



CTC30: PIN BONE REMOVAL

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Market need

Today, pin bone removal is a manual process that is labor intensive and can result in painful and permanent carpal tunnel injury for workers. Automated systems can only be used in post rigor state, and depending on the species, the majority are generally processed only a few hours after they are caught. Existing solutions involve either labor intensive manual pin bone removal with tweezers, or automated machine removal, which causes significant bone breakage, as well as the difficulty of removal once rigor mortis has set in. There is, therefore, a clear market need for an automated tool that can be used on several species, including salmon and tilapia, in both pre-rigor and rigor conditions whether fresh or smoked.

Pro-Intech EVF technology was devised to improve the removal of pin bones from salmon fillets and other fish. It reduces bone breakage and flesh tearing, especially in pre- and post-rigor; resulting in a better quality, higher value final product.

Technology





The EVF-3000 extracts pin bones from salmon and other fish fillets, and allows the removal of pre-rigor pin bones, pin bones, with preset programs that modify the operation variables depending on the fish species.

The EVF-3000 consists of a hand-held tool and an Electronic Controller. The Controller has a simple interface which provides six distinct operation settings that allow for successful extraction in multi-species and multi-rigor states.



The uniqueness of the EVF (Electronic Vibration Forces) technology is in the use of electronic monitoring to measure the firmness of the flesh, and to create vibrations to loosen the bones if resistance is detected.

Current solutions are limited to specific species, and cannot be used in pre-rigor and rigor states.

EVF is the only tool that enables the producer to process fish in pre-rigor, rigor and post rigor, extracting up to 95% of all pin bones, based on experience in seven Chilean customer plants, with minimal bone breakage (less than 2 Pin Bones per fillet, the same as Manual Extraction), saving 48 hours of inventory and freezing costs, representing approximately US\$3,000 per month, and resulting in a better quality fillet, thereby affording a market price of up to three times normal

EVF Benefits



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Benefits that this technology provides include:

- Greater productivity: 150 to 180 fillets per hour per Machine (Compared to 50 by Manual Extraction),
- Constant productivity,
- Pre rigor application, resulting in a higher-quality finished product,
- Direct cost savings, reducing by one third the number of workers required in manual processing. In an average production line in Chile of 10,500 fillets per shift, our client was able to reduce staff from 25 to 18 workers, resulting in monthly savings of US\$13,600 per Salmon line,
- Less breakage (no more than 2 Pin Bones per fillet, same as Manual Extraction)
- Less meat loss: in tilapia, as an example, increases have been experienced of up to 4% in net weight; translated into an increase in revenue, approximately USD 300 / ton, thanks to the net fillet gain and access to better prices because of the larger category.
- Improved worker conditions – elimination of carpal tunnel injury

In manual operations, EVF reduces labor costs up to 45% average per Salmon line in Chile, and, for automated operations, it reduces up to 45% of the number of inspectors needed per average per salmon line.

Installation is simple and inexpensive and is a supplement to existing machines. Training is very simple, requiring less than an hour to reach full productivity with the new technology, and there is an immediate payback, both in terms of efficiency and quality, both of which translate into economic benefits for the producer,

The increase in productivity and reduction in labor provides an average producer in Chile of 10,000 fishes per shift an economic benefit of more than US\$1.4 million per line (NPV, Net Present Value, 20% discount rate in a 5 year period)

The EVF technology appears to be unique. Other products exist, using either automated rotating wheels with tweezers, which cannot extract as many pin bones as EVF and cannot be used in pre-rigor; or manual labor, using tweezers. The EVF technology affords the additional benefit of allowing usage with other species, which opens up heretofore inaccessible markets.

Development status

So far, this technology has been implemented and is currently operational in seven production lines in Chile, with very good success.

Pro-Intech has demo machines ready for international commercialization activities and is willing to provide tools and relevant training to interested parties.

The unique EVF technology is currently protected by a US patent. Other patents have been filed and are pending in Chile, Canada, Norway, Japan, and the EU.

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