

PROJECT REPORT TO
THE EU
32- 01



Rannsóknastofnun
fiskiðnaðarins

DECEMBER 2001

DEVELOPING A PROCESS
FOR AUTOMATED TUNA
HEAD MEAT RECOVERY

FAIR CT - 98 – 9079
ABSTRACT OF THE PROGRESS REPORT
FOR THE PERIOD FROM 01-1 1-00
TO THE END OF PROJECT

Guðmundur Stefánsson

FAIR CT-98-9079

Developing a process for Automated Tuna Head Meat Recovery

Abstract of the Midterm Report for the period
from 01-11-00 to End of project

- Type of contract:** Co-operative research project
- Total cost:** 695 kECU **EC contribution:** 345 kECU or 49,6%
- Commencement date:** 01-04-99 **Duration:** 2 years
- Completion date:** 01-04-01
- EC contact:** Mr. Lopes dos Santos, DG XIV, Fax: (+35) 2 295 7862
- Coordinator:** Gudmundur Stefánsson, Ph.D.
Director of R & D, Icelandic Fisheries Laboratories
Skúlagata 4, 101 Reykjavík, Iceland
Phone: (354)-5620240 Fax: (354)-5620740
Email: gst@rfisk.is
- Partners:**
- SME** 01 A.M. Sigurdsson (MESA)
 - RTD** 02 The Icelandic Fisheries Laboratories (IFL)
 - RTD** 03 Conservas Isabel de Galicia (CI)
 - SME** 04 Scanver
 - SME** 05 Meyace
 - SME** 06 Consulting Técnico Vidal Touza
 - RTD** 07 Universidade de Santiago de Compostela (USC)

I. Introduction and objectives

Tuna heads are by-products from the canning of tuna meat. The heads contain meat, which is currently not used to any extent for human consumption. No machines are available to remove the meat, and manual removal is not economically feasible. This project aims at developing an automated prototype machine, which can remove the meat from tuna heads. The machine must recover the meat so it can be incorporated into current products of the tuna industry without loss in quality. It should also be compatible with current automated tuna processing lines in terms of capacity and flexibility regarding fish size.

The project focuses on three main work packages: 1. Determination of the parts (and quantity) of tuna head and collar meat that can be incorporated into canned goods. 2. Development of a prototype machine to remove the meat. 3. Testing of the machine under laboratory and industrial conditions. In the project a multidisciplinary approach will be used to ensure that the intended process technology development can be efficiently integrated into current working practices and that product quality is not affected by the incorporation of the recovered meat. This will involve the transfer of expertise from one fishing sector to another or from the North to the South of Europe.

The project was to start at the end of 1998 but was delayed for about 6 months because of participant changes. The prime SME is an Icelandic machine manufacturer, specialising in the construction of equipment for meat recovery from different marine species. Another Icelandic SME participates in the project, an engineer consultant. Two Spanish SMEs (machine engineering companies) also participate in the project. The RTD participants are three, two Spanish (tuna manufacturer and a University) and one Icelandic (fish research institute) that also acts as the co-ordinator.

The novelty of the technology of mechanically recovering meat from tuna heads will be patented. Initially the novel machine will be utilised in Spain and when proven successful sold and/or licensed to other countries. The prime proposer and the other SME's intend to use the new technology to obtain new markets or services.

II. Description of work

One plenary meeting has been held during the period in Spain. The research and development work has focused on *Setting of quality and hygienic standards* (Task 5), *Ergonomic and engineering study* (Task 6), *Industrial Trials* (Task 7), *Economic impact assessment* (Task 8) and *Market survey* (Task 9).

III. State of progress and achievements

All tasks have been successfully finished.

Setting of quality and hygienic standards (Task 5) was performed resulting in Code for Good Manufacturing Practices (GMP) and Hazard analysis and control of Critical

Points (HACCP) schemes for processing of recovered tuna head meat. The schemes will ensure that the recovered tuna head meat will comply with quality standards set by the factory and with the safety regulations of the EU.

Ergonomic and engineering study (Task 6) was performed to ensure successful incorporation of the prototype machine into the current processing lines. The work revealed that several changes are necessary in the classical operation procedures at tuna factories for incorporation of the machine. The main changes are at the cutting area of the tuna and in setting up of tubs for thawing heads but the tuna heads need to be unfrozen before mechanical recovery of tuna head meat. The thawing of heads requires 16 to 24 hours preferably in running water. This continuous running of water and body fluids from the fish led to modification in the drain system in the floor of the thawing area to ensure hygienic conditions. Furthermore, changes were made at the waste disposal system as cutting of the head in two pieces when leaving the machine leads to increased volume of waste.

The *Industrial Trials* (Task 7) revealed that the principle of the automatic head meat recovery works as planned. The yield of automatically recovered meat was found to be comparable to that of manually recovered meat. The trials furthermore revealed that the capacity of the machine was lower than planned and modifications of the machinery are necessary to reach the initial objective. The testing showed a number of problems most of which are minor. However, these changes are outside the scope of this research project.

Economic impact assessment (Task 8). According to the industrial trials the operation capacity of the prototype lower than expected and the machine therefore not economically feasible. It is foreseen that the optimisation of the prototype machine according to results from the Industrial trials (Task 7) will improve the capacity, lower the labour cost of recovery and make the production economically feasible. The participants are also considering designing an automated head feeding system to improve the process speed even further.

A *Market survey* (Task 9) revealed that the world catches of tuna have increased considerably and also the production of canned tuna. At the same time the number of tuna production companies has been decreasing but the companies have become bigger. This fact is very promising for marketing of the machine as the it is mainly aimed at the tuna canning industry and the companies need to be big for the machine to be economical.

IV. Future actions

Final reports have been written and will be handed in to the Commission along with the fourth periodic reports. The SME proposers will carry on work regarding patent application of the results. Marketing will be carried out built on results from the project through promotion material and on sales mass. A promotional material for the technology is being prepared and will be sent to potential users of the machinery. The participants estimate that 0.5-1 year period will be required after the completion of this project before the final machine will be marketed.