

Stunning and animal welfare considerations

An initiative by People for the Ethical Treatment of Animals ("PETA") made the Board of Directors of McDonald's look into the animal welfare issues of controlled atmosphere stunning to determine if they were going to ask suppliers to switch to this system. The study made contains interesting findings.

By Wiebe van der Sluis

In keeping up with the company's commitment to animal welfare leadership, McDonald's continuously seeks opportunities to ensure humane handling practises in their supply chain. Asked by the Board of Directors McDonald's Animal Welfare Team studied the developments in Controlled Atmosphere Stunning (CAS) technology and compared it with the experiences with electric stunning.

From the study it was concluded that their remain an number of unanswered questions, especially those related to dif-

Mc Donald's to stay with electric stunning

Following an initiative by People for the Ethical Treatment of Animals ("PETA"), owners of 199 shares of the McDonald's Corporation, the fast food giant looked into the welfare issue of current stunning methods. PETA requested the company to issue a report to shareholders on "the feasibility of McDonald's requiring its chicken suppliers to phase in controlled atmosphere killing within a reasonable timeframe.

Based on a review by McDonald's Animal Welfare Team the company agreed that CAS has potential, but feels that it would be to premature to require adoption of this "emerging" technology for its suppliers. It decided to continue work with their U.S.- based poultry suppliers to improve the effectiveness of their electrical stunning processes. Together with these suppliers, researchers, and other scientific experts, they will explore possibilities to reduce or prevent animal welfare concerns like: pre-stun stress, cases of inadequate stunning, and potential stresses and injuries related to bird catching, transportation, and shackling.

Meanwhile the company will continue to explore the practical experience of their European suppliers who use CAS systems. It will also support efforts to improve understanding of the technological issues involved in commercial CAS applications and act to accelerate further developmental work.



Gas stunning has potential but better control over the gas mixture is needed to render a constant level of insensibility of the birds to process them.

ferent types of gases, mixtures, exposure times, and concentrations. Yet unresolved issues remain for both principal gas mixture types, including the possibility that birds may experience pain or distress before insensibility is achieved.

Significant new research and reports are expected in the near future, till than McDonalds will make no definitive conclusions or commitments. It states in their report that there is still much to learn about the application of CAS in commercial environments. "As a responsible company, we must have higher confidence that any significant investment we require of our suppliers will not prove problematic or be rapidly superseded by improved technology", the report says.

Gas or electric

For many years electrical stunning has been the standard in modern poultry processing plants. It used to be the only way to render birds insensible - that is, unconscious and incapable of feeling pain - prior to slaughter. Because early stunners were ineffective, a high AC voltage had to be used to achieve reliable stunning. This ensured insensibility prior to further processing, but it impaired meat quality.

Questions were also raised about the animal welfare aspects of electrical stunning, principally because the process could be inconsistent and thus not render all birds insensible prior to slaughter. In response to these aspects CAS was developed. CAS achieves insensibility by exposing broilers to either a mixture of in-

ert gases (nitrogen and argon) or concentrations of carbon dioxide. Both the electrical as well as gas stunning method have welfare implications and thus must be considered in assessing technological alternatives for stunning, as the MacDonald's Animal Welfare Team notes.

Apparent distress

Several research teams have studied particular animal welfare aspects of various gas mixtures proposed for CAS. These studies looked at respiratory responses, head shaking, and other signs of apparent distress or used EEG tracings.

In 1998, the European Commission's Scientific Committee on Animal Health and Animal Welfare reviewed available research and issued a report on the suitability of CAS from an animal welfare perspective. It concluded that the use of gas mixtures for stunning or killing birds can eliminate stresses associated with electrical stunning, but that none of the major gas mixtures in current use had been sufficiently researched to permit "firm recommendations." The Committee also advised to conduct additional research and set forth types of scientific evidence that would be required for approval of a gas mixture. The factors it said should be considered were:

- Aversion to the method, *i.e.*, its potential for causing distress, as determined through observations of behaviour, hormonal changes, and/or other means.
- Exposure times required to stun or kill effectively, based on evidence of unconsciousness or death.

- Neck-cutting intervals required to avoid recovery of consciousness.
 - Effects on carcass and meat quality.
 - Effects on worker safety.
 - Practicality of the method.
- These unresolved issues are still subjects of research and debate.

Sign of recovery

In June 2004, the Humane Slaughter Association (HSA) and the Universities Federation for Animal Welfare (UFAW) held a workshop on CAS in poultry processing. Representatives from academia, manufacturers of CAS systems, the poultry industry, and the UK Department for Environment, Food, and Rural Affairs (DEFRA) focused the discussion on research into the effects on birds of the two main approaches to CAS - CO₂ mixtures and anoxic (argon/nitrogen) mixtures. The consensus was that the studies “provide important information but don’t seem to resolve all the issues related to current CAS systems. They also have the limitation of not being carried out in commercial conditions.” More specifically, the group found that:

- Commercially, there may be some birds that show signs of recovery before killing and that this issue may have to be resolved if CAS is to be widely adopted in Europe.
- “There seems to be a question mark about the experience of birds flapping in anoxic gas mixtures,” *i.e.*, whether the birds are still conscious or have periods of consciousness and, if so, whether the flapping is distressful or painful.
- There is “undoubtedly unpleasantness associated with the most common CO₂ mix. We seem to have a better understanding of the problems of the CO₂ mix, but it does not meet all the criteria we would like in a CAS system.”
- “The choice may be between an unpleasant or painful initial phase but apparent calm subsequent transition from unconsciousness to death or a non-aversive initial phase but with a potentially violent or distressing transition to death.”

Labs differ from plants

At the global level, the UN Office International des Epizooties (OIE) - the lead agency for global guidance on animal health and animal welfare policies - has just adopted guidelines on humane slaughter. These cover, among other things, uses of electrical stunning and of CAS, both with CO₂ mixtures and inert gases. The guidelines express no preference for one method over others. Rather they identify, for each method, animal welfare concerns and/or implications and key animal welfare requirements.

There are thus uncertainties from both a research and a regulatory perspective. In an as-yet unpublished paper, Dr Temple Grandin observes, as did the HSA/UFAW group, that the translation of research results into commercial use in-

roduces additional factors. “Inert gas mixtures that may work in a small box in the lab,” she writes, “may not work out in the commercial plant.

In the real world gas systems are subject to greater and more frequent fluctuations in the gas mixture. Slight changes in the mixture can cause birds to flap violently. Such changes can easily be caused by changes in wind direction around the plant or fans turning on in the plant.”

European processors’ experience

McDonald’s has learned about the practicalities of CAS technology through the direct experience of some of their poultry suppliers in Europe. They have been using the technology at a few of their plants - in one instance for as long as seven years - and are considering potential expansion. Benefits they have noted thus far include improvements in:

- Bird handling, because birds are not shackled while conscious or subject to certain irregularities incident on electrical stunning *e.g.*, pre-stun shocks.
- Stunning efficiency.
- Working conditions due to reduced needs for physically handling live birds.
- Meat yield and quality.
- Supplier input also indicates certain disadvantages to CAS, specifically:
- Gas control systems are more complex than electrical stunning systems. They require specialized worker training and ongoing monitoring to maintain the proper proportion of gases and avert safety risks
- Initial capital costs and gas supply costs are high.
- Gas systems require more space in processing plants than electrical systems. Reconfiguring smaller plants to accommodate a gas system may be difficult.
- Feather removal can be more difficult, and there may be scratching and/or wing damage.

Other technological developments

While CAS technology was developing in Europe, electrical stunning technology was evolving in the U.S. As a result, U.S. poultry processing plants commonly use low-voltage AC or DC electrical stunners that can render birds insensible before slaughter without affecting meat quality. In 1997, a further improvement was introduced, based on research on electroanesthesia for humans. This technology uses a low-voltage, pulsed DC current followed by a constant low-voltage AC current, rather than a constant low-voltage current of either wave type. The pulsed DC current is used to stun the bird. The AC current then prolongs the stun while the bird is moved down line for further processing. The two-phase technology is commercially available and is used in some plants that supply McDonald’s in the U.S. and the UK, as well as other poultry suppliers. ■

Assessment of existing knowledge

Research and practical experience to date have led to widespread consensus on certain issues. Other issues remain unsettled. These await further research and/or testing in actual commercial environments.

Areas of general consensus

Experts seem largely to concur on the following basic premises related to CAS:

- When compared to stunning with a high-voltage AC current, CAS has advantages from both an animal welfare and a meat quality perspective.
- CAS obviates potential distress and injury resulting from the physical handling and shackling of unstunned birds.
- Certain other potential causes of distress are eliminated, *e.g.*, premature shocks, cases of inadequate stunning.
- Properly designed and operated CAS systems can expeditiously and effectively stun and kill broilers with relatively low rates of aversion or other distress.

Issues requiring further study, testing and/or other clarification

- *Appropriate gas mixture.* Researchers and CAS manufacturers differ on the appropriate gas mixture to use. From an animal welfare perspective, the debate is critical because at least one well recognized authority, maintains that use of carbon dioxide causes pain and panic reactions, while other experts have concluded that multi-phase carbon dioxide systems are humane.
- *Regulatory environment in Europe.* The unresolved debate about gas mixtures is reflected in the regulatory environment and thus has implications for feasibility. For example, country-level legislation in Europe would, at this point, preclude the universal adoption of any CAS system for McDonald’s poultry supply chain. Great Britain permits only single-phase systems, while France permits only two-phase carbon dioxide systems. Although most European countries have no explicit legislation on the issue, their *de facto* permissiveness is not necessarily long-lived and so cannot be relied on. The pending EU legislation noted above could establish new limits on CAS options.
- *Design of current major CAS systems.* The design of major CAS systems in current use also raises unanswered questions with potential implications for animal welfare. For example, the OIE guidelines cite possible recovery of consciousness with systems using inert gases, *i.e.*, argon and nitrogen. It has also been found that, when exposed to oxygen-depriving environments in commercial settings, some proportion of birds will respond with strenuous wing-flapping. Researchers differ on whether the birds are still conscious when the flapping begins and, if so, whether the flapping is associated with distress or pain.
- *Worker health and safety issues.* There are also worker health and safety risks associated with the use of pressurized gas systems, particularly those designed to induce oxygen deprivation. It is unclear that these risks have been adequately assessed and appropriate safeguards developed.