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Health & Welfare

Killing methods, post-slaughter quality, part 1

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Developing a slaughter program

When shrimp are harvested at night, which reduces temperature stress, they are typically placed in chilled water as part of the humane slaughter process.

Harvesting fish for slaughter usually requires some handling and concentration of fish, which can result in fish stress. Harvesting is known to result in elevated levels of cortisol, the primary stress hormone in fish, as well as lactic acid and glucose. It can also cause reduced glycogen levels, decreased muscle pH and rapid onset of rigor mortis.

Preharvest physiological changes can result in lower product quality and reduced processing yields, which can have a significant effect on profitability. What is least traumatic to the animals is best for meat quality.

Slaughter methods

A variety of slaughter methods are currently used for fish, depending on the species, resulting product quality and market demand. Some fish are individually processed, while others are collectively killed.

According to the Silsoe Research Institute: “Slaughter is generally a two-stage process. The animal is first stunned to make it insensible to pain. Death is then introduced by various methods that include bleeding, stopping the heart or preventing access to oxygen. These two stages can occur together, but where they are distinct operations, the stun-to-kill time must be minimized to prevent recovery of consciousness before death occurs.”

In evaluating methods of euthanasia, the following criteria are considered:

- ability to induce loss of consciousness and death with a minimum of pain and distress
- time required to induce loss of consciousness
- reliability
- safety of personnel
- irreversibility
- compatibility with intended animal use and purpose
- documented emotional effect on observers or operators
- compatibility with subsequent evaluation, examination or use of tissue
- drug availability and human abuse potential
- compatibility with species, age and health status
- ability to maintain equipment in proper working order
- safety for predators or scavengers should the animal’s remains be consumed
- legal requirements
- environmental impacts of the method or disposition of the animal’s remains.

Protection for fish

Although the slaughter of mammals and avian species for human consumption is regulated by law in many countries, most do not yet extend this protection to farmed fish. Various groups have stated that since there is no reason to suppose fish are incapable of feeling pain and distress, there is good argument for affording fish protections similar to those given to higher vertebrates.

Acceptable slaughter methods must render the animals insensible immediately and should be performed without causing avoidable pain or suffering. According to the Humane Slaughter Association: “The ideal slaughter system for fish encompasses methods that do not remove the animals from water. Where this cannot be avoided, fish should not be out of water for more than 15 seconds. After this amount of time, the animals show adverse behavior.”

In the United Kingdom, where concern for farm animal welfare is more widespread than in many other developed countries, as evidenced by the prevalence of pro-animal legislation, policy and consumer interest, the well-being of fish is of such importance that some retailers are anticipating the inclusion of humane fish slaughter elements in their purchasing policies.

A section of the Aquatic Animal Health Standards Commission report of September 2009 includes information on personnel; fish loading, unloading and transport; facility design for holding fish prior to slaughter; and stunning and killing methods. The chapter also contains a summary of stunning methods for fish and their respective welfare issues. Some firms are currently reviewing the report and may include some of the recommendations in developing plans for new facilities or the renovation of existing structures.

Assessing insensibility

According to a report by the Humane Society of the United States, a method to assess consciousness in fish is monitoring their eye roll reflex, movement of the eyes when fish are rolled from side to side. When conscious, fish attempt to remain upright when rolled to the side, and their eyes roll relative to the head. However, when unconscious, the eyes remain fixed relative to the head, showing no movement.

Other acceptable non-invasive means of assessing unconsciousness include monitoring self-initiated behavior, such as the ability to swim normally and maintain equilibrium. Responses to stimuli such as catching or handling, pin prick or electric stimulus are additional indicators, as are clinical reflexes, such as rhythmic movement of opercula, the bony flaps over gills, which indicates breathing.

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