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Mini Review

Transportation of Poultry: A Problem to Be Solved

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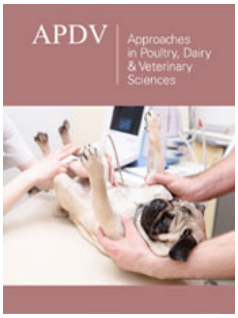
ISSN: 2576-9162



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Submission: August 22, 2019

Published: September 20, 2019

Volume 6 - Issue 4

How to cite this article: Bailone R, Roça R, Borra R, Fukushima H, Harris M. Transportation of Poultry: A Problem to Be Solved. Appro Poult Dairy & Vet Sci 6(4). APDV.000645.2019.
DOI: 10.31031/APDV.2019.06.000645

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Transportation represents a major threat to the welfare of poultry; therefore, there is considerable pressure to improve conditions to safeguard animal welfare [1]. According to the European Food Safety Authority, more broilers are transported than any other species, which means that any welfare problems during broiler transportation can affect huge numbers of animals [2]. Over twenty years ago, CIWF Trust's report The Welfare at Slaughter of Broiler Chickens raised serious welfare concerns about the slaughter process, and these concerns continue to be just as relevant today [3]. According to Mitchell [1], the major production problems associated with the transportation of broilers in the 21st century are birds "dead-on-arrival" at the abattoir (DOA), poor welfare and reduced meat quality. Transportation of broilers has been emphasized as a welfare problem [2], and it involves one of the biggest movements of live animals in the world. It can be performed under different conditions and combinations of distances, times and types of routes, which have direct impact on the quality of the final product, and will most often be responsible for DOA and condemnation of carcasses due to injuries.

DOA depends on numerous variables and may be influenced by the following factors: animal health on the farm, thermal stress (cold and hot), density and quality of the transport crates, injuries, training of employees (primarily the driver), among others. However, the effect of transportation, as well as other pre-slaughter stages on animal welfare is a multifactorial challenge. Grandin [4] describes DOA during transportation of 0.5% as "acceptable" and 0.25% as "excellent". Ritz et al. [5] commented that a typical goal of the US industry is for DOA to be less than 0.2%. Worldwide, absence of legislation or industry standards and inadequate enforcement or supervision to provide proper transportation conditions can contribute to increased mortality rates. Animal welfare guidelines and audit checklists have been developed by the US National Chicken Council for broilers, and state that when DOA rates are higher than 0.5%, corrective action is required.

Another problem related to transportation is injuries, observed most in deficient pre-slaughter management of broilers, which can range from a simple scratch on the skin, to bigger problems, such as bruises, fractures and edemas. These factors depreciate the value of carcasses and can lead to animals dying before slaughter, partial or total condemnations at the post-mortem examination, causing losses to the producer and agroindustry [6]. As with DOA, injuries depend on many factors including the method of catching; according to Lund et al. [7], manual catching has been considered as a potential source of injuries in broilers, more than mechanical catching. When the animals are transported, stress is caused by the change of location and by pre-transport management. The ideal is to promote adequate transport conditions as close to the natural as possible and with minimal handling.

Beyond physical damage, transportation can also promote reduction of meat quality due to stress. Corticosterone is the most important hormonal indicator of stress in birds, with high levels causing increased susceptibility to animal diseases and/or mortality. Broilers exposed to acute or short-term heat stress, immediately prior to slaughter, present changes in meat quality [8]. Bianchi et al. [9] demonstrated that the incidence of pale meat with impaired functional properties is higher in summer, demonstrating the influence of heat on the occurrence of low quality meat. Langer et al. [10], in a study in Brazil (a tropical country) found a relationship between pre-slaughter stress and PSE (pale, soft and exudative) meat, but corticosterone levels were not measured in this study. The authors showed that spraying birds with water just before the beginning of the journey from the farm to the slaughterhouse reduced the broilers' welfare in short distance transportation; however, for longer distances, this treatment was beneficial and reduced the amount of PSE meat in the summer season.

Clearly, transportation of poultry from the farm to slaughterhouse causes great losses to the poultry sector and is a major threat to animal welfare. Thus, it is evident that transportation routes must be planned and transportation schedules adhered to in accordance with climatic conditions. Long distance transportation should not take place during hot periods during the summer in tropical countries and if it must occur, measures must be taken to mitigate heat, as sun protection and adequate ventilation. On the other hand, in temperate countries, during the winter, long distance transportation should not take place during colder periods, and if this is necessary, the load should be covered to minimize the cold, and the comfort of the birds should be checked. Cold stress is aggravated when broilers are wet, because there is loss of temperature due to evaporation of water. According to a study by Burlinguette et al. [11] conducted in the very cold climate of Canada, management strategies for cold weather transport should include a means to protect birds near the outside of the load from cold air while removing excess heat and moisture from the center of the load. The removal of excess moisture, and the redistribution of on-board heat, could improve environmental trailer conditions, potentially improving bird welfare during transport. Setting an appropriate ventilation configuration, based on ambient conditions, requires further work and may require study of airflow patterns within the load. Therefore, on rainy days, is recommended that protection is put on the top of the load, and at low temperatures the birds should not be wet. Attention must be paid to long journeys, where losses from injuries are higher. Training of workers is also important. For this, it is necessary not only for drivers to be trained and qualified, but they could also be offered financial incentives for achieving smaller losses [12,13]. In this way, drivers' behavior towards the animals during loading and unloading, as well as the way the vehicle is driven (acceleration, vibration and impact), will be positively affected.

To conclude, the same model of poultry transport in relation to crates has been used for many years, and changes based on technical and scientific studies that contribute to better animal welfare are required. As the parameters involved are multifactorial, software and new equipment should be developed to improve logistics and animal handling, which are currently the most stressful aspects of the poultry chain for animals.

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