ANIMAL WELFARE (SHEEP AND BEEF CATTLE)
CODE OF WELFARE
REPORT

Introduction

1. The draft Animal Welfare (Sheep and Beef Cattle) Code of Welfare (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:

   - the reasons for NAWAC's recommendations;
   - the nature of any significant differences of opinion about the Code, or any provision of it, that have been shown by the submissions; and
   - the nature of any significant differences of opinion about the Code, or any provision of it, that have occurred within NAWAC.

   In providing this report, NAWAC notes that it fully considered all submissions it received and reviewed relevant scientific literature, and that there was debate among NAWAC 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. There are a number of minimum standards where the animal welfare implications are self-evident and require no explanation for their inclusion. NAWAC has decided that it will not provide comment on these minimum standards or recommended best practices, but will provide explanations on minimum standards which it believes are complex or controversial or on which it received submissions with significant differences of opinion. Minimum standards as drafted may have been amended for a number of reasons, including to make them legally robust, to ensure a more effective coverage of the issue, or to change from a recommended best practice to a minimum standard (or vice versa).

3. It should be noted that the Act does not define "significant differences". While there were a variety of opinions expressed in the submissions, NAWAC did not consider that all differences necessarily represented significant differences of opinion. NAWAC has taken the view that significant differences are either where there are large numbers of submissions which are contrary to a minimum standard in the Code, or where a submission puts forward a justification based on scientific evidence or good practice for a different or alternative minimum standard. NAWAC notes that

some individuals or organisations may interpret "significant differences" in a way that varies from the NAWAC view.

4. The Code applies to all sheep and beef cattle which are farmed principally for their meat fibre and/or offspring rather than their milk.

5. A sheep and beef cattle code of welfare is needed because it is essentially the Government's statement of policy on how New Zealanders must care for sheep and beef cattle in their charge. There is no current code of welfare for sheep or beef cattle. In addition to setting out the expectations of New Zealanders for the welfare of sheep and beef cattle, it is an important statement to the international community and in particular, to overseas consumers of our animal product exports of the welfare standards which prevail in New Zealand. These points were reinforced in the submissions.

The New Zealand sheep and beef farming industries

6. More than 30 million sheep (producing an estimated 28 million lambs) and 4 million beef cattle, on similar numbers of sheep, beef, or sheep-and-beef farms, are farmed in New Zealand (Meat & Wool New Zealand, 2009). Beef cattle and sheep are often farmed together and beef production contributes to approximately a quarter of sheep and beef farm revenues. The estimated number of breeding and younger sheep and beef cattle in each region as at 30 June 2009 were (Meat & Wool New Zealand, 2009):

Region	Beef cattle (millions)	Sheep (millions)
Northland, Waikato, Bay of Plenty	1.5	4.2
Taranaki, Manawatu	0.5	3.8
East Coast	0.9	8.0
Marlborough, Canterbury	0.7	7.4
Otago, Southland	0.2	4.7

New Zealand's sheep and beef cattle are farmed in a variety of different systems predominantly fairly extensive in nature. (This diversity is even greater worldwide e.g. sheep farming systems range from nomadic pastoral, to extensive and intensive management; hill, upland and lowland systems; and predominantly wool, meat or dairy production – Kilgour et al., 2008). Livestock get all or most of their food directly from their environment and they, and the vegetation upon which they feed, are open to the vagaries of the climate. Extensive farming essentially involves the husbandry of animals over a large area, usually with relatively low levels of inputs,

labour and resources (Pretty, 1995). However, farm and animal production can be increased, improved or intensified through modifying the farm (e.g. subdividing paddocks, increasing soil fertility, and changing pasture composition), management (e.g. strip grazing, supplementary feeding, and increased stocking rates), or the animals (e.g. genetic selection, artificial insemination, and health monitoring), each with their own implications for animal welfare (Fisher & Stafford, 2007; Stafford & Gregory, 2008). Although there are, then, varying levels of intensification few approach or resemble the more intensified systems (e.g. intensive pig and poultry systems) traditionally associated with contemporary animal welfare concerns. Furthermore, it is noted that with the increased scrutiny, both public and professional, of those very intensive systems, extensive farming is also regarded as tending to release animals from those closely confined and highly controlled environments. Thus extensive farming has both 'traditional' and 'alternative' understandings or expectations.

The New Zealand beef cattle industry has two distinctive components relevant to this Code of Welfare. One is the traditional beef cattle sector comprising predominantly beef breeds such as Angus, Hereford and Simmental, and their crosses. The other is the dairy-beef sector comprising mainly Holstein-Friesian and crosses born in dairy herds and grown out for slaughter in the beef cattle sector (a by-product of the dairy industry). Consequently, the beef industry includes the rearing of dairy or dairy-cross calves. Approximately half of the country's beef meat is derived from the beef cattle sector with the remainder from the dairy-beef and dairy industries.

While the main focus of the Code is on extensively farmed animals, it is recognised that some animals are more intensively farmed (Fisher et al., 2001; Hickey et al., 2002; Smart 2004; Wallace, 2009). These systems include smaller areas of allocated pasture and crops, and feeding pads, often to ensure animals feeding is optimal and pasture protected during sensitive periods. Smaller numbers of lambs and cattle may be finished on feedlots, and a lesser number of sheep may be housed for fine wool production. These more intensive methods of farming have been addressed in the Code. Finally, a number of more or less individual sheep or cattle may be treated quite differently – they include pet lambs and calves, and show animals. While the principles of the Code apply to this group of animals, it is not the intention to address them directly – their preferential treatment and high degree of habituation to humans ensure that compromises (e.g. roadside tethering) can be acceptable. Furthermore, such animals arguably perform important functions in raising people's awareness to farming and animal welfare. Omitted from the Code are export feedlots (dealt with under the Animal Welfare Export Certificate provisions of Part 3 of the Act) and dairy sheep. While the keeping of sheep for milk production is established in many parts of the world (see Kilgour et al., 2008), and is an important and developing industry in New Zealand (e.g. see Stevenson, 2000; Owens, 2006), NAWAC is of the opinion that it is a specialised system with husbandry practices which differ significantly in nature to the extensive pastoral sheep and beef cattle systems which

the Code addresses. Consequently, sheep milking is not included. Finally, the Code does not cover animals during transport or at saleyards (codes for both are being developed). The Sheep and Beef Cattle Code does however cover selection for transport.

Code preparation and public submissions

7. The Act allows for any individual or organisation to draft a code of welfare. The Code was initially drafted by a group designated by NAWAC. In addition, as required by the Act, representatives (including farmers) of those likely to be affected by the Code were consulted during its preparation and before public notification.
8. NAWAC considered the Code in early 2008 to ensure that it complied with the purposes of the Act, that it was written clearly so as to be readily understood, and that representatives of those likely to be affected by it had been consulted. NAWAC wishes to point out that, at that time, NAWAC decided not to make any final decisions on the Code until it had received submissions. The Code is required to be publicly consulted, and for NAWAC to come to any conclusion prior to this consultation would have meant that NAWAC was not following due process by acting in a biased and predetermined manner.
9. The Code was publicly notified on 31 October 2008 by notices in the major newspapers in Auckland, Wellington, Christchurch, Dunedin, and Napier. In addition, it was sent to specific interested groups. The closing date for submissions was 12 December 2008.
10. A total of 25 submissions were received during the public consultation period. All submissions were read in their entirety and taken into account. A summary of the submissions received on the 2008 draft Code was prepared and NAWAC's responses to the submissions were noted.
11. In addition responses to nine specific questions were sought during public consultation. The responses can be summarised as:
    - *Is a code necessary?* All responses were in the affirmative.
    - *Should sheep and beef cattle be covered by one code?* Responses were mixed. Those with reservations thought that the inclusion of both species had led to 'a lack of clarity and even potential ambiguity'. Others accepted the logic that 'there is a high likelihood that if a farmer runs sheep they will run beef cattle and vice versa'. One respondent opposed to the single code accepted that the 'code was now probably too far down the track'. NAWAC considers that on balance, and recognising the changes since made to the text to remove any possible ambiguities, the single code should proceed.
    - *Do you agree that the minimum standards are the minimum necessary to ensure that the physical, health and behavioural needs of sheep and beef cattle will be*

met? A number of submissions considered the Minimum Standards to be too general; and this criticism is reflected in comments on particular Minimum Standards.

- *Do you agree that the recommendations for best practice are appropriate?* Generally, the nature of provisions for best practice were supported. One respondent thought that these provisions were 'current practice': ''best practice' should be at a level above what is 'current practice'. As with Minimum Standards, more detail was sought in some provisions. Additionally, there is a need to ensure that Recommended Best Practices retain a degree of flexibility to allow for future changes in practices. Redrafting undertaken in light of the public submissions has clarified many best practice requirements.
- *Do you agree with the recommended maximum times off feed?* Detailed comment is dealt with below (see 17. Food and Water).
- *How, and to what extent, do you think this code would change existing arrangements for the management of sheep and beef cattle?* Submissions did not foresee significant change because the code represented good farming practice and were phrased in general outcome terms.
- *Will complying with this code involve costs for you or your business?* No additional costs were foreseen.
- *What benefits do you see from having this code?* A positive response, emphasising increased certainty about obligations, educational value, and contribution to market success.
- *What other impacts would this code have on New Zealand society, the economy or the environment?* Attitudes will vary but generally the Code will make a contribution to New Zealand's animal welfare performance.

12. All submissions were carefully considered by a subcommittee of four members appointed by NAWAC to review the Code. The subcommittee reviewed the Code in detail and all the submissions received on it. The subcommittee met for one full day in March 2009. Throughout the period the Code was under review, subcommittee members worked in collaboration by email, and in consultation with MAF Animal Welfare Directorate staff.

13. The membership of the subcommittee had extensive experience of sheep and beef cattle farming. The subcommittee reported the Code back to NAWAC on 19 August 2009 for final consideration and approval for recommendation to the Minister. The Code was subsequently peer reviewed by international animal welfare expert Dr Andrew Fisher from the University of Melbourne.

Key issues

14. The following key issues represent the significant concerns raised from the public consultation on the draft Code.

Scope of the Code	*Should this Code be prescriptive?* *Should this Code cover both sheep and beef cattle?* *Should there be equivalence with other pastoral animal codes e.g. the deer and dairy cattle codes?*
Stockmanship and Animal handling	*What constitutes good stockmanship?* *Should a requirement for a quality assurance programme be included in the code?* *Should electroimmobilisation devices be allowed?*
Food and Water	*What should the recommendations be for time off food and water?*
Body Condition Score	*What body condition score scale should be included?* *What is the science concerning body condition and effects on welfare?*
Shelter	*Should this section be more substantial and consistent with other pastoral species codes?*
Health, Injury and Disease	*Should predation risks be included in the Code?* *What should the recommendations be and who should provide professional advice?*
Selection and Breeding	*Should the code include breeding issues?* *Should libido testing be allowed?* *Is the code consistent with the research, testing and teaching requirements in the Animal Welfare Act?*
Reproductive Technologies	*What are the welfare implications of reproductive technologies?*
Artificial Rearing	*Should more information on calf rearing be included?*
Feedlots	*Should more information on housing and feedlot requirements be included?*
Humane destruction	*Should more information on 'how to' be included in the Code?*

The remainder of this report focuses on the above key issues, all other issues raised in the submissions have been addressed in the Summary of Submissions from Public Consultation.

15. Scope of the Code

(a) *Should this Code be prescriptive?*

New Zealand sheep and beef farming systems come in many different forms and the animals have different genotypes suited to different physical and husbandry environments. This means that in providing for the welfare needs of animals, especially in extensive situations characterised by varying physical environments and greater opportunity for self-sufficiency, there is less need for prescriptive standards

and recommended best practices and a greater requirement to provide the basic needs such as the provision of food and water etc, enabling livestock to be more independent. Different individual farms have different problems and they are often addressed in different ways depending on the animals, the skills of the stock-handlers and the economic constraints of particular systems.

The Sheep and Beef Cattle Code of welfare continues NAWAC's theme of developing outcome-based rather than prescriptive (e.g. facility design) animal welfare standards. The extensive environment in which most of New Zealand's sheep and beef cattle are farmed, and the varied management procedures undertaken to ensure welfare is not compromised, effectively mean prescriptive standards are not a preferred option as they might be in more uniform, intensive farm systems.

(b) *Should this Code cover both sheep and beef cattle?*

Combining two major farm species in one Code is a distinct and novel approach. Although it is noted that the Zoos and Circuses Codes cover several species, separate Codes for Sheep and Beef Cattle have been the norm, both in AWAC's time (the Beef Code was only a draft), and internationally. However, many sheep and beef cattle are farmed together in New Zealand. Furthermore, many of the factors affecting their welfare are similar – e.g. both are grazing ruminants and tend to be farmed in similar environments – and all but two of the Minimum Standards apply to both species. It was suggested that these farmers would be best suited by having one Code, that separate Codes would have entailed a great deal of repetition, and that additional effort would have been required by those making submissions (e.g. Meat & Wool New Zealand, and the Society for Sheep and Beef Cattle Veterinarians, although the latter supported separate Codes) and those who would be referring to the Codes.

The decision to have a single Code for both sheep and beef cattle brought mixed reactions with similar numbers of respondents agreeing and disagreeing with the approach. This also reflected views solicited prior to the code being drafted. Although responses tended to reflect preferences, the more substantive reasons included: a lack of clarity or succinctness, potential ambiguity with a combined code, and differences in the physical, health and behavioural needs of the two species; equally, however, many of the principles apply to both species, and that many farmers run both species. NAWAC also notes that both species are combined, presumably also for pragmatic reasons, both in institutions such as Meat & Wool New Zealand and the Society of Sheep and Beef Cattle Veterinarians, and in some scientific literature (e.g. Hogan et al., 2007).

NAWAC is mindful of the possibility of either too general or onerous standards making the Code less manageable. However, the Committee is confident that it has addressed these issues by, where appropriate, separate dedicated Minimum Standards for "Shearing, Dagging and Crutching" and "Managing Flystrike" and separate clauses with Minimum Standards for each species (e.g. Food and Water, Selection

and Breeding Tests). NAWAC is also aware that some Minimum Standards apply almost solely to cattle (e.g. using a moving vehicle to provide traction for assistance with difficult births – and hot branding in Minimum Standards 10 & 13) but nevertheless consider that they may also apply to sheep. A few other references were raised in the submissions (e.g. that the Recommended Best Practice on separating aggressive animals only applied to cattle).

(c) *Should there be equivalence with other pastoral species codes?*

Equivalence between the Beef Cattle and Dairy Cattle Codes was considered since as both animals have physiological and behavioural similarities and animal welfare needs, it could be argued that the standards for beef cattle should closely resemble those in the Dairy Cattle Code of Welfare. However, while some standards are essentially similar (e.g. feed) to the dairy cattle code (and indeed other codes, e.g. deer), some are required to be specific to each type of animal. For example, dairy cows are relatively well habituated to handling and appear to tolerate a degree of confinement and human presence around the time of giving birth. In contrast, beef cattle may be less tolerant of confinement and supervision (Dufty, 1981). Thus it appears appropriate to have some different standards for dairy and beef cattle. Where appropriate, NAWAC has attempted to maintain some consistency between the major pastoral farm animal codes, e.g. the inclusion of body condition scores.

NAWAC was cognisant of the fact that there are many, many aspects of good practices in extensive farming and has not set out develop an exhaustive account of how sheep and beef cattle should be farmed. The Committee is, however, confident that the material presented addresses the physical, health and behavioural needs of the animals.

16. Stockmanship and Animal Handling

A feature of New Zealand's pastoral farming systems is that a number of people with different and complementary skills and experience care for livestock. They include farmers, stockmen, managers, shepherds, shearers, musterers etc. Such individuals inevitably have different skill sets and levels of competency. There is also an inherent dependence on farm dogs for mustering and yarding, and to a lesser extent movement during handling whilst yarded. Although such movement is based on fear, attention to dog breeding, training and temperament, and an undoubted degree of habituation of sheep and beef cattle to being moved or herded with dogs, means efficient and less stressful handling and an improved human-animal relationship (Kilgour et al., 2008). On extensive farms, a good rapport with dogs, and horses, is regarded as an integral component of good stockmanship.

Stockmanship, a respect for the essence of the animal (Gatward, 2001), and stewardship are arguably the key to good animal welfare. In addition to the behaviour of people working with animals, stockmanship is a relationship between animals and

people (Boivin, 2003; Boivin et al., 2003; Waiblinger et al., 2006; Hemsworth, 2007; Farm Animal Welfare Council, 2007). Furthermore, animals arguably only need a stockman "in proportion to the extent that the stock-keeper has removed the resources they need to look after themselves" (Webster, 2005).

(a) *What constitutes good stockmanship?*

The importance of personal qualities has been well described especially for the more intensive dairy, poultry and pig production systems (see Hemsworth, 2007; Farm Animal Welfare Council, 2007). Their importance in more extensive farming systems, although largely undemonstrated scientifically, is probably apparent in the finding that calmer beef cattle have better growth rates and meat quality (see Rushen et al., 2008). The essentials of stockmanship have been described as knowledge of, and skills in animal husbandry, and personal qualities of affinity and empathy with animals, dedication and patience. The factors contributing to good stockmanship, at least according to extensive beef farmers (Fisher & Stafford, 2007), were experience and learning (stockmanship borne of practical personal experiences results in an intuitive feel for animals); personal qualities of patience and empathy with animals; and an understanding of the constraints and opportunities afforded by the climate, terrain and biota.

Much of stockmanship is learned and subtle. For instance, the manager of a facility where sheep are housed is extremely good at picking the early signs of sudden illness in Merinos. The first indication is that the sheep don't look at him as he walks past the pen, something which occurs before they go off their feed (Smart 2004). The involvement of children and young people in farming activities is paramount to achieving good future stockmen since such skills or "context-embedded learning" cannot be replaced, although can be complemented, by formal training. Furthermore, practically oriented people may, by their nature, be averse to undertaking formal training.

Good or competent stockmanship then, is complex, subjective and intuitive and NAWAC acknowledges that some individuals are unlikely to possess all such qualities, especially those developed principally by experience, but that within a farming operation individuals will collectively have and share those skills.

Public submissions requiring all individuals responsible for animals to have such knowledge, measures of competency, a minimum ratio of stockman to animals, or noting "the standard is very loose as a legal requirement" fail to acknowledge the ineffable component of good stockmanship in extensive environments and that the Code must have regard to the wide-ranging and varying circumstances characterising pastoral farming. Similarly, many submissions questioned the lack of precision, definition and measurability in the section relating to animal handling, largely intended to reflect husbandry activities occurring following yarding. NAWAC acknowledges these difficulties and that there are both practical limitations and good

reasons not to always adhere to best practices. Nevertheless, handling is an important component of animal welfare and NAWAC believes the information it has provided is sound.

(b) *Should a requirement for a quality assurance programme be included in the code?*

The Sheep and Beef Cattle code does not make reference to quality assurance systems, as some previous codes have done (e.g. Pigs, Broiler Chickens, Deer). It does however include reference to keeping accurate records, animal identification, and continual review of practices and investigation of significant problems as part of stockmanship.

The inference from other codes is that the inclusion of quality assurance systems will ensure that standards of animal welfare and husbandry are maintained. While that aim is admirable, NAWAC is increasingly aware of the need to formally scrutinise the impact of such schemes on animal welfare, farming and the supply chain, and consumers. The Committee further notes that there are numerous critiques of assurance and food labelling schemes (e.g. Early, 1998; Lymbery, 2002; Farm Animal Welfare Council, 2006; Fraser, 2006; Thompson et al., 2007; Food Ethics Council, 2008) and that there is a clear understanding that quality assurance schemes should be industry rather than government regulated (NAWAC, 2008). While NAWAC will continue to support the development of animal welfare assurance schemes where it is able to, no related Recommended Best Practices have been included.

(c) *Should electroimmobilisation devices be allowed?*

Electroimmobilisation, as a means of restraining animals, was initially developed in Australia in the 1970s as part of initiatives to mechanise shearing. It has since been developed and marketed for a number of farm animals (Anonymous, 2009). In addition, there have been claims that it also induces analgesia and it has been studied in a number of farm species (e.g. see Carter et al., 1983; Lambooy, 1985; Rushen, 1986, 1996; Grandin et al., 1986; Pascoe and McDonell, 1986; Jephcott et al., 1987; Matthews, 1993). They indicate that electroimmobilisation is a noxious procedure, one that animals find more aversive than physical restraint, that there is a risk of interruption with breathing, and there is little evidence of analgesia (acting more like a neuromuscular blocking agent) and it should not be relied upon for pain relief.

NAWAC has recommended to the Minister that all electroimmobilisation devices be restricted so as to regulate their sale and use. This stance is based on concerns with breathing, noxiousness and aversiveness, and the risk of such devices being used without pain relief, or being used in lieu of pain relief. These concerns are reflected in the Code.

17. Food and Water

The provision of food and water is one of the more fundamental needs of animals and adequate nutrition is central to good welfare. There are different forms of deficiencies

and challenges to livestock including seasonal changes in nutrient quality and availability; undernutrition caused by food shortages usually associated with long periods of inadequate rainfall; malnutrition caused by inadequacies in diet composition; and food and water deprivation associated with farm management. Hogan & Phillips (2008) proposed that nutrition is compromised when the normal functioning of the animal, including its behaviour, physiology and reproduction, is affected by inadequate nutrition. The section on Food and Water, and its Minimum Standard No. 5, drew a significant number of responses from submitters. Mindful of this, and of the difficult nature of objectively or precisely assessing hunger, feeding and an animal's physiological status or condition, in this and the following section (Body condition score) NAWAC provides the following insights underpinning its decisions.

Sheep and beef cattle, being ruminants, have evolved to cope with fluctuating feed levels by storing energy as fat and protein during periods of seasonal abundance (e.g. spring) for use during periods of relative scarcity (e.g. winter). Thus, an animal is able to sustain itself during periods of undernutrition not only by reducing energy expenditure and decreasing metabolism but by mobilising body fat and protein. Body reserves are naturally or usually mobilised during winter when vegetative growth slows or is dormant, and during lactation when the high-energy requirements of milk production are unable, for a short time at least, to be matched by food intake. Reserves are also mobilised in extreme climatic conditions such as when snow prevents access to vegetation, or prolonged periods of very low rainfall or droughts causing severe food shortages. Most domestic ruminants are subject to changes in food availability which may be managed by humans for economic and husbandry reasons (Chilliard et al., 1998).

Livestock can also be routinely deprived of food or water for varying amounts of time in varying circumstances. They range from, for example, short periods between when supplementary feed or breaks in pasture or crops are provided, to longer periods associated with yarding, shearing, or transport. There are a number of other aspects relating to the provision of food and water. They include the necessity, or otherwise, of having to always provide water when, especially during winter and spring, sheep and beef cattle can often obtain their needs from fresh pasture. Livestock can be especially sensitive to poisoning when hungry after shearing for example, or when moved onto a new crop which they do not find palatable and eat weeds instead (Holloway, 2002; Gilmour & Hill, 2003). Finally, animals may be trained to accept alternative feeds such as grain during times of food shortage, and perhaps to avoid plants containing toxic material (see Ralphs & Olsen, 1990).

Along with seasonal and animal differences in requirements (e.g. sheep appear more tolerant of water deprivation than cattle), differences between animals gaining and losing liveweight and condition, interactions between either food or water availability, and the arbitrary or subjective nature of any limits, determining suitable minimum standards and recommended best practices is understandably complex.

There are two general animal welfare outcomes of adequate food and nutrition: (1) the satisfaction of hunger and/or thirst; and (2) good health and therefore welfare.

While there have been few attempts to validate what animals are feeling – e.g. hungry or thirsty – it is generally accepted that underfeeding, hunger and emaciation can signify a degree of animal discomfort, distress or suffering (Gregory, 2004).

In contrast, aspects such as foetal growth, neonatal mortality, and difficult births (Hosie, 1989; Binns et al., 2002; Osgerby et al., 2003) in sheep, and metabolic diseases, calving difficulties, health problems and reproductive measures in beef cattle (Bellows & Short, 1978; Richards et al., 1989; Allen 1990; Le Neindre et al., 2001) are relatively well known to be affected by nutritional condition, pathology being both a cause of poor welfare and affected by poor welfare (Broom, 2006). Furthermore, undernourished animals may be more susceptible to cold stress (Hogan & Phillips, 2008).

On the issue of underfeeding and malnutrition, NAWAC has chosen to make it mandatory that persons in charge of very thin sheep and beef cattle undertake urgent remedial action, or humanely destroy the affected individuals. The principal change from the public draft of the Code relating to sheep, is that intervention is now based on the condition of a single animal rather than a proportion of a mob or flock. The criteria for being very thin are expressed in terms of both body condition and body condition score (see below). It is NAWAC's understanding that animals in extremely poor condition (score 0) are at risk of being too weak to walk, graze or safely obtain drinking water, in other words they are approaching death (Hogan & Phillips 2008).

(a) *What should the recommendations be for time off food and water?*

There have been a number of studies documenting weight losses in sheep (e.g. Kirton et al., 1968; Thompson et al, 1987; Burham et al., 2009) and beef cattle (e.g. Rumsey & Bond, 1976; Bond et al., 1976; Phillips et al., 1991) associated with food and water deprivation. Weight loss is most marked as loss of urine and faeces in the first 24 hours of fasting. There may be some stress, a challenge to maintaining homeostasis, and disruption to the normal control of pathogenic rumen bacteria, especially when combined with transportation stress, leading Hogan et al. (2007) to conclude "it appears prudent to ensure that total time off food and/or water does not exceed 24h." Other studies demonstrate the difficulty of establishing limits. For example, in lactating beef cattle at least, only nominal physiological changes were seen with up to 3 or 4 days off food and water, after which the animals recovered quickly (Rumsey & Bond, 1976; Wythes et al., 1980).

Perhaps the most significant occasion on which animals are deprived of food and water is when sheep are shorn since food and water deprivation are combined with a number of other stressors and metabolic and physiological changes and requirements (Dutt & Hamm, 1957; Elvidge and Coop 1974; Fulkerson & Jamieson 1982; Hargreaves & Hutson, 1990; Holm Glass & Jacob, 1992).

NAWAC has taken the pragmatic and perhaps somewhat unusual position of not recommending any limits for time off food and water. This stance reflects the inherent variability in farming practices and circumstances associated with extensive farming in this country, along with the belief that animals can be expected to, and do survive, in extreme cases, periods without food providing they're in good condition and have access to water. Furthermore, an ideal prescription that animals receive sufficient quantities of food every day is clearly not always possible, nor arguably always necessary given ruminants ability to function using their reserves. (It is also noted that while such a requirement might align the Code with European standards, NAWAC makes its own decisions based upon available evidence.)

NAWAC notes however, as a recommended best practice "time spent in yards should be kept as short as possible" (Section 2.2) and that "sheep must have access to food and water as soon as possible after shearing" (Minimum Standard 14). Together with the requirements of Minimum Standard 5 – Food and Water – and the Recommended Best Practice that "animals in ill health or poor condition, or in late pregnancy or early lactation, should not be deprived of food or water", NAWAC is confident that the needs of animals can be met along with the practical constraints of management and best practices of animal husbandry.

18. Body Condition Score

Assessing and manipulating an animal's body condition is an important means of managing its body reserves optimising nutritional management and reproductive efficiency. Measures of an animal's subcutaneous fat and protein, and changes in body condition score provide an indication of nutrient intake relative to the animal's requirements and a number of body condition score systems have been developed (initially by Jefferies, 1961; Russel et al., 1969; and Lowman et al., 1976; see Freer 2007). Body condition scores are recognised, especially in dairy cows, as an important tool in managing animal health, milk production and reproduction (Osoro & Wright, 1992; Morris, 2002; Morris et al., 2006; Flores et al., 2007; Roche et al., 2009). In addition to reflecting the adequacy and availability of feed relative to requirements, body condition score can also reflect underlying pathological conditions.

(a) *What body condition score scale should be included?*

While there are different body condition score scales, some including half-points (thought to provide better descriptive power rather than indicate greater objectivity), all describe a progression from very thin (generally 0 or 1) to very fat (generally 5 or 10). Roche et al. (2004) compared, in dairy cows at least, the different scales. Body condition scores provide relatively clear descriptions of animals at particular condition levels and have been included in the appendix of the code as guidance. Despite the different scales available, NAWAC has settled on 6-point scales (0-5) for

both sheep and beef cattle, although 0 is seldom used in sheep as it only applies to animals which are emaciated and on the point of death (Geenty, 1997; Fleming 2003). These scales are endorsed by Meat & Wool New Zealand's Sheep and Beef Councils, and the sheep and beef industry has planned, with the release of this Code, to further promote their use in enhancing animal production and animal welfare. Consideration was given to including 0.5 units but while they may be useful for some operators, NAWAC believes they risk imparting a false degree of precision to a foremost subjective measure. Although sheep and beef cattle farmers almost certainly base management practices on livestock condition (e.g. separating animals in poorer condition for preferential treatment), it is unknown how many routinely use body condition scores though it is unlikely to be a significant proportion.

NAWAC is confident that users will be able to adapt to any system, and that whatever scale is used, the benefits to animal welfare and farm husbandry will be significant in raising awareness for all those in the industry of the need to keep animals in good condition. This belief is, in part, based on experience in the dairy industry who, in particular, have been very proactive in promoting descriptions of body condition scores, albeit with a strong focus on optimising production and health. NAWAC also believes that in this area there should be some consistency between the major pastoral animal codes.

(b) *What is the science concerning body condition and effects on welfare*

It is generally accepted that while there is a strong focus on the effects of body condition score on productive performance, there is relatively little on other indicators of welfare such as survival and what the animals are feeling. While it has been proposed that condition score is used as a means of ensuring animals are free from hunger, there has apparently been no systematic attempt to validate condition score as a measure of hunger (Lawrence & Conington, 2008).

In two flocks of sheep maintained in extensive conditions hill environments in Scotland (Morgan-Davies et al., 2008), ewe survival was poorest when mid-pregnancy condition score was less than 2.5 (scale 0-5). Similarly, the survival of shorn goats exposed to severe weather was near guaranteed when condition score exceeded 2 to 2.5 (scale 1-4; McGregor & Butler, 2008). There are also established relationships between condition score and lambing and pregnancy rates in sheep and beef cattle respectively (see Freer et al., 2007).

Beef cows with reduced body condition scores have been associated with reduced calf birthweights, reduced milk production and calf liveweight gain, and delayed rebreeding (Fiems et al., 2006). However, the relationships were not always clear and Fiems et al. (2006) concluded that "it is difficult to define a universal optimum" for body condition score, at least in double-muscled beef cows. Furthermore, some animals may be able to overcome some of the negative effects of low nutrient intake

by, for example, increasing placental growth, such that it would take major reductions in intake to reduce calf birthweights (Rasby et al., 1990).

There have been a number of dairy cow studies in New Zealand which NAWAC has found useful in understanding the influence of body condition. Non-lactating cows in better body condition appeared to be somewhat insulated from cold conditions, more able to maintain stable body temperatures, and less susceptible to having to spend less time eating and displaying greater postural changes affording protection from the cold (Verkerk et al., 2006; Tucker et al., 2007a). On the occasions when feed intake and body condition score were correlated, a decrease in condition was associated with increased grazing or ruminating and decreased lying leading to the suggestion that thinner dairy cows especially are at risk of being unable to rest sufficiently when, for example, weather is adverse or feeding limited (Mathews et al., 2006). Somewhat paradoxically in a second experiment, cows with lower body condition were less motivated to work for food, whereas Schutz et al. (2006) suggested lighter lactating dairy cows may be more motivated to seek food after a period of deprivation than heavier cows. It is suggested that within the ranges studied, natural variations in body condition score have little effect on the motivation to seek feed.

Currently, a number of research projects are being undertaken on behalf of New Zealand's sheep and beef cattle industries aimed at determining the influence of static and changing body condition scores, their influence on feeding motivation, and the implications for animal welfare (AR Bray, Meat & Wool New Zealand, personal communication). While all these studies are invaluable in beginning to understand body condition, they also highlight the complex relationship between diet, hunger, and motivation and the difficulties in experimentally unravelling them. Their use in informing animal welfare guidelines is therefore limited at the present time.

NAWAC acknowledges that there are a number of difficulties with the use of a body condition score as a measure requirement, or guideline for sheep and beef cattle and had considerable discussion on points such as:

- body condition score is a subjective estimate and there are limitations to attempting to make it more objective;
- there are different scales, for example within the New Zealand beef cattle industry scales of 1-5 and 1-10 have been described although some publications present both scales for optimal production targets (Morris & Smeaton, 2009);
- most research has so far contributed to understanding the relationship between condition score and parameters of productive or economic importance, in other words as a management tool, rather than an aid to assessing animal welfare;
- similarly, most studies have investigated medium or average condition scores with fewer appraisals of the effects of extreme condition scores;
- the lack of a scientific understanding of the relationship between animal welfare and condition score as well as changes in condition score;

- difficulties with accurate appraisal and consistency (Evans, 1978; Calavas et al., 1998; Kristensen et al., 2006) perhaps requiring training of operators where accuracy and consistency are necessary;
- the best stage of assessing body condition score since it essentially reflects past nutrition – in Scottish hill sheep for example, the strongest predictor of ewe survival was body condition score in mid-pregnancy (Morgan-Davies et al., 2008);
- to what, if any, exceptions can be made with ill-health or aversive and unpredictable climatic conditions;
- the perceived lack of exposure to, and experience with, formal condition scoring amongst many within New Zealand's sheep and beef cattle industries although all undoubtedly use less formal estimates of condition;
- the view that it is a useful guide to the performance of a group of sheep but cannot be used as a preventative management strategy for any single individual (Roger, 2008);
- differences among breeds – productivity parameters suggest it is unrealistic to use the same targets for all breeds as beef cross dairy breeds tend to produce satisfactorily at lower condition scores than beef breeds (Morris et al., 1985);
- the possibility of differences in suggested optimum condition scores related to the stage of production – e.g. US sheep values on a 1-5 scale are breeding 3-4, early-mid pregnancy 2.5-4, lambing singles 3-3.5 and twins 3.5-4, and weaning 2 or higher (Thompson & Meyer, 1994);
- a generally unknown ideal body condition score – industry recommendations are of 3.5-4 for sheep (Fleming, 2003), and 2.5-3.5 for beef cattle (Morris & Smeaton, 2009) – although it is common sense that livestock should not be too thin or obese;
- the danger of minimising the legal responsibility to either a stage where welfare is likely to have already been severely compromised, or to a state unable to differentiate between livestock likely to be exposed to (e.g. snow falls) or sheltered from (e.g. housed) extreme and adverse weather conditions.

Despite these difficulties, and reflecting good practice rather than deferring to the possibility of future research, NAWAC is of the opinion that body condition score is a not only a valuable assessment of animal production but also of animal welfare. The material in the Code thus reflects the evolving nature of knowledge of body condition scoring and its relationship with animal welfare. This is especially true of what animals are feeling, and what the risks particular conditions scores represent in particular circumstances, as well as how producers, and advisors, veterinarians and regulatory bodies deal with that information. Consequently, NAWAC has made it a Recommended Best Practice that both sheep and beef cattle should be in kept in good condition, a score of 3-4.

19. Shelter

(a) *Should this section be more substantial and consistent with other pastoral species codes?*

Extensively farmed pastoral animals, such as sheep and beef cattle, have to deal with the vagaries of New Zealand's climate, both daily and seasonal fluctuations and irregular extremes. Despite changing weather patterns and conditions, most livestock are able to maintain their core body temperatures ensuring normal metabolism. Consequently, mature sheep and beef cattle are able to withstand most climatic conditions, but there can be significant risks especially for lambs, calves (addressed in Section 4) and newly-shorn sheep (addressed in Section 7.6) in adverse conditions.

The section on shelter drew many responses from submitters. While several concerns were raised regarding the adequacy of the standards to protect animal welfare, including regarding shade, that the standards were different to the dairy code of welfare, and other important issues, about half were more of a minor nature (e.g. grammatical changes).

NAWAC has comprehensively considered the issue of shelter in pastoral farming, with its views informed by an extensive number of scientific publications, including several reviews relevant to sheep and beef cattle (e.g. Holmes & Sykes, 1984; King & Sturrock; 1984; Scales, 1994; Gregory, 1995; Hawke & Dodd, 2003; Bray, 2005; Pollard, 2006; Fisher, 2007) as well as a number of recent relevant New Zealand dairy cow studies (Tucker et al., 2007a, b; Kendall et al., 2006, 2007; Schütz et al., 2008, 2009; Webster et al., 2008). Consequently, NAWAC believes that its position is well supported by scientific knowledge and the amount of information provided in the Sheep and Beef Cattle Code reflects this. The Code lays out the key points about the need to provide shelter and is fully consistent with the deer and dairy cattle codes being the other pastoral species codes that have been completed.

NAWAC is of the opinion that the Minimum Standards are substantial and sufficient to protect sheep and beef cattle. The key requirement under Section 4 of the Code is to provide all classes of animals with the means to minimise the effects of adverse weather as is stated in the Minimum Standard. However, the Code also recognises that such provision must be appropriate for the needs of the animals in the context of a particular situation. There is also specific stipulation about provision of shelter for those classes of animal at greater risk and a requirement that priority be given to remedial action when weather conditions result in animals developing health problems.

Within the context of farmed livestock, NAWAC takes shelter to encompass such factors as those related to the weather (sun, rain, wind, snow, etc), as well as other aspects of shelter (e.g. from humans, herd mates, predators etc). NAWAC takes 'adequate' to mean sufficient to maintain core body temperature within a range that does not produce tissue damage that is irreversible and therefore potentially life-

threatening (i.e. animals can be hot or cold, but not so hot or cold that it is noxious or damaging to their health).

New Zealand has a temperate climate but there are marked regional contrasts. Homeothermic animals maintain their body temperature within a thermo-neutral zone in a regular diurnal pattern that is influenced by feeding, activity and ambient temperature and within which the animal will utilise a variety of mechanisms to maintain itself (e.g. eating more and seeking shelter). Healthy livestock are relatively robust in their ability to tolerate adverse conditions encountered in such a climate including its wet and changeable nature and a number of management methods, including the provision of additional feed, may be used to provide protection during cold conditions. The Code gives no specific definition to the nature of provision of needs or what remedial action should be taken. However, further information is provided in the document to assist with interpretation. It does not mean an exact form of shelter (e.g. windbreaks) must be prescribed for every paddock which NAWAC recognises would be impractical and of varying benefit. It may also mean the provision of additional feed to mitigate the effects of bad weather for the more robust classes of animal or that stock are moved to an area with additional shelter when conditions are severe.

20. Health, Injury and Disease

(a) *Should predation risks be included in the Code?*

Predation of sheep and beef cattle is mostly limited to dog and feral pig attacks of sheep, especially lambs. Kea may attack sheep, in alpine zones, and were once killed in large numbers. Nowadays there are fewer sheep in the alpine regions so the problem is smaller, and the Department of Conservation removes offending birds placing them in regions away from sheep. The risks from predators, especially to sheep, are well documented in other countries (see Dwyer, 2008), and the Australian Model Code of Practice for Sheep requires that "where predation is known to occur, reasonable precautions should be taken." NAWAC has identified predation as a cause of newborn mortality in the section on Lambing and Calving.

(b) *What should the recommendations be and who should provide professional advice?*

The health, disease and prevention of disease, and treatment of injuries, in sheep and beef cattle is a vast subject and there are many related works (e.g. Bruere & West, 1990; Grace, 1994; Andrews et al., 2004; Roger, 2008; Rushen et al., 2008; Thomas, 2009).

Although disease and injury impact on an animal's welfare, NAWAC has not undertaken to provide an extensive list of recommendations and information relating to particular diseases, but emphasises the importance of planning and prevention, the skills and responsibilities of people involved, and the importance of professional

input. Similarly, professional advice is not limited or restricted to veterinarians. While it is acknowledged that veterinarians have a vital role in sheep and beef cattle farming, the role of other farm consultants, scientists, and professionals is also regarded as important.

21. Selection and Breeding

(a) *Should the code include breeding issues?*

Selection for increased production and/or production efficiency is one of the cornerstones of animal husbandry. However, increased production can also have undesirable consequences resulting in inappropriate behaviour, physiology and immunological function (Ott, 1996; Rauw et al 1998; Sandoe et al. 1999; Fisher & Webster, 2009) especially with more intensive livestock farming.

Undesirable consequences may be less evident in sheep and beef cattle farming, since selection for production has presumably been tempered by the relative importance of traits contributing to survival in extensive environments. However, there are some exceptions. Most notably, at least in Europe, the generally accepted association between heavily muscled ('double muscled') Belgian Blue beef cattle and difficult births (D'Silva & Stevenson, 1995; Tudge, 1997; Murray et al., 1999; Fiems et al., 2001; Webster, 2002). In one report as many as 90% of calves were born by elective caesarean section (Fiems et al., 2001). However, difficult births and elective caesarean sections are rare amongst New Zealand's small population of Belgian Blues. A combination of mating only mature or adult animals, rigorous selection for pelvic size in both cows and bulls, selection for structural correctness in the shoulder and front leg promoting ease of birth, and muscle growth on the loin and rump rather than the shoulder, along with a fitness for walking in extensive environments, have meant the risk and incidence of dystocia is markedly lower.

About 25% of yearling beef heifers are put to the bull in New Zealand. Heifers calving as two-year olds have an increased incidence of dystocia (the foetus is too large relative to the size of the heifer's pelvis) compared to mature cows, and poor rebreeding performance (Hickson et al. 2006). However, respondents to a survey about breeding heifers indicated that dystocia was not a significant problem although there was variation amongst herds. Selection of bulls (e.g. for low calf birthweight and ease of calving) was the most common strategy for reducing the risk of dystocia (Hickson et al., 2008).

Selection for the birth of more lambs per ewe can have a deleterious affect on ewe and lamb survival amongst triplet litters (O'Connor et al., 1992; Nicoll et al., 1999; Dwyer et al., 2005; Muir et al., 2005; Everitt-Hincks & Dodds, 2008). This has seen the development of alternative rearing systems (e.g. Thomson & Muir, 2009) and research into limiting litters to twins (Amer & Bodin, 2006).

Given the clear potential for breeding and selection to compromise animal welfare, unless appropriate husbandry and resources are provided, NAWAC has made a number of recommendations pertaining to selection policies, monitoring of consequences, and management of risks. Most significantly, it is recommended that where selection programmes unreasonably compromise animal welfare they should not be pursued.

(b) *Should libido testing be allowed?*

Reproductive success of a herd, or flock, depends on a range of factors, including the courtship behaviour, libido, mating ability, sperm production and semen quality of the male. In beef cattle systems, particularly the physical attributes of the bull are used as an indicator of breeding soundness – lameness, small testes, or physical defects of the penis, and semen quality can compromise farm productivity in systems where individual bulls mate a varied and often large number of cows. Several New Zealand studies have indicated that as many as a quarter of bulls have structural defects, penile injuries, sperm abnormalities or an unwillingness to serve making them reproductively unsound or subfertile (see Parkinson and Bruère, 2007). Poorly performing bulls were best detected by an assessment of structural and physical defects and a serving ability test where the bull is assessed while serving, or attempting to serve a, usually restrained and sedated "mount cow." It is the welfare of the cows which is of most concern. This component of the breeding soundness test has apparently evolved from the service capacity test designed to discriminate between bulls with superior and medium libido. That test required identifying bulls that mate often within a defined period. It was based on the finding that, for example, heifers mated to high serving capacity bulls (9-10 services) conceived earlier in the breeding season compared with those mated to medium serving capacity bulls (2-3 services) although pregnancy rates at the end of mating were similar (Blockey, 1978). However, the value of identifying bulls with high libido or serving capacity (as opposed to those with injuries or defects) is somewhat equivocal (see Jerebine et al., 2002). Consequently, the serving capacity test should not be confused with the serving or mating ability component of breeding soundness.

NAWAC notes that the veterinary guidelines (see Parkinson and Bruere, 2007) do not enable bulls with enhanced libido to be identified since the number of services is generally limited. (Note that a bull's willingness to serve is also measure of libido.) The Committee is confident the guidelines and veterinary care ensure that the welfare of the animals is acceptable given the benefits of identifying poorly performing animals. However, NAWAC encourages the beef cattle and veterinary industries to continue to further understand why bulls are, or become unsound, with a view to reduce the need for routine testing of serving ability. In response to submissions, Minimum Standard 8 and the Recommended Best Practice has been redrafted emphasising that it is the welfare of the mount animals which is of most importance, that they must be of an appropriate size for the bulls being tested, mildly sedated

before being restrained and adequately lubricated and the number of services should be minimised. Furthermore, mount animals showing signs of distress or trauma must be immediately withdrawn from testing and treated appropriately.

Of the other components for assessing reproductive soundness, semen evaluation requiring electro-ejaculation requires veterinary involvement (Minimum Standard 9a) but physical examination including scrotal palpation and measurement of scrotal circumference does not.

(c) *Is the code consistent with the research, testing and teaching requirements in the Animal Welfare Act?*

NAWAC gave consideration as to whether the selection and breeding testing described in Minimum Standard 8 were inconsistent with Part 6 of the Animal Welfare Act, The Use of Animals in Research, Testing and Teaching. However, Definition 5 (2b) under the Act excludes manipulations "for the purposes of assessing the characteristics of the animal with a view to maximising the productivity of the animal or any associated animal" provided it is in the immediate care of a veterinarian and that the veterinarian believes on reasonable grounds that the manipulation will not cause unreasonable or unnecessary pain or distress, or lasting harm. These criteria enable identifying resistant genotypes by exposing animals to the disease-causing organisms, and the serving ability component of reproductive soundness of bulls to be tested, since Minimum Standard 8 b and c require the tests to be conducted in the immediate care of a veterinarian.

NAWAC is of the opinion that such tests of susceptibility to, for example, facial eczema and footrot, while manipulations, are part of routine good practice in sheep farming enabling the characteristics of animals of a type to be assessed for genetic selection within the context of local farms and environments. The Committee also encourages the veterinary and farming industries to develop good practical guidelines which would, where possible, encapsulate the principles of Part 6 of the Act.

22. Reproductive technologies

(a) *What are the welfare implications of reproductive technologies?*

Several technologies are being used and others are being developed for possible wider use, within the sheep and beef cattle industries to facilitate genetic gains and better manage animals. They range from semen collection, and artificial insemination and embryo transfer to increasing ovulation rates and litter sizes, to pregnancy diagnosis, and altered seasonal breeding. The animal welfare implications include: (1) any additional mustering and yarding and time off feed and water; (2) the direct effects of the procedure itself e.g. discomfort or pain associated with lapascopic insemination; (3) the effects of the outcome of the procedure for the animal e.g. ewes delivering and raising triplets instead of twins; and (4) indirect effects arising from altered farm management requirements e.g. the provision of extra shelter and feed for out-of-

season breeding. The animal welfare implications of many such technologies have been much discussed (e.g. Murray & Ward, 1993; Farm Animal Welfare Council, 2004; Fisher, 2004; Stafford et al., 2006; MacArthur Clark et al., 2006; Stafford & Gregory, 2008) as have the implications of improved genetic gains and productivity (see Rauw et al., 1998; Fisher & Webster, 2009). Some technologies inevitably result in compromised welfare. For example, Stafford et al. (2006) described plasma cortisol concentrations associated with laparoscopy in ewes as being indicative of some distress, changes which could be alleviated with analgesia or sedation. In contrast, ultrasound scanning to determine litter size enabling the provision of appropriate nutrients has contributed to the better survival of ewes and lambs in hill sheep in Scotland (Waterhouse, 1996). There is also a range of developing technologies, especially molecular genetic tools (Blair & Garrick, 2007; Morris & Archer, 2007; Laible & Wells, 2007; Flint & Wooliams, 2008), many of which will presumably only require a blood or micro-tissue sample.

Given the potential to enhance and/or compromise the welfare of sheep and beef cattle, NAWAC has required that the most invasive procedures, electroejaculation and lapascopic artificial insemination, are undertaken by veterinarians or by trained and competent operators under veterinary supervision, with appropriate pain relief, sedation or anaesthesia. The less invasive cervical insemination and pregnancy diagnosis require trained and competent operators. NAWAC has also recommended that the feed and other requirements be assessed when techniques to enhance fecundity or alter the seasonal pattern of breeding are used. As part of its role, NAWAC also monitors the development of new technologies likely to influence animal welfare.

23. Artificial Rearing

(a) *Should more information on calf rearing be included?*

Dedicated low cost systems for artificial rearing of large numbers of dairy calves for beef farming systems have been developed in New Zealand over the last 10 years (Muir et al. 2000). As many as 540,000 calves are reared annually for the bull beef industry with some operators rearing up to 5000 calves a year. Many of these systems are characterized by once-a-day feeding of low volumes of concentrated milk and high volumes of supplementary feed from an early age. By consuming cereal-based feeds with the potential for fermentation, the calves' rumens rapidly develop enabling a better transition from milk to pasture. Without this development of the rumen, the animal is unable to ingest enough pasture for its nutritional requirements and consequently needs larger volumes of milk for a longer period. Housing facilities or sheds should have good drainage; clean and dry pens with fresh bedding (e.g. bark chips, sawdust) added regularly; a covered area; no draughts at calf level but adequate ventilation at a high level to prevent ammonia building up and pneumonia. At weaning on to pasture, the calves should have access shelter or ideally, the housing

shed, and, albeit reduced amounts of, supplementary feeds. The critical factors for good rearing and calf welfare are:

(1) adequate colostrum intake (up to half of dairy calves may ingest or absorb insufficient quantities (Vermunt et al. 1995; Wesselink et al. 1999, Ibrahim and Lemma 2009));

(2) providing good milk powder (that which will curd in the abomasum and be released slowly into the small intestine thereby reducing the risk of bacteria proliferating and disease occurring);

(3) when milk is restricted, clean or fresh water and supplementary feed must have been provided from an early age; and

(4) maintaining good hygiene, housing and shelter.

Calf rearing for the beef industry is inextricably linked to the dairy industry. Ensuring calves have absorbed adequate colostrum is one of the critical factors for their health, welfare and even subsequent productivity (DeNise et al. 1989; Deaker et al. 2001; Muir et al., 2006). Consequently, practices on the farm of origin (i.e. the dairy farm) are crucial to the performance and welfare of the animal on the rearing farm (i.e. beef). NAWAC encourages the dairy and beef industries to maintain good practices.

No widely accepted system has yet been developed for similarly rearing lambs but the general principles of calf rearing (e.g. importance of colostrum, good milk substitute and supplementary feed, good hygiene, shelter and housing) are thought to apply (Munro 2006).

NAWAC is of the opinion that it has adequately addressed artificial rearing in the Code. The Committee also notes that the industry has a comprehensive extension role in assisting with calf rearing via newsletters, national seminars and guidelines.

24. Feedlots

(a) *Should more information on housing and feedlot requirements be included?*

The nature of housing and the patterns of its use in New Zealand are unique. Sheep and cattle in our pasture-based systems spend much of their lives outdoors and even where provision is made to bring animals off pasture for periods of time onto feeding pads or into housing facilities, their use tends to be intermittent and largely in response to wet weather conditions which can occur at all times of the year. The amount of time spent lying down resting by sheep and cattle makes a significant contribution to their comfort and welfare (Fisher et al 1997). NAWAC believes that setting minimum standards with a requirement for animals to be able to lie down and rest comfortably provides a standard that best meets the welfare needs of the animals in any housing/management system.

While the Code was drafted using international guidelines on feedlotting as a guide (e.g. *Feedlotting lambs. A Producers Guide,* CSIRO Publishing), NAWAC also sought additional comment from experienced individuals within this country.

NAWAC believes the standards and guidance given in both the feedlots and housing sections of the code also address the welfare needs of sheep and beef cattle if they were to be housed long-term.

25. Humane destruction

(a) *Should more information on 'how to' be included in the Code?*

NAWAC considered humane destruction a critical welfare issue that must be addressed carefully. It was agreed that this section would be amended to apply to all humane destruction, not just in emergencies and to include minimum standards, recommended best practices and substantial general information within the code, rather than just a reference to other sources of information.

The Minimum Standard enforces that killing should be effective and humane, with all staff trained in appropriate techniques. NAWAC also considered it important to encourage all farmers to own a captive bolt device, which would increase the use of this preferred technique. The availability of these devices has previously been limited. A commercial source of a device that is suitable for euthanasing an adult beef cow has recently become available for a reasonable price. These devices are safer for the operator, and more humane in terms of the nature of the stun delivered and because their use is less prone to errors in their operation which could increase animal suffering. Farmers who have used these devices have noted that they much prefer this method than what they have previously used and expressed a wish that they had had them available earlier. NAWAC notes, however, that such devices would not necessarily always be available given that emergency humane destruction, by its very nature, is sometimes required at locations or at times when devices are not immediately available.

Other issues considered by NAWAC

26. NAWAC has considered how the Code aligns with other relevant codes and regulations both in New Zealand and internationally. NAWAC is not aware of any examples where the Code deviates significantly from these documents.

The nature of any significant differences

27. All significant differences of opinion about the Code, or any of its provisions, have been set out above or in NAWAC's response to submissions.

Dr John Hellström
Chairman, National Animal Welfare Advisory Committee
29 March 2010

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