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Stunning of Commercial Poultry in North America

Stunning in commercial poultry slaughter facilities is used to induce unconsciousness prior to slaughter. Stunning methods used may be reversible or irreversible. In North America, the primary methods used to stun poultry prior to slaughter are: 1) low voltage electrical current (reversible), 2) controlled atmosphere stunning - CAS (irreversible), and (3) low atmospheric pressure – LAPS (irreversible). Currently, low voltage electrical stunning remains the North American broiler industry preference while CAS systems are becoming more common in the turkey industry for ergonomic reasons.

Reversible stunning can be characterized as an electrical system which instantly induces an epileptic state of unconsciousness until death is achieved from blood loss resulting from the cutting of the major blood vessels in the neck. Reversible stunning has the benefit of quickly stunning poultry without the negative meat quality issues seen with many irreversible systems and is very cost efficient for poultry slaughter companies to operate and maintain. Improper application of reversible stunning systems of poultry can be associated with adverse welfare outcomes including additional handling of live poultry during the unloading and shackling procedures and mis-stunned birds if equipment is not adequately operated or maintained.

Irreversible stunning systems rapidly induce unconsciousness by replacing normal air with mixtures of carbon dioxide, nitrogen, or argon gas (CAS system) or by exposing birds to reduced atmospheric pressure in a controlled manner (LAPS system). Irreversible stunning has the benefit of reducing the handling of live birds prior to slaughter. Improper application of irreversible stunning systems of poultry can be associated with negative welfare outcomes including excitation and injury prior to loss of consciousness and/or incomplete stunning. This excitation and increased injury can negatively impact product quality which will, in turn, lead to negative



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economic outcomes for the slaughter plant due to hemorrhages and meat quality problems. Irreversible stunning systems offer ergonomic benefits for processing plant employees involved in placing extremely large poultry in shackles and therefore will also positively affect human safety, animal welfare, and product quality when utilized correctly.

Regardless of the system used, care must be taken to ensure that the stunning system operates as designed and that birds are properly stunned when exiting the system. There must be a robust monitoring program in place to evaluate the effectiveness of the stun while the processing plant is in operation. Effectiveness should be monitored by assessing stunning indicators (listed below) with respect to the type of stunning method. These indicators can be used to assess the outcomes of consciousness at two key stages: (a) between the exit from the stunner and neck cutting and (b) immediately post-neck cutting when bleeding starts.

Assessment of the efficiency and effectiveness of stunning systems must be based on outcome-based observations. The following criteria are indicators, but not all criteria need to be evident for each stunned bird.



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In systems that induce a reversible stun, an effective process is demonstrated by an unconscious bird post-stun and the following signs:

- no rhythmic breathing for 8-10 seconds after leaving the water bath
- neck arched with head directed vertically
- open eyes
- no reaction to comb pinch
- wings held close to the body
- rigidly extended legs (not an appropriate indicator when a bird is held in a shackle)
- constant body tremors
- no vocalization

In systems that induce an irreversible stun, an effective process is demonstrated by:

- fixed, central, dilated pupils
- no rhythmic breathing
- No corneal reflex (no nictitating membrane reflex)
- no response to comb pinch
- limp carcass; floppy head

With any stunning system, there must be corrective actions assigned as soon as it is determined that the system is not operating to established standards (reference NCC standard for low voltage electrical) and <100% irreversibly stunned for CAS and LAPS)

It is the position of the AAAP and the ACPV that reversible and irreversible stunning systems are humane and acceptable methods for stunning of poultry when properly applied, maintained and monitored. We recommend continued research on stunning physiology and methods to improve and refine stunning procedures in commercial poultry.

For further information, please see Johnson, C "A review of bird welfare during controlled atmosphere and electrical water-bath stunning" JAVMA, Vol 245, No. 1, July 1, 2014