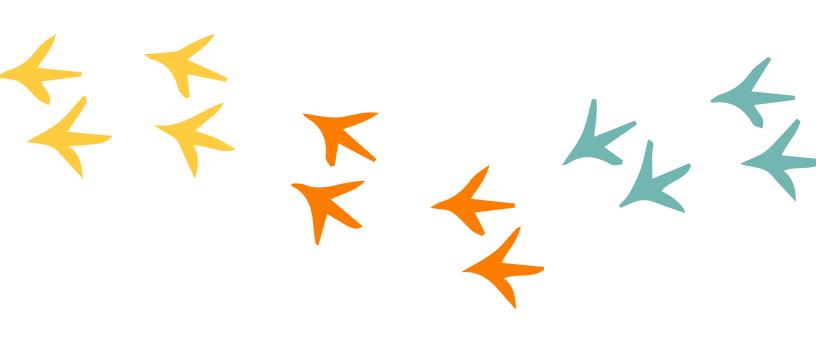


Meat chickens: Challenges and priorities for good animal welfare





© RSPCA Australia 2020

RSPCA Australia PO Box 265 Deakin West ACT 2600

Tel: (02) 6282 8300 Email: rspca@rspca.org.au Website: www.rspca.org.au

Contents

Introduction	4
Genetics	5
Stocking density	6
Housing	7
Enrichment	9
Handling	11
On-farm euthanasia	12
Depopulation	13
Transport	14
Stunning and slaughter	15
Hatchery	17
Breeder birds	18
Next steps	19
Bibliography	20

Introduction

RSPCA Australia believes that good animal welfare must be an inherent part of all farm animal production. This goes beyond preventing pain, suffering or distress and minimising negative experiences, to ensuring animals can express their natural behaviour in an enriching environment, feel safe, have healthy positive experiences and a good quality of life. Providing good animal welfare means providing animals with all the necessary elements to ensure their physical and mental health and a sense of positive individual wellbeing.

This document highlights the key animal welfare challenges for the meat chicken industry in Australia and sets out RSPCA Australia's priorities, informed by current best practice and international animal welfare science, to address these challenges, with the aim of ensuring all chickens experience good animal welfare throughout their lives.

The key challenges and priorities set out in this document will inform the future review of the RSPCA Approved Farming Scheme Standard for meat chickens. The review process considers the relevant animal welfare science, the extent to which improvements can be implemented across the entire production chain and the commercial practicality of proposed changes, but always with the underlying aim of ensuring continuous improvement to the welfare of chickens farmed under the Scheme.

RSPCA Australia recognises that the Australian meat chicken industry has made considerable changes in recent years to improve animal welfare and continues to explore and develop ways to address the animal welfare challenges outlined in this document. The significant extent to which the industry has implemented the RSPCA Approved Farming Scheme Standard for meat chickens is clear evidence of the progress that has been made. However, there is still more to do. At a time of increasing public awareness and retailer demand for good animal welfare outcomes, continual improvement is essential to fulfil community expectations and ensure that all chickens grown in Australia are able to have a good quality of life.

RSPCA Australia | Meat chickens: Challenges and priorities for good animal welfare

4

Genetics

The challenge

Meat chicken breeds have been genetically selected for a high juvenile growth rate and large body size to increase production efficiency and meat yield, respectively.

Currently, when considering growth rate, there is a direct conflict between good welfare and selecting genetics for maximising production. This selection for fast growth predisposes meat chickens to several significant welfare compromises including leg problems, metabolic disorders, and subsequently higher rates of mortality. Fast-growing genetic strains of meat chickens have lower activity levels throughout their lives, and spend more time sitting, eating and drinking than slower-growing genotypes who spend more time perching, walking and ground scratching. Fast-growing chickens may still be motivated to perform walking and perching behaviours even when they are physically unable to because of leg weakness and heavy body mass, resulting in frustration and compromised welfare.

The priority

Breeding programs prioritise traits that optimise welfare and focus on improving mobility and skeletal health, and decreasing cardiovascular and metabolic issues. Slower-growing breeds are increasingly represented within the Australian commercial flock.

Increasing genetic diversity and using multi-trait breeding programs is one way to help resolve the current conflict between welfare and performance. Breeding programs should aim to mitigate the welfare challenges that occur due to the fast growth rate of birds. The positive welfare traits that should be selected for include improved leg health, lower disease levels, and slower growth with maturity to avoid obesity.

Slower-growing breeds are more mobile and have better leg health in comparison to fastgrowing breeds. Therefore, slower-growing genetics could be used to prevent some of the welfare challenges that affect faster-growing breeds. However, due to differences in behaviour and activity levels of slower-growing chickens, they will have different husbandry and management requirements than fast-growing chickens. For example, slower-growing chickens may require more perching space and environmental enrichment. In addition, these birds have been found to better utilise ranges and should therefore also be provided with outdoor access to a quality range.

Stocking density

The challenge

Chickens housed at high stocking densities, where they are unable to all flap their wings or move around easily without disturbing other birds, can have higher mortality rates, are behaviourally restricted, and can have poorer leg health than those housed at optimal densities. High stocking densities also lead to increased competition for floor space, feed and water.

When meat chickens are housed with minimal space allowance, there is an increased risk of compromising bird welfare. High stocking densities, particularly the gradual reduction in space per bird as meat chickens reach slaughter weight, can also make management of litter quality, ammonia levels and shed temperatures more challenging. This, in turn, increases the likelihood of birds experiencing contact dermatitis (footpad, hock and breast burns) due to poor litter quality, lameness, and heat stress.

The priority

Meat chickens are provided with their optimal space requirements throughout their lives, so all birds can move around freely and perform natural behaviours such as perching, foraging and dust bathing.

The housing system is a major determining factor in the amount of space required by meat chickens. Space allowance needs are influenced by a number of factors including age and size of birds, ventilation (temperature and humidity), litter quality and management, and weather conditions. The extent to which these factors are able to be managed in a certain type of housing system, will influence what the optimal stocking density is for meat chickens within that system. Providing birds with their optimal space requirement will require a reduction in current stocking density levels.

In addition to reducing current stocking density levels, more research is required on the optimal space requirements of meat chickens in different housing systems. This research should take into account the various factors that influence space allowance needs and their impact on bird welfare.

Housing

The challenge

Meat chickens in commercial sheds may not be provided access to natural light or, alternatively, an artificial lighting regime that provides a similar broad spectrum of light. Meat chickens appear to prefer lighting that resembles natural light. When provided with natural light, chickens perform more natural behaviours, have better leg health and exhibit higher activity levels. Monochromatic light spectrums, for example the provision of only blue lighting, can cause visual signals to be lost and have negative impacts on the birds such as increased fearfulness, or reduced activity levels.

Inadequate ventilation and air quality can result in the accumulation of pathogens, moisture, dust, ammonia and other noxious gases resulting in poor welfare. Indoor temperatures above 30° Celsius and humidity levels above 80% are particularly stressful to chickens. Poor ventilation can increase the risk of birds experiencing heat stress which can result in compromised welfare and mortalities. This is a particular issue at the end of a flock's grow-out period due to high stocking densities, as well as birds' poor thermoregulation caused by their high energy diets and inactivity.

Inadequate litter provision and litter material can mean birds are unable to perform natural behaviours such as ground scratching, dust bathing and foraging. Inability to perform natural behaviours, has been shown to contribute to increased frustration and compromised welfare. Poor litter quality also has an impact on bird welfare. Litter that is too dry and dusty can cause eye and respiratory problems for chickens, and wet or damp litter can lead to increased incidences of contact dermatitis and infectious diseases.

Most meat chickens are raised without veranda or outdoor access. Where veranda or outdoor access is provided as additional space, it can decrease the indoor stocking density which can result in improved welfare and encourage activity in birds.

The priority

Meat chickens are housed in conditions that ensure bird comfort and provide them with the opportunity to perform natural behaviours, including:

- natural light or light of a broad-spectrum equivalent to natural light
- adequate ventilation to maintain air quality and shed temperatures
- litter of a preferred substrate and that is actively managed to maintain litter quality.

In addition to indoor housing, birds are provided with climate-appropriate veranda and/or outdoor access that offers shelter and further opportunities to perform natural behaviours.

Natural light ensures birds receive the benefits of full spectrum light wavelengths including UV light. Where artificial light is used it should therefore provide birds with the equivalent spectrum of natural light. Natural light also provides environmental variation, as the range of brightness in different areas of the shed changes throughout the day. Lighting regimes should provide birds with light of sufficient intensity to encourage activity during the day and at least eight hours of continuous darkness with all lights off at night to ensure sufficient rest.

Effective ventilation should remove excess heat, moisture, noxious gas levels (ammonia), dust and odour in meat chicken sheds. Ventilation should be able to provide supplemental heating and cooling if required.

Appropriate and good quality litter material maintained to be dry and friable is essential for good bird welfare. Litter provision allows birds the opportunity to perform natural behaviours such as foraging and dustbathing.

Providing access to a veranda and/or outdoor area, in addition to the minimum required space allowance indoors, can benefit bird welfare by providing additional space, natural light, fresh air and environmental enrichment. A veranda is a roofed, enclosed outdoor area that provides shade and shelter and contains litter, perches and environmental enrichment. An outdoor area (or range) should have adequate shade and shelter, environmental enrichment, and palatable vegetation. There should be enough openings to these areas so that all birds in the shed have the opportunity and are encouraged to utilise the whole area available. Provision of veranda and outdoor area access should take account of prevailing climatic conditions to ensure good bird welfare outcomes.

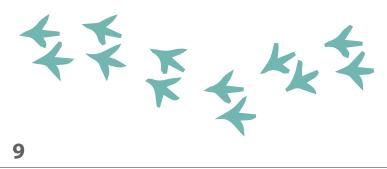
Enrichment

The challenge

Meat chicken housing systems do not always provide effective enrichment objects and materials or perching opportunities for birds. The environmental enrichment objects and materials provided to meat chickens do not always elicit or maintain birds' interest or provide the intended welfare benefits. Perch provision can be insufficient and inappropriately designed for meat chickens to be able to use effectively due to their poor mobility.

Birds that are housed in barren environments have been shown to be less active than birds provided with enrichment and perching. Inactivity in birds can contribute to an increased likelihood of lameness, leg problems and contact dermatitis.

Natural behaviours for meat chickens include ground scratching, ground pecking, perching, dust bathing and foraging. The opportunity to perform these natural behaviours is a critical aspect of good animal welfare. Where housing environments do not accommodate these highly motivated behavioural needs, bird welfare can be compromised. However, assessing whether these behavioural needs are being met can be challenging due to the fast growth rate of meat chickens which has led to some physical limitations. These limitations may reduce birds' ability to carry out not only natural behaviours but also negative behaviours such as stereotypies. Meat chicken breeder birds have been shown to display signs of frustration, increased aggression and the development of stereotypies such as stereotypic object pecking, when their behavioural needs are not met.



RSPCA Australia | Meat chickens: Challenges and priorities for good animal welfare

The priority

Meat chickens are housed in complex environments and provided with effective environmental enrichment and perches that promote natural behaviours and positive experiences.

Environmental enrichment, especially when provided from early in life, can increase exploratory behaviour and reduce fearfulness and flightiness in response to novel stimuli and handling. To ensure birds remain interested, it is critical that environmental enrichment appropriately satisfies the desired behaviour and that significant effort is put into rotating or changing enrichment materials/objects regularly to ensure variety and maintain interest. It should be distributed through the shed and in appropriate quantities so that all birds can access and use it. Environmental enrichment can include, but is not limited to, organic and non-organic manipulable materials, moveable objects, and food items.

Reduced perch and platform use can be associated with poor leg health and mobility challenges. Perches and platforms should therefore be designed to encourage perching by ensuring they comfortably support the bird's whole foot, and are adjustable and positioned at an appropriate height so birds can easily access them at all ages. Perches should be evenly distributed throughout a shed to encourage activity and uniform distribution of birds in the shed. The provision of panels, barriers or straw bales can also provide birds with additional options to perch or rest against them.

Environmental enrichment and perches should also be provided and evenly distributed throughout any veranda areas. For outdoor areas, overhead cover is critical to encourage birds to utilise the range, and outdoor areas should have a variety of palatable vegetation, trees, and environmental enrichment.

Further research is required to determine and trial the most effective and lasting enrichment types for commercial production systems. This research should also aim to assess the optimal age of introducing particular types of enrichment and determine whether birds' interaction with enrichment types changes over time.

Handling

The challenge

There is currently no formal animal welfare accreditation program for poultry stockpersons in Australia. A lack of formal training programs can lead to stockpersons having a poor understanding of good poultry care and welfare. This increases the risk of birds not being cared for or handled using best practice techniques. Poorly handled birds are at risk of being injured or experiencing distress, which leads to compromised welfare.

Good stockpersonship includes the knowledge, skills, attitude and behaviour necessary to handle animals well, and is an essential component of any farming system. To ensure good welfare, stockpersons should always interact with animals in a caring and compassionate manner and use low-stress handling and management techniques.

The priority

Meat chickens are handled using low-stress, best-practice handling methods that promote positive human-animal interactions by skilled stockpersons who are specifically trained in poultry welfare.

A formal poultry welfare training program should be developed to facilitate improved meat chicken welfare and ensure all stockpersons involved with live birds have an understanding of normal bird behaviour, and good bird care and management. The program should include practical training in all aspects of husbandry and care relevant to their role, including low-stress handling, observation of birds, identification of normal and abnormal bird behaviour, recognising signs of ill health and euthanasia techniques. Specific training programs should be required for those responsible for maintaining the shed environment to ensure bird comfort, for the catching and transport of birds, and the stunning and slaughter of birds.

On completion of these courses, stockpersons handling live birds should be required to take refresher courses or examinations to ensure they remain competent in their required tasks. Training programs could be developed and delivered by the poultry industry in collaboration with animal welfare groups, research organisations and governments. The programs should be reviewed regularly to ensure they remain up to date with the current science and best practice for poultry welfare. In the absence of formal training, stockpersons should receive on-the-job training by staff experienced and competent in bird handling and welfare.

Regular positive handling of birds can help reduce fear and stress in meat chickens. Even visual contact alone can reduce fear and stress experienced by birds. The development and use of automated or mechanical handling technologies, such as remote monitoring via robots or cameras, thermal imaging or mechanical catching machines, should also be considered as a potential way to minimise manual handling and stress to birds.

11

On-farm euthanasia

The challenge

The main method of on-farm euthanasia for birds who are weak, sick, injured, unable to walk, or will not recover from a disease or condition, is manual cervical dislocation.

This method, when performed correctly, causes separation of the spinal cord and brain stem, reduces the diameter of the carotid arteries, and results in death by cerebral ischemia (insufficient blood flow to the brain). However, this method does not result in immediate loss of consciousness and therefore birds may experience pain and distress prior to death.

The World Organisation for Animal Health (OIE) and the European Food Safety Authority state that, due to the welfare concerns, manual cervical dislocation should only be used if other methods are not available and when killing a small number of birds weighing less than three kilograms.

The priority

12

On-farm euthanasia methods involve minimal handling and result in loss of consciousness in a way that birds do not experience pain or distress prior to death.

Captive bolt gun devices and gas killing using carbon dioxide are two alternative methods to manual cervical dislocation that have been developed for on-farm euthanasia of poultry and are available in Australia.

Captive bolt gun devices are designed to kill birds immediately, through a percussive force causing irreversible structural damage to the brain and subsequent death. Although this alternative method is more humane than manual cervical dislocation, it still has some associated welfare risks.

When carbon dioxide gas is used, birds lose consciousness and are eventually killed from anoxia (lack of oxygen). However, as exposure to high concentrations of carbon dioxide gas has been shown to be aversive to birds, there are still welfare concerns with this method.

More research is needed to improve the current methods of euthanasia using captive bolt gun devices and gas killing, as well as towards the development of other more humane, viable on-farm euthanasia methods.

Depopulation

The challenge

Partial depopulation (also called thinning) is commonly practiced in Australia to allow producers to meet varying market requirements depending on bird weight. The practice involves catching and removing a portion of birds from a shed on multiple occasions. This allows for a larger number of birds to be placed in a shed so that the maximum stocking density can be reached on one or more occasion prior to final depopulation, resulting in birds generally having less space to move around over the course of their lives than in an all-in all-out system.

Higher stocking densities are associated with a number of conditions which negatively affect bird welfare, such as restricted movement, limited opportunity to perform natural behaviours and an increased risk of conditions such as lameness, contact dermatitis and heat stress. Reaching peak density, a number of times in comparison to just once, therefore increases the risk of birds experiencing negative welfare conditions.

The practice of catching poses a risk to bird welfare. The presence of catching teams in the shed is stressful for birds. Birds are usually caught manually and inverted with multiple birds held in each hand. Incorrect handling can result in birds being injured (bruising and fractures) and inverting is stressful and increases fear in birds. Other welfare risks include disruption to the birds, 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 priority

Meat chickens are picked up using an all-in all-out system so that only a single depopulation of each shed is required.

Multiple pick-ups of meat chickens should be phased out and replaced by whole sheds being grown to a specific market weight to allow for an all-in all-out system. The use of an all-in all-out system will reduce the risk of diseases being introduced and avoid the unnecessary disruption and stress that multiple pick-ups cause to birds. For all-in all-out systems to be successful, all birds should reach market weight at the same time (i.e. the focus is on flock uniformity).

Birds should be kept calm at catching. This can be done by ensuring catch is not performed on hot or humid days, dimming lights, as well as timing the removal of feed, water, environmental enrichment and perches to minimise disturbance to birds. When manually catching birds, upright handling methods should be used where birds are caught under their abdomen and carried in an upright position. The use of more automated and mechanical catching technology may also provide a solution to reduce the stress and fear experienced by birds during catch. Better handling methods will not only reduce stress and fear experienced by birds but also minimise the risk of injury to birds.

Transport

The challenge

There are several ages and stages of development where meat chickens may be transported, such as chicks from hatcheries, brood-and-move systems, and meat chickens from the farm to the abattoir. Prior to transport, birds have already been subjected to stress from the catching process, where they are caught and placed in transport crates/modules.

During transport, meat chickens are exposed to various stressors including weather, the microenvironments of modules/crates, social disturbance, noise, vehicle vibrations and motion, as well as feed and water deprivation. Longer transport times and feed and water deprivation times result in a higher risk of compromised bird welfare or mortality during transport. The minimal space allowance provided to each bird in modules/crates is also a major factor leading to stress and mortality during transport.

Transport vehicles typically rely on natural ventilation, but some vehicles may be covered or enclosed and provide mechanical ventilation (particularly for transporting chicks from hatcheries). Meat chickens are susceptible to heat stress and related problems, including muscle damage, electrolyte disturbances and mortality during transport. Heat stress can occur during transport because of high stocking densities, poor ventilation, thermal micro-environments of modules/crates, and birds' poor thermoregulatory capacity.

The priority

Meat chickens are transported in vehicles that provide sufficient space and are equipped with ventilation systems that ensure bird comfort and minimise the risk of thermal stress during transport.

Birds should be provided with increased space allowance based on thermal conditions and ventilation capacity of vehicles to minimise the risk of heat stress. The use of transport vehicles with mechanical ventilation systems is encouraged as they allow for regulation of both air temperature and humidity throughout the vehicle during transportation.

The use of automated monitoring should be used to record temperature and ventilation conditions in the transport modules/crates as well as journey times. These monitoring systems should have in place alarms to notify the driver in the event of thermal conditions that place birds at a particularly high risk of thermal stress (hot or cold).

Stunning and slaughter

The challenge

Electrical waterbath stunning is currently the most common form of stunning in Australian abattoirs processing meat chickens. Electrical waterbath stunning systems have inherent issues that compromise the welfare of chickens including the requirement of inverting and shackling conscious birds, and the variability in stun effectiveness. As a result, these systems have a high risk of causing pain, suffering and distress to birds.

During shackling, the pressure exerted on the legs is likely to cause pain, which can be further exacerbated by inappropriate shackle positioning, heavy body weights, and leg deformities. Flapping and struggling while shackling can also cause injuries to the wings and increases the risk of painful and distressing pre-stun shocks when entering the electrical waterbath.

Additionally, the electrical resistance applied to individual birds in the waterbath can vary significantly between birds. The effectiveness of the stun is dependent on the electrical frequency of the waterbath and the electrical resistance of the individual bird, which can vary depending on body size, muscle and fat content, sex, skull bone structure and thickness, and plumage condition. For this reason, the correct frequency may not always be applied to individual birds, meaning birds may be ineffectively stunned or potentially electro-immobilised. If birds are electro-immobilised, then conscious birds may appear unconscious, leading to the risk of birds having their neck cut while conscious.

Carbon dioxide gas stunning systems have several advantages for animal welfare in comparison to electrical stunning systems. However, exposure to high concentrations of carbon dioxide gas has been shown to be aversive to birds. Therefore, there are concerns that birds experience pain and distress before unconsciousness due to carbon dioxide being an acidic gas and a potent respiratory stimulant that causes breathlessness.

During the slaughter process, there is also a risk that birds may miss the automatic neck-cutting blade or be ineffectively cut by not having both carotid arteries completely severed. Current practice allows for birds to have their neck manually cut if they are found to be ineffectively stunned or incorrectly cut by the automatic neck cutter. This means birds may be conscious when having their neck cut and experience pain and suffering during the bleed-out process prior to entering the scalding tank.

The priority

Meat chickens are stunned and slaughtered using methods which eliminate the handling and shackling of conscious birds. Meat chickens are effectively stunned prior to slaughter without pain or distress.

Although some aspects of electrical waterbath stunning can be improved, the inherent welfare issues remain. Therefore, electrical waterbath stunning should be phased out and replaced by more humane stunning systems. These systems should not require the individual bird handling or shackling of conscious birds and should provide a reliable and effective stun.

The replacement of electrical waterbath stunning systems should also remove the need for manual back-up neck cutting of potentially conscious birds. Carbon dioxide gas stunning systems allow for birds to be placed back through the stunning system as consciousness is assessed at the point of shackling rather than neck cutting. Alternatively, the use of back-up stunning methods prior to manual neck cutting could be used, such as non-penetrative captive bolt gun or head-only electrical stunning devices.

Carbon dioxide gas stunning systems are slowly being adopted in Australian abattoirs and resolve some of the welfare issues in electrical waterbath stunning systems. However, due to the aversiveness to high concentrations of carbon dioxide gas there are still some welfare concerns with this method. More research to develop alternative stunning methods that are reliable and non-aversive to birds, such as inert gas stunning or low atmospheric pressure stunning systems, should be encouraged.

本文をな

Hatchery

The challenge

Breeder bird age can have negative impacts on egg hatchability and hatched chicks' quality. The use of young and older breeder birds can result in reduced egg and chick quality. Older breeder birds especially have been associated with decreased hatchability and producing chicks of lower quality resulting in a higher chick cull rate. Extended egg storage times (more than seven days) has been shown to have negative welfare outcomes for chicks, including increased risk of physical abnormalities and chick mortalities, and decreased immune function.

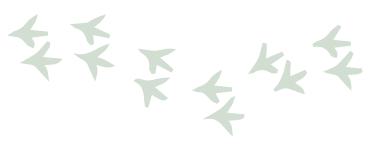
After hatching, chicks are transported from the hatchery to farms. During transport, chicks are particularly vulnerable to experiencing thermal stress, resulting in compromised welfare and mortalities. Chicks being transported may have delayed access to feed and water post-hatch for up to 72 hours until they arrive on farm. This can result in compromised welfare due to the risk of dehydration, depressed body weights and reduced immune response.

The priority

Eggs and chicks are managed in a way that ensures good chick welfare.

The use of breeder birds within the optimal age range and minimising egg storage times can improve hatchability and overall chick quality. This will minimise the risk of chicks having physical abnormalities and other conditions that may result in chick mortalities.

The use of on-farm hatching technology is one way to ensure good chick welfare. This would avoid the stress caused by transport and provide chicks with immediate access to feed and water post-hatching, which could improve their gastrointestinal and immune-response development in the first few days of life.



Breeder birds

The challenge

Genetic selection for fast growth in meat chickens has resulted in breeder birds being at high risk of obesity causing leg problems and high mortality rates. Obesity in male breeder birds can result in reduced fertility and female birds having multiple ovulations and decreased egg output. Multiple ovulations in female breeder birds can cause increased systemic inflammation and lead to abnormal egg development, low hatchability and increase mortality rates of chicks.

To manage obesity, feed restriction is commonly practiced by feeding breeder birds only 25-50% of their daily food requirements. This can result in birds being chronically hungry and stressed, leading to the development of redirected and damaging behaviours towards other birds such as aggression and feather pecking.

Female breeder birds are motivated to perform natural pre-laying and nesting behaviours. Where nests are not provided in sufficient numbers or are poorly designed, birds are unable to satisfy these behavioural needs, causing frustration and chronic stress. Frustration may be demonstrated through inactivity like sitting, redirected behaviours such as feather pecking, or the development of stereotypies.

The priority

Breeding programs prioritise traits that optimise welfare, including addressing obesity in breeder birds.

Genetic selection could be used to alter the growth curve of birds through selecting for early productive growth rates and low body fat percentages at older ages. By aiming for steady growth of young meat chickens while significantly slowing growth with maturity, the risk of obesity in breeder birds is reduced.

Breeder birds should be able to fulfil their pre-lay and nesting behavioural needs. The attractiveness of a nest is influenced by factors such as seclusion, material, litter substrate and the microclimate of the nest. Due to social interactions amongst breeder birds, ensuring a sufficient number of nests of preferred material are provided will avoid nest competition and the risk of submissive females being unable to access nests.

Other welfare improvements for breeder birds should reflect the same provisions for meat chickens in this document.

Next steps

The animal welfare challenges set out in this document should be considered priority issues for all those with an interest in the chicken meat industry. Meat chicken growers farming to the RSPCA Approved Farming Scheme Standard are already on a pathway of continuous improvement and working towards addressing the challenges described. For further progress to be made, it is critical that all elements of the chicken meat supply chain recognise their responsibility for addressing the animal welfare challenges described.

Some of these animal welfare priorities may not yet be commercially feasible in Australia. To become commercially feasible, meat chicken growers, transporters and processors who work to address these animal welfare challenges need to be recognised and rewarded for the inevitable higher cost of raising, transporting and slaughtering meat chickens to higher welfare standards. As such, consumers who expect good standards of animal welfare should also expect to pay more for chicken meat products to support the investment required to achieve good animal welfare outcomes for meat chickens.

The current challenges in animal welfare should be considered and addressed in all aspects of chicken meat production, including birds at hatcheries and breeder bird facilities. Prioritising welfare positive traits in breeding programs, as well as the provision of optimal space and enriched housing environments will ensure meat chickens' physiological and psychological needs are better met. Improving the handling, on-farm euthanasia and transport of birds will minimise the risk of birds experiencing compromised welfare. Additionally, with slaughter being the final point where animal welfare can be compromised, the need for effective stunning and methods that do not require individual handling and shackling of conscious birds will be essential to ensuring good welfare for meat chickens.

RSPCA Australia encourages the development of industry self-monitoring procedures and third-party certification systems to improve transparency and demonstrate compliance with best practice for good animal welfare during all stages of production. Public reporting against key performance indicators on the industry body website or in annual reports should occur and focus on how the animal welfare challenges discussed in this document are being addressed. These reports should provide evidence of progressive animal welfare improvement year on year. This would allow for both increased consumer awareness about production practices and enable consumers to make more informed choices about chicken products. Additionally, third party animal welfare certification from a reputable organisation gives consumers confidence in the validity of animal welfare compliance.

Effectively addressing the animal welfare challenges set out in this document is critical to achieving the goal of ensuring all meat chickens farmed in Australia experience good animal welfare throughout their lives.

Bibliography

- Altan O, Seremet C, and Bayraktar H (2013) The effect of early environmental enrichment on performance, fear and physiological responses to acute stress of broiler. Arch. Geflügelkd. 77:23-28.
- Baracho MS, Naas IA, Lima NDS et al (2019) Factors affecting broiler production: a meta-analysis. Brazilian Journal of Poultry Science. 21,3.
- Bensassi N, Vas J, Vasdal G et al (2019) On-farm broiler chicken welfare assessment using transect sampling reflects environmental inputs and production outcomes. PLoS ONE 14(4):e0214070.
- Bessei W (2006) Welfare of broilers: a review. World's Poultry Science Journal 62:455-466.
- Bokkers EAM, Koene P (2003) Behaviours of fast- and slow growing broilers to 12 weeks of age and the physical consequences. Applied Animal Behaviour Science 81:59-72.
- Bokkers EAM, Zimmerman PH, Rodenburg TB et al (2007) Walking behaviour of heavy and light broilers in an operant runway test with varying durations of feed deprivation and feed access. Applied Animal Behaviour Science 108: 129-142.
- Boyal RS, Buhr RJ, Harris CE et al (2020) Equipment and methods for poultry euthanasia by a single operator. Journal of Applied Poultry Research 29(4):1020-1032.
- Cockram MS, Dulal KJ (2018) Injury and mortality in broilers during handling and transport to slaughter. Canadian Journal of Animal Science 98(3):416-432.
- Dawkins MS, Layton R (2012) Breeding for better welfare: genetic goals for broiler chickens and their parents. Animal Welfare 21:147-155.
- De Jong I, Berg C, Butterworth A et al (2012) Scientific report updating the EFSA opinions on the welfare of broilers and broiler breeders. European Food Safety Authority, Supporting Publication 2012:EN-295.
- De Jong IC, Guemene D (2011) Major welfare issues in broiler breeders. World's Poultry Science Journal 67:73-81.
- De Jong IC, Gunnink H (2018) Effects of commercial broiler enrichment programme with or without natural light on behaviour and other welfare indicators. Animal 13(2):1-8.
- De Jong IC, Gunnink H, van Hattum T (2019) Comparison of performance, health and welfare aspects between commercially housed hatchery-hatched and on-farm hatched broiler flocks. Animal 13(6):1269-1277.
- De Jong IC, van Hattum T, van Riel JW et al (2020) Effects of on-farm and traditional hatching on welfare, health, and performance of broiler chickens. Poultry Science 99(10):4662-4671.

- De Jong IC, van Riel J, Lourens S et al (2009) Effects of food and water deprivation in newly hatched chickens - a systematic literature review and meta-analysis. Wageningen University & Research, Report 999.
- De Lima VA, Ceballos MC, Gregory NG et al (2019) Effect of different catching practices during manual upright handling on broiler welfare and behaviour. Poultry Science 98(10):4282-4289.
- Dixon LM (2020) Slow and steady wins the race: The behaviour and welfare of commercial faster growing broiler breeds compared to commercial slower growing breed. PLoS ONE 15(4):e0231006.
- Dymond J, Vinyard B, Nicholson AD et al (2013) Short periods of incubation during egg storage increase hatchability and chick quality in long-stored broiler eggs. Poultry Science 92:2977-2987.
- EFSA Panel on Animal Health and Welfare (2011) Scientific opinion concerning the welfare of animals during transport. EFSA Journal 9(1), 1966.
- EFSA Panel on Animal Health and Welfare (2012) Animal welfare measures broilers. EFSA Journal 10(7), 2774.
- EFSA Panel on Animal Health and Welfare (2017) Scientific opinion: Low atmospheric pressure system for stunning broiler chickens. EFSA Journal 15(12), 5056.
- EFSA Panel on Animal Health and Welfare (2019) Scientific opinion: Killing for purposes other than slaughter poultry. EFSA Journal 17(11), 5850.
- EFSA Panel on Animal Health and Welfare (2019) Slaughter of animals: Poultry. EFSA Journal 17(11), 5849.
- Fasenko GM (2007) Egg storage and the embryo. Poultry Science 86(5):1020-1024.
- Garces APJT, Afonso SMS, Chilundo A et al (2017) Evaluation of different litter materials for broiler production in a hot and humid environment: 2. Productive performance and carcass characteristics. Tropical Animal Health Production 49:369-374.
- Gebhardt-Henrich SG, Toscano MJ, Wurbel H (2018) Use of aerial perches and perches on aviary tiers by broiler breeders. Applied Animal Behaviour Science 203:24-33.
- Gent TC, Gebhardt-Henrich S, Schild SA et al (2020) Evaluation of poultry stunning with low atmospheric pressure, carbon dioxide or nitrogen using a single aversion testing paradigm. Animals 10, 1308.
- Gerritzen M, Hindle V, Reimert H et al (2013) Multistage carbon dioxide gas stunning of broilers. Poultry Science 92(1):41-50.

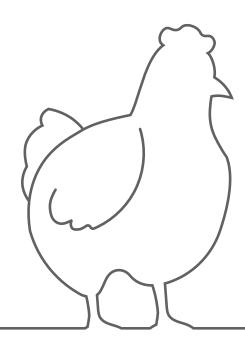
- Girasole M et al (2015) Optimization of stunning electrical parameters to improve animal welfare in a poultry slaughterhouse. Italian Journal of Food Safety 4576.
- Girasole M et al (2016) Effect of electrical waterbath stunning on physical reflexes of broilers: evaluation of stunning efficacy under field conditions. Poultry Science 95:1205-1210.
- Hartcher KM, Lum HK (2020) Genetic selection of broiler and welfare consequences: a review. World's Poultry Science Journal 76(1):154-167.
- Hocking PM, Jones EK (2006) On-farm assessment of environmental enrichment for broiler breeders. British Poultry Science 47(4):418-425.
- Hocking PM, Jones EK, Picard M (2005) Assessing the welfare consequences of providing litter for feed restricted broiler breeders. British Poultry Science 46:545-52.
- Hongchao J, Jiang Y, Song Z et al (2013) Effect of perch type and stocking density on the behaviour and growth of broilers. Animal Production Science 54(7):930-941.
- James C, Asher L, Herborn K et al (2018) The effect of supplementary ultraviolet wavelengths on broiler chicken welfare indicators. Applied Animal Behaviour Science 209:55-64.
- Jones RB, Hughes BO (1981) Effects of regular handling on growth in male and female chicks of broiler and layer strains. British Poultry Science 22(5):461-465.
- Jones RB, Waddington D (1992) Modification of fear in domestic chicks, Gallus gallus domesticus, via regular handling and early environmental enrichment. Animal Behaviour 43(6):1021-1033.
- Kannan G, Mench JA (1997) Prior handling does not significantly reduce the stress response to pre-slaughter handling in broiler chickens. Applied Animal Behaviour Science 51(1-2):87-99.
- Kapell DNRG, Hill WG, Neeteson AM et al (2012) Twenty-five years of selection for improved leg health in purebred broilers lines and underlying genetic parameters. Poultry Science 91:3032-3043.
- Karaaslan S, Nazligul A (2018) Effects of lighting, stocking density, and access to perches on leg health variables as welfare indicators in broiler chickens. Livestock Science 218:31-36.
- Kaukonen E, Norring M, Valros A (2017) Perches and elevated platforms in commercial broiler farms: use and effect on walking ability, incidence of tibial dyschondroplasia and bone mineral content. Animal 11(5):864-871.
- Kittelsen KE, Granquist EG, Aunsmo AL et al (2018) An evaluation of two different broiler catching methods. Animals 8,141.
- Martin JE, Christensen K, Vizzier-Thaxton Y et al (2016) Behavioural, brain and cardiac responses to hypobaric hypoxia in broiler chickens. Physiology & Behavior 163:25-36.
- Martin JE, Sandercock DA, Sandilands V et al (2018) Welfare risks of repeated application of on-farm killing methods for poultry. Animals 8(3), 39.
- Nasri H, van den Brand H, Najar T et al (2020) Interactions between egg storage duration and breeder age on selected

egg quality, hatching results, and chicken quality. Animals 10(10), 1719.

- Nicol CJ, Bouwsema J, Caplen G et al (2017) Farmed Bird Welfare Science Review. Agriculture Victoria Department of Economic Development, Jobs, Transport and Resources.
- Norring M, Kaukonen E, Valros A (2016) The use of perches and platforms by broiler chickens. Applied Animal Behaviour Science 184:91-96.
- Proszkowiec-Weglarz M, Schreier LL, Kahl S et al (2020) Effect of delayed feeding post-hatch on expression of tight junction and gut barrier - related genes in the small intestine of broiler chickens during neonatal development. Poultry Science 99(1):4714-4729.
- Raccoursier M, Thaxton YV, Christensen K et al (2019) Light intensity preferences of broiler chickens: implications for welfare. Animal 13(12):2857-2863.
- Rayner AC, Newberry RC, Vas J et al(2020) Slow-growing broilers are healthier and express more behavioural indicators of positive welfare. Scientific Reports 10:15151.
- Riber AB, de Jong IC, van de Weerd H et al (2017) Environmental enrichment for broiler breeders: An undeveloped field. Frontiers of Veterinary Science 4, 86.
- Riber AB, van de Weerd HA, de Jong IC et al (2018) Review of environmental enrichment for broiler chickens. Poultry Science 97:378-396.
- Robins A, Phillips C (2011) International approaches to the welfare of meat chickens. World's Poultry Science Journal 67:351-369.
- Rocha JSR, Baião NC, Barbosa VM et al (2013) Negative effects of fertile egg storage on the egg and the embryo and suggested hatchery management to minimise such problems. World's Poultry Science Journal 69(1):35-44.
- Satterlee D, Parker L, Castille S et al (2000) Struggling behaviour in shackled male and female broiler chickens. Poultry Science 79:652-655.
- Savory JC, Seawright E, Watson A (1992) Stereotyped behaviour in broiler breeders in relation to husbandry and opioid receptors blockade. Applied Animal Behaviour Science 32:349-360.
- Schwean-Lardner K (2018) The Effects of Hatchery Practices on the Welfare of Poultry. Elsevier Ltd.
- Shields SJ, Garner JP, Mench JA (2004) Dustbathing by broiler chickens: a comparison of preference for four different substrates. Applied Animal Behaviour Science 87:69-82.
- Tona K, Onagbesan O, De Ketelaere B et al (2004) Effects of age of broiler breeders and egg storage on egg quality, hatchability, chick quality, chick weight, and chick posthatch growth to forty-two days. Journal of Applied Poultry Research 13:10-18.
- Van den Oever ACM, Rodenburg TB, Bolhuis JE et al (2020) Relative preference for wooden nests affects nesting behaviour of broiler breeders. Applied Animal Behaviour Science 222, 104883.

- Vasdal G, Vas J, Newberry RC et al (2018) Effects of environmental enrichment on activity and lameness in commercial broiler production. Journal of Applied Animal Welfare Science 22(2):197-205.
- Wilhelmsson S, Yngvesson J, Jonsson L et al (2019) Welfare Quality® assessment of a fast-growing and a slower-growing broiler hybrid, reared until 10 weeks and fed a low-protein, high-protein or mussel-meal diet. Livestock 219:71-79.
- Yngvesson J, Wedin M, Gunnarsson S et al (2017) Let me sleep! Welfare of broilers (Gallus gallus domesticus) with disrupted resting behaviour. Acta Agriculturae Scandinavica, Section A – Animal Science 67(3-4):123-133.
- Zulkifi I, Gilbert J, Liew PK, Ginsos J (2002) The effects of regular visual contact with human beings on fear, stress, antibody and growth responses in broiler chickens. Applied Animal Behaviour Science 79(2):103-112.

RSPCA Australia | Meat chickens: Challenges and priorities for good animal welfare





for all creatures great & small