

ANIMAL WELFARE (MEAT CHICKENS)

CODE OF WELFARE REPORT

Introduction

1. The Animal Welfare (Broiler Chickens: Fully Housed) Code of Welfare 2003 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 (Meat Chickens) Code of Welfare (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 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. 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 those where there are large numbers of submissions 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 meat chickens. NAWAC has changed the title of the Code of Welfare for Broilers to 'Code of Welfare for Meat Chickens'. This is in line with industry changes and NAWAC believes the nature of the Code will now be more apparent to the public.

5. NAWAC stated when the 2003 code was issued that it recognised that stocking density requirements would need to be reviewed within five years to take into account new scientific information and practices. In 2008 NAWAC completed a review of the minimum standard relating to maximum stocking densities and considered that a change to that standard wasn't needed – partly on the basis of the Bagshaw *et al* (2006) research which showed that broiler chicken welfare in New Zealand was on a par with global best practice. NAWAC also undertook to review the whole Code and convert all of the minimum standards set out in the 2003 code to a form that describes the welfare outcomes to be met, rather than prescribing the physical requirements of each meat chicken management system. This will allow the code to be more flexible for producers to apply, and means it is likely to remain up to date for its 10 year lifespan.
6. A meat chickens code of welfare is needed because it will represent the Government's statement of policy on how New Zealanders must care for meat chickens in their charge. In addition to setting out the expectations of New Zealanders for the welfare of meat chickens, it is an important statement to the international community and, in particular to overseas consumers of our animal and animal product exports of the welfare standards which prevail in New Zealand.

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 its preparation and before public notification.
8. NAWAC did not make any final decisions on the Code until it had received and considered submissions. The Code is required to be publicly consulted, and for NAWAC to come to any conclusion prior to this consultation process would have meant that NAWAC was not following due process and may have acted in a biased and predetermined manner.
9. The Code was publicly notified on 27 September 2010 in the major newspapers in Auckland, Wellington, Christchurch, and Dunedin. In addition, it was sent to all major libraries and to specific interested groups. The closing date for submissions was 8 November 2010.
10. A total of 41 submissions were received during the public consultation period of which 16 were 'form letters'. All submissions were considered in their entirety by a subcommittee of three members appointed by NAWAC to review the Code. A summary of submissions was prepared and NAWAC's responses to the submissions were recorded.
11. The subcommittee reported on its considerations and recommendation of the Code to NAWAC on 17 May 2011 for final consideration and approval for recommendation to the Minister. The Code and report were peer reviewed before recommending to the Minister by Dr Andrew Butterworth, an animal welfare scientist at Bristol Veterinary School with experience in welfare assessment including poultry.

New Zealand Meat Chicken Industry

12. The New Zealand Poultry Industry is described as vertically integrated, with poultry processing companies often owning their own hatcheries and feed companies. There are a dozen poultry processing companies that contract poultry farmers to raise meat chickens. In 2008 there were 160 poultry farmers (Poultry Industry Association of New Zealand, 2008).
13. In 2009 chicken meat consumption per capita averaged 30.4 kg, with consumption of a total of 136,728 tonnes of chicken meat (around 80 million birds). Chicken meat consumption constitutes the highest percentage of meat consumed in New Zealand (35.79%) (<http://www.pianz.org.nz/>).

Key issues

14. The following key issues represent the significant concerns raised from the public consultation on the draft Code.
- Requirements for chickens with access outdoors
Should there be a requirement to provide shade and shelter?
 - Lighting schedule and intensity
What is an adequate lighting schedule?
Can dark periods be partitioned or does this adversely affect animal welfare?
Should there be a minimum lighting intensity?
 - Ventilation
What levels of ammonia build-up are acceptable?
 - Stocking density
Should the existing recommended stocking density be reduced?
 - Providing conditions for behavioural needs to be met.
What are the normal behaviour patterns for chickens and do high stocking densities preclude expression of normal behaviour patterns?
Should the provision of environmental enrichment be mandatory?
 - Treatment of birds during catching, loading and transport
Should there be stricter standards for handling meat chickens prior to slaughter?
Should catching of chickens occur mechanically by devices proven to be humane?
What defines adequate transport conditions?
 - Breeding of genetically 'flawed' birds
Should there be limits imposed on selective breeding?

15. Requirements for chickens with access outdoors

(a) *Should there be a requirement to provide shade and shelter?*

Submissions expressed concern that there is no requirement for shade and shelter for meat chickens with access outdoors in the current Code.

Domestic chickens are descended from the red junglefowl which inhabits dry forests in Asia (Dawkins et al., 2003). It is therefore not surprising that research shows that domestic free-ranging chickens prefer ranging areas with tree cover (Dawkins et al., 2003). However, ranging was also affected by season, temperature, time of day and ramp design (Dawkins et al., 2003; Jones et al., 2007). Whether tree cover was preferred because trees provide shade from the sun, dry areas for dust bathing and/or shelter from predators and the wind is not clear (Dawkins et al., 2003). However, even with the provision of trees for shade and shelter, use of the range was found to be generally quite low (Dawkins et al., 2003; Jones et al., 2007).

NAWAC acknowledges the need for shade and shelter in production systems with access outdoors. It has therefore included a requirement for access to shelter from adverse weather and conditions to be managed within the minimum standard.

16. Lighting schedule and intensity

(a) *What is an adequate lighting schedule?*

Submissions were of the opinion that Minimum Standard No. 5 should include a minimum of 4 hours darkness in a 24h period, with some submissions advocating a minimum of 8 hours darkness. In addition, a 24h light-dark cycle was advocated to allow for circadian behavioural and physiological cycles. Current industry practice in New Zealand is a minimum of 4 hours darkness in every 24h period, which is in accordance with the requirements set out in the minimum standard.

Lighting schedules impact on meat chicken behaviour and welfare. Recent research has shown that increasing the length of the dark periods reduced overall bird mortality, led to an improvement in average gait score, a decrease in the number of birds falling into categories associated with pain, and increased bird mobility, time spent eating and comfort behaviours (Schwean-Lardner et al., 2009bc; Schwean-Lardner and Classen, 2010). The positive effect of increased dark periods on behaviour is supported by Bayram and Özkan (2010). Overall, near constant light (23L:1D) schedules appear unacceptable from a welfare perspective. Adding several hours of darkness (20L:4D) resulted in an improvement in all welfare parameters tested as well as production parameters (growth rate). This is reflected in the current Code, as the minimum standard requires a minimum dark period of four hours per day.

According to Schwean-Lardner and Classen (2010), taking production and welfare indicators into consideration, 17 hours of light appears to be the optimum day length for meat chickens. NAWAC has therefore included a recommended best practice that meat chickens should be provided with a lighting pattern that mimics natural conditions.

(b) *Can dark periods be partitioned or does this adversely affect animal welfare?*

Some submissions asked for the requirement of a 'continuous' period of 4 hours darkness in any 24h period to be included in the minimum standard.

The effect of partitioning of dark periods was assessed by Schwean-Lardner et al. (2009bc). They showed that over a 24h period partitioning a 9h dark period into 2 or 3 periods reduced comfort behaviours. In addition, the behaviour of chickens in the second

period indicated that rest was not as complete in the second period thereby possibly affecting quality and length of sleep. Partitioning of dark periods could thus have negative effects on bird welfare. While splitting dark periods appeared to positively affect growth rates when the dark period was long (9h), this was not the case in the shorter dark periods (Schwean-Lardner et al., 2009a).

The European Union (Council Directive 2007/43/EC) requires at least one uninterrupted period of darkness of at least four hours, within the six hours of total darkness required.

NAWAC has therefore changed the minimum standard to require a minimum dark period of four *continuous* hours per day if only four hours darkness is provided each day. If more than four hours darkness is provided each day then each dark period must be a minimum of three continuous hours.

(c) *Should there be a minimum lighting intensity?*

Submissions expressed concern that lighting intensity was not detailed in the minimum standard. A minimum lighting intensity of 10 lux, in some cases 20 lux, was suggested to be included.

The effects of lighting intensities on production characteristics and other parameters have been assessed previously and have produced varying results, due in part to experimental protocols with varying photoperiods as well as lighting intensities. However, significant effects on poultry welfare have been found in response to dim lighting (5 lux or less) including increased incidence of leg disorders and ocular defects (Blatchford et al., 2009; Deep et al., 2010). Lighting intensities have been shown to influence distribution of behaviours over the photoperiod with birds in dim lighting (5 lux) showing less pronounced behavioural rhythms than birds in brighter conditions (50 and 200 lux) (Alvino et al., 2009ab; Blatchford et al., 2009). However, whether these effects would be present at lighting levels commonly used in commercial production has not yet been investigated.

Prescott et al. (2003) summarised the differences in visual abilities between chickens and humans and concluded that the unit commonly used to measure luminance 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. In 2002, the Department for Environment, Food and Rural Affairs (DEFRA) in the UK set a minimum of 10 lux at bird eye level and recommended a level of 20 lux to further encourage activity (DEFRA, 2002). Likewise, the European Union has legislated the use of at least 20 lux lighting intensity for meat chicken production (Council of the European Union, 2007).

NAWAC has therefore decided to adjust the example indicators to include a minimum of 20 lux lighting intensity and a recommended best practice of 50 lux.

17. Ventilation

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

Some submissions were concerned about the levels of ammonia allowed (25 ppm) and one submission suggested to lower the limit to 7 ppm.

Ammonia is a recognised air pollutant in poultry houses and exposure to high concentrations is detrimental to poultry health and can lead to pathological conditions (Kristensen and Wathes, 2000). However, many previous studies have investigated the effects of high levels of ammonia rather than those required by the draft Code (Kristensen

and Wathes, 2000). Birds exposed to 25 ppm ammonia levels have been shown to develop ocular abnormalities (Miles et al., 2006) and research investigating avoidance behaviour of poultry in response to varying concentrations of ammonia suggests that birds find environments with levels above 10 ppm aversive (Jones et al., 2005b).

NAWAC has decided to reduce the minimum ammonia levels to 20 ppm in line with international guidelines (Council of the European Union, 2007 and DEFRA UK, 2000) and recommend best practice of 10 ppm to take into consideration avoidance behaviour of poultry in response to higher levels of ammonia.

18. Stocking density

(a) *Should the existing recommended stocking density be reduced?*

Submissions were concerned that the stocking density limit of 38kg of live weight of meat chickens per square metre was too high and would lead to overcrowding and associated problems such as inactivity, heat stress, lameness, cardiovascular disorders, skin disorders and other injuries due to competition for food and water. In addition, submissions were concerned that birds would not be able to express normal behaviour under these conditions. The suggested limits for stocking density by submissions ranged from 14kg to 30 kg live weight per square metre.

Although there has been extensive research done on stocking density, there are many inconsistencies in results between studies mainly because many studies have been conducted on a small scale and/or in environmentally controlled settings. Results of such studies may also not be applicable to commercial practice.

Several studies have assessed the impact of stocking density in commercial non-environmentally controlled settings. A study by Dawkins et al. (2004) showed that although very high stocking densities (42 and 46 kg/m²) did affect the welfare of meat chickens, stocking density *per se*, within limits, was less important than environmental factors, including temperature, humidity and aspects of stockmanship. This is supported by other studies (Martrenchar et al., 2002, Jones et al., 2005a; Bagshaw et al., 2006 and Meluzzi et al., 2008). The science indicates that acceptable health and welfare of meat chickens can be achieved at a range of densities and that this can be achieved as long as environmental quality is ensured (Estevez, 2007). Behavioural studies conducted in commercial situations support studies on physiological health parameters. While high stocking densities may have an impact on behaviour (Hall, 2001; Febrer et al., 2006) it may not be the most important factor affecting behaviour in meat chickens (Febrer et al., 2006). In conclusion, reducing stocking densities without addressing environmental factors may not lead to the expected improvement of meat chicken welfare (Febrer et al., 2006). However, a review of the welfare of meat chickens (SCAHAW, 2000) concluded that, from behaviour and leg disorder studies, above 30 kg/m² there is an increased risk of serious welfare problems.

While NAWAC acknowledges that high stocking densities are associated with a greater risk to meat chicken welfare, the maximum stocking density currently practised in the industry lies within the range of other countries. The European Union has set a maximum stocking density of 33 kg/m². However, member states of the EU can increase the maximum stocking density to 39-42 kg/m² by way of derogation, provided that a series of requirements are met (Council of the European Union, 2007). In the UK, a 'local' decision has been made to set a maximum stocking density of 39 kg/m² in relation to requirements of Directive 2007/43/EC.

It should be noted that meat chickens are only at maximum stocking density for a relatively short period at the end of the grow-out-period.

A survey of New Zealand commercial meat chicken farms by Bagshaw *et al.* (2006) showed that overall mortality of meat chickens was lower than the levels commonly observed overseas and that the proportion of birds with severe leg weakness was about a quarter of that reported in several European countries. At stocking densities between about 32 and 39 kg/m², stocking density was not correlated with any of the welfare measures or epidemiological data. Overall, leg health in New Zealand birds was better than for birds in Europe, indicating that good litter quality and good environmental control were being achieved (Bagshaw *et al.*, 2006).

NAWAC therefore concludes that New Zealand standards regarding stocking density are appropriate as long as environmental conditions are taken into consideration, which is indicated in the minimum standard and recommended best practice.

19. Providing conditions of behavioural needs to be met.

(a) *What are the normal patterns of behaviour of chickens and do high stocking densities preclude expression of normal behaviour patterns?*

Submissions supported the inclusion of behavioural needs as a minimum standard. However, many believed that the proposed minimum standard was inadequate and that normal behaviour patterns cannot be exhibited by meat chickens housed in current conditions.

The concept of providing animals with the opportunity to display normal patterns of behaviour is one of the main provisions around which the Animal Welfare Act 1999 is based. In addition to their physiological (e.g. food, water and thermal comfort) and health needs, animals also have behavioural needs. A 'behavioural need' can be viewed as a motivation to perform species-specific behaviours. Preventing an animal from performing a particular behaviour in a particular situation may cause suffering and reduced welfare.

If the management system used to house animals causes unavoidable problems and prevents them from performing normal behaviours that are important to their welfare, however good the care of the animal is, their welfare will be compromised.

The modern meat chicken is descended from the red jungle fowl (*Gallus gallus*) and the modern chicken displays few basic changes in behaviour patterns from those of its ancestors (Bagshaw and Matthews, 2001). The behavioural repertoire of the chicken includes walking, jumping, flying, roosting, exploration, pecking, scratching and dust-bathing. These behaviours relate to different biological functions and motivations which were relevant to the living conditions of wild fowl and remain relevant to chickens in modern husbandry conditions.

NAWAC believes that performance of normal behaviours should be catered for as far as possible and has included a minimum standard that meat chickens must have the opportunity to express their normal behaviours, and a list of those behaviours.

(b) *Should the provision of environmental enrichment be mandatory?*

Submissions were concerned that environmental enrichment was not included in the minimum standard.

Various studies have assessed the effect of environmental enrichment on the behaviour and welfare of meat chickens. The provision of supplementary resources (e.g. bales of straw, peat moss, sand or perches/barriers) and of novel objects (e.g. rubber boots, trays of

sand or mirrors) showed that chickens are motivated to seek opportunities to explore novel stimuli (Newberry, 1999; Kells et al., 2001, Bizeray et al., 2002). In addition, provision of such material increased activity in meat chickens (Kells et al. 2001).

NAWAC recognises the advantages of providing material, such as hay bales, in housing systems encourages meat chickens to perform a wide a range of behaviours. NAWAC would prefer to see advances made towards systems where behavioural enrichment is provided to improve the welfare of meat chickens. The code requires that litter material, the most available and fundamental of manipulable materials, must be provided. However, the provision of manipulable material *per se* has not been included as a minimum standard within the Code. Provision of material that will enable meat chickens to perform explorative and manipulative behaviours is important to ensure good welfare and so this has been included as a recommended best practice.

20. Treatment of birds during catching, loading and transport

(a) *Should there be stricter standards for handling meat chickens prior to slaughter?*

Some submissions were concerned that there is no limit on how many birds can be carried in each hand at any one time by catchers during the catching process.

Catching of birds often involves birds being caught by one leg, inverted and carried to transport crates with up to 4 birds being carried in one hand (Knierim and Gocke, 2003, Deleziel et al., 2006). This catching method has been shown to lead to injuries and bruising and is a major stressor for birds due to human contact and the process of being inverted (Lacy and Czarick, 1998; Delezie et al., 2006). A reduction in the number of birds carried simultaneously in this way may therefore not reduce the stress on the birds. In Sweden birds are often not inverted and this may reduce stress and the incidence of bruising and injury (Ekstrand, 1998). However, no scientific studies have assessed differences between different manual catching techniques and their impact on bird welfare.

In New Zealand industry practice is for the catcher to kneel or stoop close to the ground when catching the chickens. This allows the chickens to be bunched in one hand whilst they are resting on their breasts on the litter. In addition if a chicken starts flapping its wings while being carried to the transport crates, it is recommended that it be brought under control by either resting it against the catcher's leg or by resting it on the ground.

NAWAC acknowledges that chickens must be handled at all times in a manner that minimises the risk of falls, pain and distress and avoids injury and has added a physical handling section. In addition specific requirements for catching and loading are included in a separate minimum standard which includes the requirement that no more than four chickens may be carried at any one time in each hand of a catcher.

(b) *Should catching of chickens occur mechanically by devices proven to be humane?*

One of the submissions has suggested that manual catching of meat birds should be replaced by modular systems whereby birds are caught and placed into transport cages mechanically.

Several recent studies have assessed whether mechanical catching is an improvement over manual catching with regard to animal welfare measures. A reduction in the number of injuries sustained during the catching process when mechanical catching methods are employed has been observed (Knierim and Gocke, 2003; Delezie et al., 2006). Problems observed with mechanical systems included the high levels of wing haemorrhage due to

wing flapping as birds were dropped into transport crates (Delezie et al., 2006) and uneven stocking densities in transport crates (Knierim and Gocke, 2003).

NAWAC believes mechanical catching and crate handling systems provide better overall chicken welfare and has included that recommendation as best practice.

(c) *What defines adequate transport conditions?*

Submissions raised concerns that there is no requirement to keep temperature and humidity in transport vehicles within a certain range. While NAWAC agrees that both can affect the welfare of meat chickens during transport, it is not the purpose of the present Code to address transport issues. This is covered by the Animal Welfare (Transport within New Zealand) Code of Welfare 2011.

In addition, several submissions called for an increase in the minimum cage size required for transport purposes, with a minimum suggested cage height between 30 and 50cm. Chickens normally sit during transport and as such NAWAC believes the requirements suggested in the example indicators are appropriate.

21. Breeding of genetically ‘flawed’ birds

(a) *Should there be limits imposed on selective breeding?*

Submissions voiced concern that many welfare problems observed in meat chickens are due to genetic selection for fast growth. A new Animal Welfare (Meat Chicken Breeders) Code of Welfare is currently under development and will directly address welfare in relation to breeding and genetic selection.

This code sets minimum standards for meat chicken production in New Zealand based on current scientific knowledge and industry practice. Although New Zealand meat chicken welfare standards are at least as good as and often slightly better than international standards, NAWAC has concerns about the welfare implications of trends in this industry, particularly in relation to growth rates. The rapidity of chicken growth that enables harvesting at about 5 weeks of age risks creating birds that may spend part of their short lives in pain from lameness, and the fully-housed production systems risk producing birds that are unable to develop and display normal behaviours. The industry needs to take steps to ensure these trends do not create future welfare problems that will not be ethically acceptable to New Zealanders.

The nature of any significant differences

22. 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

Chair, National Animal Welfare Advisory Committee

12 October 2011

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