ANIMAL WELFARE (LAYER HENS) CODE OF WELFARE REPORT

Introduction

1. The Animal Welfare (Layer Hens) Code of Welfare 2005 has been reviewed by the National Animal Welfare Advisory Committee (NAWAC), pursuant to the Animal Welfare Act 1999 (the Act). This report accompanies the draft Animal Welfare (Layer Hens) Code of Welfare 2012 (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 persons responsible for the welfare of layer hens in all types of management systems regardless of the reasons for which they are kept. When the Animal Welfare (Layer Hens) Code of Welfare was released in 2005 (MAF, 2005), NAWAC indicated that it expected to review the code in 2009. The specific issue for review was

the use of cages. In 2005, NAWAC said it would ideally like cages to be eventually phased out but was unable to recommend replacement with alternative systems until it could be shown that, in comparison to cage systems and in the context of supplying New Zealand's ongoing egg consumption needs, they would consistently provide better welfare outcomes for birds and be economically viable.

5. The Animal Welfare (Layer Hens) Code of Welfare Amendment came into force on 7 September 2007. The purpose of this minor amendment, following a review by the Regulations Review Committee, was to clarify the definition of "cages" in the code.
6. NAWAC has reviewed the world's scientific literature so that it is fully aware of the latest research and developments in layer hen systems, both from New Zealand and internationally. 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.

Code preparation and public submissions

7. The Act allows for the review of a code of welfare by NAWAC. In addition, as required by the Act, representatives (including farmers, veterinarians and welfare organisations) of those likely to be affected by the Code were consulted during the review and before public notification.
8. NAWAC wishes to point out that it 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 predetermined manner.
9. The Code was publicly notified on 8 February 2011 by notices in the major newspapers in Auckland, Wellington, Christchurch, and Dunedin. In addition, it was sent to specific interested individuals and groups. The closing date for submissions was 29 April 2011.
10. A total of 210 full submissions were received during the public consultation period. In addition 22,681 SAFE postcards, 10,911 SAFE e-cards and 66 SAFE standard letters, 745 Green Party E-cards, 110 SPCA form letter emails, 144 letters from the Kapiti Animal Welfare Society and 1276 signatures were received in a petition from Change.org. All submissions were read in their entirety and taken into account. A summary of the submissions received on the draft Code was prepared and NAWAC's responses to the submissions were noted.
11. 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 two full day meetings in July and August. Throughout the period the Code was under review, subcommittee members worked in collaboration by phone, email, and in consultation with MAF Animal Welfare Directorate staff.
12. The membership of the subcommittee also visited a number of different egg production operations and consulted with the industry (EPF). The subcommittee reported the Code back to NAWAC on 28 October 2011 and on 8 February 2012 for final consideration and

approval for recommendation to the Minister. A further recommendation from the subcommittee regarding transition times was considered by NAWAC on 16 May 2012.

13. The Code was peer reviewed by Dr Claire Weeks, an international layer hen welfare expert.

The New Zealand Egg Industry

14. The New Zealand egg industry currently has 150 producers with a total of 3.3 million birds producing 1 billion eggs in 2010 (EPF, 2012). Over 85 percent of eggs are sold as table eggs within the domestic market, with the remainder used in the baking and catering industries. Retail sales of eggs are worth upwards of $200 million.

15. Total egg production has slowly increased over the past decade, with an increase in per capita consumption also, now around 230 eggs per person annually. Egg consumption in New Zealand is high by international standards. Eggs are seen as an important part of New Zealanders' diets, particularly in lower income families, as they are a relatively cheap source of high-quality protein.

16. Intensive, indoor cage production is a major part of egg production in New Zealand and, as at April 2011, 88% of layer hens were currently kept in cages, with 12% kept in alternative systems, barn or free range systems. New Zealand currently has around 150 commercial egg producers, with the largest 20 producers accounting for over 75% of total production.

17. New Zealand maintains a high avian health status with most of the major avian diseases being absent. New Zealand therefore has strict biosecurity controls with regard to importation of poultry and poultry products and is self sufficient with regard to egg production and no table eggs are currently imported.

18. The New Zealand egg industry has a small, but growing, export base. At present, significant numbers of live day old chicks and fertile hatching eggs are exported to the Pacific and Oceania regions. New Zealand also exports a small number of table eggs and egg products, mainly to the Pacific Islands. In the year ending December 2010, over 927 metric tonnes of table eggs and egg products were exported, valued at more than $4.2 million.

Key Issues

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

    - Scope of the Code

      How does this code balance physical, health and behavioural needs?

      Why is the term 'free range' not used within the code?

    - Shade and Shelter

      What measures can be taken to encourage hens to use the range?

- Housing
  What are the available systems for housing laying hens in New Zealand?
  What systems are other countries using to house their laying hens?
- Lighting
  What is the appropriate lighting intensity for layer hens?
- Ventilation
  What levels of ammonia build-up are acceptable?
- Behaviour
  What are the normal patterns of behaviour for a laying hen?
  What is the importance of dustbathing to the laying hen?
- Transitioning from Cage Systems
  Why are cages being phased out?
  What would be the economic effects of phasing out cages?
  Does housing hens in colony cages meet the requirements of the Act?
  What is the welfare of the birds like in non-cage systems?
  What can be done to improve the welfare of hens when moving away from cage systems?
- Depopulation
  Should there be stricter standards for handling laying hens at depopulation?
- Induced Moulting
  Why are the requirements for performing induced moulting not outlined in the code?
- Beak Tipping
  Why is beak tipping carried out on a routine basis on layer hens?

20. **Scope of the Code**

(a) ***How does this code balance physical, health and behavioural needs?***

While the Animal Welfare Act does not provide for trade-offs between the physical, health and behavioural needs as defined in s4 of the Act, it qualifies needs by referring to a case-by-case application according to the species, environment and circumstances of the animal. NAWAC acknowledges that, in general, balancing between the needs of animals is inevitable in order to arrive at an overall optimum welfare outcome because the requirements to satisfy each need may be in conflict.

Layer hens will have each of their physical, health and behavioural “needs” met to different extents depending on the system that they are housed in. Each commercial egg-producing system has its own inherent advantages and disadvantages. Hens housed in cage systems are kept in a finely controlled environment, with the aim of controlling many aspects of their health. However, in achieving this controlled environment, the hen’s behavioural needs are restricted. Conversely, hens housed in barns, with or without outdoor access, are able to express an increased range of behaviours, but are exposed to greater risks to their health because their environment is harder to manage effectively.

Each commercial egg-producing system has different welfare benefits and risks to the hens, be they health, physical or behavioural. The code provides NAWAC's view as to what constitutes the acceptable range of "needs" in the environment and circumstances of layer hens.

(b) ***Why is the term 'free range' not used within the code?***

'Free range' is a commonly used term in the egg production industry to indicate a housing system where the birds have access to an outdoor area. However, what the term 'free range' actually depicts in an egg production system is poorly defined. A number of submissions were received regarding the definition of 'free range', and what this term indicated about the size of the outdoor area, the stocking density of the hens in the outdoor area, the number of hours a day (or days a year) that the birds were able to access this area, and the willingness of birds to access the outdoor area on any given day (as a result of the management systems, the condition of the range, fear of predators etc). All of these aspects vary considerably between systems.

Free range eggs tend to market at a higher value than barn eggs, but as outlined above, if the range is not utilised for any reason, then the hens are, for all intents and purposes, existing as barn hens. There was some concern expressed in the public submissions that hens kept in conditions that did not allow access to the outdoor for sufficient time for whatever reason, should not be allowed to be classed as 'free range' eggs for marketing purposes. Some submitters were concerned about increased competition and considered that this may damage their own reputation as free range egg producers. In addition to the issues associated with the commercial use of this term, this code also applies to the large number of backyard hen houses with a small number of hens, resulting in additional complexity to the use of the term 'free range' in any given situation.

For these reasons, NAWAC considers that it is not appropriate to state a definition of 'free range' for this code and will refer simply to these systems as barns with outdoor access. This of course, does not preclude the industry from using the term when marketing its products.

21. **Shade and Shelter**

(a) ***What measures can be taken to encourage hens to use the range?***

Hens accessing outdoor areas can be at risk of predation. As a result, birds are often reluctant to make full use of the range; many hens choose not to access the outdoor areas, and those that do tend to remain close to the house (Bright et al., 2011). The addition of diverse overhead cover (e.g. trees, covered sand baths, fallen branches) that provide shade and protection from avian predators will encourage hens to use more of the range. This in turn will decrease the amount of surface damage to the ground directly in front of the hen house.

NAWAC has therefore added a minimum standard that chickens must be provided with shelter in order to avoid predation, and has also added a recommended best practice stating that shade and shelter should be provided in outdoor areas to encourage the hens to make full use of the range.

22. **Housing**

(a) ***What are the available systems for housing laying hens in New Zealand?***

Cages

Cage systems (also known as conventional or battery cages) have been used extensively in the NZ egg production industry over the past 50 years as they have been shown to have a high production yield, produce eggs of good quality and there is good repeatability between batches. In addition, hens have a good level of physical health in cage systems; hygiene is good, parasitic pressure is minimal and cannibalism is infrequent due to the stable social order provided by having a small group of birds. Climate, dust and ammonia levels are easy to control and mortality levels and the need for medical treatment are low (EC, 2004c; MAF, 2011a).

However, cages severely restrict the bird's ability to perform most of their normal behaviours. As a result of this, some countries are in the process of phasing out cages via legislative requirements and requiring other systems for housing hens.

Colony Cages

Colony cages (also known as 'furnished' or 'enriched' cages) house between 20 and 90 birds (typically 40-60 birds) and contain 'furnishings' consisting of a secluded nest area, perches, claw shortening devices, and an area that allows for scratching, foraging and dustbathing.

Colony cages also improve the hens' opportunity to exercise, thereby strengthening the bones (Abrahamsson et al., 1996). Layer hens housed in colony cages are provided with more space per bird than in the conventional cage, which has a positive effect on bone strength (Abrahamsson et al., 1996; Tauson, 2005), and the addition of perches to the cage further improve bone strength as the hens use their wings to ascend onto the perches (Tauson, 1984; Abrahamsson and Tauson, 1993).

The furnishings contained within the colony cages are intended to enable the birds to express a range of behaviours considered most important to the birds. Colony cages therefore attempt to combine the benefits of the cage system by maintaining the levels of hygiene and productivity (Appleby, 1993) with the behavioural freedoms afforded by non-cage systems.

From a commercial perspective most colony cages have been shown to provide similar production and feed conversion results to cages (Abrahamsson et al., 1995; Guesdon and Faure, 2004), and mortality rates are also found to be similar (Tauson, 2005). A study performed to assess the health, welfare and productivity of layer hens housed in colony cages in New Zealand (MAF, 2011a) found similar results. Egg production and feed conversion were marginally better in cages than colony cages, but bird mortality was lower so the total egg output was similar in both systems. The lower number of birds held in each colony cage has also been shown to minimise the levels of injurious pecking and there was less feather loss in birds in colony cages when compared with those being kept in barns with or without access outdoors.

Non-Cage Systems (Alternative Systems)

Non-cage systems have a large open ground floor area that is fully or partially covered with litter as well as separate nest boxes and perches. Some systems allow the birds access to the outside via pop holes and may also have a 'winter garden' (a covered area attached to the main barn, which has substrate on the floor and provides a transition area, protected from predators and weather, between the barn and outdoors). The birds are free to move around the floor area as they wish, are able to perform perching, roosting, foraging and dustbathing behaviour, and have a secluded place to lay their eggs. They are also able to perform other normal behaviours such as stretching and wing flapping more easily than in cages.

However, non-cage systems (both those with and without outdoor access) are associated with higher indoor levels of ammonia and dust and disease than cage systems. There is also a greater risk of smothering and outbreaks of injurious pecking than in cage systems, which, if left uncontrolled, can be hugely detrimental to birds welfare (Richards et al., 2012). Maintenance of the range in systems with access to the outdoors requires careful management, especially in wetter weather. Non-cage systems have advantages in terms of the bird's ability to express normal behaviour, but the risks to the bird's health in these systems are higher. Excellent stockmanship skills are required to maintain all birds' welfare at a satisfactory level in non-cage systems.

Other Systems

Other systems with varying designs have been developed for example, aviaries and percheries. Aviaries and percheries are generally similar to barn systems (i.e. a shed in which hens are housed on the floor and typically have access to litter and nest boxes), with the addition of multi-tiered platforms or perches. The platforms and perches allow birds to use more of the available space in the barn and help build up bone strength via the use of the perches. However, birds housed in these systems are not only subject to the same risks as birds housed in other barn systems but have an increased risk of keel damage. The incidence of keel fractures in laying hens is significant in all systems (Wilkins et al., 2011) but aviaries and percheries have been shown to have a particularly high rate of keel damage as a result of misjudged landings on the perches and midair 'clashes' with other birds.

Other laying hen housing systems have recently been developed, for instance, the roundel and plantation systems, which were developed in the Netherlands. The roundel system is based on a circular house design that provides the hens access to indoor and outdoor 'segments' according to their requirements, whereas the plantation system is based on an oval design. Both of these systems aim to provide the hens with a safe, clean environment whilst also providing them with the ability to express their behavioural needs and experience a natural outdoor environment. Although the hens have access to an outdoor environment, systems are also are in place to prevent the hens from being exposed to extreme cold or rain or predators and disease. These systems are in use in the Netherlands, but are not yet used commercially in other countries.

(b) ***What systems are other countries using to house their laying hens?***

Directive 1999/74/EC required that conventional cages be prohibited throughout the European Union (EU) from 1 January 2012, leaving the option for producers to convert to furnished cages or alternative non-cage systems only. Switzerland, Sweden, Austria and Germany have exceeded the EU requirements in their national legislation and ceased using conventional cages in 1992, 2002, 2008 and 2009 respectively. Switzerland has gone one step further and banned all cages, including furnished cages in 1992. Austria is also anticipated to ban furnished cages by 2020.

In Australia, all new cages from 1 January 2001 had to provide a minimum floor area of 550 cm^2 per hen and any existing cages which comply with the 1995 standards (which includes a minimum space allowance of 450 cm^2) are to have an economic operative life of 20 years (i.e. to 2020). All other cage systems must be scrapped by 1 January 2008, unless modified to comply with the above requirements.

A voluntary agreement between the Humane Society of the United States (HSUS) and the United Egg Producers (UEP) in 2011 has been enacted to make changes to federal legislation in the United States. The new legislation will make compulsory the phasing in of colony cages to replace the cage system in the US over a 15-18 year time period from the date of the agreement. The legislation will also prohibit induced moulting using the method of food or water withdrawal, will set maximum ammonia levels within hen houses and will require specific standards to be utilized during euthanasia of egg-laying hens.

Although Canada has guidelines protecting its laying hens in a code of practice (CARC, 2003) at the present time the large majority of laying hens are housed in cages. The guidelines, however, are currently undergoing review.

23. **Lighting**

(a) ***What is the appropriate lighting intensity for layer hens?***

Public submissions outlined concerns over the number of hours and level of light that hens received in different housing systems. Some submissions also stated that lighting needed to be of a level of brightness that enabled hens to see their surroundings.

The visual system of a hen is more extensive than that of a human and hens use ultraviolet lighting to assist in identifying conspecifics (Prescott and Wathes, 1999). Low light intensity and the use of red lighting are commonly used in the egg production industry to reduce the incidence of injurious pecking, as it has been shown that low light levels reduce the amount of severe injurious pecking in flocks of birds (Kjaer and Vestergaard, 1999). However, low light levels may also impair welfare by restricting the movement of hens and preventing them from performing some behaviours that they would be performed in brighter conditions. Dim lighting has been shown to inhibit a hen's willingness to jump between perches and also to increase the number of vocalisations emitted prior to jumping (Taylor et al., 2003), suggesting that they find jumping between perches in low light conditions unnerving.

Prescott et al. (2003) summarised the differences in visual abilities between chickens and humans and concluded that the unit commonly used to measure luminance (brightness) in

poultry houses, the lux, is inappropriate. However, due to the lack of scientific information in this area, interim lighting parameters to safeguard the welfare of housed poultry have been established. NAWAC has therefore decided to include a minimum standard stating that the lighting levels during the light phase must be of an intensity of no less than 20 lux. NAWAC has also included a recommended best practice that light levels should be no less than 50 lux, which is consistent with the lighting level recommended for other poultry, in the Animal Welfare (Meat Chickens) Code of Welfare (MPI, 2012).

24. **Ventilation**

(a) ***What levels of ammonia build-up are acceptable?***

Most submissions agreed with the inclusion of a minimum standard stating that ventilation must be sufficient to prevent ammonia rising to levels that would cause hens discomfort. Some submissions asked that the maximum level of ammonia allowed be less than 25ppm.

Ammonia is a recognised air pollutant in poultry houses and exposure to high concentrations can lead to pathological conditions (Kristensen and Wathes, 2000). Ammonia levels of 25ppm have been shown to cause damaging effects on the respiratory tract of poultry (Nimmermark et al., 2009) and eye abnormalities (Miles et al., 2006). Some research investigating avoidance behaviour of poultry in response to varying concentrations of ammonia has suggested that birds find environments with levels above 10ppm aversive (Jones et al., 2005).

NAWAC has therefore decided to reduce the maximum permitted ammonia levels to 20ppm. This is in line with international guidelines for poultry (EC, 2007 and DEFRA, 2000). NAWAC has also recommended a best practice concentration of 10ppm to take into consideration avoidance behaviour of poultry in response to higher levels of ammonia.

25. **Behavioural needs**

(a) ***What are the normal patterns of behaviour for a laying hen?***

Public submissions conveyed a concern that birds were not able to express their normal patterns of behaviour in cage and colony systems and that, in particular, they were not able to perform nesting or dustbathing behaviour due to the lack of space and litter material in these systems. Submissions argued that this demonstrated that neither system met the requirements of the Animal Welfare Act and that colony cages offered the birds no better standard of welfare than cage systems.

Domesticated hens show much of the behaviour exhibited by their wild ancestors, jungle fowl. Some behaviours have been largely bred out of them during the domestication process and other behaviours are exhibited at a lower intensity (e.g. broodiness), but much of the behavioural repertoire between them is very similar (Duncan, 1998).

However, not all the behaviours that laying hens could choose to perform are essential to their well-being. If hens are prevented from being able to meet their behavioural needs, a state of frustration and reduced welfare in the hen can occur (Duncan, 1998).

Behaviours considered important for laying hens are feeding, drinking, perching, sleeping, preening, dustbathing, ground pecking, wing flapping, scratching, nesting, head shaking, tail wagging, feather ruffling, beak wiping, unilateral wing-leg stretching and avoiding predators (although the husbandry system used should be designed so that hens do not need to perform this latter behaviour) (Duncan, 1998; Weeks and Nicol, 2006).

Other behaviours, including extensive locomotion and exploration, sexual behaviour and brooding (when it occurs), are considered non-essential for a bird's welfare and the birds will not experience reduced welfare if prevented from performing these behaviours as a result of the housing system in which they exist (Duncan, 1998).

There are many behaviours which the majority of domestic hens cannot express while being housed in any commercial egg producing system, be that cage, barn or barn with outdoor access. These behaviours include sexual courtship behaviour, brooding and chick rearing. Other natural behaviours of hens can be performed in some systems, but are restricted in others. These include wing stretch and flap, stretching their body to full height, flying, sunbathing and dustbathing in substrate. Some natural behaviours are unwanted in any system, and include flee behaviours in response to predators, shivering in response to extreme cold or distressed panting as a result of high environmental temperatures. The Act reflects this in the definition of the physical, health and behavioural needs that must be provided for an animal in order to meet the requirements of the Act. Section 4 states that the need (which must be provided for the animal), in each case, is appropriate to the species, environment and circumstances of the animal.

It is not, therefore, essential that every hen is able to display all normal patterns of behaviour in every system. In fact, many birds choose not to express the behaviours that they have been given the opportunity to express (e.g. some birds do not exit the barn to walk on the range or roost in branches of trees, even if provided with the opportunity to do so).

In every commercial system, the benefits of providing an environment in which the birds can perform their normal behaviours has to be assessed against the associated costs and likely affects on the bird's productivity, health and well-being. The role of NAWAC is to ensure that this balance is acceptable in terms of the welfare of the hen in each system.

As a result of the lack of space and facilities, cages effectively deny most of the behavioural needs of hens. NAWAC therefore considers that cages do not meet the requirements of the Act.

However, although neither colony systems nor barn systems (with or without outdoor access), allow the birds to display their full repertoire of behaviours, NAWAC considers that they meet the requirements of the Act.

(b) ***What is the importance of dustbathing to the laying hen?***

A large number of public submissions stated concern over the ability of birds to perform dustbathing behaviour in each of the housing systems, and in colony systems in particular. Dustbathing behaviour is performed to remove excessive gland lipids, maintain plumage condition (Olsson et al., 2002) and dislodge parasites (Weeks and Nicol, 2006) and is considered to be an important behaviour for laying hens (EFSA, 2004). Studies have shown that hens give it a lower priority than other behavioural needs such as nesting and

perching (Weeks and Nicol, 2006) and, under unrestricted conditions, do not all perform this behaviour every day (Olsson et al., 2002). Peripheral factors, emanating from the feathers (including parasites), seem to be unimportant in the hens motivation to dustbathe as even featherless chickens will perform this behaviour (Vestergaard et al., 1999).

Hens have also been shown to exhibit dustbathing behaviour in the absence of a suitable substrate; this is called sham dustbathing. Sham dustbathing has been found to contain all the behavioural components of normal dustbathing, although not always at the same frequencies (Lindberg and Nicol, 1997; Merrill et al., 2006).

The relationship between substrate and dustbathing behaviour is not simple. If provided with an allotted littered area containing substrate in colony cages, hens will perform dustbathing activities in this allotted area (McLean et al., 1986), but will also perform sham dustbathing behaviour on the wire floor of the cage (Lindberg and Nicol, 1997; Olsson et al., 2002). The reasons for why they do this are not clear. However, sham dustbathing is not due to social competition for access to the dustbath (Olsson and Keeling, 2002), nor is it a socially facilitated action in response to the visual stimuli of another bird dustbathing in litter (Olsson et al., 2002). Some authors have suggested that the material provided in colony cages is not adequate or is of the wrong type, although many birds will continue to dustbathe on material that they are familiar with even when presented with an apparently more 'suitable' materials (Vestergaard and Lisborg, 1993). Other authors have suggested that sham dustbathing may be a habit (Olsson et al., 2002), or that the mere presence of some type of loose material, such as that the foraging material that is provided in colony cages, may satisfy the birds need to dustbathe in substrate (Lindberg and Nicol, 1997). In addition, rearing experience has also been shown to influence the dustbathing behaviour of hens (Wall, 2003; Weeks and Nicol, 2006) and the use of the litter has been found to vary considerably between individual birds, with some individuals never using the dustbath (Olsson et al., 2002).

Debate around the ability of sham dustbathing to satisfy a birds' motivation to dustbathe is ongoing. At the present time, due to the lack of conclusive scientific evidence, it is difficult to reach a conclusion on how important litter is to enable dustbathing in hens. Certainly, the presence of foraging material, which is provided within the scratching area of colony cages on a daily basis, enables the hens to perform dustbathing behaviour in this system. As a result, NAWAC considers that the presence of a scratching area in colony cages is sufficient for hens to perform dustbathing behaviour and that colony cages therefore meet the birds behavioural need to exhibit this behaviour.

In non-cage systems, the provision of adequate litter material in which birds are able to perform their full range of dustbathing related behaviour is a simpler task. NAWAC therefore considers that hens housed in non-cage systems need to be provided with daily access to litter and has added a minimum standard to reflect this.

26. **Transitioning away from Cage Systems**

(a) ***Why are cages being phased out?***

In the 1930s and 1940s, keeping birds on floor systems was a normal way of producing eggs. It was then discovered that problems with endo-parasites were reduced when birds were lifted into cages, away from litter and manure. Farmers were also able to stock birds

at higher densities in the new cage systems. The use of the conventional cage flourished as the industry developed. However, since the early 1980s, the welfare of the birds in these barren cages began to be questioned and people started to consider the welfare advantages of moving away from the cage system again. Societal concern for hens housed in cages was reflected in the public submissions received during consultation on this code of welfare, a large number of which requested banning these cages due to the behavioural limitations that they imposed on the hens. There was also a general societal concern that cages did not meet the requirements of the Act.

Upon the issue of the 2005 code of welfare for laying hens, NAWAC stated that they would ideally like cages to eventually be phased out, primarily because of the barren environment that they offered. However, at that time, NAWAC was not confident that the other systems available in New Zealand offered realistic alternative management systems for the large number of hens housed in cages. Since then, much research has been conducted in New Zealand and overseas, and alternative systems, including colony cages, developed.

The cage system is widely criticised for the negative effects on the welfare of the hens (Baxter, 1994) and the fact that it provides a barren environment with very limited possibility for the birds to move or perform their normal behaviours. Cages do not allow birds to fulfil their normal patterns of behaviour. In addition, the spatial restriction imposed on the hens in this type of system provides them with only very limited opportunity to move and prevents the birds from performing adequate exercise which has a negative effect on bone strength and density, resulting in breakage of parts of the skeleton (Vits et al., 2005). Many studies have shown that hens housed in cages possess a lower bone breaking strength than those housed in systems in which they are able to perform more exercise (Knowles and Broom, 1990; Fleming et al., 1994).

Cages do however provide some clear advantages in terms of maintenance of animal health and management practices required. They have low production costs, high production yields, good egg quality and good repeatability between batches. Hens sustain a good level of physical health in conventional systems, as cannibalism is uncommon due to stable social order in a small group of birds and ‘serial pecking’ is less common as these birds do not have access to a large number of other hens. Hygiene is good in cage systems, dust and ammonia levels are easy to control and birds usually show no evidence of parasitism. As a result, the level of medical treatment required for hens in cage systems is low, as is mortality (EC, 2004c).

NAWAC believes that the disadvantages that are intrinsic to the use of cages outweigh the positive aspects of these cages. Moreover, the disadvantages that are imposed on the hens in cages are imposed on every single hen for the entire duration of the laying period. There are advantages and disadvantages in terms of welfare in each different commercial laying hen system but the disadvantages of other systems are much less certain and are unlikely to affect every individual to a similar degree than the constraint placed on the birds in the cage system.

As more research has been performed since the issue of the 2005 code, additional information is now available on how to maintain the welfare of birds in other housing systems to provide good levels of hygiene, similar levels of management and egg output.

As this is the case, NAWAC believes that the use of cages should now be phased out and has proposed a stepwise transition period to encourage producers to move away from the use of cages by 1 January 2022.

(b) ***What would be the economic effects of phasing out cages?***

Over the past few decades, the relative price of eggs has fallen dramatically in New Zealand. This has been made possible, at least in part, by increasingly intensive agricultural practices. The cost of eliminating cages in New Zealand will require substantial capital investment from producers which will increase the cost of egg production. Eggs are an important source of protein with few ideal substitutes and they constitute a small proportion of the overall food budget for most consumers. Their demand in New Zealand is therefore likely to be relatively inelastic. The EPF commissioned Nimmo-Bell to examine the impacts on the egg producing industry of a ban on cages. MAF also performed its own economic analysis to assess the impacts of this ban. These analyses assumed that producers currently using cages would switch to colony cages.

Transitioning from cages to alternative systems, including colony cages, requires significant investment in new infrastructure. To accommodate the larger colony cages, farmers may build new sheds, renovate existing ones or decrease the number of birds they farm. If the cages need to be replaced with colony cages prior to the end of their useful life, the cost to the producer increases significantly as the producer is effectively incurring capital expenditure earlier than he/she would otherwise need to. The significant costs to the farmer are therefore two-fold: 1. there is an additional capital cost of colony cages, including additional shed space and 2. in many cases there will be a cost of replacing existing cages before the end of their useful life. The estimated annual increase in costs, in the long term, would be between 10 – 14%. This increase is likely to be reflected in a corresponding increase in the cost of eggs to consumers.

Industry research, both in New Zealand and internationally, reveals that feed, labour and pullet (bird) costs are among the most significant variable costs for egg producers; housing also represents a significant expense. Non-cage housing systems attract higher expenses in all of these variables. Feed consumption is greater in non-cage systems to compensate for the greater movement of the birds and less effective climate control. In addition, labour use is higher in non-cage systems as a result of the additional labour required to gather the eggs from the nests and floor, to maintain the litter, inspect all the birds, and to compensate for the generally lower level of mechanisation. Hen mortality is also higher in non-cage systems, which also contributes to higher pullet costs per unit of output. Finally, marketable egg production is lower when cages are not used because total egg production is slightly lower and eggs laid on the floor or the ground (which can be as high as 15% in poorly managed farms) must be downgraded. Non-cage operations generally require less capital investment than cage farms, however, due to the lower stocking rates in non-cage systems, the cost per bird is higher in non-cage systems. In addition, as the birds have greater space requirements in non-cage systems, these systems usually require a greater amount of land to be purchased.

An industry wide move to barn housing without outdoor access has been estimated to increase farm level prices for eggs by 23 – 56%, and the actual price is likely to be toward

the higher end of this range. This, in turn, will have an impact on the retail price of eggs and thus, on those households in New Zealand that consume eggs. It is anticipated that this would translate to an increase in the retail price of eggs of between 18 - 45%. An industry move to barn systems with outdoor access would be even more expensive, with an estimated increase in the retail price of eggs of between 37.6 – 56%.

Both economic analyses suggest that the total cost of moving away from cages will be affected by a variety of assumptions such as the timing of the ban, the impact of the transition on the price of eggs, and the resulting industry structure. The total cost for transitioning earlier is increased, partly because it involves producers disposing of the cages which still have a useful economic life and partly because the cost of the new equipment begins accruing sooner.

Many of the public submissions stated that they wished to see cages phased out, and a range of suggestions for the time period over which this should occur were noted. These suggestions ranged from those wishing to see cages banned immediately, to suggestions that a 30 year phase out period was required for the change. The EPF stated that it required 18 years to transition away from cage systems to allow for full depreciation of existing systems and to enable farmers to generate sufficient finance to change to different housing systems for their hens.

There was extensive discussion within NAWAC about the time required to phase out the use of cage systems. The committee decided that a phase out period for cages is necessary in order to mitigate the chances of a critical supply shortage and subsequent price volatility that would be likely to accompany a shorter time-line with no managed transition. The ten year phase out period outlined in the Code reflects a desire to balance the welfare of the hens with practicality and feasibility for the producers and affordability of eggs to all consumer groups. The code therefore outlines a stepwise transition to the prohibition of birds in cage systems. At the date of issue of the code, no further cages can be installed for housing layer hens, as they don’t meet the standard required to meet the behavioural needs of layer hens. Every two years from 1 January 2016, all cages older than 17 years must be phased out. From 1 January 2022, no hens are to be housed in cages.

A single requirement of a ban of cage systems in 10 years time would allow producers to retain the current cage systems and transition just prior to 1 January 2022. The stepwise transition proposed by NAWAC will allow the majority of producers to see a return on their investment and removes the oldest cages from production first. NAWAC also believes this step-wise transition has a net welfare benefit for layer hens in that it removes more birds from the oldest and least welfare-friendly cages sooner than would otherwise happen if only a single date was chosen.

These step-wise changes, in conjunction with the requirement from the existing Code for all birds to be housed at a density of not less than 550 sq cm per bird from 2014, will mean that famers will have to implement alternative housing systems steadily over a 10 year period rather than waiting 10 years to change or to leave the industry. NAWAC considered an alternative approach, to require a stepwise increase in space for birds in cages, but were concerned that this could have resulted in more birds being denied a better behavioural environment before the transition was completed.

(c) ***Does housing hens in colony cages meet the requirements of the Act?***

Public submissions related to the intensive farming of layer hens showed a deep public concern for the welfare of hens. The concern mainly centred around the lack of ability for hens to move and perceived 'cruelty' of the confinement of cages. There was concern that the manner that hens are kept in cages does not meet the requirements of the Animal Welfare Act and that keeping birds in cages did not allow them to express their behavioural needs. The public perception was that hen's welfare would be higher overall if they were given the ability to move around within the confines of a larger barn, or have access to an outdoor area, which would allow them greater behavioural freedom. For this reason, a large number of submissions asked for a phase out of all cage systems for birds.

There was a broad view among the submissions that New Zealanders would be willing to pay a higher price in the supermarket for animal welfare friendly eggs. This claim is contrary to that behaviour observed historically. Willingness to pay for animal friendly products varies significantly across consumer groups (Nocella et al., 2010; MAF, 2011b).

Documented disquiet with confined animal housing systems dates back to the 1960s. Among other things, the British Government's Brambell Commission recommended that animals have the freedom to 'stand up, lie down, turn around, groom themselves and stretch their limbs' - beliefs which evolved into the current Five Freedoms (see Webster, 1994), which in turn form the basis of the physical, health and behavioural needs defined in New Zealand's Animal Welfare Act 1999. Arguably, these beliefs are, over four decades later, still at the heart of contemporary discontent with confined housing. In general public opinion, the modern intensive hen production industry is considered inherently 'bad' because of lack of space, because the environment is barren, and because the system relies on technology. In contrast, outdoor housing is considered 'good' as it provides a more 'natural' environment and hens may have the option to perform a large number of behaviours over a relatively large area. The system is also less reliant on technology, and is considered to be less prone to negative outcomes due to technological breakdowns.

Because the advantages and disadvantages of housing systems are qualitatively different, there is no simple or objective way to rank systems for overall welfare (Rhodes et al., 2005). It is not possible, using science alone, to balance different attributes of housing systems and say, for example, how much freedom of movement is equal to how much freedom from injurious pecking.

There was concern expressed in the public submissions that the colony systems were simply another cage for housing birds. The concern centred around the fact that it was believed that the birds did not have sufficient space within the colony cage to perform their natural movements and behaviours or the furnishings were of a design that would not allow the birds to express their behavioural needs. The colony system for laying hens was developed, however, to attempt to balance the hens' requirements to express their behavioural needs whilst retaining the advantages of cages i.e. the ability to maintain close control of the environment that the hens lived in. They are therefore designed to combine the benefits of the cage system whilst reducing the disadvantages of cages and non-cage systems. Colony cage systems built with furnishings according to the requirements as outlined in the minimum standards in the code will enable the birds to

perform a range of their normal behaviours including nesting, perching, scratching, ground pecking, and dustbathing (Duncan, 1998; Weeks and Nicol, 2006). The provision of perches in colony cages allows birds to roost and in general, most birds do perch to roost during the night (Olsson and Keeling, 2000). Hens can also use the perches provided in colony cages to obtain more space and distance from other hens or to escape active feather peckers (Struelens and Tuyttens, 2009; EC, 2004b). It has been shown that 15cm of perch space per hen is sufficient to allow all hens to be able to roost in synchronisation (Appleby, 1995, 2004; Struelens and Tuyttens, 2009). Birds will prefer to perch at higher, rather than lower, heights (Struelens and Tuyttens 2009; Struelens et al., 2008b; Schrader and Muller, 2009), but will generally use a perch of any height if it is provided.

To ensure that all birds housed in these systems are given the opportunity to perch, NAWAC has added a minimum standard stating that hens should be provided with at least 15cm of perch space (to allow synchronised perching) and a recommended best practice that 17cm should be provided. An example indicator has also been added to ensure that perches be designed to minimise keel damage and foot problems.

Hens make use of the nests provided in colony cages to lay their eggs close to 100% of the time. The use of the nestbox can be used as an indicator of the hen's welfare as hens place a very high value on laying eggs in a secluded area. Seclusion seems to be an essential factor in the choice of nest site and recent studies have shown that hens readily use nest boxes equipped with non-transparent plastic flaps, like those used within the colony cages, to provide seclusion (Struelens et al., 2008a). To ensure that birds are provided with an appropriate nesting area in colony cages, NAWAC has included a minimum standard stating that a secluded nest area must be provided in colony cages, and the floor of the nest area must be covered with a suitable substrate.

Colony cages also contain an area which the hens can use to perform some foraging, scratching and dustbathing behaviour. The use of this area to dustbathe by laying hens in colony cages has been shown to vary between 21 and 81 % depending on the cage model (EC, 2004a). NAWAC has included a minimum standard stating that a scratching area (on which they can perform scratching, foraging and dustbathing behaviour) must be provided for birds in colony cages.

The colony cage also provides extra space, when compared with cages, as a result of the increase in the number of birds housed together. For any given housing density in any system, the more birds in the colony, the greater the free space (Cook et al., 2011). Layer hens tend to group together in any given area, thus leaving areas of space in which any bird can leave the group to perform behavioural requirements such as wing stretching, preening or dustbathing. As these behaviours are performed relatively infrequently, the birds in this way are able to meet their behavioural needs.

NAWAC has included a minimum standard that each bird must have 750cm^2 of space in colony cages (compared to the minimum old space allowance of 550cm^2 per bird in cages). This provides each bird with a minimum of an additional 200cm^2 per bird in the colony cage systems, however, as birds in colony cages are also housed in large groups, they also have access to a comparatively greater amount of free space in which to exercise and perform other behaviours.

As hens are housed in a relatively controlled environment in the colony cage system, the environmental temperature and the hen's nutritional requirements can be easily managed. The smaller group sizes kept in colony cages also tends to reduce levels of injurious pecking. The levels of stockmanship required in colony cage systems therefore tend to be lower than those required in non-cage systems due to the ability for more aspects of the birds' environment to be automatically controlled.

NAWAC employed a multiple criteria decision analysis framework to help clarify their thinking regarding if colony cages meet the requirements of the Animal Welfare Act. The analysis framework allows a numerical figure to be placed on different aspects of each housing system which are then added to produce an overall total for each system. This enables decisions to be made in regard to the system as a whole. In accordance with section 4 of the Animal Welfare Act, NAWAC considered and ranked the different aspects of nutrition, health, housing/shelter, behaviour and pain/distress for hens housed in each of the systems; cages, colony cages, barn systems and free range systems. It was found that, with the exception of cages, which produced a low score, the other three housing systems had a similar ranking when all aspects were considered.

Based on the evidence above, NAWAC therefore considers that all production systems (with the exception of cages) that meet the specifications of the code of welfare also meet the requirements of the Act. Each system has particular advantages and disadvantages, and stockmanship is critical in determining the welfare of birds in any layer hen housing system. However, no system (with the exception of cages) is considered to be better or worse for hen welfare overall than any other system and NAWAC considers that colony cages meet the requirements of the Act and are a viable option to house layer hens. Non-cage systems remain a valuable option under high levels of stockmanship.

(d) ***What is the welfare of the birds like in non-cage systems?***

Public opinion on the welfare of laying hens generally favours them being housed in a more 'natural' systems; the public wants to see a system where they are able to perform a range of natural behaviours, they should feel well and their physical and physiological systems should function normally (Fraser et al., 1997). This sentiment was reflected in the public submissions received during consultation of this code. However, in reality, the issue of layer hen housing is multi-factorial. Each type of system has inherent advantages and disadvantages not only from an animal welfare perspective, but also from other perspectives such as animal health and food safety. Evaluation of different production systems is a complex issue, as it depends on the different weightings that different individuals place on health, production, physiological and behavioural parameters; all of which can be used to measure welfare.

Non-cage systems provide birds with a greater ability to express more of their normal behaviours. In barn systems birds are provided with sufficient space to explore and exercise, which is beneficial for their physical and health needs and increases bone strength (Lay et al., 2011). However, despite the increase in bone strength, the birds do tend to sustain more fractures, especially of the furculum and keel as a result of landing badly from perches or other raised areas (Gregory et al., 1990)), although keel damage is a significant issue in all systems (Wilkins et al., 2011). Due to the large flock sizes in non-cage systems, birds are also are prone to exhibiting greater levels of injurious pecking and

cannibalism, are at a higher risk of disease and parasites and have a higher rate of mortality. Smothering can occur in non-cage systems due to the number of birds that are able to pile on each other and one smothering event can result in the death of a large number of hens (Richards et al., 2012). As a result of the substrate on the floor, the enclosed area and the number of birds contained within the area, barn systems are also prone to high levels of ammonia and dust which can have deleterious effects on the health of birds (Tauson, 2005).

The provision of an outdoor area which the hens can access via pop holes can provide even higher space allowances, a higher level of behavioural stimuli and the freedom for the hens to move between different environments with different climatic conditions (indoors/outdoors). These factors have been shown to have a positive effect on the welfare of hens. Hens in systems with outdoor access are also exposed to natural light which enhances their visual perception (Prescott and Wathes, 1999). Several studies have shown that the use of an outdoor run by hens reduces the prevalence of feather pecking (Green et al., 2000; Knierim, 2006), allows the hens to choose their preferred climatic conditions, to move away from the dust and ammonia within the hen house to areas of fresh air (Kristensen et al., 2000; Jones et al., 2005), and enables hens to dustbathe simultaneously with other hens, which may have an important social benefit (Duncan et al., 1998). However, the addition of an outside area to the barn can also increase the susceptibility of the hens to predation and make them more likely to select an unbalanced diet (Knierim, 2006). In addition, it can be difficult to maintain the quality of the range, particularly around the 'popholes' in wet conditions, increasing the susceptibility of birds to disease and to increased levels of mortality (Häne et al., 2000).

Food conversion ratios are increased in non-cage systems due to the greater amount of movement and activity encouraged by these systems (Tauson et al., 1999; Michel and Huonnic, 2003), and the larger amount of energy required by the birds in order to thermoregulate in non-cage systems (Tauson 2005). Production rates are generally lower, as hens have been shown to lay fewer eggs when housed in non-cage systems (Abrahamsson et al., 1996; Horn and Süto, 1997; Vits et al., 2005).

Aviary and perchery systems allow birds to express a range of normal behaviours and build up bone strength via use of the perches. However these systems are subject to the same problems and risks to the bird's health as barn systems. In addition, dust levels tend to be particularly high in these systems due to the birds flying between levels and keel damage is particularly high due to misjudged landings and clashes between birds midair (Sandilands et al., 2009). If used, aviary and/or perchery systems need to be designed to ensure that they meet the minimum standards as outlined in the code, in particular, the minimum standard requiring that perches must be placed such that they prevent the fouling of hens on lower levels.

There is also evidence that the positioning of perches in these systems has a direct influence on the incidence and the severity of bone fractures sustained by the birds. In particular, the use of very high perches can increase damage to the keel, probably due to the higher velocity that the birds reach when descending to the floor and the associated reduction in control of the landings and resulting damage sustained. However, the individual bird's genetic make-up and practices used in rearing are also confounding

factors and will influence the damage sustained by each bird in these systems (Wilkins et al., 2011). NAWAC has added a recommended best practice that swinging or aerial perches should not be used as they are associated with a very high incidence of keel fractures.

Non-cage systems are able to satisfy many of a hen's behavioural needs, but do have their own significant welfare and management risks. A high level stockmanship together with a good knowledge of husbandry is necessary to maintain the hen's welfare in these systems (Savory, 2004).

NAWAC has included minimum standards and recommended best practices to address the health and welfare of layer hens in different systems, however the feasibility of each system will be dependant on the particularities of each individual farm, the space available and the surrounding environment and climate. NAWAC believes that all systems, except the cage system, are able to provide adequate welfare for laying hens, however, a number of factors will influence the welfare that hens experience in any system, including the design of the facilities, levels of management and stockmanship, the climate and the interacting effects between all the above factors.

Therefore NAWAC does not believe that a compulsory transition to currently available barn or free-range systems will result in an increase in the overall welfare of layer hens. In NAWAC's assessment the, enriched, colony cages provide equivalent or superior overall welfare when compared with these other systems.

(e) ***What can be done to improve the welfare of hens when moving away from cage systems?***

Stockmanship

Following the increased focus on housing systems for production animals and the associated requirements to maintain animal welfare within these systems, a recent view is that good, well-founded knowledge and skill is essential to good welfare in any system (Hemsworth, 2007). The welfare of the hens in any housing system will largely depend on the competence, knowledge and observational skills of the stockpersons.

A willingness to increase the amount of care that the stockperson provides for the hens will have a positive effect on their welfare (Hemsworth, 2003). In addition, it has been shown that the positive returns obtained as a result of the extra work involved (such as decreased mortality, injurious pecking and other negative outcomes) often stimulates stockpersons to improve their skills further and increase their knowledge on caring for their hens.

Injurious pecking

Injurious pecking (i.e. feather pecking, vent pecking and cannibalism) can be a significant problem in non-cage systems. It can also occur in cage and colony cage systems, although usually not to the same extent. Due to the large number of birds present in the one area in non-cage systems and the free access that all birds have to each other, outbreaks of injurious pecking can spread quickly through the flock, with potentially serious consequences. If blood is drawn during these pecking bouts, the pecking can progress to cannibalism and result in fatalities.

Outbreaks of injurious pecking can be started by one or two birds. Removal of the birds that are showing the most severe pecking can prevent the spread of this behaviour through the flock, although recognising and removing these birds may be a difficult task in many larger commercial systems. The opportunity to forage in litter may lower the risk of injurious pecking (Lay et al 2011).

Litter management

Systems containing litter, although beneficial in allowing birds to perform scratching, dustbathing and foraging behaviour, can also significantly increase the amount of dust, ammonia, risk of disease and parasite build up when compared to cage-based systems. The presence of these deleterious factors can be decreased by regular maintenance of the litter. The degree of manure removal greatly affects the ammonia levels that the birds are exposed to (Tauson, 2005) and increased litter hygiene has a positive effect on parasite load and levels of disease (Tauson, 2005). NAWAC have included a recommended best practice within the code that litter is used for one laying cycle only.

Stocking density

Stocking density can have a significant effect on the welfare of hens in laying systems. The size of the enclosure in which the hens are housed and the density of hens within the enclosure will both have effects on the distance that hens travel per day (and therefore the amount of exercise that they perform to strengthen their bones) and the distance that they remain from conspecifics (Leone and Estevez, 2008). Higher stocking densities have been associated with higher levels of injurious pecking (Nicol et al., 1999).

The complexity of stating a stocking density as a specific amount of space per bird should be noted, as space is not evenly used in colony cage or non-cage systems due to the way birds tend to distribute themselves according to the time of day, activity, social effects, individual bird preferences and other factors. In addition, in those systems with outdoor access, the condition of the range will also affect its use by the birds, which will have a follow on effect and influence the stocking density of birds within the barn.

NAWAC has included minimum stocking densities for barns, both with and without outdoor access. The stocking density for barns with outdoor access is consistent with that required for non-cage systems in the European Union (being 9 birds m^2). The stocking density for barns without outdoor access has been set slightly lower (7 birds m^2), as in the latter, the birds are able to escape from each other by going outside if necessary.

However, the outdoor range does need to be maintained in good condition in order it to provide the birds with the advantages for which it is intended (additional space and environmental stimuli). NAWAC has therefore set minimum standards that are designed to maintain the range in a manner that is beneficial to the hens and maintains their welfare. The minimum standards are designed to reduce pugging and muddy areas, and maintain the pasture quality so that the hens make maximum use of the range with no deleterious side effects. The minimum standards will be achieved in different ways depending on topography, climate, region, soil type, vegetation cover, management system, stockmanship and other factors.

27. **Depopulation**

(a) ***Should there be stricter standards for handling laying hens at depopulation?***

Submissions ranged throughout the spectrum in regard to opinions on the catching procedures used, the training that the catching team should undertake prior to performing this procedure, documentation of the catching process and appropriate use of techniques to ensure minimisation of pain and distress during depopulation.

The technique and manner used during the catching process as part of depopulation at end of lay can have a significant effect on the welfare of the birds. As a result of the limited amount of exercise that the birds have been able to perform (particularly in cages), and the large depletion in calcium that has occurred in their skeleton as a result of the large number of eggs that the hens have produced over the laying cycle, their bones tend to be weak and may fracture easily. Studies have shown that the incidence of bone breakages is significantly reduced when birds are caught by two legs, rather than one (Gregory et al., 1992).

NAWAC has added minimum standards that persons performing the catching procedure must be trained and must handle the birds in a manner that minimises pain and injury at all times. In addition, specific requirements for catching and loading are included in a separate minimum standard, which includes the requirement that no more than four hens may be carried at any one time in each hand of a catcher.

28. **Induced Moulting**

(a) ***Why are the requirements for performing induced moulting not outlined in the code?***

Induced moulting of laying hens is used to rejuvenate the reproductive cycle and extend the life of the laying hen. It causes hens to stop laying, shed their feathers, and then resume laying. There is, however, concern that induced moulting of layer hens significantly compromises their well-being and welfare (McCowan et al., 2006). In particular the use of fast-induced moulting has been shown to cause severe physiological stress, and cause frustration and/or discomfort in individuals, and it can be associated with high mortality rates (Duncan and Mench, 2000; McCowan et al., 2006).

Due to the large amount of stress that induced moulting places on the birds, and the fact that, under normal circumstances, producers are able to replace birds to maintain required levels of egg production, NAWAC has therefore decided that induced moulting must not be conducted and has included a minimum standard within the code to reflect this. Hence no further information has been provided within the code about how to carry out this procedure.

29. **Beak Tipping**

(a) ***Why is beak tipping carried out on a routine basis on layer hens?***

Beak tipping is performed in layer hens to reduce the extent of damage and injury as a result of injurious pecking between birds. The traditional technique utilises a hot blade to slice the end of the beak off. The performance of this procedure has the potential to cause acute and chronic pain to the hens.

A newer technique called the ‘InfraRed beam Beak Treatment’ (IRBT) delivers a short burst of energy to the beak tip, after which, it will slowly soften and erode away over the

following two weeks (Dennis and Cheng, 2010). Recent research has shown that, although the use of IRBT is still likely to cause some acute pain, beak tipping using this technique in young chicks does not cause chronic adverse neurophysiological consequences and chronic pain (McKeegan and Philbey, 2012).

The long term negative effects of tipping the beak can also be reduced or eliminated by removing less than 50% of the beak (Kuenzel, 2007) as it is thought that the larger number of mechanoreceptors remaining in the beak tissue when removing only a small piece of beak tissue maintains the hen's ability to perform more natural feeding behaviours and maintain weight (Kuenzel, 2007).

Therefore, NAWAC decided that beak tipping must only be performed by trained operators on chicks within the first 3 days of hatching using IRBT and that operators must not remove more than one-quarter of the upper or lower beaks. Due to the potential to cause pain and distress in performing this procedure on hens over 3 days of age, the procedure must only be carried out on adult birds in an emergency situation, with veterinary supervision, to help control outbreaks of cannibalism, which can be potentially harmful to the welfare of many birds in the flock.

The nature of any significant differences

30. 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.

31. Significant differences of opinion about the Code, or any of its provisions, were recorded within NAWAC. There was extensive discussion about the transition away from cage systems and as noted earlier in the report, NAWAC was divided on the time required for cages to be phased out. Following multi-criteria decision analysis there was unanimous agreement that all housing systems (except cages) met the welfare requirements of the Act. There followed careful deliberation regarding whether there should be a step-wise transition or an 'end-stop' move away from cages. NAWAC reached a majority decision on the recommendations set out in the draft code and in Section 26 above.

32. When considering a transition from current to new practices, the conditions set in the Animal Welfare Act require that NAWAC has regard to the feasibility, practicality and economic effects of a transition. While considering these aspects in regard to the transition, NAWAC considered that its main focus should be on the welfare of the hens. The committee preferred an earlier end-date to use of cages but reached a majority position to recommend a phase-out period of 10 years with a stepwise transition to encourage producers to move away from cages systematically. This decision represents a compromise between the economic cost of transitioning sooner and the loss of welfare for hens of transitioning later. A transition period of less than eight years was considered neither feasible nor practical.

Dr John Hellström

Chair, National Animal Welfare Advisory Committee
29 June 2012

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