information is difficult to interpret, and that there are differences of opinion within the scientific and veterinary communities. Why young calves respond with behavioural changes indicative of significant pain whereas older animals appear relatively unaffected is a question requiring additional research. However, it is clear that stress hormone release and behaviour both indicate greater pain associated with bands than with rings, at least during the first hour after application in younger animals. Thus, NAWAC is confident that there is sufficient reason to err on the side of caution and question the technique on the grounds that the application of high tension bands produces additional significant pain and distress. Furthermore, there are alternative procedures to high tension bands (conventional rubber rings at an earlier age) and lack of sufficient rationale for castrating later to achieve growth rates in some studies (though this may be contested by some farmers). Therefore, high tension bands must only be used with local anaesthetic at any age. In taking this stance, NAWAC accepts that it could be interpreted that band castration without pain relief is significantly more harmful than surgical castration without pain relief, which, at least in older animals, appears to be at odds with common practices both in New Zealand and overseas. NAWAC is aware of the difference between industry beliefs and its own position and has recommended further research is undertaken to resolve these differences.

G. TAIL-DOCKING

Background information[74]

93. Docking of tails is carried out for a variety of animal health and management reasons. Sheep are the most commonly docked animals with perhaps more than 95% docked to reduce faecal soiling or dag formation and thus reduce susceptibility to flystrike. Tail docking also makes dagging, crutching, and shearing easier to perform. Dairy cows may be tail docked to improve comfort for milking personnel and to enhance udder and milk hygiene. Pigs can be docked to prevent tail biting which, if it occurs, is injurious. Deer and goats have naturally short tails while docking of horses' tails is a restricted surgical procedure under the Act.

94. Tails have a variety of functions in different species ranging from the dissipation of excess heat, to a form of visual or social communication, as an aid in balance and locomotion, in deterring insects, to providing an anchor point for some muscles of the rectal tract, and in storing fat.

95. There are a number of potential risks associated with tail docking including increased risk of infection (particularly skin infections but also tetanus, gangrene and neuritis); and of postoperative pain from nerve regrowth, phantom sensations and pain, and increased sensitivity to pain. However, the prevalence of these complications is unknown. An animal may also be less able to signal its intentions, mood or social status. Finally, if the tail is involved in thermal regulation, removal could alter the animal's tolerance to heat.

Sheep

96. As wild sheep have short tails (no more than 13 vertebrae) long tails in sheep are evidently a consequence of domestication (modern sheep can have up to 35 tail vertebrae).[75] In the 1940s in Australia, tail docking was found to reduce flystrike rates in Merino sheep from 12-41% to 8-25% depending on the season.[76] In addition, a long tail was subject to tail strike, became very dirty at the extremity and soiled the animal's hocks resulting in sores in some cases. It should be noted that much of this work was significant in that it was undertaken on large numbers of animals over several seasons. However, it was also undertaken in an era when insecticides were not as conveniently applied as they are today. In two subsequent studies, leaving the tail on lambs has been shown to result in a 3 fold increase in flystrike rates on one of three farms in Australia[77], and in more flystrike (1% docked sheep struck compared with 7% undocked) in the UK.[78] (Note that the effect of docking on flystrike is dependent on tail length – see below.) Removal of the tail may enable heat loss[79] from the perineal and lower abdominal regions thereby perhaps reducing humid conditions predisposing the animal to flystrike. Tail removal also slightly reduced faecal soiling in the breech, another risk factor for flystrike.[80] Significantly, tail removal facilitates management practices such as crutching, dagging and shearing with longer tails requiring more effort.[81]

97. Alternatives to tail docking include using breeds with shorter tails and/or breeding for shorter tails.[82] There have been several attempts to breed short-tailed sheep though some have been hampered by complex inheritance patterns and lethal genes with an affect similar to spina bifida.[83] Management techniques such as shearing wool off the tail and breech are also used in some, albeit very few animals (usually those that missed tail docking or those destined to be slaughtered before flystrike becomes a significant risk).

98. Methods for tailing sheep usually involve either applying a rubber ring to the tail to prevent blood flow resulting in atrophy of the tail, so it sloughs off after 4-6 weeks, or with a heated iron which severs and cauterises the tail. Other less common methods include cutting the tail off with a sharp knife, or using a castration clamp below a rubber ring.

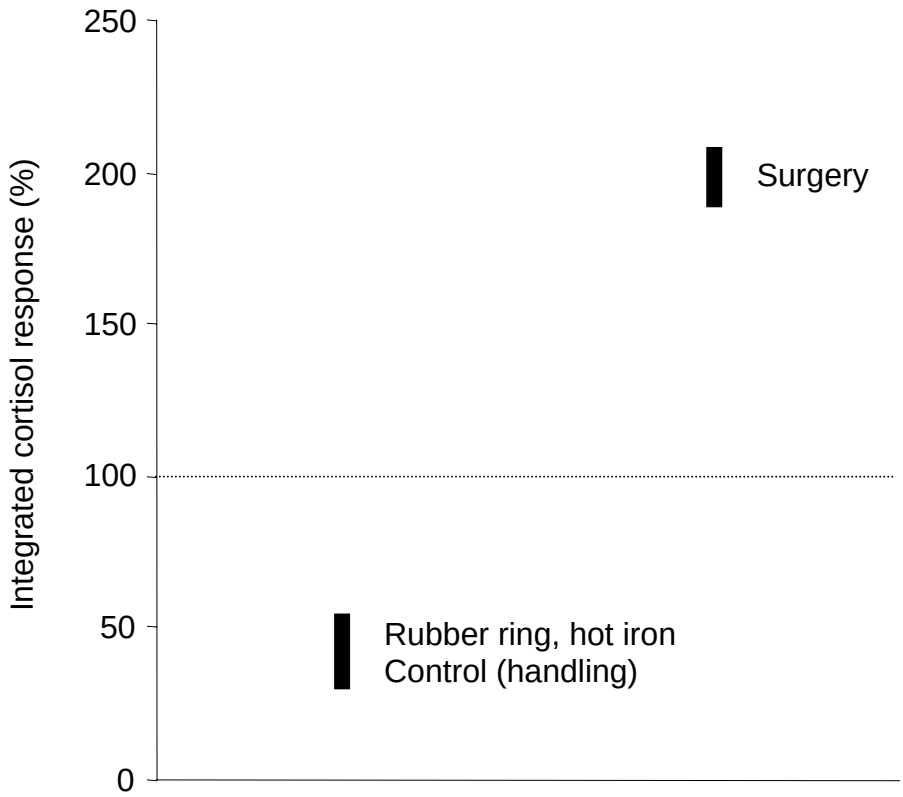
99. The acute effects of tail docking have been well studied in sheep, and there are many variations of techniques, ages at which they are performed, and measures.[84] Typically these studies detail behavioural changes (mainly posture and activity), and changes in stress hormones (mainly cortisol) in the blood with tail docking. These, together with the demonstration that such changes are reduced in the presence of local anaesthetic or analgesic, are suggestive of the animals experiencing pain, distress or irritation. (Interestingly, some 16% of animals show no behavioural responses to tail docking with a rubber ring.[85]) Generally, behavioural and hormonal indicators of pain and distress in the hours following tail removal are least with hot-iron tail docking, intermediate with rubber ring, and most with surgical tail removal (which probably represents very significant acute pain). The magnitude of these changes, and their duration, suggest that rubber ring and hot-iron methods of tail docking, though painful, are markedly less so than castration. In contrast to the acute responses, the chronic effects of tail docking are not well known. There is no evidence that it affects mortality, and only limited evidence that it affects some long-term measures of production, although growth was reduced for 2 weeks after docking in one study.[86] There is evidence of neuroma development in the stumps of docked lambs,[87] but whether this is associated with low level chronic pain is not known. Finally, tail movements are associated with aggression, tactile stimulation, close contact, isolation, pain or fear, suckling, sexual situations, and defaecation and urination. The tail may thus have value in communication, along with associated changes in movement and whole body posture (note that clear sight of tail movements is often marred by wool growth).[88] It is not known how much the tail contributes to communication, and if animal welfare is reduced by modifications to the tail, or whether it is enhanced if long tails are a consequence of domestication.

100. The length at which the tail is severed in New Zealand varies considerably between being long enough to cover the vulva in ewe lambs and at a similar length in males (as in the AWAC Code), to leaving no visible tail at all. A tail of the recommended length may protect animals from flystrike, at least in Australia, with strike rates of 0-32% compared with 0-61% in sheep with shorter tails, depending on the climate.[89] It is possible that docking tails short increases healing time and the risk of

infection, and predisposes animals to compromised rectal function, including, in some circumstances, increased prolapses. Short tails may also increase the risk of cancer of the tail region. However, longer tails usually mean more effort is required to dag, crutch and shear the animals, and possibly an increased likelihood of faecal soiling and urine staining which contribute to attracting flies. Finally, longer tails perhaps detract from the square visual appearance of the rump, something ram buyers possibly use to assess suitable stock. (Note that much of the above information has been collated in Australia with respect to Merino sheep and it is possible that it is not always applicable to New Zealand situations.)

101. There are several possible ways of describing the length at which tails should be docked e.g. ranging from a physical measure (*x* cm, or a pencil width etc), to a relationship with other body parts (long enough to cover the vulva, or at the end of the caudal skin fold etc). In recommending a tail long enough to cover the anus (without including wool), NAWAC is wishing to preclude the risk of rectal prolapses which have been related to very short tail docking.[90] NAWAC notes the costs of longer tails include dirtier perineal regions and the additional effort in shearing, crutching and dagging. The Committee also notes that tail length has yet to be related to the potential for flystrike in New Zealand conditions.

102. The various methods of tail docking sheep have different advantages and disadvantages and it is difficult to make definitive comparisons. However, the acute responses to different methods can be ranked according to how cortisol levels (and by inference pain and distress) compare with conventional castration and tail docking (rubber rings without any form of pain relief which was assigned a value of 100%).[91] It is clear that surgical methods cause much more acute pain and distress than conventional rings or a docking iron (see figure below).



The chronic responses to tail removal should also be considered along with the acute. Unfortunately, there is apparently no information available on the affects of technique on the risk of chronic complications. Interestingly, there are anecdotal beliefs within the farming industry that arthritis in lambs is related to different tail-docking techniques.[92]

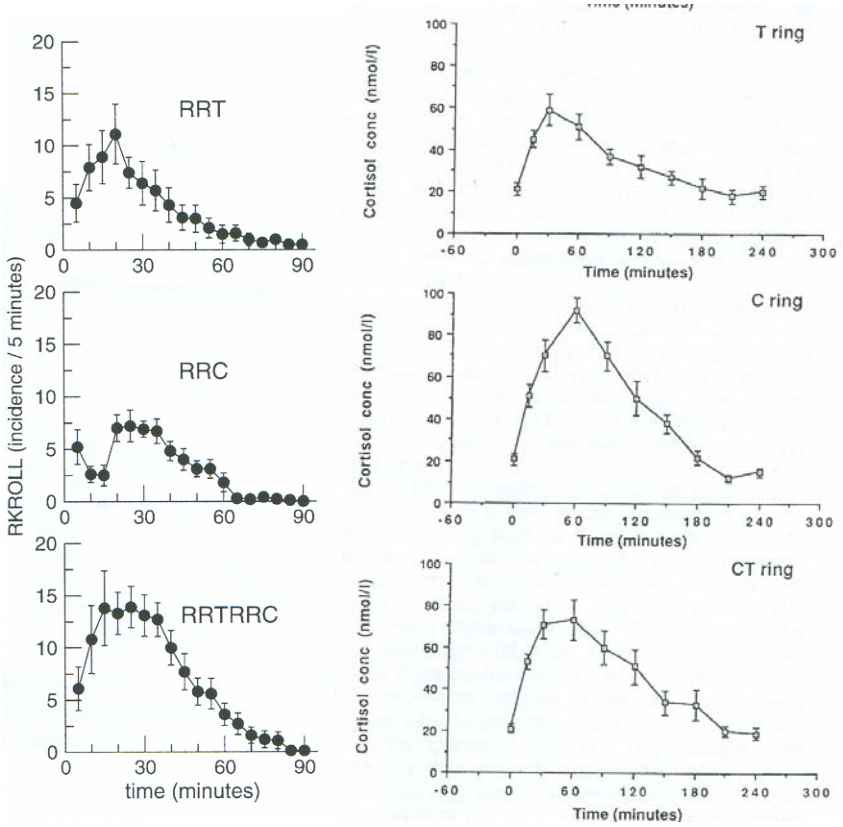
103. The pain, distress and risks associated with tail docking should be minimised by giving additional consideration to:
    - only performing the operation in clean paddock or yard areas,
    - avoiding wet weather,
    - maintaining clean hygienic practices,
    - completing the procedure and allowing young stock to mother up well before darkness.

104. NAWAC has taken the following position regarding tail docking in sheep. (1) Tail docking is warranted to reduce the risk of flystrike (itself a significant welfare and management issue for sheep[93]), as well as to prevent the build-up of dags (an independent risk factor). Although the incidence of strike is relatively low (nationally between 1 and 5%[94]), this presumably reflects the practice of tail docking since undocked lambs have been shown in overseas studies to be struck more often. (2) Tail docking is also undoubtedly beneficial for perineal hygiene and for management practices such as dagging, crutching and shearing. However, with the advent of modern insecticides, slaughter of animals before periods of intense fly activity, and more frequent shearing cycles, the need to tail dock may not always be

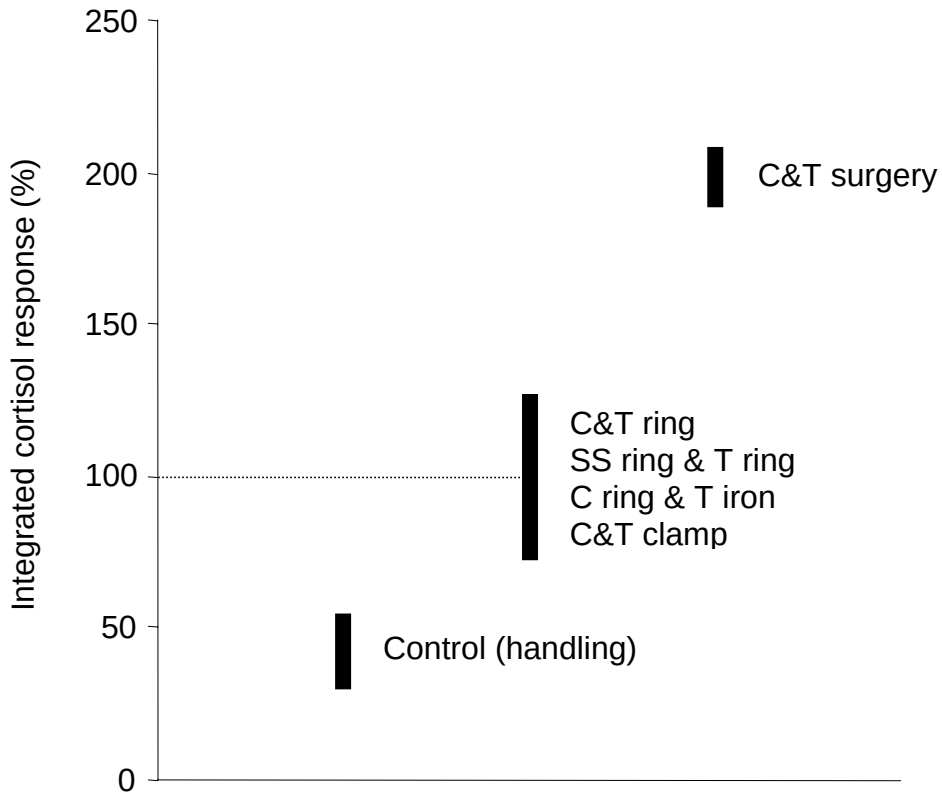
absolute to ensure animal health and welfare. (3) NAWAC is further of the opinion that surgical (knife) methods of tail removal are significantly more painful for the animal, and that rubber ring and searing iron methods of tail removal are to be preferred. (4) The use of local anaesthetic or pain relief is currently not recommended in lambs for tail docking as its application is likely to be more stressful than the procedure without pain relief. Furthermore, there is currently no practicable or economic way to deliver pain relief for docking. Should such methods become available, NAWAC believes they should be implemented, especially in lambs (calves do not appear to be as adversely affected by tailing docking as are lambs), but notes that tail docking alone in lambs causes less pain and distress than do castration and castration plus tail docking.[95] (5) NAWAC notes the long term approach of breeding animals with shorter tails[96] and encourages the industry to further pursue this strategy.

Combined tail docking and castration

105. In sheep, when both tail docking and castration are carried out, they are almost always performed at the same time (along with ear marking and vaccination, and sometimes mulesing). Therefore, it is necessary to consider both techniques as one procedure. With reference to behaviour, the effects of these procedures appear to be at least partially additive in magnitude and duration. For example, the first of the following figures shows the incidence of active pain behaviours (restlessness, kicking and rolling) in lambs tail docked by rubber rings (RRT), castrated by rubber rings (RRC) or tail docked and castrated both by rubber rings (RRTRRC).[97] The second figure, shows blood cortisol concentrations in lambs tail docked (T ring), castrated (C ring), or tail docked plus castrated (CT ring) by rubber rings.[98] In contrast to the behavioural responses, the cortisol responses to the C ring and CT ring procedures are similar, suggesting that with the combined procedure (CT) castration dominates the lower-level pain caused by tail docking.



Comparison of the acute cortisol responses (and by inference pain and distress) to the various methods of castrating and tail docking are shown in the following figure. They are ranked according to how they compare with conventional castration and tail docking with rubber rings (assigned a value of 100%).[99] (Only the common techniques and ages are presented; C = castration, T = tail docking, SS = short scrotum castration.)



NAWAC is of the opinion that, on balance, castration is the stronger acute pain stimulus, and that when castration and tail docking are undertaken together, the pain from castration probably dominates, swamping the pain pathways activated by tail docking. For this physiological reason, as well as for the practical advantages, NAWAC believes that undertaking both procedures simultaneously is both appropriate and acceptable.

Dairy cattle

106. Currently, some 21% of dairy suppliers tail dock dairy cows, with some variation between regions. While at one time a greater proportion of dairy farmers in some regions docked their cows, it is likely this has dramatically reduced following industry initiatives related to possible trade issues and public perceptions. The dairy industry is the driving force behind reducing the prevalence of tail docking in dairy cattle with the aim of ending tail docking by 2008. At present this initiative is voluntary and applies to all cows (there is thus some discretion for docking problem animals, as well as the small number of cows with tail injuries best treated by docking).

107. While the dairy industry is moving to phase out tail-docking, it is noted that this is in response to likely resistance in the market place to product from tail-docked

animals. The industry initiative is not therefore based on any stated animal welfare concerns, rather it relates more to the perceptions of the market. (Note that market perceptions may in fact be based on concern for the welfare of the animals.) It is however, worth noting that a third of New Zealand dairy farmers regarded tail docking as an animal welfare issue in one survey,[100] and unnatural, unnecessary or cruel in another.[101]

Benefits and costs of tail docking dairy cows

108. The reasons given for docking of dairy cows' tails mainly relate to faster milking; reduced risk to, or improved comfort for, milking staff and for the cows themselves; improved milking hygiene or reduced rates of mastitis; and a lower incidence of cracked sore teats especially in wet, windy weather.[102] In Australia, farmers who docked tails believed that milking was finished quicker, the risks for leptospirosis for the operator and mastitis for the cow were smaller, the cows were easier to handle, fly numbers were smaller and milk quality was better through affects on somatic cell counts and milk sediments.[103]

109. Tail docking was first practiced partly in order to limit the spread of pathogens such as leptospirosis (which is spread through urine) to farm workers. However, tail docking does not appear to be related to signs of exposure to leptospirosis among milkers[104] and there is now a bovine vaccine against that disease.

110. A common advantage put forward for tail docking appears to relate mainly to cleanliness and hygiene. The primary source of contagious pathogens is the udder of infected cows and the primary source of environmental pathogens are water, manure and dirt. Risk of infection is related to amount of exposure to pathogens and health of the cow. Dirty teats and udders are considered to be a significant source of environmental bacteria in milk and there is a relationship between hygiene and mastitis.[105] Contagious pathogens tend to be spread by milking machines, hands of milkers and other "points of contact". Evidence is developing that environmental pathogens are present in larger numbers from mud on races/paddocks/standoff areas and have seasonal peaks during cold/wet conditions. Two North American studies have been unable to show a beneficial effect of tail docking on hygiene. There were no differences in udder or leg hygiene, or milk quality, in one study (n = 1250) and it was suggested that other management decisions may play a more significant role in determining milk quality.[106] Similarly, tail docking did not provide cleanliness or udder health benefits (somatic cell counts) in another study (n = 413).[107] These results are similar to those reported in a smaller (n = 47) New Zealand study suggesting no effect of tail length on cow washing rates, or somatic cell counts (mastitis rates were too low to analyse).[108] In apparent contrast, two other studies (n = 16, and n= 30) have reported that tail docked cows were cleaner. In the US, researchers found tail docked cows had cleaner rear ends (but not udders), but there were no differences in somatic cell counts (mastitis rates were too low to analyse).[109] In New Zealand, more docked animals had cleaner rear ends, apparently due to differences in the area at the side of the base of the tail.[110] It is suggested that tail length, if it does affect cleanliness, is only one factor and other factors such as scouring, muddy paddocks and raceways, and confinement and enforced movement

preventing normal defecation, and type of milking shed installation, are more important. It should be noted that dairy farmers who do not dock also value clean animals and cleanliness in the shed and manage their herds to maintain acceptable standards. The conclusion drawn from the above studies[111] that tail docking does not improve cleanliness and hygiene, is also the conclusion reached by two recently published reviews.[112] Note that many of these studies are from overseas and it is not known whether the unique features of New Zealand's pastoral based dairy industry provide different challenges to maintaining cleanliness and hygiene. Neither is it known whether hygiene is a problem for individual New Zealand dairy cows and herds.

111. The one seemingly uncontested justification for tail docking, then, appears to be faster milking and greater comfort for milking personnel. Docked tails presumably facilitate easier cup placement – the lack of a tail removing the need for the milker to handle the tail (e.g. hold, move it to the side or remove if from the cups) during milking.[113] It is worth noting that the advantages of tail docking may be dependent on the type of milking shed (in rotary systems the cups are placed through the hind legs (and tail) on to the udder, whereas in herringbone sheds, they are placed on from the side of the cow. Shorter tails also prevent discomfort and injury following contact. On the one hand, tail contact with milkers is relatively rare and mostly limited to the arm (an average of 9% of tail-to-arm contacts at each milking in one study and only one instance over an entire season of the tail making contact with a milker's face[114]). On the other hand, tail swishing and flicking is undoubtedly an irritation, especially around the face. While these events may be rare, lack of patience or frustration may lead to milkers retaliating and hitting cows or in extreme cases breaking their tails (thereby compromising welfare).[115] However, it is normally a feature in particular cows rather than a generalised problem. If this is the case it could be best addressed by docking only those cows that are persistent problem animals. In herds in which it is a problem, the source of irritation to the cows may well be worth investigating. Finally, there is a view that in large herds, washing and tail trimming may represent significant additions to milker's workloads, and are thus unwarranted.[116] This belief appears to neglect the finding that washing (without drying) compromises milk quality (water carries pathogens onto the teats and into the milk).

112. There are also disadvantages of tail docking. A number of studies have reported on the acute affects of tail docking including the following (note that tail docking is usually carried out when the animals are calves, or heifers prior to their first lactation):

    - A small number (3/18) of 3-4 month calves exhibited unexplained increases in plasma cortisol concentrations following tail docking possibly indicating mild pain.[117]
    - Behavioural changes (restlessness, attempts to bite tails, kicking of hind legs, tail grooming) indicating irritability, discomfort or pain in two thirds of 3-4 month old calves.[118]

- Time spent eating was altered in one study by the application of a band (eating time returned to normal after the tail was severed), but lying, standing, walking, drinking and grooming behaviours were not affected.[119]
- Some studies have been unable to show any benefits of using local or epidural anaesthesia.[120]
- Other studies have been unable to show any significant behavioural or physiological changes apart from a small amount of restlessness in young animals,[121] leading to the conclusion that tail docking is not a particularly distressing procedure causing, at most, mild discomfort.[122] Similarly, apart from fly avoidance behaviour (see below), no affects were apparent in a number of physiological and immunological measures, at least in the first month after tail removal.[123]

113. The inability of the animal to perform its normal array of behaviours, especially to deter flies, merits consideration. The main biting insect that attacks cattle is the biting fly (nuisance or cattle fly) *Stomoxys calcitrans*. The cow may attempt to compensate for the lack of a tail with other fly avoidance behaviours (e.g. foot-stamping) but docked cows can have up to twice the number of flies as non-docked animals. The following is a summary of part of a comparison of cows that had had their tails docked or switch trimmed or were left intact during periods of high fly periods in the Waikato[124]:

Group	**Tail docked**	**Switch trimmed**	**Undocked**
Mean number of flies on cows at 10.30am			
Nov-Dec	1.12	0.87	0.59
Jan-Feb	0.72	0.34	0.28
Mar-Apr	3.29	3.07	3.02
Percentage of flies which settled on the rear leg of cows			
Nov-Dec	62.2	30.8	5.7
Jan-Feb	51.2	35.7	13.3
Mar-Apr	42.7	29.0	4.0
Tail flicks			
Nov-Dec	23.8	21.2	9.0
Jan-Feb	20.4	10.7	9.5
Mar-Apr	33.4	21.1	14.7

The lack of a tail also affects other behaviour and there is anecdotal evidence that when flies are active docked cattle may cease grazing and prefer to stand in the shade.[125] (At very high levels of fly predation cow welfare, growth rates and eventually milk production can sometimes be affected by flies even in those animals with full tails.) Insecticides can also be used to give cows relief from flies. Depending upon season and location, intense periods of fly activity can affect cows whether or not they are docked. In the Waikato for example, flies are an issue for 6-8 weeks per annum (especially in February after rain), whereas Horowhenua might experience a similar problem perhaps once a decade.

114. As the tail is moved in a number of circumstances, it may have value in communicating motives and moods to herd mates.[126] High tail elevation is linked with rapid locomotion, while the tail may be raised when an animal is in oestrus, when a male is courting a female, during homosexual activities, and during fighting and threatening, greeting and suckling. The tail may rest during normal standing and grazing, and be depressed during dozing or when the animal is cold, chased or frightened. Many tail movements are part of the animal's whole movement and posture which together contribute to communication. Persistent tail shaking (rapid side-to-side movements) may accompany pain (e.g. after dehorning). It is not known how much the tail contributes, and if animal welfare is compromised by modifications to the tail.

Alternatives to tail docking

115. Alternatives to tail docking include trimming the hair of the tail switch (switch trimming), usually in spring. Trimming also reduces the ability to remove flies but is intermediate between docked and undocked tails. Other less common alternatives are the use of tail and switch clamps, tail restrainers, and curtains or rails in the milking shed.

Switch removal in dairy cows

116. A relatively recent (apparently first described in 1993[127]) alternative to full tail docking, is the removal (docking) of the end portion of the tail, limiting tail shortening to the last (distal) 2-3 vertebrae. Known as switch shortening or removal,[§§] it is not common and its effects on cow welfare and its acceptance internationally, are largely unknown. NAWAC is mindful that switch removal is being promoted by part of the dairy industry in order to negate the negative perception associated with tail docking and it is not necessarily to enhance cow welfare. The argument is put forward that if it is appropriate to remove tail hair (switch trimming) then it is also appropriate to remove the lower three tail vertebrae (switch removal). Furthermore, switch trimming is required to be undertaken as much as 3-4 times per year and can result in dirtier cows (it is often only undertaken when the cows are very dirty), whereas switch removal is only required to be undertaken once and results in cleaner animals and consequently better conditions for staff. The practice is claimed to improve hygiene, convenience and milker comfort. In contrast, dirty herds which have not had their switches trimmed or tails shortened, can experience compromised health and welfare, pathological problems (untrimmed compressed dags can result in the tail being severed in up to 1% of cows) and high microbiological contamination together with food safety issues.

117. While the cost to the animal is not known, the procedure is probably no more harmful than docking higher up the tail and is likely to be less so. The lower portion of the tail has less innervation (and by inference there will be less pain associated with switch removal than with docking at the nearer to the base of the tail). To some

[§§] In the Code, tail docking of dairy cattle has been referred to as tail shortening or switch removal. Although it falls within the definition of tail docking, NAWAC is aware that tail docking is commonly associated with more extensive shortening of the tail. It is thus important to maintain a distinction between this form and switch removal.

extent, the cow is still able to use her tail for fly avoidance and the expression of behaviour.

Methods of dairy cow tail docking

118. Rubber rings are apparently most often used to tail dock and remove the switch. Tail docking with a hot docking iron appears to cause similar, or perhaps less pronounced behavioural and physiological responses (though there may be some risk of haemorrhage), but the long-term effects need to be studied.[128] It would also appear beneficial to place the rubber ring in the joint rather than over the bone where there is evidence of more swelling and bone inflammation.[129] There have been few studies investigating the most appropriate age for docking. One report suggested there were no advantages or disadvantages with docking younger or older animals.[130] Another suggested some slight behavioural differences with age, and tails did not slough off of their own accord in younger, compared with some older animals, in the 42 days after rubber ring application.[131] (This was possibly because a lighter tail would take longer, or that the tail might not have been big enough for the rubber ring to work as quickly as it would on a larger tail). Note that the tail docking (or switch removal) technique has two components, the application of the ring and subsequently severing of the necrotic tail end and these components may result in separate behavioural and physiological responses.[132]

119. NAWAC considered a number of questions relating to tail docking in cows. (1) Should tail docking be phased out based on compromises to animal welfare? (2) Should NAWAC support the industry-set timeframe or set more or less stringent requirements? (3) Should NAWAC diverge from the industry position and allow tail docking in certain circumstances (e.g. persistent flickers or dirty cows)? (4) Should switch removal be allowed?

120. NAWAC noted the market-led industry moves to ban full tail docking (between the joints of the tail at a point not less than 5 cm below the tip of the vulva in a cow and not less than 2.5 cm below the lower tip of the vulva in a calf) but determined that full tail docking is not justified (unless for therapeutic reasons). In NAWAC's opinion, the benefits to farm management do not outweigh the impact on the animal's ability to manage flies. Additionally, there are alternative less harmful procedures such as switch removal and switch trimming. (Note that NAWAC considers the cost to the animal in terms of pain experienced at the time of docking is relatively minimal.) Although there are potential implications of tail removal for the ability of the cow to signal or communicate, NAWAC is unaware of any evidence suggesting that the loss of this function does or does not compromise welfare. NAWAC notes that a complete ban on tail shortening is beyond the scope of this Code, requiring tail shortening to be made a restricted surgical procedure or to be banned through an amendment to the Act.

121. Switch docking (or switch removal) is a relatively recent technique aimed principally at countering the negative market perception of full tail docking. NAWAC notes that the industry-led initiative is market-driven and not necessarily because of concerns about animal welfare (sic – people see it as unnatural and

therefore poor welfare). Furthermore, NAWAC does not wish to become involved in the market issue of describing switch removal differently to tail docking for market perception reasons but does note that such a distinction may well help the industry to focus on the issue from a welfare perspective. It is a recently developed procedure and consequently there is little information available on its costs and benefits. However, the following points have been advanced to support the necessity to undertake the procedure:

- the alternative, switch trimming or the removal of the hair only with shears, is required to be undertaken 4-5 times per year;
- the practice is time consuming, difficult, has some risk of cutting the tail, and
- inevitably is often undertaken only when tail hair is long and matted, and laden with dung and urine meaning it is uncomfortable, and heavy and thus ineffective in managing flies;
- cows do not apparently like it, or at least do not like having their tails held;
- finally, a switch-docked cow will be unable to be recognised as tail-docked satisfying the market concerns and any potential shortening for aesthetic reasons (as with the debate over docking dogs tails).

NAWAC notes these reasons without questioning their veracity or importance. However, the Committee accepts that the benefits of switch removal (improved comfort for milking personnel and enhanced milking efficiency) can outweigh the mild discomfort associated with switch removal. Since the effect of switch removal on the cow's ability to manage flies is largely unknown, though likely to be real, it has been recommended that switch removal is only undertaken on those animals with persistently compromised hygiene and only after alternative solutions have been attempted.

Tails should be shortened when the animals are young as there is likely to be less trauma (though the tail needs to be big enough to allow the ring to constrict the blood vessels and thus remove the tail as quickly as possible). It may be preferable to treat animals before they are to be milked, rather than limited to those individual cows that require it. As the procedure is likely to be relatively benign, pain relief, which also has costs for the animal, is not indicated.

122. NAWAC considered the apparent inconsistency between its stance that full docking of cows' tails is not justified, whereas docking of lambs' tails is. If everything else was identical, then perhaps it would be reasonable to expect that the rationale for tail docking should be comparable between different species. However, NAWAC considers that each case for tail docking should be judged on its merits, be they risk of parasitism, or efficiency of handling etc.

Related issues raised by in the submissions and NAWAC's responses

Switch removal

123. Tail-docking of dairy cows is limited to removal of the switch in the draft Code. This stance was opposed (or limited to therapeutic reasons) since it has no advantage over regular trimming of the switch hair, or that the switch is important

to the cow for managing insects. In addition, it was questioned whether this practice would be accepted internationally, especially since the practice it is replacing, full tail docking, is being phased out by the industry in response to anticipated market perceptions. Other submissions supported the proposed cow tail docking standards, noting that they were aligned with industry initiatives.

124. As the pain associated with switch removal is likely to be minimal, and the benefits to milking efficiency apparently uncontested, NAWAC decided that tail docking, if conducted, must be limited to switch removal. However, since the consequences of switch trimming for fly management appear to be intermediate between full length docking and leaving the tail intact, it was considered that switch removal would also have some consequences for fly management. This would be especially so in those regions where flies are an issue for cow welfare. For these reasons NAWAC recommended that switch removal should still only be undertaken when it is necessary as indicated by cow hygiene and worker safety.

125. NAWAC acknowledged the market perception issues faced by the dairy industry with tail docking. Although it has moved to distinguish tail shortening or switch removal from tail docking, it is unlikely that international animal welfare interest groups will accept the distinction. NAWAC therefore asks the dairy industry whether the industry should accept the procedure without first demonstrating that the pain associated with the procedure is in fact minimal, and that other consequences for the animal (e.g. fly management) do not compromise animal welfare.

H. DISBUDDING AND DEHORNING

Background information[133]

126. Most of the 9.7 million cattle in New Zealand[134] are born with the ability to develop horns. Some 53% are dairy cattle of which the main breeds are horned (Holstein Friesian and Jersey). Most of the beef cattle are Angus which are naturally polled, or Herefords (some of which are horned) and their crosses. Other breeds such as the Simmental, Charolais, Limousin and Shorthorn have registered polled animals but the majority are horned.[135] Horns are removed primarily for safety reasons, to reduce the risk of injuries to other cattle and to humans, horses and dogs. Other advantages of dehorning are to take off damaged horns; prevent bruising[136] and hide damage; and allow more animals in confined spaces (e.g. on feedlots and during transport). There are more than 150,000 farmed goats in New Zealand. Almost all of the female goats destined to be milked are disbudded with hot irons at about 4 days of age (as with calves, some are sedated as well as given local anaesthetic, some are just given local anaesthetic, and some are not given anything).[137] Goats farmed for meat and fibre are not usually dehorned. While some sheep also have horns, they are not usually routinely dehorned. While most of the information in this section is based on knowledge of disbudding and dehorning cattle, generally the same principles are thought to apply to goats, with the exception of greater risk of

thermal cautery techniques causing extensive burning of underlying tissues (due to kids having thinner skulls) and brain damage.[138] Note that deer antlers are not true horns being made of bone and are shed each year, unlike horns which grow from the skin.

127. The main alternative to dehorning is to utilise naturally polled animals. Historically horned bulls have been regarded as superior in terms of liveweight gain, survival or fertility to their polled counterparts (since some may have only recently been subjected to breeding programmes pursuing productivity and being polled). While today there is no evidence that polled bulls are inferior,[139] there may still be a perception that the absence of horns compromises the structure and conformation of cattle. Some breeders, at least in Canada, are maintaining traditional traits such as horns as recognised parts of a particular breed (e.g. Hereford). In New Zealand the Holstein Friesian is in greatest need of polling as it and its crosses make up 77% of dairy cows and it contributes to the beef industry. However, the gene pool for polled dairy cattle seems to be fairly small in New Zealand. The only other alternative to dehorning is tipping, the removal of the non-sensitive sharp tip of the horn which reduces some but not all of the safety issues associated with horned animals.

128. It is important to note that there are differences in the management of beef, and dairy and dairy-beef cattle which impact on the feasibility and practicality of dehorning techniques. In contrast to beef animals, especially those on extensive farms, dairy and dairy-beef animals are usually more docile, frequently handled and are more accessible at younger ages. The method of restraint, and the technique used, has important implications for the safety of the operator in more well grown animals, such as beef cattle, which are often older when they are dehorned.

Disbudding and dehorning methods

129. Horns grow from horn buds – free-floating tissues in the skin layer above the skull which appear before birth. Any variation in the time that horn buds first appear has apparently not been described, though it is possible there is confusion between the appearance of horn buds and horns proper, since identifying the former requires close scrutiny, if not palpation. As the animal grows older, the horn bud attaches to the skull and a horn starts growing as a bony extension of the skull. The horn grows from the skin around its base and grows continuously throughout life. The base of each horn is sensitive while the horn itself has no sensation. As the animal grows and the horn gets larger (usually when, in calves at least, they are 6 months of age or older) the core of the horn opens into the frontal sinus of the skull.[140] Horns are dealt with in two general ways. The first method involves destroying the horn bud (typically when they are 5-10mm long and easily palpable) in the young animal and is known as disbudding. It typically results in relatively small and superficial wounds. The second method involves amputation of the horns in the older animal and is known as dehorning. This approach is much more invasive (gouge wounds of the skull and some penetration of the frontal sinuses) and painful. The main methods of each procedure are:

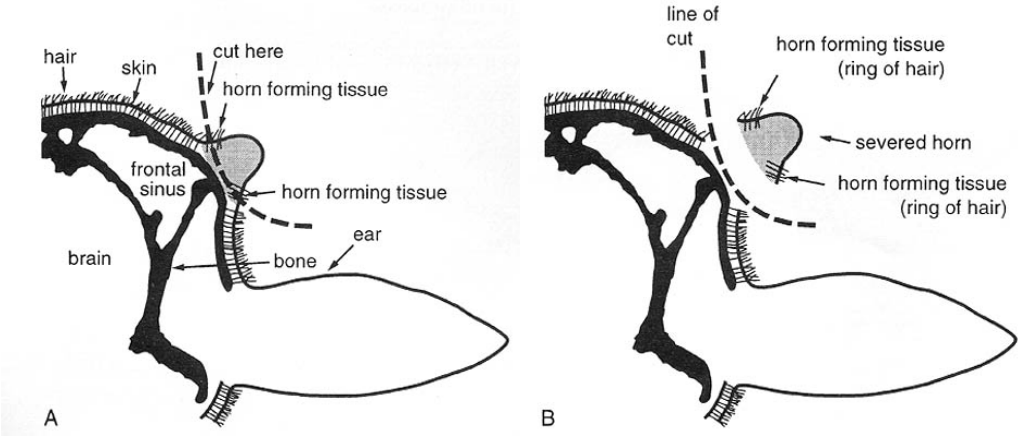
(1) Disbudding or destruction of the horn buds

- Caustic or chemical disbudding – a substance such as sodium hydroxide, potassium hydroxide or colloidon is applied to the horn bud.

- Cautery disbudding – typically involves pressing a very hot ring-shaped iron (electrically or gas heated) onto each horn bud for about 5 seconds so that it burns through the tissues that nourish the horn bud and thereby prevents the horn from developing. This method cauterises the skin and dermis around the horn bud, there is no loss of blood and no open wound to become infected. Cautery itself results in pain from burning. The head of the iron comes in a standard size although heads can be purpose built to accommodate larger horn buds of older calves.

- Knife disbudding – a curved knife is used to slice off the horn bud.

Removal of the horns before they attach to the skull (shown in the following diagrams[141]) is much simpler and results in far less distress and better healing.



Disbudding is preferably carried out between 2-6 weeks of age as horn buds are smaller, easier to remove completely, usually only require one application of the cautery iron, and are likely to heal more quickly. To ensure that there is no regrowth or scur (a rudimentary or deformed horn), all the horn-forming tissue must be removed. Depending on the breed of calves, disbudding (with a disbudding iron) is not recommended after about 8 weeks of age.

(2) Dehorning by amputation of the horn proper

- The horn is amputated using guillotine shears, butcher's saw, embryotomy wire (effective on larger animals in which movement is more difficult to prevent, though is slow and requires significant effort) or, when the horn is not very long, scoop dehorners. Scoop dehorning (also practiced as scoop disbudding) consists of closing 2 interlocking semi-circular blades over the horn bud or small horn (usually when the animal is less than 6 months of age) to amputate the horn bud or horn, adjacent skin and some underlying bone. Scoop dehorners are small and usually only effective up to about 6 months of age, after which the diameter of the horn is too large for the scoop dehorners

to fit over it. Following amputation, the wound may also be cauterised to reduce bleeding and prevent infection.

130. The use of local anaesthesia with or without sedation 15-20 minutes prior to disbudding or dehorning can help reduce behaviour indicative of pain, though the additional use of analgesic may be required to largely eliminate signs of discomfort.142 The two methods of administering local anaesthetic involve injection either near the nerve supplying the sensitive tissue of the horn, or around the base of the horn bud or horn. In practice, both calves and kids are sometimes sedated as well as being given local anaesthetic, sometimes given local anaesthetic only, and sometimes do not receive any form of pain relief.

The effects of disbudding and dehorning

131. The acute effects of *disbudding* include:

- increases in cortisol concentrations for up to 2 hours, the first hour of which indicates significant pain,
- elevated heart rates for up to 4 hours suggesting the pain lasts for several hours,
- distinct escape behaviours (rearing, falling down, pushing, head-jerking and moving) during cautery disbudding indicative of severe pain, as well as head-shaking for up to two hours,
- behavioural changes indicative of low-grade pain and/or wound sensitivity for up to one day,
- with caustic techniques there is risk of damage to other tissues if the chemical is transferred by rain or rubbing to other parts of the animal, or to its herd mates including other calves and dams,
- no changes in food intake and liveweight after cautery disbudding in one study[143], but calves given pain relief tended to gain more weight in the 24 hours after disbudding in another[144]

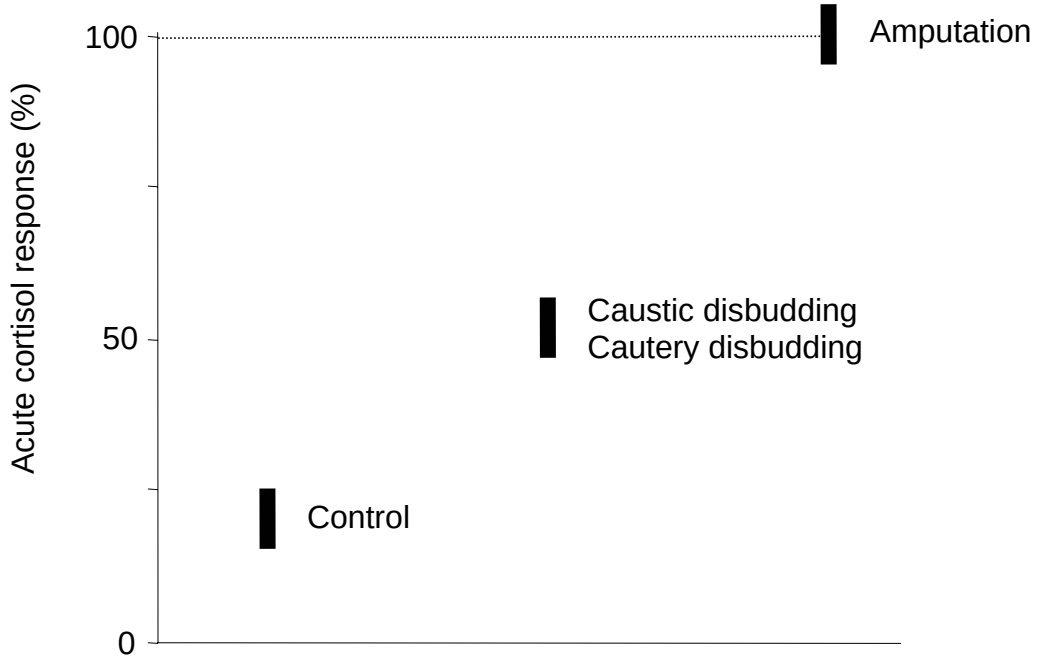
The acute effects of *dehorning* include:

- the possible effects of handling and restraint because of the greater age and live weight of the animals,
- exposure of the frontal sinuses,
- a marked increase in cortisol secretion, lasting up to 9 hours,
- behavioural changes (increased tail-shaking, head-shaking, ear flicking, scratching and lying down, and reduced grazing, ruminating and grooming) lasting up to 8 hours,

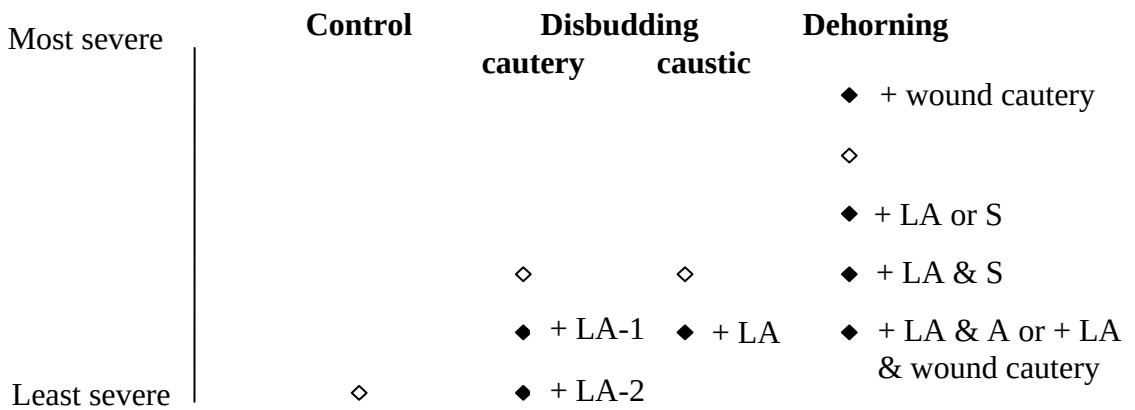
- sometimes, but not always, amputation dehorning has resulted in significant reductions in liveweight gain,[145]
- healing may take 4-6 weeks or more.

Any chronic effects of both *disbudding* and *dehorning*, as with most other painful husbandry procedures, have not been well researched.

Comparison of the acute responses (according to the cortisol profiles and by inference pain and distress) to the various methods of disbudding and dehorning have been ranked according to how they compare with amputation dehorning (assigned a value of 100%), the data from calves.[146]



The addition of behaviour and production (growth rate) responses to the cortisol results, and different methods of pain relief produces the following ranking of dehorning and disbudding procedures from most to least severe:[147] (◊ = procedure without pain relief, ◆ = procedure with pain relief where LA = local anaesthetic, LA-1 = local anaesthetic administered to the cornual nerve, LA-2 = local anaesthetic delivered in a ring around the horn bud, A = analgesic and S = sedative).



132. 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. Chemical disbudding has been considered to be more painful than disbudding using heat cauterisation on the basis of differences in cortisol responses.[148] However, it is noted that this conclusion has been based on a single study where comparison between techniques was questionable because of differences in ages of the animals.[149] More recently, somewhat subtle differences in behaviour have been described between thermal and caustic methods in calves given sedative and/or local anaesthetic. 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.[150] As in the former study, local anaesthetic (given subcutaneously) did not appear to help in providing post-operative pain relief, possibly because the function of the anaesthetic is disrupted by the active ingredients in the caustic chemicals used. While it is accepted that both methods appear to result in pain, more work needs to be undertaken to clarify their relative merits and constraints.

Minimising the harmful consequences

133. There are a number of factors which should be considered to reduce the risks to animal health and welfare.

Disbudding

- Disbudding and dehorning should be carried out in dry, clean conditions, and exposure to rain limited to avoid the risk of wound infections and promote healing.
- If calves are to be sedated, they should not be fed during the 3-4 hour period either side of sedation, especially prior to sedation, as it can disrupt gastrointestinal function. Sedated calves should be kept in sternal recumbency during disbudding.
- When local anaesthetic is used, it must be given at the appropriate site, and the animal left for sufficient time to ensure sufficient anaesthesia before being operated on. To ensure effectiveness of local anaesthesia operators should

only proceed when the animal does not respond when pricked in the area with a small needle ("pin prick test").

- Disbudders must be hot and of a size suitable for the calves. Two cautery disbudders may be needed if operating in fast succession and the equipment is unable to generate sufficient heat. Cautery irons need to be kept at the right temperature to avoid repeated applications (too cold) or unnecessary tissue damage (too hot). They need to be applied correctly to prevent unnecessary damage to nearby skin and potential abscess formation.
- Care must be taken with gas fired cautery disbudders in order to avoid burning body parts of calves or operators. To prevent damage to underlying tissues such as the skull and brain, they should only be applied for a limited period (maximum of 5 seconds), and reapplied after a short period if longer durations are necessary. Kid goats have a relatively thin skull and thermal disbudding, the method of choice, consequently has risks for the welfare of the animal. Skin, bone and brain damage have been described, as well as deaths.[151]
- Chemical or caustic disbudding has additional risks associated with the material getting into eyes and other sensitive tissues including when calves suck each other or nuzzle their dams, or when it rains. The top of the horn bud should be roughened with a rasp to ensure the paste adheres to the horn bud and petroleum jelly may be used around the treated area to minimise chemical spread.

Dehorning

- Precautions, such as vaccination, should be taken to minimise the risk of clostridial infections.
- Equipment used for amputation dehorning should be kept clean and disinfected between animals.
- Dehorning pads (which drop off with the scab) may be used to reduce blood loss.
- Following dehorning, a wound dressing should be applied, and if flies are likely to be a problem the animals should also be treated with an insecticide.
- Dehorned animals should be inspected regularly for the first 10 days and any infected wounds treated.

134. NAWAC is of the opinion that where horns are likely to be dangerous to other animals and/or humans, they should be prevented from growing by disbudding the animal before horn growth proper occurs. The preferred means of minimising pain is to use cautery disbudding and local anaesthesia when calves are less than 8 weeks old. Where dehorning must be done in older animals, either prior local anaesthetic and analgesic, or local anaesthetic plus subsequent wound cautery (i.e. the application of cautery to the amputation wound for pain relief rather than primarily for haemostasis) should be used. Since analgesic is expensive (and may have some risk to human or animal safety) local anaesthetic and wound cautery would be more economic (and safer).

135. NAWAC is of the opinion that amputation dehorning without pain relief is the most painful method of removing horns (animals show hormonal and behaviour indicative of pain for up to 8 hours). In light of the fact that many (but not all) farm systems will be able to disbud calves (with markedly less pain than dehorning at a later age), this approach is preferred. NAWAC notes that less than a half of calves are prevented from growing horns in this way (and without local anaesthetic) and only 5% are done by veterinarians using mostly local anaesthetic and sedative. The application of local anaesthetic reduces or abolishes pain for 2.5-3 hours, after which it wears off, delaying rather than abolishing the pain response, though it has a different character. Even with local anaesthetic there is significant pain, but some pain relief is better than none at all. It also means the animal struggles less and the procedure is able to be performed swiftly and efficiently (i.e. it is better for operator and the animal). For these reasons NAWAC considers that the use of local anaesthetic is justified on animal welfare grounds. It suggests that this may become mandatory in future as practical, economic, safety and social constraints are overcome.

Related issues raised in the submissions and NAWAC's responses

Requirement for disbudding or dehorning

136. NAWAC initially took the somewhat unusual position of recommending that all cattle be dehorned, or prevented from growing horns, when there is significant risk to either other animals or humans. In response, several submissions noted that dehorning, or horn growth prevention, would not be necessary when breed selection and/or careful management are used effectively to minimise the negative welfare and safety consequences for animals with intact horns. Furthermore, the practice of removing the sharp tip of the horn was not addressed.

137. NAWAC concurs and also considered whether it was appropriate to have a standard requiring a painful process in a Code aimed at reducing pain and distress, and that it might overshadow alternatives such as breeding polled animals. Consequently, NAWAC revised the standard to require that animals with intact or tipped horns are managed to minimise the risk of injury to other animals.

Age limits and pain relief

138. Some submissions considered the proposed standards (initially a 6 month limit on impractical and unworkable, and suggested that current practices were good and acceptable (as evident in the few stock losses associated with dehorning). In contrast, there was also support for the phasing in of mandatory pain relief for disbudding.

139. NAWAC notes that the proposed standards represent a significant change from the present legislation. As described above, a 9-month limit for dehorning without pain relief is now imposed (initially dehorning was to have required local anaesthetic at any age). Dehorning is painful and there are means of reducing the pain, though there are issues to be dealt with before pain relief could be made compulsory for

dehorning. NAWAC is mindful that this standard is most likely to affect those systems where horns develop on a small number of animals at different times or ages (e.g. extensive beef systems). Nevertheless, it requires pain relief to be used for animals older than nine months as part of the evolution towards greater use of pain relief.

Horn and sinus development

140. The age at which frontal sinuses invade the horn was questioned, since in the draft Code disbudding was required to be undertaken before this time. Four submissions sought guidance on this time and pointed out that operators would be unable to ascertain it prior to dehorning anyway.

141. In the course of further researching this aspect, it became apparent that there is little published information on the age at which horn buds first appear (generally considered to be before or soon after birth), the age at which horns proper first appear (can vary, presumably with breed and nutrition, with horns developing up to 1-2 years of age), and the age at which the frontal sinuses become continuous with the horn (often stated as 6 months of age, but dependent on the size of the horn). The minimum standard dealing with disbudding and dehorning was substantially revised and does not require reference to the age of sinus development. This information has now been added to the general information.

I. OPERATOR TRAINING AND STOCKMANSHIP

Background information

142. The relationship between good stockmanship or animal handling, and animal welfare is well recognised.[152] Many painful husbandry procedures require the stock handlers and operators to be skilled in order for the operation to be carried out successfully, and to ensure the health and welfare of the animals are not unnecessarily compromised. Generally, those undertaking the procedures are trained on the job and have extensive knowledge and skills of the animals they are dealing with.

Related issues raised in the submissions and NAWAC's response

Training

143. Several submissions referred to the issues of experience, competence and operators having to have received training. Although appearing to value formal training, there was a perception that "on the job training" was not appreciated or valued as much.

144. NAWAC concurs with the value of informal or "on the job" training and knowledge in New Zealand's farming systems. Differences in factors as diverse as topography, climate, and livestock mean that stockmanship borne of experience and adapted to specific circumstances is invaluable, if not critical to the welfare of many farm animals. NAWAC wishes to point out that it does not see, or wish to see,

requirements for formal training (especially that outside of practical settings) take the place of this knowledge, some of which is tacit, ineffable and even arcane. NAWAC believes however, that there is a place for more formal training (be it farm field days, discussion groups, or in tertiary settings) in complementing such knowledge, especially with respect to new knowledge, emerging techniques and changing practices.

J. OTHER ISSUES CONSIDERED BY NAWAC

145. NAWAC's response to submissions pertaining to specific parts of the Code is summarised in Appendix 1.

146. During the course of developing this Code, NAWAC grappled with several issues where common views and scientific research were unclear, equivocal or unknown. NAWAC lists these areas so that they may help give direction to future research, in keeping with one of NAWAC's functions (section 57a(ii) of the Act). However, NAWAC wishes to point out that it did not see this as a prerequisite to the completion of the Code. This list also notes where such research is being undertaken so that it might provide a resource during subsequent review of the Code. The list is neither exhaustive nor in any order of priority.

(a) The possible chronic effects of many of the painful husbandry procedures in farm animals.
(b) The effects of various procedures on wound healing.
(c) The fair distribution of costs (mainly to farmers) and benefits (mainly to veterinarians) of making the use of Prescription Animal Remedies mandatory for pain relief.
(d) A comprehensive physiological and behavioural investigation of high tension bands to castrate older bulls.
(e) The age/stage of growth at which rubber rings are not able to constrict blood supply to the scrotum or tail, leading to swelling and associated pain, and preventing their humane use for these procedures.
(f) The age, liveweight and season at which (1) horn buds are present, (2) horns erupt, and (3) frontal sinuses invade the horn, in different animals in New Zealand farming systems, and the costs and benefits of disbudding compared with dehorning.
(g) The effects of switch removal from dairy cows on their short-term behaviour and physiology at the time of the procedure (both ring application and tail severing), and long-term consequences for fly management (and possibly communication).

K. THE NATURE OF ANY SIGNIFICANT DIFFERENCES

147. All significant differences of opinion about the Code, or any of it provisions, have been set out above or in the NAWAC's response to the Public Submissions (Appendix 1).

148. No significant differences of opinion about the Code, or any provision of it, were recorded within the Committee.

L. ACKNOWLEDGEMENTS

149. NAWAC would like to thank all of those individuals and groups who contributed immensely to the development of this Code through making submissions, both prior to and during the public consultation phase.

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