

The Electrified Stun Bath: Canada's Outdated Method of Stunning Poultry



Tour of Vleesch du Bois
Poultry slaughterhouse
using
Controlled Atmosphere
Killing (CO₂)
in
Blokker, The Netherlands



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Eyes on
Animals

Watching
out for their
well-being



by Twyla Francois

INTRODUCTION

In October, representatives from Canadians for the Ethical Treatment of Food Animals (CETFA), the Canadian Coalition for Farm Animals, Stichting Varkens in Nood, L214, Vier Voeters and Eyes on Animals met with two senior managers of Vleesch du Bois poultry slaughterhouse located in Blokker, NL. The meeting and tour were kindly arranged by Lesley Moffat, Coordinator and Inspector of Eyes on Animals.

The purpose of the meeting was to discuss the company's move away from the electrified stun bath method of stunning poultry (which requires live-hanging of the birds by their feet and is the most commonly used method of stunning poultry in Canada) to a CO₂ system developed by Stork Ltd. (<http://www.stork.com/526/Products.html>). We were also provided with a tour of the system while in operation.

The ultimate goal of the meeting and tour was to learn about the system of controlled atmosphere stunning with gas to determine: (1) whether it provides some welfare improvements for poultry during slaughter, and (2) its impact on meat quality to determine if it would be a viable option for poultry slaughterhouses in Canada to adopt.

Information on Vleesch du Bois

The facility toured was one of a number of poultry slaughterhouses owned by the Plukon Royale Group. Their largest plant kills 175,000 chickens per day. Together, the group of plants kill 4.1 million birds per week.

All broiler chickens killed are approximately 2 kg at time of kill, and the birds vary in age from 35 to 65 days of age. This weight is consistent with poultry slaughter weight in Canada, although birds reach this size more quickly in Canada, with an average of just 36 days.

History of Controlled Atmosphere Killing in Europe

After a series of exposés in the European media showing the poultry welfare problems inherent in the electrified stun bath method, Europeans became increasingly interested in how chickens were killed and began demanding change. Controlled Atmosphere Killing and Stunning (CAK/CAS) was evaluated as it ensures a 90% stun rate.

According to one of the managers of Vleesch du Bois:

"In the US (ed: and presumably, Canada), birds are immobilized but no one's sure if they're unconscious...There is a natural tension between animal welfare and meat quality when it comes to stunning poultry as good meat quality (without blood spots and bruising) is only ensured when the voltage is low – too low to ensure a proper stunning."

Earlier this year, the Dutch Ministry of Agriculture commissioned the Animal Sciences Group of the University of Wageningen to conduct an evaluation of the efficacy of the electrified stun bath method as it is currently used in Dutch slaughterhouses (Hindle, V.A. et al., 2009).

The researchers visited 18 Dutch poultry slaughterhouses, taking readings of the currents to which individual birds are exposed during the electric stun baths. While the legal minimum current per bird is 100mA, the investigators' findings showed that birds were being exposed to currents that ranged from 20mA to 216 mA, and for widely varying lengths of time.

The researchers concluded:

"It is highly probable that large numbers of birds are inadequately stunned during current usage of the water bath technique in slaughterhouses."

"Use of the conventional electrical water bath in its present form is to be strongly discouraged because of the inability to guarantee that each bird receives sufficient current for an effective stun."

Resulting European Slaughter Legislation

Because of the report's findings, legislation was passed in The Netherlands that requires all poultry slaughterhouses to provide electric currents that are high enough to ensure that birds are adequately stunned. This is required to be in compliance with the federal slaughter regulations. Because slaughterhouse operators know the required higher voltage will compromise meat quality, all are moving away from the electrified stun bath method, towards other methods of stunning the birds. The most popular method is the implementation of a gassing system.

CURRENT CANADIAN SLAUGHTER LEGISLATION

Canada has the same federal humane slaughter regulations as The Netherlands. These require that all birds be rendered unconscious with no risk of regaining consciousness.

Regulations

Meat Inspection Act – PART III

79. *Every food animal that is slaughtered shall, before being bled,*
- (a) be rendered unconscious in a manner that ensures that it does not regain consciousness before death, by one of the following methods:*
 - (i) by delivering a blow to the head by means of a penetrating or non-penetrating mechanical device in a manner that causes immediate loss of consciousness,*
 - (ii) by exposure to a gas or a gas mixture in a manner that causes a rapid loss of consciousness, or*
 - (iii) by the application of an electrical current in a manner that causes immediate loss of consciousness.*

In relation to the manual handling and live-hanging of birds in Canada, the federal humane slaughter regulations state:

62. *(1) No food animal shall be handled in a manner that subjects the animal to avoidable distress or avoidable pain.*



Photo taken in Quebec, Canada

Selective breeding in Canada has resulted in unnaturally fast-growing birds with weakened skeletons and painful leg and hip disorders.

In relation to the use of electrical currents too low to bring about unconsciousness, the federal humane slaughter regulations state:

Regulations

Meat Inspection Act – PART III

80. *No equipment or instrument for restraining, slaughtering or rendering unconscious any food animal shall be used by any person for those purposes*
- (a) unless the person is, by reason of the person's competence and physical condition, able to do so without subjecting the animal to avoidable distress or avoidable pain; or*
 - (b) where the condition of the equipment or instrument or the manner in which or the circumstances under which the equipment or instrument is used might subject the animal to avoidable distress or avoidable pain.*



Photo taken in Manitoba, Canada

Chickens and turkeys in Canada are routinely live-hung for electric bath stunning, putting enormous pressure on their hips and legs.

PART I

DISCUSSION OF STUNNING SYSTEMS

Welfare Concerns with Electrified Stun Baths

The following list of concerns with the electrified stun bath method were noted by management of Vleesch du Bois during our meeting:

- The birds must be live-hung which causes pain and pressure in their joints,
- The birds receive pre-electric shocks to their heads and wings, and shocks from splash-back,
- There is a variance in bird resistance and electrical uniformity in stunning, so not all birds are stunned sufficiently, and
- The electric current causes convulsions, spasms and uncontrollable movements in birds, causing blood spots on (and in) the breast fillet, as well as fractures and blood spots in wings.

Improved Care with CO₂ System

The following were presented by Vleesch management as improvements they have recorded since conversion to a gassing system:

- Dramatic improvement in animal welfare: No live-hanging required; 100% stun rate (no risk of revival),
- Dramatic improvement in carcass quality (decrease in fractures; decrease in blood spots on (and in) breast fillet; decrease in wing damage),
- Improved working environment and worker morale: Less heavy and specialized labour; less dirty labour,
- Improved brand image and reputation which allows them to protect consumer brands for large corporations like McDonalds and Marks & Spencer. These corporations will stop accepting electrically stunned birds by 2012, so conversion positions them well in retaining markets,
- Less methicillin-resistant Staphylococcus aureus inhaled by workers as there is no live-hanging of birds, and
- While the system conversion was expensive (\$1.6 million), the facility recouped its costs within three years. This was due to a dramatic increase in meat quality (little to no loss due to blood spots as compared to the electrified stun bath system).

PART II

TOUR OF VLEESCH DU BOIS FACILITY

The tour was given from the freezer to the live-holding area (for hygiene reasons), but will be explained in the order of the birds' processing stages.

i. Transportation, Tarping, and Manual Handling at Arrival at Plant

Superior Transportation Crates

The birds are caught and loaded into crates designed by Easyload (alsengineering.net/Brochure/Eleng.pdf). These crates offer large open-top drawers which, even when stacked, can be opened, making the birds always readily accessible.

Comparison to Canada

In Canada, crates are top-loading through a very small opening and once stacked, none of the birds are accessible. This is contrary to Canadian transport regulations which require that all birds must be able to be fed and watered without being removed, and must be able to be readily inspected and removed should they be injured.

In fact, investigations in Canada have recorded instances of bird deaths due to crushing from these poorly constructed crates. Truck drivers frequently do not install the metal columns between the rows of crates. As a result, if the driver applies the brakes too quickly, entire columns of crates fall into the gap. The tops of the crates fly open and birds are spilled onto busy roadways and struck by cars. Other birds cling to the sides of crates or fall into the cracks between crates, and become inaccessible and suffocate to death.



Photo taken in Quebec
Birds suffocated to death in trailer accident

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PART II

TOUR OF VLEESCH DU BOIS *cont'd*

i. Transportation, Tarping, and Manual Handling at Arrival at Plant *cont'd*

Canadian Regulations

Health of Animals Act

Transportation of Animals – PART XII

Containers

144. (1) *No person shall load or transport or cause to be loaded or transported a container used in the transportation of animals unless the container is constructed and maintained so that*

- (a) animals therein may, where required, be fed and watered without being removed therefrom;*
- (b) animals therein may be readily inspected*

Superior Tarping Systems

The trailers at this facility also had specially designed systems that allow the tarps to remain in place. The tarps provided good ventilation but also protection from inclement weather. The outside edge of the tarps was of a solid plasticized fabric with the inside layer (the area covering the birds) made of a plasticized mesh, providing protection and ventilation.

Comparison to Canada

In Canada, tarping systems are used haphazardly – sometimes applied, sometimes not, and frequently attached only to one side of the trailer, namely the passenger side. (We suspect the drivers are not installing the tarps on their side as it may impede field of vision while driving, but we do not know for certain.)

What is clear, according to Canadian Food Inspection Agency non-compliance reports, is that the mortality rates from frozen chickens are shockingly high and commonplace. We were stunned to see on these reports, acquired through an ATIP request, that the vast majority of these trailers with high dead-on-arrival rates from freezing, were marked as “in compliance” with transport regulations by CFIA veterinarians and inspectors.

Canadian Regulations

Health of Animals Act

Transportation of Animals – PART XII

Protection of Animals from Injury or Sickness

143. (1) *No person shall transport or cause to be transported any animal in a railway car, motor vehicle, aircraft, vessel, crate or container if injury or undue suffering is likely to be caused to the animal by reason of*

- (d) undue exposure to the weather*

Reduced Manual Handling at Plant

Birds were held in their crates in a quiet area well away from vehicle and foot traffic routes. The lighting used was blue light, which is more calming to the birds. (This contrasts starkly to common holding areas for poultry in Canada, which by necessity of the live-hanging, are in high traffic areas with loud talking by the staff, fans, machines and white light.)

From the holding area the birds (still within their crates) are brought to the unloading area. It was again surprisingly quiet in this area, with just one worker in place, quietly ensuring that crates were tipped properly.

Four crates were tipped at once onto a moving conveyor belt. There was no need for workers to grab each bird from top-loading crates (as is done in Canada which leads to massive welfare problems).

Comparison to Canada

In Canada, birds' feet may become lodged between the slats of transport crates. Further, workers must remove the birds from crates very quickly - up to 200 birds per minute (Striffler S., 2002) and live-hang them. A bird who is trapped is simply pulled out more roughly – to such an extent that his or her foot is torn off.

We have been documenting this incredible trauma since 2006. These birds then become “one-legged hangs”, at risk of slipping out of the metal leg shackles or falling on to the floor. Such birds are at increased risk of abuse from kicking and stomping, or of missing the electrified stun baths or partially or completely missing the spinning neck-cutting blades.



Photo taken at Maple Leaf in Toronto, Ontario

Torn off chicken foot left in just-washed trailer

PART II

TOUR OF VLEESCH DU BOIS *cont'd*

i. Transportation, Tarping, and Manual Handling at Arrival at Plant *cont'd*

Reduced Manual Handling at Plant *cont'd*



Photo also taken at Maple Leaf in Toronto, Ontario

Another torn off chicken foot left in just-washed trailer



Retrieved chicken foot that was trapped in a transport crate

Extensive damage can be seen from the severe pressure and rubbing of the crate as the worker roughly pulled out the bird.

Many of these one-legged birds are then scalded alive in the scald baths. Over 250,000 birds die this unbearable way each year in Canada.

The live-scalding of birds in Canada is not only a major welfare concern but a human health worry as well. This is because many of the birds defecate in the scald bath water, introducing salmonella bacteria which are then picked by on the the next 500+ carcasses put through the bath (Cason et al, 2000).

ii. The Slaughter process at Vleesch Du Bois and the Birds' Response to CO₂

The Gassing Process in The Netherlands

Once tipped out onto the conveyor belt, the birds are transported to the CO₂ chambers.

With the use of a small blue hand-held light we were able to view inside the CO₂ chambers to observe the behaviour of the birds. A conveyer belt steadily moved the birds between the chambers, allowing approximately one minute per chamber.

At the first window the birds showed little aversive behaviour. The birds' introduction to the gas is important because if the concentration is too high it will be aversive to the birds and they will hold their breath - extending the time it takes them to suffocate. Because of this, the birds must be introduced at a low gas level, which is then increased as they continue through the different chambers. At this time, 40% CO₂ was being used. However, tests were being conducted on lower levels as aversive reactions can be reduced with reduced CO₂ levels. The managers were open to research recommendations.

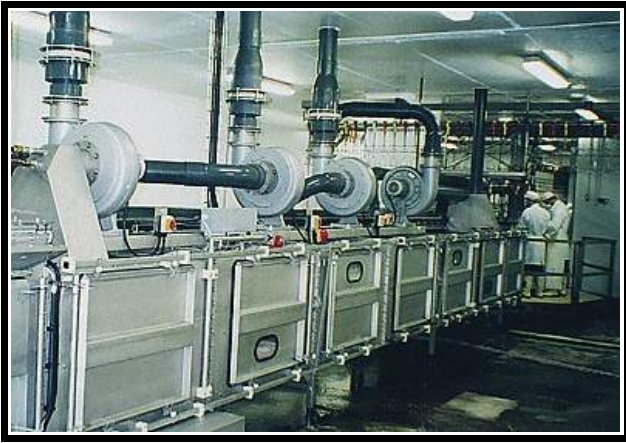
Birds' response to CO₂

Aversive behaviour in the form of gasping, shaking of heads and stretching of necks to breathe could be seen beginning in window two, and by window three all birds were exhibiting strong convulsions.

The birds' movements eventually became still and by the time they emerged from the CO₂ chambers they were completely lifeless, and showed no signs of consciousness or return consciousness. This fact alone makes the gassing system superior to the electrified stun bath where revival rates can be high.

The dead birds were hung by their feet and continued via a suspensory railing into the butchering area, which was heavily mechanized.

While the management did not allow photographs, the following images are from the Stork website and show the same system we observed.



Gas chambers where CO₂ levels are gradually increased



Dead birds, exiting chambers, are then hung

Discussion and Future Directions

We appreciate the cooperative relationship existing in Europe between industry and animal welfare organizations. The management of the toured facility was open and honest with us, and sincerely interested in our view of their operation and whether improvements could be made.

We view the movement away from the electrified stun bath method in poultry slaughter as an important and necessary step towards improved bird welfare. The present system in Canada does not use sufficient electrical voltage to bring about unconsciousness as required by federal humane slaughter regulations. Early investigations and tours by CETFA Board members of poultry slaughterhouses in Canada showed the same findings as those of the researchers from the University of Wageningen in poultry slaughterhouses in The Netherlands ie. voltage levels are not high enough to ensure the federal regulations are followed (CETFA, 2004. *Rethink the Way We Live*).

Other significant welfare concerns exist with the electrified stun bath method, including the manual unloading of birds which can result in their leg or legs being torn off, and live-shackling of birds upside down, putting enormous pressure on their legs and hip joints.

According to Dr. Mohan Raj, Senior Research Fellow in the Department of Food and Animal Science at the University of Bristol:

“Hanging upside down on metal shackles is a physiologically abnormal posture for all poultry, including turkeys and is painful and distressing. Under this situation, compression of their legs by metal shackles is known to be an extremely painful experience to all poultry, especially heavy turkeys.”

Therefore, any move away from live-shackling is of enormous benefit to the birds.

That said, we feel it necessary to investigate other and better methods of gassing, because the use of CO₂ is not without concerns.

Again according to Dr. Mohan Raj: “More than 30 percent carbon dioxide is not recommended, as birds show aversion to CO₂ by gasping, shaking their heads, stretching their necks to breathe, and showing signs that in human brain regions are associated with pain and panic. Inhalation of carbon dioxide is distressing and inevitably painful.” (cited by United Poultry Concerns, 2005).

Controlled Atmosphere Killing with Inert Gases

Controlled Atmosphere Killing with inert gases (nitrogen and argon) provide an appealing alternative.

The aversive response in the chickens that we observed with the CO₂ system is said to not be present when using inert gas systems. This is because birds have chemical receptors in their lungs (intrapulmonary chemoreceptors) that are acutely sensitive to CO₂ and the suffocation brought about by its presence, but are insensitive to the anoxia (lack of oxygen) and hypoxia (subnormal levels of oxygen) induced by inert gases (United Poultry Concerns, Mass Depopulation of Poultry as a Disease Control Method, 2006).

Suffocation involves receptors that trigger a pain response. Anoxia however, is without such signals.

Alternative Inert Gasing Systems

Two systems have emerged as the least detrimental to poultry welfare while increasing meat quality:

1. Low volume CO2 in argon

In a report to the USDA, Dr. Mohan Raj concluded:

“A mixture containing low concentration (20% by volume) of carbon dioxide in 80% argon (welding gas mixture), which is better than using a high concentration of carbon dioxide on bird welfare grounds, is universally available in large quantities and should be used in containerized gas killing systems.”

Dr. J.P. Quine, University of Alberta, described the behaviour of birds stunned in this system at a slaughterhouse in Eye, Suffolk, U.K. in “Field Study of Control of Atmosphere Stunning of Poultry”:

“Immediately following immersion in the tank, birds bobbed their heads two or three times and then fell over. No evidence of panic or excitement was observed. Exiting crates were closely examined for any signs of life in the recumbent birds, but none was noted.”

2. Nitrogen

Nitrogen is colourless, odourless, inert and inexpensive. It is the most abundant gas in the atmosphere forming four fifths of the air, and is easily extractable.

Research conducted by the University of Bristol, concluded that nitrogen-based controlled atmosphere stunning (CAS) produced the highest meat quality and presented the best welfare solution.

Brandons Plc, became the first poultry company in the world to install a nitrogen-based CAS system at its plant in Scropton, Derby, U.K. in 2002.

Brandons Plc noted substantial advantages with the system, including decreased hanging personnel required (50% reduction in hang-on-line employees), increased line speed, dramatically improved meat quality without any blood spots, and the resulting complete elimination of trimming staff required, as well as an increase in yield of up to 1.5%. Tests confirmed that meat quality became substantially more tender using nitrogen-based CAS, while chilling and maturation time were dramatically reduced.

Recommendations

With such a plethora of information, research studies and tried and tested in-field examples, it is a concern that so few poultry slaughterhouses in Canada are investigating the advantages CAS has to offer.

While Canadian federal humane slaughter regulations dictate that all birds be rendered insensible before slaughter, the fact is that insensibility is not being ensured with the current electrified stun bath system. This, together with the shocking welfare abuses such as torn off legs and high numbers of birds being live-scalded mean it is just a matter of time before the Canadian public begins demanding change as Europeans did.

Rather than continuing in the trend of reactivity or complete lack of action, we encourage Canadian poultry slaughterhouses to consider the alternatives presented here. It is in their best interest to do so on many levels: international trade, worker morale, increased and consistent high quality yield, improved brand image, market retention of large corporations, and social and ethical corporate responsibility.

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