2008

The Welfare of Animals in the Turkey Industry

The Humane Society of the United States

An HSUS Report: The Welfare of Animals in the Turkey Industry

Abstract

The natural behavior and habitat of wild turkeys stand in sharp contrast to the life of turkeys commercially raised for meat. Overcrowded in automated, barren "grow-out" houses, turkeys are offered little opportunity to display their full range of complex social, foraging, and exploratory behavior. Today's commercial breeds grow at an unnaturally rapid pace to unprecedented weights. This forced rapid growth further compromises their health and welfare, and causes them to suffer from skeletal, muscular, and other health problems, as well as painful and often crippling leg disorders. Breeding birds, unable to mate naturally due to genetic selection for fast growth and excess breast muscle (meat), must be continuously feed-deprived in order to control weight. The catching, transport, and slaughter of turkeys subject them to stress, injury, and pain. Each of these issues is a highly significant welfare problem in need of immediate redress.

Introduction

Turkeys in the wild show behavior that is complex, adaptive, and intelligent. Turkey hens are devoted mothers who care diligently for their young, with broods staying together for 4-5 months and male siblings remaining as a social unit for life.[1] Young turkeys under four weeks of age, known as poults, learn what to eat, how to avoid predators, the geographical topography of the home range, and important social behavior from their mothers.[2] During the day, the birds forage together in brush, fields, and wooded expanses, using their beaks to explore and manipulate their environment; by night, they roost high in trees. The size of turkey broods' home range varies, but can be as large as 202 hectares (500 acres).[3] Turkeys develop a sophisticated social structure of small groups with stable dominance hierarchies and remember individuals within their own group and distinguish them from neighboring flocks.[4,5]

These birds were originally domesticated in 2,500 BC in Central America and Mexico.[6,7,8] In 1910, the U.S. turkey industry was composed of 870,000 farmers raising 3.7 million turkeys, an average of 4 birds per farm,[9] typically in free-ranging systems that allowed the birds to experience a varied, complex environment in which they could display normal behavior patterns. In contrast, in 2007, more than half of the nearly 265 million turkeys slaughtered in the United States[10] were raised under contract in industrialized production facilities for only three companies.[11]

Intensive Production Systems

Industrial animal agriculture is mechanized, highly automated, and guided by principles of production efficiency. The overwhelming majority of turkeys raised in the United States are reared in intensive confinement facilities, typically confined indoors in large, usually windowless, brooding and growing houses, with artificial light and ventilation. The environment is barren and crowded compared to the wild turkey's varied and complex natural habitat, and contains only litter flooring and an automated feed and water supply.

As many as 10,000 birds may be confined per house at a stocking density of 2.3 km^2 (2.5 ft^2) per hen or 3.7 km^2 (4 ft^2) per tom.[12,13] As turkeys grow and approach market weight, available floor space diminishes. As such, the birds increasingly step on each other as they maneuver through the crowded shed. The high stocking densities lead to deterioration in litter quality, which is associated with leg problems and resultant difficulty in walking,

and hip and foot-pad dermatitis.[14] Overall welfare of commercially raised turkeys is so compromised that industry tolerates mortality rates of 7-10%,[15,16] which totaled 18.2-26 million birds in 2007 alone.

In overcrowded sheds largely devoid of meaningful stimuli, there is no opportunity for turkeys to explore, forage, roost, or form normal social groups. Naturally, turkeys display considerable beak-related behavior,[17] and one wildlife biologist observing broods of young, wild turkeys found that they spent 86-95% of the day foraging.[18] Scientists have postulated that the lack of outlets in industrial turkey production for normal, investigative pecking and foraging lead to abnormal behavior, including feather-pecking and cannibalism.[19,20,21]

Commercial Poult Processing

Turkeys are hatched by the thousands in large incubators where temperature and humidity are tightly controlled. At the hatchery, turkey poults are "processed," undergoing procedures that include some or all of the following: de-snooding (slicing off the fleshy protuberance over the bird's beak), toe-clipping, and beak-trimming (also called partial beak amputation). Toe-clipping (also referred to as de-toeing) with surgical shears,[22] which is done to prevent scratching and subsequent carcass downgrading,[23] is practiced despite the fact that it is associated with reduced growth rate[24] and higher early mortality.[25] Turkeys are routinely beak-trimmed both to prevent outbreaks of abnormal cannibalistic behavior (see below) and to reduce the impacts of stress-induced aggression. The beak-trimming procedure is performed using sharp secateurs, a heated blade, or a high-voltage electrical current.[26,27] Birds' beaks are highly sensitive and innervated, and, when the end of the beak is removed, nerves are severed.[28] Beak-trimming is painful,[29,30] but current science suggests that turkeys may differ from chickens in that while they do experience pain, they may not endure chronic pain due to neuroma formation.[31]

Although these mutilations are meant to prevent later injury, they are highly significant welfare problems in themselves, as Ian Duncan, Emeritus Chair in Animal Welfare at the University of Guelph, explains: "Chopping off parts of young animals in order to prevent future welfare problems is a very crude solution. These surgeries are all preformed without anesthesia or analgesia and, at the very least, will cause some acute pain."[32]

Injurious Pecking and Intensive Production

Raised in overcrowded, barren environments without mental stimuli, adequate space, or the ability or means by which to perform most natural behavior, turkeys in commercial production may injure one another. Indeed, injurious pecking is a problem for the turkey industry and can lead to cannibalism that can spread throughout a flock. To prevent this problem, turkeys are often beak-trimmed, as discussed above, and raised in low light, which curbs the initiation and spread of this behavior.[33,34]

Lack of Individual Care

As industrial production facilities use automated feeding, watering, and environmental control, a single person may be responsible for the care of 30,000 birds.[35] Sick or injured individuals undoubtedly go unnoticed. Although veterinary services are utilized by turkey producers, the emphasis is on the health of the flock as a whole, and individual care for each bird is impossible. When sick or injured birds are found, they are typically culled (killed), a process described as such: "In practice, stockmen may use cervical dislocation or the crushing of the head or vertebrae by striking the birds against a wall or with an object. These methods are not satisfactory and research is required on alternative procedures such as overdosing with barbiturates or exposure to gas."[36]

Air Quality

In crowded turkey production facilities, air quality is diminished with build-up of aerial pollutants such as dust and pathogens, and noxious gases including ammonia, methane, carbon dioxide, and nitrous oxide.[37] While workers are exposed to poor air quality for short periods of time, turkeys remain in this environment

continuously. Aerial pollutants and high ammonia levels are associated with a number of health problems in birds,[38] including damage to the epithelial lining of the respiratory tract, keratoconjunctivitis (swelling of the eyelids, discharge, and clouding and ulceration of the cornea), and possibly increased susceptibility to certain viral and bacterial infections.[39,40] Poor ventilation is also associated with foot-pad dermatitis.[41] As Christopher Wathes of the Silsoe Research Institute describes, "The air of a poultry house seethes with a disease miasma of gases, dusts and micro-organisms that arise from the birds themselves, their feed, droppings and the litter. The high concentration of aerial contaminants is a direct consequence of high stocking densities and slow ventilation rates which help to maintain a warm building temperature."[42]

Turkeys have a heightened olfactory sense. According to Wathes, "For a bird with an acute sense of olfaction the polluted atmosphere of a poultry house may be the olfactory equivalent of looking through dark glasses."[43]

Lighting

Lights are dimmed inside the sheds in order to reduce feather-pecking behavior.[44] While a typical business office may have a light level of 23.2 footcandle (250 lux),[45] light levels common in turkey production are much lower, 0.093-0.65 footcandle (1-7 lux),[46,47] which poses additional concerns for the animals' welfare. Research has shown that turkeys find low light aversive[48] and that they prefer brighter environments.[49] Additionally, it is difficult for personnel to inspect flocks in such dim lighting, and sick or injured birds who should be separated or euthanized may be overlooked.[50]

Litter

Turkeys are typically housed on litter made of wood shavings. Sheds are not cleaned of excrement, feathers, debris, and litter during the birds' lifetime and may not be cleared between successive flocks.[51,52] If management is poor and turkeys must sit, stand, and lie in wet, soiled litter, they may develop breast blisters, hock burns, and foot ulcers.[53,54,55] One study found that 98% of turkeys in commercial conditions suffered from foot-pad lesions,[56] which may become pathways to bacterial infections.[57] Wet or sticky litter can also lead to "shaky-leg syndrome," a severe lameness characterized by reluctance to stand and walk.[58,59] One study found that more than 45% of turkey flocks scored at slaughter had a greater than 10% incidence of severe foot-pad lesions.[60] Careful management practices, including keeping the litter dry, can reduce the incidence of foot-pad dermatitis.[61]

Selective Breeding for Rapid Growth and Heavy Body Weight*

One of the most significant welfare problems within the turkey industry is selective breeding for rapid growth to reach heavier final body weights in exceedingly shorter periods of time. Wild male turkeys grow from approximately 51 g (1.8 oz) at hatch to 3.5 kg (7.7 lb) in approximately 4 months.[62] During that same period, selectively bred turkeys raised for meat grow to more than 11.3 kg (25 lb),[63] more than three times the weight of their wild counterparts. Demand has continuously shifted turkey production toward heavier slaughter weights. Hens are now marketed at 99 days of age, or at 5.9-7.7 kg (13-17 lb), and toms are marketed when approximately 136 days old, or when they reach 14.0-16.3 kg (31-36 lb).[64]

Rapid growth and heavy body weight can compromise the health of turkeys by leading to muscle damage,[65] cardiovascular problems,[66] and increased susceptibility to disease,[67,68,69,70,71] and is a factor in the development of focal ulcerative dermatitis (small skin lesions commonly called "breast buttons"), which develop on the keel bone.[72] Another significant welfare concern for commercially raised turkeys is the development of painful leg problems. Rapid growth and heavy body weight stress bones, joints, ligaments, and tendons, and can result in leg problems, such as the development of an abnormal cartilage mass at the end of a growing bone (tibial dyschondroplasia), lesions in the hip joint (epiphyseal ischemic necrosis), and angular bone deformity (valgus-

* Portions of this report were drawn from "An HSUS Report: Welfare Issues with Selective Breeding for Rapid Growth in Broiler Chickens and Turkeys." For more information, please see www.hsus.org/farm/resources/research/practices/fast_growth_chickens_turkeys.html.

varus deformity).[73,74,75,76] Avulsion (rupture) of tendons or ligaments in the hock may also occur.[77,78] One study found that 1.7-3.3% of turkey toms raised at stocking densities typical within industry exhibit severe gait abnormalities that hinder walking ability.[79] Another report estimated that a 5% mortality rate due to lameness is normal in heavy toms, with up to 20% mortality caused by lameness in problem flocks.[80] Turkeys may become so affected by leg problems that they go "off their legs," becoming too crippled to walk.[81] Except for one study,[82] research has shown that leg problems of farmed birds are indeed painful.[83,84,85,86,87] Although leg problems are clearly a serious welfare problem, economic considerations often trump concern by industry for the well-being of affected birds. Explains Scott Beyer, Poultry Specialist at Kansas State University: "Although a small percentage of birds may be predisposed to leg problems, use of highly selected fast-growing strains is recommended because savings in feed costs and time far outweigh the loss of a few birds."[88]

Increased body weight of turkeys can also lead to sudden death, associated with perirenal hemorrhage (SDPH). Turkeys who die of SDPH exhibit signs of acute heart failure and bleeding of the kidneys.[89] For turkeys between 8-14 weeks of age, SDPH is a significant cause of mortality for otherwise healthy, albeit rapidly growing, turkey toms.[90,91] During this period, total mortality due to SDPH can reach up to 6% in some flocks.[92] Although rapid growth is an important contributing factor, continuous lighting regimens, stress, crowding, and exposure to toxins may also lead to SDPH.[93]

The link between selection for heavy body weight and incidences of leg abnormalities and cardiovascular problems, as well as impaired immune system development, is recognized by turkey breeders and thought of as a challenge that must be addressed to achieve the "biological maximum."[94]

Breeding Turkeys

The turkey industry has increasingly become vertically integrated. Today, production sectors are compartmentalized, and separate operations raise breeding birds, turkeys who produce fertile eggs. Hatching eggs are collected, incubated, and the young poults are then raised by the meat production sector of the industry. Turkey breeders, also known as parent stock or simply as breeders, have the same genetic predisposition as non-breeding turkeys for fast growth and skeletal disorders,[95] and are feed-restricted in order to minimize health and reproductive problems and to enhance fertility.[96,97,98] Hence, turkey breeders are given as little as half of the amount of food they would eat *ad libitum*.[99] Studies with broiler chickens on feed restriction at this level have concluded that birds experience chronic hunger.[100]

Male breeding turkeys of fast-growing, breast-heavy, commercial strains are so large that they cannot mate naturally without harming the female. As a result, most turkeys are bred using artificial insemination (AI). According to the Merck Veterinary Manual, "Collecting semen from a chicken or turkey is done by stimulating the copulatory organ to protrude by massaging the abdomen and the back over the testes. This is followed quickly by pushing the tail forward with one hand and, at the same time, using the thumb and forefinger of the same hand to 'milk' semen from the ducts of this organ."[101] Hens are then inseminated by applying pressure to the abdomen around the vent, causing the oviduct to protrude "so that a syringe or plastic straw can be inserted [2.5 cm] ~1 in. into the oviduct and the appropriate amount of semen delivered."[102] Although turkey hens may display maternal broodiness, the natural desire to nest and incubate,[103] their eggs are removed and hatched artificially.[104]

When commercial breeding hens go out of egg production, they may be force-molted in order to bring them back into reproductive condition. Force-molting is induced by placing the hens in a completely dark house and removing all food and water for 72 hours. Feed and water are returned gradually. This deprivation of food, water, and light induces an additional egg-laying cycle in the hens.[105,106]

Because breeding birds are kept alive longer than turkeys raised exclusively for slaughter, skeletal problems are more common. At termination of breeding, at least 75% of parent stock suffer from abnormal gait or lameness.[107] Male breeding turkeys are predisposed to degenerative hip lesions.[108] One study found that all breeding toms examined had extensive hip joint degeneration, and results strongly suggest that turkeys

experience chronic pain from hip problems,[109] though one study found no evidence of pain associated with destructive cartilage loss of the hip joint.[110] Traditional turkey lines do not tend to exhibit the degenerative joint disease problems found in breeds artificially selected for productivity.[111]

Catching, Crating, and Transport

After turkeys reach market weight, the birds are "harvested"—caught and crated for transport to the slaughter plant. The process of removing the turkeys from the grower house to the transport vehicle has been described in the scientific literature thusly: "Generally, birds are caught by one or both legs and then forcibly pushed to the rear of the crates in order to make space for the next birds. During this procedure the heads or wings of the birds often knock against the solid sides of the crates."[112] Heart rate measurements suggest that catching and crating are stressful.[113] There are reports of severe injuries to the birds as they are loaded for transport, including bruising,[114,115] dislocated hips and internal hemorrhage,[116] wing fractures, heads hit on the side of transport crates as they are loaded, tails caught as crates are closed, amputated toes,[117] leg fracture, and avulsion (rupture) of tendons in the hock.[118] Turkey carcasses are often trimmed and downgraded during processing post-slaughter due in part to bruises and fractures sustained on the farm or during transport.[119,120,121]

Some producers are moving toward more automated systems that involve loading the turkeys using a conveyer belt.[122] This is a promising method that may improve turkey welfare.

Following crating, turkeys may be transported over long distances to the slaughter plant, during which time they are exposed to unfamiliar experiences, such as noise, motion, and vibration associated with the transport vehicle, as well as extremes of heat and cold.[123,124] One survey at a Canadian processing plant found that turkeys may spend more than18 hours in transit before arriving at the slaughter plant, although the mean journey time was 13.4-14.9 hours.[125] It is standard practice in commercial poultry production to deprive birds of food and water during catching, crating, transport, and while being held in lairage as they await slaughter. This is done in order to prevent contamination of the carcass with the contents of the lower intestine.[126] Invariably, some turkeys will arrive at the slaughter plant dead. One estimate of the dead-on-arrival (DOA) rate for turkeys is 0.38%.[127] Although this percentage may seem negligible, extrapolation across all U.S. turkey production means that of the approximately 260 million turkeys slaughtered in 2007, 988,000 turkeys died that year during crating and transport to the slaughter plant.

Slaughter†

Although the Humane Methods of Slaughter Act requires that animals be rendered insensible prior to shackling and slaughter,[128] the U.S. Department of Agriculture (USDA) does not interpret the law as including turkeys and other birds killed for food.[129] Upon arrival at the slaughter house, turkeys are unloaded from transport crates, inverted, and hung upside-down on shackles that pass over an electrified water bath. Evidence from studies of chickens demonstrates that the process of inversion and shackling is both stressful[130,131] and painful,[132,133] and the wingtips may become bruised if turkeys flap while being hung.[134] The birds are given an electric shock that is meant to render them unconscious and immobile while their necks are cut.[135] However, when shackled turkeys are conveyed through the water bath, they may experience electric shocks before they are stunned into unconsciousness, because their wings, hanging lower than their heads, may touch the water before their heads are submerged.[136,137,138] Additionally, not all birds are stunned adequately prior to exsanguination[139,140] and are conscious while their throats are cut. In 2007, more than 33,000 turkeys were condemned under the "cadaver" category of the USDA's annual poultry slaughter report.[141] According to the agency's Food Safety and Inspection Service poultry slaughter inspection training guide, "Poultry that die from causes other than slaughter are condemned under the cadaver category. These birds are not dead when they enter the scald vat. When submerged in the hot water, they drown…."[142]

† For more information, see "An HSUS Report: The Welfare of Birds at Slaughter," co-authored by Sara Shields, Ph.D., and Mohan Raj, BVSc, MVSc, Ph.D.: www.hsus.org/farm/resources/research/practices/welfare_of_birds_slaughter.html.

Innovations in turkey slaughter processes have been gaining acceptance. The use of gas systems, rather than passing turkeys' heads through electrified water baths, are in use by some processing plants in the United States[143] and Europe,[144] and these efforts should be commended for improving the animals' welfare.

Conclusion

Animal agriculture is beginning to respond to the public's demand for more humane animal care, transport, and slaughter. However, as in other sectors of farm animal production, major welfare issues remain to be addressed in the turkey industry. Selective breeding for rapid growth and heavy weight jeopardizes the health and well-being of turkeys, while overcrowded, barren housing conditions that are devoid of meaningful stimuli compromise behavioral opportunities, lead to outbreaks of abnormal behavior, and cause physical and psychological suffering. Breeding birds are routinely food-deprived to manage weight gain. Transport and slaughter remain, at best, stressful experiences. These are serious issues endemic to the industry and must be prioritized above production efficiency and economic interests.

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