

Can new technology address 'humane harvest' dilemma?

A newly announced system developed and evaluated by Robin McKimm and his associates, Martin O'Farrell, Carl Burger, Phong Nguyen, and Jack Tipping, at Smith-Root may provide solutions for the long-standing, complex problems associated with humane harvest, and maintenance of freshness in the end products.

The system, called Humane Fish Harvester, has been tested in Ireland, Scotland, and the United Kingdom, but public announcements about successful operations have been "under wraps" while patent applications were filed and processed; an exercise that has been completed.

The innovative design of the system consists of a stacked series (loops) of plastic tubes through which fish can be moved by water flow. The loops can be designed and constructed to accommodate the size of fish being processed.

Strategically placed electrodes deliver direct current electrical charges of specifically selected waveforms as fish move through the pipes. "Portion-sized" fish are rendered senseless in less than one second and then move through stronger fields for approximately 90 seconds, gradually shifting them from mild sedation to full euthanization. By the time they pass through the final loop they are dead, killed rapidly, without stress, thus preventing the onset of biochemical changes associated with rapid development of rancidity. Exiting the system, the fish drop into a container filled with ice slurry and are ready for transport to market or a processing center. A single unit of the system can process 6,000 to 10,000 "portion-sized" fish per hour without causing any blemishes or internal injuries.

A "short stun" version of the system will be available for use on larger fish that need to be exsanguinated (bled) immediately. While this version of the system has not been marketed and used at the production level, it has been tested systematically in a variety of conditions, said the developers.

The "short-stun" system requires much less pipe, only about 15 m (45-50 feet), which could be either straight or in a U-shaped configuration, depending on available space. For example, the U-shaped configuration would probably fit better on an ocean-going salmon trawler. If space permitted, a straight 15-m pipe would be easier to construct.

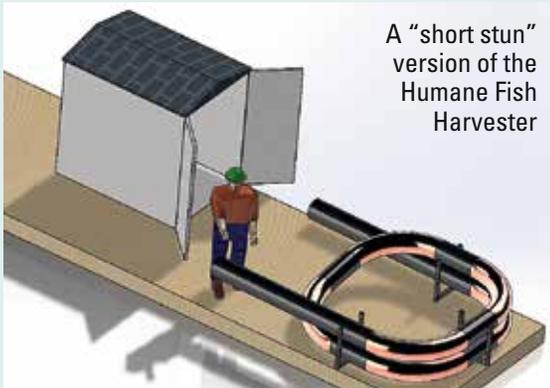
Testing of the Humane Fish Harvester began in Scotland over three years ago. More than 5 million fish, including Atlantic salmon, rainbow trout, and sea bass have now been processed at farms in Ireland, Northern Ireland, and Scotland.

Test results showed that less than 1% of the fish suffered very mild injuries, typically minor hematomas that inspectors found to be within acceptable limits for sale as human food. Tests with adult Atlantic salmon, ranging in size up to 5 kg, in full salinity seawater were considered "completely successful." Seawater, or any water containing high amounts of dissolved solids, has always been a challenge for electrical systems so these tests results were cause for celebration. The Humane Fish Harvester system can be used on land, in freshwater, in seawater, or on board ocean-going vessels.

Veterinarians and representatives from various regulatory bodies, including the Irish Sea Fisheries Board, have observed testing and routine operations. Although such officials must be cautious about endorsing the system, they have offered comments, such as: "Your results are quite impressive", and "We observed a nice, strong bleed-out after the stun application". The Humane Slaughter Association as well as Freedom Foods have certified this technology as humane for fish processing in the UK.



Humanely harvested fish sliding from the Harvester tube system into vats; ready to be processed for market



A "short stun" version of the Humane Fish Harvester





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