

An HSUS Report: The Economics of Adopting Alternative Production Practices to Electrical Stunning Slaughter of Poultry

Background

Virtually all poultry in the United States are shackled and electrically stunned in a water bath prior to slaughter. Live shackling and electrical stunning are associated with pain and trauma from injuries during shackling, pre-stun shocks, and consciousness during cutting, bleeding, or scalding.(1)

Live shackling and electrical stunning reduce meat quality and yield. Rough handling during shackling and convulsions induced by electrical stunning cause broken bones, bruising, and hemorrhaging.(2) Raj et al. found that most broilers sustained at least one bone fracture and one hemorrhage during shackling and electrical stunning.(3) During electrical stunning, chickens can defecate and inhale water, contaminating carcasses.(4) These factors lead to carcass downgrades and condemnations, decreasing processors' revenue. In 2004, 5 million U.S. poultry were condemned, post-mortem, due to bruising and contamination, alone.(5)

Shackling and electrical stunning take their toll on workers, as well. Slaughter facility employees suffer muscle strain, cuts from chickens' claws, and respiratory problems. The injury rates among poultry slaughterhouse workers are among the highest of any U.S. industry.(6)

Alternatives to Electrical Stunning Slaughter of Poultry

Controlled atmosphere killing (CAK) of meat, egg, and breeding birds is a practical alternative to electrical stunning and is being adopted by many European processors. In CAK, live birds are kept in their transport crates after reaching the slaughterhouse. While still crated, they are passed through a chamber containing gas—typically either 90-percent argon in air or 30-percent CO₂/60-percent argon in air. These mixtures are not poisonous, but cause the birds to die by anoxia. The dead birds are then hung on shackles for processing. Raj has summarized the welfare advantages of CAK over live shackling and electrical stunning. CAK reduces:

“stress and trauma associated with removing conscious birds from their transport containers, in particular, under the bird handling systems which require tipping or dumping of live poultry on conveyors; the inevitable stress, pain and trauma associated with shackling the conscious birds, i.e. compression of birds' hock bones by metal shackles; the stress and pain associated with conveying conscious birds hanging up side down on a shackle line which is a physiologically abnormal posture for birds; the pain experienced by some conscious birds that receive an electric shock before being stunned (pre-stun shocks);...the pain and distress experienced by some conscious birds which miss being stunned adequately (due to wing flapping at the entrance to the water bath stunners) and then pass through the neck cutting procedure; [and] the pain and distress associated with the recovery of consciousness during bleeding due to inadequate stunning and/or inappropriate neck cutting procedure.”(7)

To that list should be added the pain and distress of some birds who are still conscious when they enter the scalding tanks for feather removal and die by scalding or drowning.(8) Duncan has concluded that “[CAK] is the most stress-free, humane method of killing poultry ever developed. The birds are quiet throughout the operation.

They remain in the transport crate until dead and the killing procedure itself is fast, painless, and efficient. There is no risk of recovery from unconsciousness.”(9)

Effects on Production Costs

Adoption of CAK involves large capital costs in the purchase of gas stunning equipment. A system in the United States that processes around 1 million birds per week (150 to 200 birds per minute) costs less than \$1 million and is compatible with existing crates and loading equipment.(10) According to the European Integrated Pollution Prevention and Control Bureau (EIPPCB), the running costs of gas, using an 80-percent nitrogen/20-percent argon mixture, are between 51 and 84 cents per 100 birds (2005 USD).(11)

CAK results in cost savings and increased revenues by decreasing carcass downgrades, contamination, and refrigeration costs; increasing meat yields, quality, and shelf life; and improving worker conditions. Without live shackling and electrical stunning, CAK results in fewer broken bones and less bruising and hemorrhaging.(12-17) The reduction in carcass defects increases boning yield and deboned meat quality.(18-21) CAK has been shown to reduce bruising by as much as 94 percent and bone fractures by as much as 80 percent.(22,23) Conservatively assuming that CAK increases yield only 1 percent, a plant processing 1 million broilers per week with an average dressed carcass weight of 4.5 pounds and wholesale price of \$0.80 per pound would increase annual revenue by \$1.87 million after adopting CAK.

Because CAK increases the rate of rigor development, it results in faster carcass-maturation times and reduces handling, floor space, and refrigeration costs.(24-27) Because gas-stunned chickens do not inhale contaminated water as they do during electrical stunning, CAK also decreases contamination costs.(28)

CAK can improve worker conditions and safety, decreasing labor costs due to production line inefficiencies, injuries, and turnover from handling conscious birds. The Canadian Food Inspection Agency concluded that “[t]he environment for the [personnel] working in the poultry stunning area is also very much improved with the use of controlled atmosphere stunning. Dust is reduced since unconscious birds are placed on the evisceration line.”(29) O’Keefe reports that for one CAK plant, annual labor savings due to easier handling in post-stun shackling more than offset increased operating costs.(30)

Based on the estimates above, a plant that installs a CAK line at a cost of \$1 million, with a capacity to slaughter 1 million birds per week, would have annual operating costs of between \$265,200 and \$436,800, and increased revenue of \$1.87 million from increased meat yield. Payback would be achieved in less than one year, with increased profits thereafter. Similarly, Shane found that U.K. producers adopting CAK were able to recoup their capital investment in one year.(31)

Effects on Consumption and Profits

Because the costs of adopting CAK can be recouped in a short period, there is no evidence that the adoption would have a significant effect on consumption or profits.

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