



Animal Welfare Institute

Fact Sheet: The Welfare of Chickens Raised for Meat

INTRODUCTION

More chickens are killed for meat in the U.S. by far than all other animals combined – nearly 9 billion in 2010.¹ These birds, referred to by the poultry industry as “broilers” or “roasters,” are raised in a manner that would shock most Americans. They are crowded with thousands of others in windowless sheds, without access to fresh air and sunlight, for their entire short lives. Ammonia in the air and on the litter causes irritation and burns. They grow so large, so fast that their legs have trouble holding up the excessive weight (i.e., the birds “outgrow their strength”). Every aspect of the birds’ living conditions, from the lighting to the feed, is manipulated to increase production and decrease costs.

Serious health and welfare problems result from the rapid growth and inhospitable living conditions characteristic of commercial chicken production. In 2005 the conventional chicken industry in the U.S., represented by the National Chicken Council, responded to public and retailer concerns about chicken welfare by establishing voluntary guidelines for the raising of meat birds.² However, the guidelines are woefully inadequate in providing for even the most basic welfare needs. This report will demonstrate the major shortcomings of these standards and offer more humane alternatives for the raising of chickens for meat.

RAPID GROWTH

As a result of genetic selection, over the past 50 years growth rates for meat chickens have increased by over 300 percent, from 25 grams per day to 100 grams per day.³ Educational materials for the classroom developed by the Alabama Department of Agriculture include the following fact: “If you grew as fast as a

chicken, you would weigh 349 pounds by the time you were two years old.”⁴

While this might be a fun piece of trivia for dinner conversation, such rapid growth is hardly a source of amusement for commercially raised poultry. British researchers have shown that rate of growth is a primary risk factor for impaired locomotion and poor leg health in meat chickens.⁵ As a result of their study into the causes of leg disorders these scientists concluded that “modern husbandry and genotypes, biased toward economics of production, have been detrimental to poultry welfare in compromising the ability of chickens to walk.”⁶

Serious leg problems may prevent birds from such simple activities as standing and eating food.⁷ In those who can walk, the rapid growth of breast muscle moves the chicken’s center of gravity forward and causes an altered gait that is inefficient and rapidly tires the bird.⁸ In studies lame birds select feed that is drugged with an analgesic over non-drugged feed, telling us that lame chickens experience pain.⁹

In addition to lameness, rapid growth has been associated with bone defects and deformities, tibial dyschondroplasia (birds suffering from this disorder are referred to as “creepers,” moving around on their hocks), ruptured tendons, spondylolisthesis (or “kinky back”), and rickets.¹⁰ Selecting breeds for a high muscle-to-bone ratio predisposes the modern commercial chicken to metabolic and cardiovascular diseases, including ascites, pulmonary hypertension syndrome, cardiac arrhythmias, and sudden death syndrome where birds simply “flip over” and die.¹¹

Welfare alternative

In 2000 the European Union Scientific Committee on Animal Health and Animal Welfare concluded that the

fast growth rate of chicken strains used for meat production “is not accompanied by a satisfactory level of animal welfare and health,”¹² and as a result the European Commission is currently considering how to address the influence of genetic parameters on chicken welfare.¹³ While National Chicken Council guidelines fail to recommend any cap on weight gain, some humane food certification programs in Europe and the U.S. require that growth be limited to 34 – 45 grams per day.¹⁴

CROWDED HOUSING

To maximize income, chicken factories raise their birds at high stocking densities.* National Chicken Council guidelines provide only 0.6 – 0.7 square feet of space per bird, about the size of an 8½ X 11 inch sheet of paper.† Intensively raised poultry grow rapidly, and as a chicken approaches market age and weight, the bird’s own body takes up most of the allotted space, leaving no room to perform simple activities without coming in contact with other birds. NCC guidelines grant each chicken only about 100 square inches, yet research on laying hens has shown that each bird needs 138 square inches just to stretch one wing, 178 to preen, 197 to turn around, and 291 inches – or about 2 square feet – to flap her wings.¹⁵ The ability to perform all behaviors is impacted by this level of

* “Stocking density” refers to the number of birds, or the weight of birds, per area specified, such as 30 kg/m² or 6 lb/ft². On the other hand, “space allowance” refers to the amount of space allotted to each animal, such as 0.19 m² or 2 ft². Some references cite metric units while others cite customary U.S. units, so conversion is often required when comparing different program’s animal care standards for space.

† National Chicken Council guidelines recommend a range of stocking densities from 6.5 lb/ft² for “light broilers” to 8.5 lb/ft² for “roasters.” In 2003 the Food Marketing Institute and National Council of Chain Restaurants recommended to NCC that stock density not exceed 6.0 lb/ft². (See Food Marketing Institute & National Council of Chain Restaurants. June 2003. FMI-NCCR animal welfare program.)

crowding, and even reaching food and water can be a challenge.

One experiment conducted to compare the welfare and behavior effects of two stocking densities found that at the higher density: (1) the daily mortality was greater for part of the rearing period; (2) the incidence of leg problems, skin dermatitis, and bruising increased; (3) the birds’ resting behavior was increasingly disturbed; (4) activity and ground pecking decreased; and (5) lying and preening was affected, probably due to increased disruption by other birds.¹⁶ The higher stocking density used in this study was 40kg/m², or the approximate density allowed by NCC guidelines for birds over 5 ½ lbs.¹⁷

High stocking densities also result in more chicken waste products (like uric acid) being discharged into the air and into the litter on which birds sit and lie. This can lead to irritation and burning of the eyes, respiratory tract, and skin (see “Indoor Confinement” section below). While it is known that increasing housing density reduces bird welfare,¹⁸ the influence of stocking density on other housing conditions, such as litter quality, temperature, humidity, and ventilation, may be as or more important to animal welfare than the impact of density itself.¹⁹

Welfare alternative

All food programs marketing themselves as providing good animal welfare require significantly more space than conventional industry standards, as represented by the NCC guideline.²⁰ High welfare programs require birds have access to an outdoor forage area of at least 4 square feet per bird.²¹ Although the regulations of the National Organic Program (“USDA Organic”) don’t include specific space requirements, most organic certifiers look for at least 1.5 square feet per bird, or two to three times the conventional industry standard.²²

UNNATURAL LIGHTING

In an attempt to increase feed consumption and weight gain, the conventional chicken industry warehouses birds under near-continuous dim lighting. Day length is prolonged by allowing only a few hours of dark, while light intensity is kept low – about 0.5 foot candles, similar to a moonlit night.²³ NCC guidelines require only four hours of darkness per 24 hour period, and the hours of darkness may be provided in as short as one-hour increments.²⁴ Moreover, NCC defines darkness as 50 percent of the light level in the remaining hours, yet sets no minimum light intensity.²⁵ In other words, there is no true light and no true dark for intensively raised chickens, just constant shades of gray.

Natural light and dark cycles are important to stimulate activity in chickens and for the development of a circadian rhythm.²⁶ Poultry welfare scientists speculate that failure to provide the level of lighting required for effective vision may negatively affect behaviors such as feeding and social interaction, leading to distress and poor welfare.²⁷ Research has demonstrated that increasing light intensity in chicken sheds enhances the birds' locomotor activity and reduces leg problems.²⁸

But chickens also need periods of dark. According to sustainable agriculture specialist Dr. Anne Fanatico, "Birds need a dark period for good health; they only produce melatonin – a hormone important in immune function – during dark periods."²⁹ The incidence of leg problems such as tibial dyschondroplasia has been found to be increased among chickens kept in continuous light,³⁰ while exposure to more natural intervals of light and dark results in reduced leg abnormalities, reduced physiological stress, and improved eye condition.³¹

Welfare alternative

Following the recommendation of welfare scientists,³² food certification programs that are based on animal

welfare generally require a minimum of six hours of continuous darkness per day and a light intensity of 15 – 20 lux³³ (equivalent to 1.4 – 1.9 foot candles, or three to four times the light level common to conventional chicken factories). Although the regulations of the National Organic Program don't include specific lighting requirements, many organic certifiers look for an eight-hour dark period and a relatively high light intensity to encourage bird activity.³⁴

INDOOR CONFINEMENT

A chicken's behavioral repertoire includes eating, drinking, sleeping, idling, preening, running, jumping, scratching, foraging and ground pecking, wing flapping, wing or leg stretching, dust-bathing, encounters with other birds, and vocalizing.³⁵ Chickens have evolved with exposure to natural sunlight, and need access to plentiful space, fresh air, and sunlight to maximize their welfare.³⁶ Birds raised for meat should have access to housing that is comfortable and provides protection from climatic conditions and predators, but they should also be given the opportunity to spend significant amounts of time on pasture, performing all the natural behaviors mentioned above.

Intensive production, which is standard in the conventional meat chicken industry, confines birds indoors for their entire short lives. Confinement under extremely crowded conditions compromises air quality in the sheds, exposing chickens to high levels of dust and various toxic gases including ammonia, hydrogen sulfide, carbon dioxide, and carbon monoxide. Ammonia, which is formed during the decomposition of uric acid, can cause respiratory, skin, and eye ailments.³⁷ Research has documented the development of physical maladies in meat birds housed at the NCC maximum ammonia level of 25 parts per million.³⁸

The litter in chicken confinement sheds may not be completely replaced for years, and as the uric acid content of the litter increases, the impact on a bird's skin, which is in constant contact with litter, rises.³⁹ Litter with higher concentrations of waste caused by a high stocking density in the shed increases the incidence of one particular skin problem, foot pad dermatitis.^{40†} While National Chicken Council guidelines set a maximum moisture content of 35 percent for litter, they don't require that birds actually have access to litter or how much.⁴¹

Welfare alternative

High welfare programs require that chickens raised for meat have a chance to spend time on pasture in order to express their natural behaviors.⁴² The National Organic Program currently requires access to the outdoors and exercise areas for chickens, but not necessarily access to pasture.⁴³ Welfare programs not mandating access to the outdoors typically require that environmental enrichment and/or cover be provided indoors to allow for the performance of some natural behaviors, and to reduce boredom and aggression and supply a more uniform use of space.⁴⁴ Research has shown that offering indoor chickens the use of enrichment devices such as perches and straw bales increases activity (more walking and running), and decreases sitting and the amount of time spent in contact with litter soaked with waste.⁴⁵ However, neither outdoor access nor environmental enrichment is required under NCC guidelines.

CONCLUSION

The three largest poultry producers in the U.S. – Tyson, Pilgrim's Pride, and Perdue – produce no humanely raised chicken products. The companies say they follow the voluntary guidelines of the National Chicken Council, but, as this report illustrates, these

[†] This study found a reduction in the occurrence of foot pad dermatitis as a result of the combined effects of lower stocking density, greater amount of litter material, and a photoperiod similar to the natural one.

guidelines fail to provide the most modest level of animal welfare. More humane alternatives exist. Consumers have the power to force the conventional chicken industry in the U.S. to improve its animal care standards by making informed decisions when they shop and refusing to purchase meat from animals who were inhumanely raised.

References

- ¹ U.S. Department of Agriculture, National Agricultural Statistics Service. 2010. Poultry slaughter: 2010 summary. http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-25-2011_new_format.pdf. Accessed Dec. 28, 2011
- ² National Chicken Council. 2010. National Chicken Council animal welfare guidelines and audit checklist for broilers. <http://www.nationalchickencouncil.com/aboutIndustry/detail.cfm?id=19>. Accessed Dec. 28, 2011.
- ³ Knowles TG, Kestin SC, Haslam SM, et al. 2008. Leg disorders in broiler chickens: prevalence, risk factors and prevention. *PLoS ONE* 3(2):e1545.
- ⁴ Alabama Department of Agriculture. Alabama agriculture in the classroom, additional information about poultry.
- ⁵ Knowles, et al, op cit.
- ⁶ Ibid.
- ⁷ Weeks CA. 2000. The behavior of broiler chickens and its modification by lameness. *Applied Animal Behavior Science* 67(1):111-125. See also Beyer RS. 2002. Leg problems in broilers and turkeys. Kansas State University, Agricultural Experiment Station and Cooperative Extension Service, EP-113.
- ⁸ Corr SA, Gentle MJ, McCorquodale CC, et al. 2003. The effect of morphology on walking ability in the modern broiler: a gait analysis study. *Animal Welfare* 12:159-171.
- ⁹ Danbury TC, Weeks CA, Chambers JP, et al. 2000. Self-selection of the analgesic drug carprofen by lame broiler chickens. *Veterinary Record* 146(11):307-311.
- ¹⁰ Julian RJ. 1998. Rapid growth problems: ascites and skeletal deformities in broilers. *Poultry Science* 77:1773-1780.
- ¹¹ Ibid.
- ¹² European Union. June 28, 2007. Council Directive 2007/43/EC. Laying down minimum rules for the protection of chickens kept for meat production.
- ¹³ Ibid.
- ¹⁴ Animal Welfare Approved. 2011. Animal Welfare Approved standards for laying hens and meat chickens, section 2.2.4.

<http://www.animalwelfareapproved.org/standards/meat-chicken-2011/>. Accessed Dec. 28, 2011. See also Royal Society for the Prevention of Cruelty to Animals. 2011. RSPCA welfare standards for chickens, section H3.0.

<http://www.rspca.org.uk/sciencegroup/farmanimals/standards>. Accessed Dec. 28, 2011.

¹⁵ Dawkins MS and Hardie S. 1989. Space needs of laying hens. *British Poultry Science* 30:413-416.

¹⁶ Hall AL. 2001. The effect of stocking density on the welfare and behavior of broiler chickens reared commercially. *Animal Welfare* 10:23-40. See also Martrenchar A, Morisse JP, Huonnic D, et al. 1997. Influence of stocking density on some behavioral, physiological and productivity traits of broilers. *Veterinary Research* 28(5):473-480; Sorensen, P, Su G and Kestin SC. 2000. Effects of age and stocking density on leg weakness in broiler chickens. *Poultry Science* 79:864-870; Knowles, et al., op cit.

¹⁷ National Chicken Council, op cit., section C5.1.

¹⁸ Meluzzi A and Sirri F. 2009. Welfare of broiler chickens. *Italian Journal of Animal Science* 8(suppl. 1):161-173. See also Estevez I. 2007. Density allowances for broilers: where to set the limits? *Poultry Science* 86:1265-1272.

¹⁹ Dawkins MS, Donnelly S and Jones TA. 2004. Chicken welfare is influenced more by housing conditions than by stocking density. *Nature* 427:342-344. See also Dozier WA, Thaxton JP, Purswell JL, et al. 2006. Stocking density effects on male broilers grown to 1.8 kilograms of body weight. *Poultry Science* 85(2):344-351; Dozier WA, Thaxton JP, Branton SL, et al. 2005. Stocking density effects on growth performance and processing yields of heavy broilers. *Poultry Science* 84:1332-1338.

²⁰ Humane Farm Animal Care. 2008. Animal care standards: chickens, section E20b.

http://www.certifiedhumane.org/index.php?page=standard_s. Accessed Dec. 28, 2011. See also Food Alliance. 2009. Inspection tool for poultry production, p. 5-6.

<http://foodalliance.org/certification/producer/crop%20tools-criteria>. Accessed Dec. 28, 2011; Global Animal Partnership. 2009. Global Animal Partnership 5-step animal welfare rating standards for broiler chickens, section 7.4.

<http://www.globalanimalpartnership.org/wp-content/uploads/2011/01/5-Step-Animal-Welfare-Rating-Standards-for-Broiler-Chickens.pdf>. Accessed Dec. 28, 2011; American Humane Association. No date. American Humane Certified, Welfare Standards Checklist: Broiler, section E20. <http://www.thehumanetouch.org>. Dec. 28, 2011.

²¹ Animal Welfare Approved, op cit., section 5.4.11.

²² Fanatico A. 2008. Organic poultry production in the United States. National Sustainable Agriculture Information

Service. <http://attra.ncat.org/attra-pub/organicpoultry.html>. Accessed Dec. 28, 2011.

²³ Fanatico A. 2007. Poultry house management for alternative production. National Sustainable Agriculture Information Service. <http://attra.ncat.org/attra-pub/poultryhousemanage.html>. Accessed Dec. 28, 2011.

²⁴ National Chicken Council, op cit., section C53.

²⁵ Ibid.

²⁶ Bessei W. 2006. Welfare of broilers: a review. *World's Poultry Science Journal* 62:455-466.

²⁷ Prescott NB, Wathes CM and Jarvis JR. 2003. Light, vision and the welfare of poultry. *Animal Welfare* 12:269-288.

²⁸ Newberry RC, Hunt JR and Gardiner EE. 1988. The influence of light intensity on behavior and performance of broiler chickens. *Poultry Science* 67:1020-1025.

²⁹ Fanatico (2007), op cit.

³⁰ Sanotra GS, Lund JD and Vestergaard KS. 2002. Influence of light-dark schedules and stocking density on behavior, risk of leg problems and occurrence of chronic fear in broilers. *British Poultry Science* 43(3):344-354. See also Buyse J, Simons PCM, Boshouwers FMG, et al. 1996. Effect of intermittent lighting, light intensity and source on the performance and welfare of broilers. *World's Poultry Science Journal* 52:121-130.

³¹ Buyse, et., op cit.

³² Meluzzi and Sirri, op cit.

³³ Animal Welfare Approved, op cit., section 8.0.9. See also Humane Farm Animal Care, op cit., section E14-E19; Food Alliance, op cit., p. 5-6; Global Animal Partnership, op cit., section 7.3.3; American Humane Association, op cit., section E15, E16.

³⁴ Fanatico (2008), op cit.

³⁵ Meluzzi and Sirri, op cit.

³⁶ Fanatico A. 2006. Alternative poultry production systems and outdoor access. National Sustainable Agriculture Information Service.

http://www.fao.org/fileadmin/user_upload/animalwelfare/poultryoverview.pdf. Accessed Dec. 28, 2011.

³⁷ Meluzzi and Sirri, op cit. Welfare of broiler chickens. *Italian Journal of Animal Science* 8(suppl. 1):161-173. See also Kristensen HH and Wathes CM. 2000. Ammonia and poultry welfare: a review. *World's Poultry Science Journal* 56:235-245; Miles DM, Miller WW, et al. 2006. Ocular responses to ammonia in broiler chickens. *Avian Diseases* 50(1):45-49.

³⁸ Kristensen and Wathes, op cit. See also Miles, et al., op cit.

³⁹ Bilgili SF, Hess JB, Blake JP, et al. 2009. Influence of bedding material on foot pad dermatitis in broiler chickens. *Journal of Applied Poultry Research* 18:583-589.

⁴⁰ Meluzzi A, Fabbri C, Folegatti E, et al. 2008. Effect of less intensive rearing conditions on litter characteristics, growth performance, carcass injuries and meat quality of broilers. *British Poultry Science* 49:509-515. See also Meluzzi A, Sirri F, Betti M, et al. 2004. Effect of stocking density, litter depth and light regimen on foot-pad disorders of broiler chickens. *Proceedings 22nd World's Poultry Congress*, No. 1715; Haslam SM, Knowles TG, Brown SN, et al. 2007. Factors affecting the prevalence of foot pad dermatitis, hock burn and breast burn in broiler chicken. *British Poultry Science* 48:264-275.

⁴¹ National Chicken Council, op cit., section C37.

⁴² Animal Welfare Approved, op cit., section 7.0.3.

⁴³ National Organic Program regulations, 7 CFR 205.239.

⁴⁴ Humane Farm Animal Care, op cit., section E28. See also Food Alliance, op cit., p. 6; Global Animal Partnership, op cit., section 7.3.5.

⁴⁵ Kells A, Dawkins MS and Borja MC. 2001. The effect of a 'Freedom Food' enrichment on the behavior of broilers on commercial farms. *Animal Welfare* 10:347-356. See also Leone EH and Estevez I. 2008. Economic and welfare benefits of environmental enrichment for broiler breeders. *2008. Poultry Science* 87:14-21.

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