



## An HSUS Report: Welfare Issues with Conventional Manual Catching of Broiler Chickens and Turkeys

### Abstract

Approximately 9 billion chickens and 270 million turkeys are raised for meat annually in the United States. When these farmed birds reach market weight, they must be caught and crated for transport from production facilities to slaughter plants. Conventional manual catching results in severely compromised welfare. Birds experience stress and fear, and can be physically harmed, suffering bruises, broken bones, dislocated joints, and other injuries. Alternatives to conventional manual catching practices that improve bird welfare exist, including mechanical harvesters, gentle manual catching, and, for turkeys, herding into specially designed transport crates.

### Introduction

Of the 9.5 billion land animals raised annually in the U.S. meat production industry,<sup>1,2</sup> farmed birds\* make up the overwhelming majority—more than 9 billion broiler chickens and 270 million turkeys slaughtered each year.<sup>3</sup> On industrialized factory farms, chickens and turkeys are confined by the tens of thousands in large, dimly lit,<sup>4</sup> warehouse-like sheds,<sup>5,6</sup> completely barren except for litter material on the floor and long rows of automated feeders and drinkers.

Chickens and turkeys are selectively bred for rapid growth and increased muscle (meat), reaching slaughter weight in increasingly shorter periods of time. In 1920, a chicken reached 1 kg (2.2 lb) in 16 weeks, but broiler chicken strains may now reach 2.27 kg (5 lb) in only 7 weeks.<sup>7</sup> Turkeys now reach 15.87 kg (35 lb) in 132 days, rather than the 220 days it took 40 years ago.<sup>8</sup> As a result of this rapid growth, many chickens and turkeys struggle to withstand the pressures their weakened bodies endure. Many suffer from gait abnormalities<sup>9</sup> and painful skeletal disorders,<sup>10,11,12</sup> serious welfare issues that can be exacerbated by catching and handling procedures,<sup>13</sup> a major cause of stress and injury for these animals.

### Conventional Manual Catching

When birds raised for meat reach market weight, they must be caught and crated for transport from production facilities to slaughter plants. In the United States, most farmed birds are caught by hand by “catchers.” Turkeys are caught by one or both legs, or by one leg and the opposite wing,<sup>14</sup> and chickens are typically carried inverted by a single leg, three or four birds per hand,<sup>15,16</sup> before they are put into transport crates. During an average shift, a single catcher will lift 5-10 tons of birds at a rate of 1,000-1,500 animals per hour.<sup>17,18,19</sup> Catching the birds is a physically demanding task,<sup>20</sup> and, as researchers report, “[f]or a member of a catching team, it could be difficult

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\* For more information, see “An HSUS Report: Welfare Issues with Selective Breeding for Rapid Growth in Broiler Chickens and Turkeys” at [www.hsus.org/farm/resources/research/practices/fast\\_growth\\_chickens\\_turkeys.html](http://www.hsus.org/farm/resources/research/practices/fast_growth_chickens_turkeys.html), “An HSUS Report: The Welfare of Animals in the Chicken Industry” at [www.hsus.org/farm/resources/research/welfare/broiler\\_industry.html](http://www.hsus.org/farm/resources/research/welfare/broiler_industry.html), “An HSUS Report: The Welfare of Animals in the Turkey Industry” at [www.hsus.org/farm/resources/research/welfare/welfare\\_turkeys.html](http://www.hsus.org/farm/resources/research/welfare/welfare_turkeys.html), and “An HSUS Report: The Welfare of Birds at Slaughter” at [www.hsus.org/farm/resources/research/welfare/welfare\\_of\\_birds\\_at\\_slaughter.html](http://www.hsus.org/farm/resources/research/welfare/welfare_of_birds_at_slaughter.html).

to maintain concentration and exercise care throughout a longer catching time.”<sup>21</sup> Rough handling, which causes birds to experience fear,<sup>22</sup> can increase as crews become weary from physical exertion. Researchers have concluded that “as fatigue sets in, one’s primary motivation becomes just getting the job over with. Catching and crating the birds as quickly as possible with the minimum effort possible becomes the major focus. Careful handling becomes secondary.”<sup>23</sup>

Birds raised for meat are typically unaccustomed to being touched by humans. When handled, farmed birds experience fear<sup>24,25</sup> and stress, as indicated by physiological measures of elevated plasma corticosterone levels<sup>26,27</sup> and heterophil/lymphocyte ratios.<sup>28</sup> The method of handling can also affect stress. Researchers have reported that carrying multiple birds at once and carrying birds in an inverted position both elevate plasma corticosterone levels compared with the practice of carrying single birds and holding them upright by their bodies.<sup>29</sup>

As such, manual catching, as well as handling and loading for transportation, have been identified by researchers as “major sources of stress and trauma to the birds.”<sup>30</sup> Injuries associated with conventional manual catching have been well-documented in scientific studies and the lay press. For example:

- A study published in the *Journal of Agricultural Engineering Research* reported that up to 20% of birds experienced injuries during catching that led to downgrading of the carcass.<sup>31</sup>
- *The Wall Street Journal* reported that “[u]p to 25% of broilers on some farms are hurt in the [catching] process.”<sup>32</sup>
- Reports from slaughter plants show that birds exhibit bruising of the breast, thighs, or wings at the rate of 5-25%.<sup>33,34</sup>
- According to industry trade journal *Poultry*, 90% of bruises recorded at slaughter plants are caused by catching and crating.<sup>35</sup>
- In a study appearing in *Poultry Science*, nearly 3 out of 10 (29.5%) of dead-on-arrival (DOA) broiler chickens at slaughter plants exhibited trauma that the authors attributed to catching and crating.<sup>36</sup>
- A scientific review of transport systems reported that 35% of DOA broiler chicken mortality was due to trauma associated with catching and transport injuries.<sup>37</sup>
- In a study published in *The Veterinary Record*, causes of DOA mortality included hemorrhages associated with dislocated hips, thought to occur during catching and carrying by one leg, and crushed skulls attributed to heads caught as the door to transport modules were closed.<sup>38</sup>

In a review of welfare problems caused during catching and transport of farmed birds, Toby Knowles, professor of Farm and Food Science at the University of Bristol, and Donald Broom, professor of Animal Welfare at the University of Cambridge, concluded, “[T]he most traumatic stages of the process and the stages most likely to give rise to physical damage, are the times when the birds are manually handled.”<sup>39</sup>

## Alternatives in Bird Handling

Alternatives to conventional manual catching practices, including mechanized catchers,<sup>40</sup> gentle handling techniques,<sup>41</sup> and herding into transport modules,<sup>42</sup> exist and are able to cause less stress and/or injury to birds.

## Welfare Advantages of Mechanical Harvesting

Commercially available automated catching machines are increasingly being used by the poultry industry, particularly where labor costs are high or where the work force is scarce.<sup>43</sup> These mechanical harvesters gather birds with soft rubber-fingered rotors and pull them onto a conveyer belt to transport crates.<sup>44,45</sup> Automated catching may cause birds less stress than conventional manual catching,<sup>46</sup> as the machines reduce the amount of time the birds are in physical contact with humans, handle the birds upright, and may move the birds more gently.

In a study published in 1986, Ian Duncan, Emeritus Chair in Animal Welfare at the University of Guelph, and his colleagues reported that elevated heart rates and tonic immobility (TI)—indicators of stress and fear, respectively—were shorter in duration among birds caught by a prototype harvester and concluded:

The differences in duration of TI...suggested that the machine-caught birds were no more fearful than those treated as gently as possible by hand. Tonic immobility in the manually-caught birds lasted about twice as long, suggesting that they were much more frightened. These results indicate that short-term stress associated with the catching of broiler chickens can be considerably reduced by using a carefully-designed machine instead of catching by hand.<sup>47</sup>

The type of mechanical harvester may be important. In contrast to Duncan *et al.*'s early findings, a 2005 study found that automated catching by a "Chicken Cat" machine was not associated with any significant improvement in physiological measures of stress.<sup>48</sup> However, a 2006 study of the CIEMME Super Apollo L harvester reported lower stress levels and shorter TI durations (i.e., less fear) in chickens tested at the end of the catching period, when the production shed was nearly empty.<sup>49</sup> These results suggest that the Apollo harvester may be more effective in reducing stress at certain points in the catching process.

In addition to reductions in stress and fear, mechanically caught birds may also suffer fewer injuries. Although one study failed to find a difference,<sup>50</sup> several studies that examined a variety of different automated harvester models, have shown significantly less bruising<sup>51,52</sup> and wing hemorrhaging<sup>53</sup> when birds are caught by machine. Field experience corroborates these studies' findings: Perdue Farms reported a 14% decrease in bruising among birds caught by machine.<sup>54</sup> A 2003 study found that, compared to conventionally manually caught birds, those caught with a "Chicken Cat" machine experienced significantly lower incidences of leg and wing fractures and dislocations: Leg, wing, and rump injuries were 50%, 22%, and 27% lower, respectively, and the percentage of birds with one or more injuries was 30% lower than those caught manually.<sup>55</sup>

Two potential disadvantages to mechanical versus manual catching exist, both related to personnel. Workers operating automated harvesters may be less likely to remove dead birds or cull those who are sick and likely to die during transport. Several studies have reported higher rates of dead-on-arrival (DOA) birds with mechanical harvesting,<sup>56,57,58,59</sup> attributed to the inclusion of birds who were already dead or sick in mechanically loaded crates. Additionally, the use of mechanical harvesters requires both training and experience, and the animals' welfare could be compromised during the period in which personnel learn to effectively operate the machinery.<sup>60</sup>

### Welfare Advantages of Gentle Manual Catching

Birds can also be caught gently by hand. One study measured rates of injury and DOA using an automated Tekniikka "sweeping catcher" and a gentle manual catching technique common in Sweden, where birds are carried upright in pairs.<sup>61</sup> The gentle manual method caused significantly fewer bruises and fractures than mechanical harvesting,<sup>62</sup> and these injury rates were very low compared to the figures attributed to manual catching crews in the United States.

At this time, results are not yet definitive. Much could depend on the machine used and the level of training received by operators. However, findings do suggest that, at least under some operating conditions, gently handling birds upright in pairs causes fewer injuries than other catching methods. (Corticosterone levels were not measured, and no conclusions were made about stress.<sup>63</sup>)

It is unclear whether the Swedish method would be adopted in the United States and elsewhere, as it requires training and possibly economic incentives for catching crews to slow their catch rates, which would likely increase labor costs for industry. As noted by researchers, while it is possible to manually catch and crate chickens with almost no harm to the birds, the process is arduous and it is difficult to maintain the concentration and attitude necessary to handle the birds carefully throughout a 5-8 hour work period.<sup>64,65</sup>

## Welfare Advantages of Herding into Transport Modules

Rather than catch and carry, workers can herd turkeys into transport modules, a system associated with less bruising, injury, and stress. In a study published in 2000, three traditional turkey transport systems that require manual catching and loading were compared with a system that involves driving or herding the birds into transport crates. The researchers found that when the turkeys were not caught and carried, the birds had fewer bruises and injuries. Heart rate was used in this study as a measure of stress, and turkeys who were herded onto transport modules had lower heart rates after loading. With further study, this system is a promising alternative that could be more widely utilized in the turkey industry to improve the animals' welfare.<sup>66</sup>

## Conclusion

Injury rates during catching and crating of slaughter-bound farmed birds in the United States are unacceptably high. Conventional manual catching of chickens and turkeys raised for meat can be hurried and rough, jeopardizing the animals' welfare. Of the alternatives to typical catching methods, manual catching of broiler chickens upright in pairs and herding turkeys into crates appear to be the best methods for ensuring the welfare of the animals during preparation for transport. If producers are unwilling to adopt the gentle manual catching method, chickens' welfare may still be improved by the adoption and proper operation of mechanical harvesters, though the model used and the level of training received by operators are important variables to consider. The practice of any catching method should be complemented by regular and routine auditing of bruises, fractures, and other injuries at the slaughter plant, and financial incentives to catching crews for careful animal handling.

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<sup>1</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2009. Livestock slaughter: 2008 summary. <http://usda.mannlib.cornell.edu/usda/current/LiveSlauSu/LiveSlauSu-03-06-2009.pdf>. Accessed March 6, 2009.

<sup>2</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2009. Poultry slaughter: 2008 annual summary. <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-25-2009.pdf>. Accessed March 6, 2009.

<sup>3</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2009. Poultry slaughter: 2008 annual summary. <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-25-2009.pdf>. Accessed March 6, 2009.

<sup>4</sup> Weeks CA. 2007. Poultry handling and transport. In: Grandin T (ed.), *Livestock Handling and Transport*, 3rd Edition (Wallingford, U.K.: CAB International, pp. 295-6).

<sup>5</sup> Ernst RA. 1995. Chicken meat production in California. University of California Cooperative Extension. Poultry Fact Sheet No. 20, June. <http://animalscience.ucdavis.edu/avian/pfs20.htm>. Accessed February 25, 2009.

<sup>6</sup> Voris JC. 1997. California turkey production. University of California Cooperative Extension. Poultry Fact Sheet No. 16c, September. <http://animalscience.ucdavis.edu/Avian/pfs16C.htm>. Accessed February 25, 2009.

<sup>7</sup> Aho PW. 2002. Introduction to the U.S. chicken meat industry. In: Bell DD and Weaver WD Jr (eds.), *Commercial Chicken Meat and Egg Production*, 5th Edition (Norwell, MA: Kluwer Academic Publishers, p. 805).

<sup>8</sup> Ferket PR. 2004. Tom weights up seven percent. *WATT Poultry USA*, July, pp. 32-42.

<sup>9</sup> Kestin SC, Knowles TG, Tinch AE, and Gregory NG. 1992. Prevalence of leg weakness in broiler chickens and its relationship with genotype. *Veterinary Record* 131:190-4.

<sup>10</sup> Mench J. 2004. Lameness. In: Weeks C and Butterworth A (eds.), *Measuring and Auditing Broiler Welfare* (Wallingford, U.K.: CABI Publishing, pp. 3-17).

<sup>11</sup> Danbury TC, Weeks CA, Chambers JP, Waterman-Pearson AE, and Kestin SC. 2000. Self-selection of the analgesic drug carprofen by lame broiler chickens. *Veterinary Record* 146:307-11.

<sup>12</sup> Duncan IJH, Beatty ER, Hocking PM, and Duff SRI. 1991. Assessment of pain associated with degenerative hip disorders in adult male turkeys. *Research in Veterinary Science* 50:200-3.

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- <sup>13</sup> Weeks CA. 2007. Poultry handling and transport. In: Grandin T (ed.), *Livestock Handling and Transport*, 3rd Edition (Wallingford, U.K.: CAB International, p. 297).
- <sup>14</sup> Martrenchar A. 1999. Animal welfare and intensive production of turkey broilers. *World's Poultry Science Journal* 55(2):143-52.
- <sup>15</sup> Gerrits AR, de Koning K, and Migchels A. 1985. Catching broilers. *Poultry* 1(5):20-3.
- <sup>16</sup> Bayliss PA and Hinton MH. 1990. Transportation of broilers with special reference to mortality rates. *Applied Animal Behaviour Science* 28:93-118.
- <sup>17</sup> Nijdam E, Arens P, Lambooij E, Decuypere E, and Stegeman JA. 2004. Factors influencing bruises and mortality of broilers during catching, transport, and lairage. *Poultry Science* 83:1610-5.
- <sup>18</sup> Ramasamy S, Benson ER, and Van Wicklen GL. 2004. Efficiency of a commercial mechanical chicken catching system. *Journal of Applied Poultry Research* 13:19-28.
- <sup>19</sup> Metheringham J and Hubrecht R. 1996. Poultry in transit—a cause for concern? *British Veterinary Journal* 152:247-50.
- <sup>20</sup> Metheringham J and Hubrecht R. 1996. Poultry in transit—a cause for concern? *British Veterinary Journal* 152:247-50.
- <sup>21</sup> Nijdam E, Arens P, Lambooij E, Decuypere E, and Stegeman JA. 2004. Factors influencing bruises and mortality of broilers during catching, transport, and lairage. *Poultry Science* 83:1610-5.
- <sup>22</sup> Jones RB. 1992. The nature of handling immediately prior to test affects tonic immobility fear reactions in laying hens and broilers. *Applied Animal Behaviour Science* 34:247-54.
- <sup>23</sup> Lacy MP and Czarick M. 1998. Mechanical harvesting of broilers. *Poultry Science* 77:1794-7.
- <sup>24</sup> Jones RB. 1992. The nature of handling immediately prior to test affects tonic immobility fear reactions in laying hens and broilers. *Applied Animal Behaviour Science* 34:247-54.
- <sup>25</sup> Zulkifli I, Che Norma MT, Chong CH, and Loh TC. 2000. Heterophil to lymphocyte ratio and tonic immobility reactions to preslaughter handling in broiler chickens treated with ascorbic acid. *Poultry Science* 79:402-6.
- <sup>26</sup> Duncan IJH. 1989. The assessment of welfare during the handling and transport of broilers. In: Faure JM and Mills AD (eds.), *Proceedings of the Third European Symposium on Poultry Welfare* (Tours, France: World's Poultry Science Association, pp. 93-107).
- <sup>27</sup> Kannan G and Mench JA. 1996. Influence of different handling methods and crating periods on plasma corticosterone concentrations in broilers. *British Poultry Science* 37:21-31.
- <sup>28</sup> Zulkifli I, Che Norma MT, Chong CH, and Loh TC. 2000. Heterophil to lymphocyte ratio and tonic immobility reactions to preslaughter handling in broiler chickens treated with ascorbic acid. *Poultry Science* 79:402-6.
- <sup>29</sup> Kannan G and Mench JA. 1996. Influence of different handling methods and crating periods on plasma corticosterone concentrations in broilers. *British Poultry Science* 37:21-31.
- <sup>30</sup> Kettlewell PJ and Mitchell MA. 1994. Catching, handling and loading of poultry for road transportation. *World's Poultry Science Journal* 50:54-6.
- <sup>31</sup> Kettlewell PJ and Turner MJB. 1985. A review of broiler chicken catching and transport systems. *Journal of Agricultural Engineering Research* 31:93-114.
- <sup>32</sup> Kilman S. 2003. Poultry in motion: with invention, chicken catching goes high-tech. *Wall Street Journal*, June 4.
- <sup>33</sup> McGuire AR. 2003. Improving carcass quality. *Poultry* 10(1):25-6.
- <sup>34</sup> Farsaie A, Carr LE, and Wabeck CJ. 1983. Mechanical harvest of broilers. *Transactions of the American Society of Agricultural Engineers* 26:1650-3.
- <sup>35</sup> McGuire AR. 2003. Improving carcass quality. *Poultry* 10(1):25-6.
- <sup>36</sup> Nijdam E, Zailan ARM, van Eck JHH, Decuypere E, and Stegeman JA. 2006. Pathological features in dead on arrival broilers with special reference to heart disorders. *Poultry Science* 85:1303-8.
- <sup>37</sup> Bayliss PA and Hinton MH. 1990. Transportation of broilers with special reference to mortality rates. *Applied Animal Behaviour Science* 28:93-118.
- <sup>38</sup> Gregory NG and Austin SD. 1992. Causes of trauma in broilers arriving dead at poultry processing plants. *Veterinary Record* 131:501-3.

- 
- <sup>39</sup> Knowles TG and Broom DM. 1990. The handling and transport of broilers and spent hens. *Applied Animal Behaviour Science* 28:75-91.
- <sup>40</sup> Weeks CA. 2007. Poultry handling and transport. In: Grandin T (ed.), *Livestock Handling and Transport*, 3rd Edition (Wallingford, U.K.: CAB International, p. 298).
- <sup>41</sup> Ekstrand C. 1998. An observational cohort study of the effects of catching method on carcass rejection rates in broilers. *Animal Welfare* 7:87-96.
- <sup>42</sup> Prescott NB, Berry PS, Haslam S, and Tinker DB. 2000. Catching and crating turkeys: effects on carcass damage, heart rate, and other welfare parameters. *Journal of Applied Poultry Research* 9:424-32.
- <sup>43</sup> Weeks CA. 2007. Poultry handling and transport. In: Grandin T (ed.), *Livestock Handling and Transport*, 3rd Edition (Wallingford, U.K.: CAB International, p. 298).
- <sup>44</sup> Weeks CA. 2007. Poultry handling and transport. In: Grandin T (ed.), *Livestock Handling and Transport*, 3rd Edition (Wallingford, U.K.: CAB International, p. 299).
- <sup>45</sup> Delezie E, Lips D, Lips R, and Decuypere E. 2005. Mechanical catching of broiler chickens is a viable alternative for manual catching from an animal welfare point of view. *Animal Science Papers and Reports* 23(Supplement 1):257-64.
- <sup>46</sup> Vizzier-Thaxton Y, Thaxton JP, and Shilling MW. 2006. Hand versus mechanical catching and loading of broilers. *Poultry International* 45(9):18-24.
- <sup>47</sup> Duncan IJH, Slee GS, Kettlewell P, Berry P, and Carlisle AJ. 1986. Comparison of the stressfulness of harvesting broiler chickens by machine and by hand. *British Poultry Science* 27:109-14.
- <sup>48</sup> Nijdam E, Delezie E, Lambooij E, Nabuurs MJA, Decuypere E, and Stegeman JA. 2005. Comparison of bruises and mortality, stress parameters, and meat quality in manually and mechanically caught broilers. *Poultry Science* 84:467-74.
- <sup>49</sup> Delezie E, Lips D, Lips R, and Decuypere E. 2006. Is the mechanisation of catching broilers a welfare improvement? *Animal Welfare* 15:141-7.
- <sup>50</sup> Nijdam E, Delezie E, Lambooij E, Nabuurs MJA, Decuypere E, and Stegeman JA. 2005. Comparison of bruises and mortality, stress parameters, and meat quality in manually and mechanically caught broilers. *Poultry Science* 84:467-74.
- <sup>51</sup> Knierim U and Gocke A. 2003. Effect of catching broilers by hand or machine on rates of injuries and dead-on-arrivals. *Animal Welfare* 12:63-73.
- <sup>52</sup> Lacy MP and Czarick M. 1998. Mechanical harvesting of broilers. *Poultry Science* 77:1794-7.
- <sup>53</sup> Delezie E, Lips D, Lips R, and Decuypere E. 2006. Is the mechanisation of catching broilers a welfare improvement? *Animal Welfare* 15:141-7.
- <sup>54</sup> Meat Industry Internet News Service. 2000. Does Perdue have a chicken-catching machine. *Meat Industry Insights*, June 11. [www.spcnetwork.com/mii/2000/000618.htm](http://www.spcnetwork.com/mii/2000/000618.htm). Accessed February 25, 2009.
- <sup>55</sup> Knierim U and Gocke A. 2003. Effect of catching broilers by hand or machine on rates of injuries and dead-on-arrivals. *Animal Welfare* 12:63-73.
- <sup>56</sup> Delezie E, Lips D, Lips R, and Decuypere E. 2005. Mechanical catching of broiler chickens is a viable alternative for manual catching from an animal welfare point of view. *Animal Science Papers and Reports* 23(Supplement 1):257-64.
- <sup>57</sup> Knierim U and Gocke A. 2003. Effect of catching broilers by hand or machine on rates of injuries and dead-on-arrivals. *Animal Welfare* 12:63-73.
- <sup>58</sup> Ekstrand C. 1998. An observational cohort study of the effects of catching method on carcass rejection rates in broilers. *Animal Welfare* 7:87-96.
- <sup>59</sup> Delezie E, Lips D, Lips R, and Decuypere E. 2006. Is the mechanisation of catching broilers a welfare improvement? *Animal Welfare* 15:141-7.
- <sup>60</sup> Knierim U and Gocke A. 2003. Effect of catching broilers by hand or machine on rates of injuries and dead-on-arrivals. *Animal Welfare* 12:63-73.
- <sup>61</sup> Personal correspondence with Charlotte Berg, Department of Animal Environment and Health, Swedish University of Agricultural Sciences, Skara, Sweden, February 12, 2009.
- <sup>62</sup> Ekstrand C. 1998. An observational cohort study of the effects of catching method on carcass rejection rates in broilers. *Animal Welfare* 7:87-96.

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- <sup>63</sup> Ekstrand C. 1998. An observational cohort study of the effects of catching method on carcass rejection rates in broilers. *Animal Welfare* 7:87-96.
- <sup>64</sup> Kettlewell PJ and Mitchell MA. 1994. Catching, handling and loading of poultry for road transportation. *World's Poultry Science Journal* 50:54-6.
- <sup>65</sup> Lacy MP and Czarick M. 1998. Mechanical harvesting of broilers. *Poultry Science* 77:1794-7.
- <sup>66</sup> Prescott NB, Berry PS, Haslam S, and Tinker DB. 2000. Catching and crating turkeys: effects on carcass damage, heart rate, and other welfare parameters. *Journal of Applied Poultry Research* 9:424-32.

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