

RSPCA APPROVED FARMING SCHEME  
INFORMATION NOTES

# MEAT CHICKENS

AUGUST 2019





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# **MEAT CHICKENS**

AUGUST 2019

Information supporting the RSPCA Approved Farming  
Scheme Standards – Meat Chickens

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# INFORMATION NOTES

## MEAT CHICKENS

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The RSPCA Approved Farming Scheme is part of the RSPCA's efforts to improve the lives of Australia's farm animals. The RSPCA's animal welfare standards for meat chickens provide the requirements for housing, handling, transport and slaughter that must be met under the Scheme. The RSPCA encourages producers to exceed these Standards as the opportunity arises, and commit to a pathway of continuous improvement in the welfare of their chickens. These notes provide information about a range of aspects relating to the Standards, to meat chicken welfare and to the growing of meat chickens generally.

### Meat chickens – production cycle

Meat chickens are the offspring of great grandparent breeder stock hatched from fertile eggs which are imported under quarantine into Australia from specialist breeding companies. Meat chickens have been selectively bred over many generations to grow and gain weight very rapidly. The rapid growth rate can cause severe welfare problems, particularly leg disorders and cardiovascular disease, which have been partially addressed by the breeding companies. The RSPCA is encouraging the chicken meat industry to use breeds with slower growth which will help to improve bird welfare.

Fertile eggs produced by parent meat chicken breeder birds at the breeder farms are sent to hatcheries where they are incubated until the chicks hatch. The incubation of fertilised eggs at hatcheries takes a total of 21 days. Once hatched, both male and female chicks are transferred to growing farms. During transport between hatchery and farm, the chicks rely on the nutrients provided by the remains of the embryonic yolk sac to sustain them for the journey.

On arrival at the growing farm, day-old chicks are placed in sheds - the newer sheds are climate-controlled, while others may be naturally ventilated - and, whether the meat chickens are grown entirely in an indoor environment (indoor system) or have access to an outdoor area (outdoor or free-range system), they will generally remain inside for the first 3 weeks of their life. The chicks are often first housed in a smaller area within the shed called 'the brooding area' - which may form a third to half of the floor space of the entire shed. This area is heated to provide a suitable temperature for young chicks and allows them to quickly find their food and water. The chicks' bedding is usually sawdust, wood shavings or rice hulls.

RSPCA Approved farms may house birds indoors where their behavioural and physical needs are met, or in systems where they have access to an outdoor area, are provided with shade, shelter and protection from predators and are able to range during daylight hours for a minimum of 8 hours per day once the chickens are reasonably feathered.

Meat chickens are collected for slaughter either all at once or in smaller batches depending on the weight requirements of the market. The birds are placed into plastic crates or transport modules which are loaded on trucks for transport to the abattoir. If birds are to be sold as spatchcock (younger meat chickens), they are usually processed around 21 days of age. Meat chickens destined to be sold as chicken meat may be picked up as early as 30-35 days (whole birds) and up to 55 days (chicken pieces).

Once at the abattoir, chickens are rested for up to 2 hours to allow them to settle from being transported. The chickens are then stunned by passing through an electrical water bath or by inhaling gas in a controlled atmosphere system which renders them unconscious. The RSPCA encourages the use of controlled atmosphere systems as it avoids the welfare problems associated with shackling of conscious birds. If controlled atmosphere systems are used, chickens are not shackled until they

have passed through the controlled atmosphere system and are rendered unconscious. Once they are dead, chickens are plucked, cleaned and further processed either as whole birds or cut into pieces such as drumsticks, breasts, wings and thighs. They are then packaged for sale.

The RSPCA Approved Farming Scheme standards for higher welfare indoor and outdoor systems focus on providing for the birds' behavioural and physical needs. Under the Scheme, maintaining good quality litter through control of temperature, humidity and ventilation is essential. The lighting regime encourages activity during the light period while providing sufficient and proper rest during the dark period, and birds are provided with sufficient space to move. Environmental enrichment is key to the RSPCA's Standards - perches and pecking materials such as straw is beneficial for good welfare. Meat chickens using perches can build leg strength and, if given the opportunity, birds will perch from as young as 7 days old.



## **Animal welfare**

The welfare of an animal includes both its physical and mental state. Ensuring good animal welfare goes beyond preventing pain, suffering or distress and minimising negative experiences, to providing opportunities for animals to have healthy positive experiences and the ability to perform normal behaviours to enhance their quality of life. Thus good animal welfare means providing animals with all the elements required to ensure their health, physiological fitness and ability to carry out natural behaviours so that they may experience a sense of positive individual wellbeing.

RSPCA Australia encourages participation in independent certification schemes that improve animal welfare along the supply chain - in other words, on farm, during transport, and at the abattoir, and allow participants to demonstrate compliance with relevant codes, standards and legal requirements. Regular as well as unscheduled on-site assessments (including resource- and animal-based measurements) are important in ensuring farm animal welfare. Regular assessments also allow for benchmarking and improving animal welfare along the supply chain, identifying and resolving animal welfare issues, and improving animal welfare standards. RSPCA Australia believes that on-site assessments must also include inspections by the relevant government authority as well as third-party audits.

See also 'Five Freedoms / Five Domains'.

## **Animal Welfare Officer**

The importance of good animal handling, stunning and slaughter at abattoirs cannot be overstated. Persons responsible for the handling (including stunning and killing) of animals must be appropriately trained and competent in their required tasks. An understanding of animal behaviour and the ability to recognise abnormal behaviour is particularly important. In addition, positive attitudes towards animals and working with animals is essential. To ensure that animal welfare is monitored, abattoirs should appoint a designated Animal Welfare Officer, trained and certified by a recognised training organisation, who is present at all times when animals are being handled and who ensures that the required animal handling and management procedures are adhered to. The RSPCA Approved Farming Scheme requires that the abattoir nominates a designated person (or persons) who fulfils this role.

## **Animal-based welfare assessment**

The assessment of animal-based and resource-based indicators of animal welfare is an important part of continuously improving the welfare of animals, be that on farm, at the abattoir, or any other part of the production process. Assessing animal welfare based on animal indicators (i.e. animal-specific characteristics) is one way the extent to which an animal is thriving in the environment within which they have been placed can be determined.

RSPCA Australia strongly recommends that producers implement the [AssureWel](#) indicators and assessment protocols. [AssureWel](#) has protocols to assess various aspects of meat chicken welfare including foot pad dermatitis, hock burn, walking ability, behaviour, and interaction with enrichment objects.

See also 'Stockpersonship'.

## **Animal-based welfare assessment at the abattoir**

The principle of continuous improvement in animal welfare also extends to the welfare of animals at abattoirs where, through regular self-assessments using measurable and objective criteria, benchmarks can be established. As such, the Approved Farming Scheme Standards require animal-based welfare observations to be recorded at the abattoir, and trigger levels to be set for the criteria

to be assessed. A trigger level is a predetermined threshold which sets in motion a course of actions to address a breach of the threshold. The self-assessments should quickly and accurately allow trends to be identified and thus any deviations from that trend to be recognised and acted upon.

The protocol used to assess animal-based measures at the abattoir should be objective, differentiate between minor, medium and severe conditions, be able to be implemented consistently and provide consistent results within and between different observers, and provide reliable and accurate data. The targets for each criterion should reflect an excellent rating where there is very little hock and foot lesions, wing or leg damage or scratches, and no ineffective stunning or cutting.

## **Antimicrobials**

An antimicrobial is an agent that kills or stops the growth of microorganisms such as bacteria, viruses, fungi and parasites. The World Organisation for Animal Health (OIE) does not include anthelmintics, disinfectants or antiseptics in their definition of antimicrobial agents. Antimicrobials may be used therapeutically for treatment of a diagnosed disease or injury, or they may be used prophylactically to prevent the occurrence or spread of disease.

Medications called anticoccidials are used to treat and prevent a common parasitic infection of poultry called coccidiosis which, if left untreated, can predispose the bird to necrotic enteritis, an often fatal inflammation of the intestines. Ionophores are one type of anticoccidial compound, but there are other non-ionophore compounds that are also used as anticoccidials. Both ionophore and non-ionophore anticoccidials are a category of antimicrobial but neither are used in human medicine. Anticoccidials are routinely added to chicken feed to prevent outbreaks of coccidiosis in meat chicken flocks.

The RSPCA supports the responsible use of antimicrobials for the treatment of sick birds. Preventative use of antimicrobials (including coccidiostats) is discouraged under the RSPCA Approved Farming Scheme standards for meat chickens. Preventative use may mask the impact on animals of poor housing and management conditions as well as potentially contribute to antimicrobial resistance which occurs when microorganisms continue to grow in the presence of levels of antimicrobial agents that would normally stop their growth or kill them. Under the RSPCA Approved Farming Scheme, an Antimicrobial Stewardship Plan is required to be in place and updated yearly in order to demonstrate responsible antimicrobial use. Some strategies to implement in disease prevention include good shed hygiene and farm biosecurity, reducing stocking density, effective shed ventilation, appropriate feeding and the use of effective antibiotic alternatives and vaccination. The aim is to see greater focus placed on optimising the animal's environment, on good animal handling and appropriate management practices to reduce reliance on antimicrobials (particularly where they are used preventatively).

Surveillance of antimicrobial resistance is needed to monitor the efficacy of programs that aim to reduce antimicrobial use. Public reporting of antimicrobial use (including coccidiostats) in every livestock sector would provide transparency to consumers while at the same time allowing industry to demonstrate commitment to their responsible and prudent use.

See also - 'Biosecurity', 'Health and disease'.

## **Behavioural needs**

Chickens have innate behavioural needs which include ground-scratching, foraging for food, perching, dustbathing, laying their eggs in a nest, and social interaction. For chickens to have good welfare, their environment needs to allow these behaviours to be performed. For meat chickens, this includes the provision of good quality friable litter to allow foraging, ground-scratching and dustbathing behaviours (dustbathing also functions to keep the plumage in good condition), and perches which

are easily accessible by meat chickens at all ages and provide places of refuge, as well as improving leg strength and walking ability. Adequate space and lighting are also required to allow birds to perform normal behaviours and to stimulate activity levels.

See also 'Environmental enrichment'.

### **Biosecurity**

The key objective of biosecurity measures is to prevent or control the introduction and spread of disease regardless of whether birds are housed indoors or have access to an outdoor area. Appropriate and effective biosecurity measures include hygiene and sanitation/disinfection procedures relating to the movement of staff, visitors, equipment, supplies, and vehicles onto and between different sites and work areas. Further information on biosecurity practices can be found at [www.farmbiosecurity.com.au](http://www.farmbiosecurity.com.au) and in the *National Farm Biosecurity Manual for Poultry Production*.

See also 'Health and disease'.

### **Brood**

Chicks have a very limited ability to thermoregulate, and therefore require transportation in temperature-controlled trucks and sufficient heat in the shed to keep them warm. For the first week of life, chicks may be confined to an area of the shed, the 'brooding area' which is heated to 32°C for the first two days, and gradually lowered as the birds grow. However, up to half of all meat chicken mortalities can occur in the first week of life. Mortality during the first week of life can be affected by the parent flock, incubation conditions, time of hatch, and conditions on farm such as temperature, feed and water access and environmental conditions during brood. Chicks sourced from young breeder flocks may require a higher level of management and care in the first week as they can have lower feed intake and smaller body sizes. Regardless of the fitness of the chicks and where they were sourced, important aspects of their management include careful and considerate placement upon arrival in the shed, maintaining appropriate shed temperatures, drinker height, and the provision of appropriate feed with correct composition and form.

The presence of ammonia in the air can indicate a build-up of noxious gases, and can cause nasal and eye irritation in both birds and humans. Young chicks are more sensitive than older poultry, and a concentration greater than 10ppm of ammonia can damage the lung surface of young chicks. The presence of ammonia and other gases in the shed can be avoided through the use of fresh litter and managing shed ventilation.

### **Catching for slaughter**

Catching and handling birds during depopulation is very stressful for the birds, and every effort should be made to minimise their discomfort during the process. It is a legal requirement that birds are assessed to be fit for the intended journey prior to loading. If a bird is unable to walk, severely emaciated, visibly dehydrated, showing signs of injury or distress, blind in both eyes or suffering from a condition that is likely to worsen during the journey, it is not considered fit for the journey and must not be transported.

Handling and inversion is very stressful for chickens and being carried by the legs is likely to cause pain if the bird is suffering from leg problems. Ideally, when picking up birds, they should be picked up and carried gently by the body. Birds must never be lifted by the head, neck, wing, tail, or feathers. Mechanical catching has the potential to reduce stress and injuries to meat chickens as long as staff are well trained and the machinery is operated and maintained appropriately.

See also 'Flight zone', 'Stockpersonship'.

## **Closed Circuit Television (CCTV)**

The RSPCA Approved Farming Scheme standards for meat chickens require that CCTV be used to monitor those areas of the slaughtering facility where live animals are handled. CCTV should not replace the employment of people with the right attitude towards animals, comprehensive staff training and good stockpersonship. CCTV, however, is an excellent means by which facility management and auditors can monitor compliance with standards and regulations relating to animal welfare. CCTV allows problem areas to be identified and promptly addressed. It is important that a protocol is in place to determine the use of CCTV. Such protocols should include information about the positioning of the camera to allow a clear view of bird handling, stunning and slaughtering processes; about the period for which the footage should be retained (3 months is considered good practice); about the review of the footage and who should be responsible; and how the footage should be kept safe and secure. These protocols are well described in the UK Farm Animal Welfare Committee's *Opinion on CCTV in slaughterhouses*.

## **Environmental enrichment**

Providing environmental enrichment can be an effective strategy to improve animal welfare by enabling positive affective states and improving biological functioning, particularly where animals are confined indoors. Environmental enrichment may improve the environment by increasing the complexity of the animal's surroundings, and by increasing behavioural opportunities.

Poor animal welfare occurs where there is a mismatch between the animal's needs and aspects of animal management and/or the animal's environment. However, environmental enrichment alone will not address this mismatch. Good animal welfare relies on meeting an animal's physiological needs (e.g. good health, good nutrition, comfortable housing), on good stockpersonship (e.g. low-stress animal handling, positive interactions), on providing for innate behavioural needs (e.g. in chickens, the ability to perch, dustbathe, and to perform foraging behaviours such as ground-scratching and ground-pecking), and on providing the opportunity to have positive experiences (e.g. through the ability to express play and social behaviour, and to forage and explore).

Enrichment such as novel objects can enable birds to better cope with fearful stimuli and reduce the harmful effects of panic and smothering, and negative physiological effects of long-term stress. Straw bales provide an interesting item to peck at and straw pieces to manipulate. They can also encourage jumping and movement, and improve leg health. This may contribute to a reduction in the number of birds which need to be euthanased due to leg problems. Effective enrichment for meat chickens may be in the form of roughage, vertical panels, straw bales, elevated resting places such as platforms, and access to covered verandas and outdoor areas. Barrier perches and panels in the shed can allow birds to escape disturbances and reduce skin lesions.

The ability for animals to manipulate and control enrichment items is important. Enrichment items can sometimes stimulate short-term interest which does not persist over a long period of time. Therefore, it is important to monitor whether birds are interacting with the enrichment or whether the level of interest and activity has decreased over time. Renewing and replacing enrichment may be necessary to maintain interest. More research is needed in order to identify types of enrichment birds prefer and how interest can be maintained.

Care is needed in selecting enrichment items. Any items which may cause injury or stress to birds should be avoided. This may include entanglement in string, entrapment, impeding movement or access to resources particularly at a young age, or negative nutritional impacts or impaction if items are ingested.

Bird welfare is enhanced through the provision of perches, foraging materials and other manipulable materials indoors, and where birds have access to an outdoor area that offers many more opportunities for enrichment, bird access is encouraged by providing shade and shelter.

RSPCA Australia encourages provision of these features in excess of the minimum required under the Standards and the monitoring of the birds' use of environmental enrichment.

## **Euthanasia**

Euthanasia (humane killing) is defined in the RSPCA Approved Farming Scheme standards for meat chickens as humanely ending the life of an animal when it is in the interest of the animal's welfare and using a technique that avoids further pain, suffering or distress. All methods of humane killing, including slaughter and on-farm euthanasia, must meet the same criteria: instant death of an animal or the animal rendered unconscious/insensible until death ensues, without pain, suffering or distress; and with equipment that is easy to maintain.

Examples of conditions where animals may need to be euthanased may be because they are weak, sick, injured, and/or unable to walk, and will not recover. Euthanasia should result in immediate brain death or immediate loss of consciousness which lasts until brain death occurs. Every bird must always be checked to ensure it is dead immediately following the procedure. Signs of unconsciousness include a lack of corneal reflexes (eye does not blink when touched), an absence of spontaneous blinking, no rhythmic breathing, no vocalising, no swallowing, no head-shaking, and no muscle tone. The euthanasia method should be immediately repeated if there are any doubts about its effectiveness.

Manual cervical dislocation is the most common form of euthanasia used in Australia. The technique requires skill and experience. It is performed by swiftly stretching the neck downwards while at the same time pulling the bird's head back, which causes separation of (and damage to) the spinal cord and brain stem, reduces the diameter of the carotid arteries, and death occurs by cerebral ischemia (insufficient blood flow to the brain) if performed correctly. There are welfare concerns around cervical dislocation since loss of consciousness is not immediate.

The Humane Slaughter Association do not recommend neck dislocation without prior stunning for the routine killing of poultry and should only be used in an emergency or for killing very small numbers of birds where better methods are not available. They further recommend that electrical or percussive stunning followed by neck-cutting or neck dislocation are more appropriate, humane methods of killing poultry. The European Food Safety Authority (2004) also state that cervical dislocation should not be used due to welfare concerns, and if it is used, it should be limited to small numbers of birds weighing less than 3kg.

Captive bolt devices may be an alternative, more humane method of euthanasia than cervical dislocation, where appropriate equipment is developed and maintained appropriately. Captive bolt devices are designed to kill the bird immediately, as the blow from the bolt is sufficient to produce significant damage to the skull and brain, resulting in immediate loss of consciousness and death. This method therefore offers animal welfare advantages over cervical dislocation but is not commonly used in the chicken meat industry in Australia to date.

Important aspects of using captive bolt guns include testing the devices each day prior to being used, appropriate restraint of birds, accurate positioning (placement and angle) of the device on the bird's head, the use of an appropriately designed device for the species, and always checking that the bird is dead following the procedure. Appropriate size and shape of the bolt and firing energy are important to ensure an effective stun. If any of these aspects are incorrect, such as placement of the device, it can result in severe trauma without loss of consciousness.

## **Feed and water**

Feed composition has important effects on welfare. The provision of whole grain or coarse cereal fragments as part of grower and finisher feeds is recommended to aid with development of the digestive tract. Whole wheat can also be added to the diet to improve digestive health and leg health. Ingredients such as vitamin D3, calcium and phosphorous, and their ratio in the diet affects bone quality and reduces leg issues such as tibial dyschondroplasia.

Feed form can also impact welfare. Mash feed has been found to improve bone strength and walking ability compared with pelleted feed but care needs to be taken to avoid mash feed causing lesions in the corner of the bird's beak. Scattering feed pellets in the litter increases activity levels including walking and foraging behaviours but care needs to be taken to avoid birds eating excessive amounts of litter. Bone density has also been improved by spacing feeder and drinkers further apart which increases walking and reduces lameness, without impacting production.

Drinkers should be positioned so that birds stretch their necks slightly to access water but not vertically. The drinker position and water pressure should allow birds to access water easily without prevent dripping or spilling onto the litter.

## **Five Freedoms / Five Domains**

The Five Freedoms were first mentioned in 1965 in a UK report on the Welfare of Animals kept under Intensive Livestock Husbandry Systems which stated that "farm animals should have freedom to stand up, lie down, turn around, groom themselves and stretch their limbs". Following the establishment of the UK Farm Animal Welfare Council shortly after, the concept was further refined into the Five Freedoms we know today.

Criteria for assessing the welfare of meat chickens against the Five Freedoms include:

- Freedom from hunger and thirst – by ready access to fresh water and a diet to maintain full health and vigour
- Freedom from discomfort – by providing an appropriate environment including shelter and a comfortable resting area
- Freedom from pain, injury or disease – by prevention or rapid diagnosis and treatment
- Freedom to express normal behaviour – by providing sufficient space, proper facilities and company of the animal's own kind
- Freedom from fear and distress – by ensuring conditions and care which avoid mental suffering.

The RSPCA considers that the welfare of an animal includes its physical and mental state. Good animal welfare implies both fitness and a sense of wellbeing. An overall welfare assessment can be made by looking at the bird's physical environment, its biological functioning and by observing bird behaviour in response to challenges in the environment. The latter, in particular, requires an understanding of normal behaviour, behavioural needs and wants, and being able to identify behaviours which are indicative of poor welfare.

More recently, a new framework for assessing animal welfare has been developed called the Five Domains which emphasises the need to consider the mental as well as physical wellbeing of animals. Thus, animals are able to be assessed on the basis of whether aspects of their nutrition, their health, their housing and/or their behaviour affects their mental state either positively or negatively. For example, an animal housed in a barren pen may exhibit signs of frustration.

See also 'Animal welfare', 'Animal-based welfare assessment'.

## **Flight zone**

The flight zone is effectively the animal's 'personal space' and is indicated by the distance an animal will allow a human to approach before moving away. An awareness of the flight zone allows a handler to move animals in a manner that minimises stress, particularly when combined with other low stress handling methods including slow, deliberate movements and low noise. A bird will move forward if the person stands on the edge of the flight zone at a point behind the bird, and backwards if a person stands on the edge of the flight zone in front of the bird. Animals quickly learn that, if they move in the desired direction, a handler will move out of their flight zone.

See also 'Handling', 'Stockpersonship'.

## **Growth rate and genetic strain**

Over the last 50 years, meat chickens have been subjected to intense genetic selection for increased growth rate and body mass. This selection has led to behavioural differences when compared with slower-growing strains. Fast-growing meat chickens have lower activity levels throughout their lives compared with slower-growing genotypes. Slower-growing meat chickens spend more time perching, walking and ground scratching, while fast-growing meat chickens perform more sitting, eating and drinking. It is likely that chickens with heavy body weights are still motivated to perform walking behaviours and have higher activity levels even when they are physically unable to do this sufficiently due to the large body sizes, resulting in frustration and compromised welfare. This has been shown in experiments that found that the motivation to walk is not correlated with the actual distance walked, but was affected by body weight.

Selection for a fast growth rate has resulted in significant changes and welfare problems. Fast-growing meat chickens have a greater incidence and severity of foot pad dermatitis and hock burn than slower-growing genotypes. Slower-growing birds have better leg health than fast-growing birds.

Slower-growing strains have been developed and are in use commercially overseas. While it is acknowledged that the meat chicken industry need to consider productivity and efficiency of production as well as bird welfare, RSPCA Australia encourages industry to introduce slower-growing strains into Australian production as a matter of urgency.

## **Handling**

People handling meat chickens should have an understanding of bird behaviour and, when moving them, understand the principle of using the bird's flight zone and point of balance to move the bird in the intended direction. Chickens must be handled competently and humanely at all times by people who have a positive attitude and behaviour towards the animals in their care - whether it is on farm, during transport or at the abattoir.

Chickens must never be subjected to rough handling. Since inversion is particularly stressful, chickens should be picked up and carried with both hands supporting the bird's body. Transport is recognised as a stressful experience for animals and poor handling at this time can compound the effect of stress on welfare and meat quality.

The aim should be for birds to have positive interactions with those handling them. Positive handling results in less fearful, more productive birds.

See also 'Flight zone', 'Stockpersonship', 'Catching for slaughter'.

## **Hatching and placement**

There is a window of approximately 36 to 48 hours during which the majority of chicks hatch from their eggs. The chicks that hatch earlier than others therefore inevitably experience longer periods of time before they access feed and water on farm. These birds can subsequently experience dehydration and impaired performance, and can have higher rates of mortality.

Appropriate incubation conditions, immediate access to feed and water, and correct brooding temperatures can reduce mortality in the first week of life. Technologies where the eggs are transported to the farm shortly before hatching have been developed overseas and allow chicks immediate access to feed and water after hatching.

Chicks are unable to effectively thermoregulate, so it is important for transport and placement conditions to be appropriately insulated and warm. Chicks should be unloaded from the truck and placed into the heated brood area of the shed as quickly as possible.

Chicks must be placed carefully into the shed in a coordinated and planned manner. When emptying chicks from the transport containers, the containers must be kept close to the floor and tipped gently, without dropping the chicks from a height and to avoid them falling on top of each other.

See also 'Brood'.

## **Health and disease**

Birds must be protected from pain, injury and disease, through good management and husbandry practice, and by rapid detection and treatment of disease. Disease can be a major cause of poor welfare and mortality. Therefore, it is essential to take all reasonable steps to minimise the likelihood of disease outbreaks.

Generally, the key risk factors for disease include stress, immunosuppression, high stocking densities, overheating, poor hygiene and biosecurity, poor nutrition, diet change (or insufficient feed and water), group size, temperature variation, and poor air quality. Optimising the environment and ensuring appropriate handling and management practices (including regular inspection of animals) will go a long way towards preventing disease. Some steps to consider include avoiding the preventative use of antimicrobials where possible, reducing stocking density, vaccination, effective shed ventilation, appropriate feeding, and breeding for robustness.

Chicks are generally vaccinated for infectious bronchitis and Marek's disease. Newcastle disease vaccination is not compulsory in Australia, but where Newcastle disease vaccination of meat chickens is practiced, chicks are vaccinated at day old at the hatchery or through drinking water at 7-14 days of age.

Ongoing adherence to established biosecurity protocols can also help to reduce the incidence of disease. Preventative treatment such as vaccinations should be implemented where available in addition to ongoing monitoring by farm workers who should be able to recognise early signs of disease. The RSPCA Approved Farming Scheme standards require that producers develop a veterinary health plan in consultation with a designated veterinarian.

See also 'Antimicrobials', 'Biosecurity'.



## Lameness and gait scoring

Good leg health promotes growth and welfare, and conversely, lameness is a serious welfare problem which causes pain and discomfort in the birds and impedes normal behaviours. Poor leg health may be due to abnormal bone development, nutritional factors and infections. Gait scoring to assess leg health and lameness should be conducted regularly. Particular attention should be given in the final week before slaughter, as this is when the birds are heaviest and leg problems can manifest with the highest prevalence. Regularly assessing levels of lameness on farms, as well as contact dermatitis at abattoirs, allows targets to be set, performance monitored, and early intervention with corrective actions if needed. This may result in a reduction in those conditions over time where abattoir data is communicated to producers.

The incidence of lameness can be reduced by genetic selection for robustness and leg health, such as slower-growing strains, by stimulating activity as well as providing a dark period to allow sufficient rest, and by maintaining good quality litter. There are several gait-scoring systems developed by different universities including Bristol and California. The RSPCA has included in the Approved Farming Scheme Standards for meat chickens the Dawkins (2004) gait-scoring system to assess lameness, as below:

- 0 = normal (bird walks at least 10 steps with ease, has regular and even strides, and is well balanced)
- 1 = abnormal (bird walks abnormally for at least 10 steps with irregular and uneven strides and is unbalanced)
- 2 = unacceptable (bird is reluctant to walk and is unable to walk many strides before sitting down, or not able to walk).

## Lighting

Chickens prefer different light intensities for different activities - darkness is preferred for resting, whereas active behaviours are performed in brighter lighting. The provision of brighter light is encouraged for meat chicken welfare, particularly during brood where it should be particularly bright to facilitate chick activity and finding feed and water. While a minimum lux is stipulated for the light period in the standards, brighter intensity is encouraged due to the positive effects on chicks. Brighter light throughout the lives of the birds stimulates activity and feeding, and more pronounced behavioural rhythms. Brighter light also causes birds to have longer and less interrupted periods of resting during the dark period.

Exposure to near-continuous light causes several health issues including eye deformities. An adequate continuous dark period of approximately 6-8 hours has beneficial effects on bird welfare including on fearfulness, walking ability, lameness, foot pad dermatitis, leg health and mortality. Lighting programs may also be designed to prevent excessive growth, to reduce mortality due to ascites, sudden death, and leg problems. Further, the provision of an appropriate photoperiod, particularly when in combination with elevated structures (such as straw bales, platforms with ramp access, or low perches) encourages activity during the light period, and consequently improves leg health. Therefore, it is important that birds have access to complete darkness during the dark periods to allow proper rest. This means all lights off, not dimmed, and the dark period to be provided at night, to prevent any daylight from entering the shed.

The right type of lighting is important for normal eye development and the lack of eye abnormalities. It can also stimulate activity and certain behaviours including foraging, exploration, and social behaviours. Consideration needs to be given as to how birds perceive light. The human eye is the most sensitive in the green spectrum and the least sensitive in the red and blue part of the spectrum.

Poultry, however, are sensitive in the green, red and blue parts of the spectrum and also perceive radiation in the UV spectrum. The different colours affect bird behaviour and where monochromatic lights are used (e.g. LED lights) their impact on bird behaviour (resting, feeding, walking, etc.) needs to be considered. Blue and blue-green light has been found to decrease activity levels and increase body weights in meat chickens, while red and red-yellow light has been found to increase activity but also increase fearfulness. Reduced activity levels increases contact time with the litter and may increase the likelihood of birds developing foot pad dermatitis and hock burns from the litter. Both fearfulness and decreased activity levels are undesirable outcomes. Visual signals may be lost in monochromatic light (i.e. only one colour), and, ideally, light from the entire spectrum (i.e. all wavelengths) should be used in meat chicken sheds.

Meat chickens prefer lighting which most closely resembles daylight. Birds provided with natural light have been found to have better leg health, and may also perform more normal behaviours and exhibit higher activity levels. Natural light provides a range of brightness in different areas of the shed which changes throughout the day and therefore creates some variation in the environment. Natural lighting appears to be the optimal light source for welfare and productivity outcomes as long as temperature can be managed within a normal range for bird health.

Light-emitting diodes (LED) may be a suitable alternative to incandescent bulbs as they have not been found to cause detrimental growth or welfare outcomes, including eye development, walking ability and mortality. LED lighting has also been found to result in lower stress and fearfulness, better plumage condition, less hock burn and foot pad dermatitis, improved eye development, and improved feed conversion in meat chickens compared to those housed under dimmable compact fluorescent lamps.

## **Litter**

RSPCA Australia places a strong emphasis on the need to maintain litter in a dry and friable condition. Managing shed conditions and ongoing maintenance of features in the shed including drinker lines combined with nutrition management and appropriate space allowance will affect litter quality. Poor litter quality can cause lesions on the underside of birds due to contact with wet litter, dirty feathers, and may prevent birds from performing normal behaviours. If litter quality is managed well, conditions including foot pad burn, breast blisters and lameness can be minimised. Every effort should be made to ensure shed managers are aware of the principles and methods of removing moisture from the litter under varying environmental conditions.

Scoring systems to assess litter quality have been developed (e.g. Welfare Quality) which give guidance on litter quality assessment methods. Assessment of litter quality is a combination of classifying the condition of the substrate (i.e. whether it is completely dry and friable, or in a condition where there may be caking or excess moisture in the litter), as well as the total area of the litter affected by the different litter quality.

Maintaining dry and friable litter is a combination of a number of different factors including selecting appropriate litter material, good ventilation to remove moisture, appropriate water pressure and drinker height (to avoid spillage), good nutrition to avoid watery excrement, actively maintaining the litter and aerating the substrate with equipment if necessary, and removing litter that is not in a friable condition. Litter must be of an appropriate material and of sufficient depth to allow birds to scratch, forage and dust bathe. A key feature of good quality litter material is the ability to absorb and quickly release moisture, and consideration needs to be given to the ability of the chosen litter material to be maintained in good condition.

## **Mortality**

Causes of mortality in meat chickens can include metabolic disorders, ascites, leg problems and lameness, and disease. Leg problems affect the ability for birds to perform normal behaviours, cause pain, and are a major cause of euthanasia. After the first week, metabolic disorders, infectious diseases and severe lameness are the major causes of mortality. These conditions cause pain and a reduced state of welfare in the affected birds. Efforts should be made to manage the birds appropriately and minimise the incidence of these conditions. Genetic selection for more robust birds is also an important area to progress.

## **Noise levels**

Chickens are sensitive to sound, and appear to be able to hear lower frequency sounds than humans can. Sudden loud noises can cause fear in meat chickens, and chronic or regular exposure to louder noises can cause fear and long-term stress, and can have negative effects on production. For example, abrupt or loud noise, vehicle noises, loud speech, machinery and construction noises can cause stress in meat chickens and should be minimised.

## **Outdoor area**

Providing access to an outdoor area may enhance welfare by providing additional stimulation in the environment. Providing shrubs, trees and forage vegetation, shelters, and maintaining good drainage can encourage birds to access and use range areas, and may also cause lower rates of lameness and contact dermatitis.

Overhead cover is an important feature in the outdoor area and can enhance range use. Shade may be provided in the form of trees, bushes, or artificial cover structures that provide shade and protection from the threat of aerial predators. Features of overhead cover that may affect how it is used could include the height of the structure, how it is constructed and maintained, its size, whether it moves in the wind, and how much visual protection or shade it provides. During periods of warmer weather, it may be necessary to give access to the outdoor area early in the day and later in the afternoon when the temperatures are cooler and birds are more comfortable outside.

## **Pest control**

There are a wide range of pest control methods available. The methods vary greatly in their impact on animal welfare, with many causing significant pain, suffering or distress. Humane pest control is the development and selection of feasible control programs that avoid or minimise pain, suffering and distress to target and non-target animals. A totally humane pest control method is one where the animal experiences no pain, suffering or distress. The pest control methods employed should be the most humane method available. Further, deterrents such as physical exclusion methods and the absence of elements that may encourage the presence of pest animals should be considered first. RSPCA Australia encourages ongoing investment in research and development to identify more humane pest control methods for use by the meat chicken industry.

## **Perches / Platforms**

Although it may be physically difficult due to their unwieldy body sizes and shapes, chickens are highly motivated to perch, particularly at night. The preferred perch type is rectangular, wooden lengths that support the whole foot, with rounded edges, and not metal surfaces. The perches should not be too far from the floor in order to facilitate use at all ages or should be adjustable to cater for birds at different stages of their growth.

Platform structures may also serve as perches as they fulfil the birds' motivation to be elevated off the ground. They also increase environmental complexity and provide places for refuge. Fast-growing meat chickens often have physical difficulty in using typical linear perch structures and the provision of raised platforms (low barrier perches, or plastic slatted areas accessible by a ramp) or low and wide perches may enhance usage and improve leg health. Some studies suggest platforms have benefits for meat chickens compared with typical linear perches.

## **Slaughter**

For an animal to be killed humanely, they must be either killed instantly or rendered insensible to pain until death supervenes. When killing animals for food (termed slaughter), this means they must be stunned so they immediately become unconscious prior to bleeding out. All methods of humane killing, including slaughter and on-farm euthanasia, must meet the same criteria: instant death of an animal or the animal rendered unconscious/insensible until death ensues, without pain, suffering or distress; reliability; simplicity; and with equipment that is easy to maintain. A high level of operator skill is essential for the humane killing of animals. Operators must be trained in: animal handling; selection of the best killing method; correct application of the killing method; and proper maintenance of equipment. It is also essential that checks for unconsciousness are performed following the stunning and killing methods. Indicators of death include a lack of corneal (blinking) reflex to the eye being touched, lack of breathing, limp carcass, and lack of pupil response. There must be back up and emergency procedures in place for incidents where stunning or killing procedures have not been effective.

Following stunning, there must be insufficient time for recovery of consciousness before permanent brain death occurs. Severing both common carotid arteries and both jugular veins leads to a quicker (15-30 seconds) bleed-out than severing only one carotid artery and jugular vein, which may take 1-2 minutes for brain death to occur. Severing both carotid arteries and jugular veins will reduce the proportion of birds that show indicators of consciousness, and is important in addition to appropriate and effective stunning parameters.

Failure to properly exsanguinate can result in poultry entering the scald tank before breathing has stopped. This leads to red discolouration of the skin, or 'red birds'. Studies have shown that red discolouration of the skin post-slaughter is usually a result of live birds entering the scalding tank, and that the red colouration is confined to the body areas where feathers grow. It is unacceptable for any bird to reach the scald tank alive; all birds must be dead upon entering the scalding tank.

## **Stunning – Electrical**

Electrical stunning is performed where the heads of the shackled birds enter an electrified water bath and an electric current passes from the water through the head, body and legs and to the metal shackle. The correct voltage, current and application time must be delivered to ensure that every bird is humanely stunned. If an appropriate electrical frequency is used, birds immediately lose consciousness and cardiac fibrillation occurs. However, if inappropriate frequencies are used, birds may not be stunned, or they may be stunned, but heart fibrillation does not occur which increases the risk of recovery. Good staff training, and well-designed and managed equipment reduce the risks associated with the procedure. Other provisions such as breast comforters, low light levels and noise, and the use of a ramp at the entrance of the water bath to avoid pre-stun shocks can improve the effectiveness.

Tight fitting shackles can cause pain, but contact is required between the leg and the shackle for an effective stun. Further, differently-sized birds means that larger birds experience greater leg compression, and shackle lines may not always accommodate birds of different sizes. Water may be sprayed on the shackles to improve conductivity while allowing the shackles to not be too tight. The shackle line should be designed to minimise bends and be free of sharp corners.

There are significant welfare concerns with electrical stunning. Shackling of live birds occurs in electrical stunning systems. This represents welfare concerns since the processes of handling, inversion and shackling are stressful for chickens. Hanging upside down is a physiologically abnormal posture for poultry which causes fear, and the compression of the legs by shackles is likely to be painful. Birds suffering from lameness or leg abnormalities are likely to experience greater pain and suffering during shackling both from compression on the legs and also from the pressure put on the legs due to the hanging weight of the bird.

Severe wing flapping can occur during shackling which increases the risk of injuries to the wings, as well as the risk of pre-stun shocks. To reduce the pain and discomfort associated with shackling, bird handling should be calm and gentle. Wing flapping on the shackles can be reduced by gently running the hands down the legs and body of the bird or keeping hold of the legs for half a second after shackling, and by using low lighting and blue lighting in the shackling area. Breast comforters prevent wing flapping and head-raising prior to entering the stunning bath. A breast support conveyer and compliant shackles which conform to the size of a bird's legs have been proposed but not taken up commercially. The RSPCA strongly encourages the adoption of systems that do not involve the shackling of conscious birds as soon as possible.

Painful pre-stun shocks may occur when birds flap their wings or do not enter the electrified water bath in the correct position and make contact with the water before their heads are immersed, and birds may miss the electrified water bath completely or partially if they lift their heads, which leads to a total failure or inadequate stunning. The risks of pre-stun shocks and ineffective stunning may be reduced by measures including entry ramps into the stunner and breast comforters.

There are concerns that the incorrect electrical frequencies (i.e. high electrical frequency rather than low electrical frequency stunning) will lead to electro-immobilisation but not an effective stun, and there may be higher rates of ineffective stunning than is reflected by bird behaviour. Different bird sizes mean that there are varying levels of resistance between birds and a variable stun. Further, inappropriate settings may mean that a high proportion of the current in the water bath flows through the body of the bird rather than the brain.

While electrical stunning is a common form of stunning in Australia and is an efficient form of rendering birds unconscious when performed properly, there are significant welfare concerns with the procedure. Due to these concerns, electrical water bath stunning should be phased out and replaced with alternative systems such as controlled atmosphere stunning and low atmospheric pressure stunning.

### **Stunning – Controlled atmosphere systems**

RSPCA Australia strongly encourages the use of systems where birds are rendered unconscious prior to being shackled. Controlled atmosphere systems (CAS) are widely used in Australia and have the benefit of reducing handling of live birds and avoiding the need to shackle conscious birds, as well as allowing a greater level of control and uniformity of the stun between birds.

Gas mixtures that may be used in CAS include argon with oxygen, low concentrations of carbon dioxide with oxygen, nitrogen with oxygen, or carbon dioxide and argon with oxygen. Carbon dioxide appears to be aversive to poultry due to the pungency of the gas, hyperventilation, breathlessness, and suffocation. Inert gas mixtures have less aversive effects. While carbon dioxide is the most common gas used for stunning, studies have found that poultry do not find argon aversive, and do not show signs of distress during nitrogen-induced stunning. Studies therefore indicate that stunning with argon, nitrogen, or a mixture of the two gases is ideal for stunning poultry.

Systems that allow birds to be stunned in their transport containers to minimise the handling of live birds are encouraged.

## **Stunning - Low Atmospheric Pressure Stunning**

Low Atmospheric Pressure Stunning (LAPS) is a newer form of stunning which may offer significant welfare improvements over gas and electrical stunning methods and should be considered for use in Australia. A report by the European Food Safety Authority concluded that LAPS is acceptable for commercial slaughter of meat chickens weighing less than 4 kg. LAPS causes birds to lose consciousness gradually and painlessly by placing them into a chamber and gradually reducing the atmospheric pressure. A reliable, irreversible and consistent stun is achieved, and birds remain in their transport containers, therefore avoiding the need for tipping or shackling conscious birds.

## **Stocking density**

Animals need enough space to ensure they remain physically healthy and can carry out normal behaviours. Space allowance should enable animals to exercise, explore and express social behaviours. When determining the appropriate stocking density, consideration needs to be given to a range of factors, including: ventilation, temperature, humidity, age and size of the animals, group size and composition, weather conditions, litter quality and management, and quality and management of the outdoor area. In other words, it is not only the quantity of space provided to each animal, but also the quality of the space provided that influences animal welfare. More space may be required in areas subject to high temperatures and humidity unless appropriate temperature, humidity and ventilation controls are in place and fully operational.

Lower stocking densities are associated with increased activity and reduced lameness, foot pad dermatitis, skin scratches, fearfulness, heat stress and contact dermatitis. There are many other factors that affect welfare in combination with stocking density, and limits on stocking density with targets for animal-based measures of conditions including lameness and contact dermatitis are beneficial. Stocking density should be reviewed regularly and where animals are ill, injured, or behaving abnormally, or where environmental conditions cannot be maintained appropriately (e.g. litter quality and air quality), space allowance should be increased to ensure the welfare of the animals.

## **Stockpersonship**

The interaction between stockpeople and birds (the human-animal relationship) is a large determinant of welfare outcomes. The attitude and behaviours of a stockperson strongly affects an animal's fear of humans and subsequently their well-being, productivity and meat quality. Research has shown that regular, positive human contact reduces chickens' fear of humans, and reduces stress and fear reactions to road transportation in meat chickens.

The attitudes and competence of stockpersons and staff are vital in determining whether high standards of animal welfare can be achieved. It is the responsibility of management to ensure there is a culture among staff that prioritises animal welfare and recognises and rewards staff for maintaining good welfare. Financial rewards, career pathways, and general job satisfaction may also contribute to motivation and performance.

In addition to attitude and behaviour, technical skills, and knowledge are influential. Therefore, selection of the right people and effective training of stockpeople is crucial. It is essential that stockpersons are suitably selected, trained and experienced (or directly supervised by experienced staff), and are able to recognise indicators of poor and good welfare.

Stockpeople should observe birds' appearance, vocalisations and behaviour regularly, including: feeding and drinking; active, responsive, calm behaviour; engagement in normal behaviours and interactions; absence of abnormal behaviour; even distribution of birds throughout the usable area; positive or neutral response to stockperson; use of environmental enrichment; use of perches; signs

of disease, injury or distress (including panting); body condition and absence of dirty feathers; and walking ability (including lameness). In addition to observing and responding to birds' behaviour and physical needs, the stockperson is responsible for maintaining an optimal housing environment. They must have a good working knowledge of the husbandry system and the animals under their care.

See also 'Handling'.

## **Stress**

The mechanism that allows animals to cope with challenges in their environment is called a stress response and it allows the animal to overcome or avoid such challenges (referred to as 'stressors'). However, where the animal is not able to escape the stressor or where stressors persist beyond the short term, chronic stress can result. Chronic stress compromises animal welfare and can usually be observed through physical and behavioural changes in the animal (e.g. loss of appetite and weight, compromised immune and reproductive system, impaired mental function and coping ability).

## **Temperature, ventilation and air quality**

Shed temperature should provide a comfortable environment for birds at all times of the year. Temperature extremes (hot or cold) require additional monitoring of the birds (e.g. for signs of panting or huddling) and ventilation may need to be adjusted to minimise any impact on the animals. Adequate air exchange is essential for managing heat, moisture, dust and harmful gases, including ammonia. If ammonia can be smelled/detected by humans (10-15ppm) or dust levels are noticeably unpleasant to humans, corrective action, such as increasing ventilation, must be taken.

Facilities must be designed, constructed and maintained to manage periods of heat or cold, and avoid impacts on the birds. Further, protocols must be in place to rectify situations in which temperatures may negatively affect birds. Mortality due to heat or cold stress is unacceptable and demonstrates an inability to effectively manage the shed environment.

The risk of heat stress increases with age and also with stocking density. This risk may be minimised by appropriate ventilation, lowering stocking density, by providing supplements in the diet, and by using more robust and tolerant breeds.

Bird welfare is impacted not only by temperature, but also by the humidity and air flow in the shed. Air exchange and air flow have important impacts on litter condition, and therefore ammonia concentrations in the air, the presence or absence of health conditions relating to ammonia concentrations (eye and respiratory functions), and the ability for birds to scratch and dustbathe in the litter, and the propensity to develop contact dermatitis due to litter moisture. Stockpersons must be aware of the relationship between shed environment and bird welfare, and therefore proactively manage the shed environment to avoid compromising one or the other or both.

## **Thinning**

The practice of 'thinning', i.e. partially depopulating a shed, is common in Australia and allows a larger number of birds to be placed in the shed so that the maximum stocking density can be reached on one or more occasions prior to final depopulation, and to allow producers to meet varying market requirements. Stocking density is negatively associated with a number of conditions which negatively affect welfare. Where maximum stocking density is reached a number of times within a batch compared with just once, the risk of negative welfare conditions in the birds increases. In addition to this, the practice of catching itself poses risks to welfare. This includes feed and water deprivation prior to catching, noise and dust during catching, disruption of the dark period and resting, and the risk of introducing diseases into the shed. The presence of catching teams in the shed is also stressful for birds. Thinning should therefore be minimised and eliminated where possible.

See also 'Catching for slaughter'.

### **Training and competency**

Good stockpersonship includes the knowledge, skill, attitude and behaviour necessary to handle animals, and is an essential component of any farming system. Stockpersons must always interact with animals in a caring and compassionate manner that ensures good animal welfare and enhances the human-animal relationship. Stockpersons must be appropriately trained and competent in their required tasks. Stockpersons should successfully complete recognised training and accreditation programs where they exist, and on-the-job training in all aspects of husbandry and care relevant to their role, including euthanasia.

See also 'Handling', 'Stockpersonship'.

### **Transport**

Transport is stressful for animals and, if not well managed, can cause suffering and deaths. Animals should be transported in a way that avoids injury and minimises suffering or distress. Stressors that affect bird welfare during transport, and should be considered when transporting meat chickens, include the duration of transport, density of the birds in the transport crates, motion of the truck, age and health status of the birds, transport equipment, temperature, humidity, loud noises and new situations, air flow within the transport crates, and the time off feed and water. Journey times should be as short as possible; generally, long journeys result in poorer welfare since the duration of exposure to stressful conditions is extended.

It is crucial to assess the welfare of the birds prior to transport to determine whether they are fit to make the intended journey. It is also essential to monitor the welfare of the birds during transport and lairage to ensure that their welfare is not compromised. This may be done using meat chicken welfare monitoring tools and protocols (e.g. Welfare Quality or WELLTRANS).

Birds should not be transported in extreme weather conditions. If essential to transport birds during hot weather, this should occur during the cooler parts of the day, fewer birds should be placed in each transport container, they should be transported for the shortest possible time, shade and increased airflow should be provided where possible, and any unnecessary stops of the vehicle should be avoided. It is recommended that transport vehicles and drivers participate in independent audit schemes that include animal welfare (e.g. TruckSafe or equivalent). In lairage, suitable conditions must be maintained for bird welfare including appropriate temperatures to avoid heat and cold stress, adequate air flow between transport containers, and the provision of shade and cover to protect birds from direct sunlight or wind and cold temperatures. Regular monitoring of the conditions in lairage as well as the behaviour and condition of birds in lairage is important.

See also 'Catching for slaughter'.



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