

TUNNA LOINS CUTTING BY ULTRASOUNDS

AZTI

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PU	Public	
PP	Restricted to other program participants	
RE	Restricted to a group specified by the consortium	
CO	Confidential, only for members of the consortium	CO

1. Title of the case description

TUNA LOINS CUTTING BY ULTRASOUNDS

2. Indicate your role in the Smart Food Supply Chain (AZTI, Project partner):

- individual member of the chain:
- chain operator:
- network operator:
- association:
- technical, scientific, or management expert:
- advisor:
- policy maker:
- other:

3. Indicate the region (if applicable): world-wide supplier network

4. WP2 Cross-reference table

Please indicate with an X in the relevant box of the matrix for which needs and the steps / functions of the supply chain the described innovative solution is applicable

		Individual steps of the SFSC							Short food supply chain as whole						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Needs of the consumers (citizens)	food safety		X		X			X							
	food quality		X		X			X							
	trust														
	ethical aspects														
	accessibility														
Needs of the chain actors	fair price		X		X										
	increased negotiating power		X		X										
	shared use of available resources		X		X										
	product development support		X		X										
	access to markets and consumers														
	access to infrastructure		X		X										

1: Farming

2: Primary production

3: Transport

4: Processing and packaging

5: Storage

6: Logistics

7: Sale

8: Product integrity, authenticity, transparency

9: Marketing concepts

10: Food chain management and networking for enhancing cooperation among chain actors

11: Business modelling

12: Policy environment

13: Legal requirements

14: Labelling

5. Short description of the innovative solution

- **Describe the specific need or problem being addressed by the case and please explain what is the novelty of this innovative solution**

In the canning industry, and especially in the process to manufacture/cut pieces of tuna loins canned in crystal bottles, the productivity can be improved by increasing the yield (by reducing waste in the cutting operation, 3%) and the quality of the cut section (less crumble formation).

Here, we propose a technological innovation by the use an automatic cutting process using an ultrasound knife. In the solution the tuna loins have to be positioned to be cut into different directions, after the positioning the sonotrode (cutting element) cuts the tuna loins into the previously determined dimensions. The solution is innovative due to the application of the ultrasound technology to fish products because this technology is mainly used to cut bakery and sticky products.

- **Describe the enabling function(s) and the practical benefit(s) - (e.g. for which types of problems and opportunities is used and can it be used, and how)**

The benefit associated to the implementation of this solution is the improvement of production since this process could increase yields (approximately 3-4% less crumb formation) by reducing waste and in the same way improve the quality of the cut since the crumbled in this phase would be lower. Moreover, the implementation of an ultrasonic cutting equipment would allow an increase in the production rate.

All this would entail a greater benefit per kilogram of transformed raw material, an improvement in production through the generation of lower product losses and therefore less efforts to recover or value these as well as to treat or clean the production line.

- Describe the method/procedure/technology/solution implemented. (Please explain, whether the innovative method is a product / service / process / marketing or organizational / management innovation) After completing the description, please indicate, whether this innovation is a technological or non-technological one.

The technological solution proposed is a process to cut tuna loins by using ultrasound technology.

The procedure consists of three principal steps; 1. loin positioning in the conveyor belt, 2. First cut in the longitudinal direction, 3. Different cuts in the transversal section, the number of cuts in this section is related to the thickness of the loin and normally could be between 2 (for small loins) and 5-6 (for bigger ones). At the completion of the process, the cut pieces retain the original compaction/form and the cutting process does not affect to the quality of the loins properties.

technological

non-technological



Figure 1. Ultrasonic cutting machine for bakery (Source. <https://bakon.com/>)

- **Describe the business, which implemented the innovated solution (size, country, region, location, type of food)**

This innovation can be used for a small/medium sized business or a multinational company, it is independent of the size of the business to be applied. The size and the capacity of the required cutting machine depends on the volume of the production and the size of the tuna loins.

The innovation proposed can be applied as a collaborative investment.

- **Describe the distribution channels of the product(s)**

The distribution channels of the products will be the same used than before incorporating the technological innovation because the final product obtained is the same than obtained by the traditional process.

- **Describe what makes the innovation work.**

- Better appearance of the cut loin
- high efficacy of cutting (less percentage of crumb)
- high productivity
- preserve quality and taste
- existing different sizes of machine according to the capacity required
- save on operational costs (labour) comparing to traditional process
- not many workers required to control de process

- **Describe the specific prerequisites for the business related to the implementation of the method and/or related to the location, method, procedure, solution**

a: List the relevant necessary resources (including the estimated cost) for the specific innovation.

Please list the relevant ones only (list is annexed)

MATERIALS:

- Cooked fish, ...
- local perishable

HUMAN:

- human resource for operation (1-2 persons per production line, depend on automation/inversion). The skill for these persons is production because the provider of the know-how (technological center) will develop the procedure/process

TECHNOLOGY:

- Capacity required, because the capacity is related with the size of the machine

FINANCIAL

- estimated cost: depends on the volume of the production

b: List the relevant necessary capabilities for the specific innovation.

Please list the relevant ones only (list is annexed)

FOOD SAFETY:

- basic skills to comply with the EU food safety regulations
- food safety culture (motivation, responsibility for food safety) and basic skills for the implementation of HACCP

FOOD QUALITY:

- ability to define the target segments of consumers for SFSCs
- ability to define the product characteristics which are (tacit) basic requirements for the target segment(s) of consumers;
- ability to define which product attributes/levels and augmented services represent an added value for the target segments of consumers;
- food quality culture (motivation, responsibility for food quality);

- ability to provide distinguishable quality which meets the needs of the targeted consumer segment;
- ability to access the consumer willingness to pay for specific products of SFSCs.

INPUT FOR R+D:

- ability to develop new products, **processes**, packaging, preservation techniques, systems and access to new markets, including in other categories;
- access to innovative technologies
- access to local input for R+D covered by other aspects

- **The method/technology was established by**

NAME: <https://bakon.com>

ADDRESS: Stanleyweg 1, 4462 GN Goes

DEALER AND SERVICE POINTS: Netherlands

APPLICATION AREAS:

The innovation is applicable to cooked tuna loins

6. Describe the results, achievements and typical failures

- Better quality of the cut
- High productivity (less % crumb and more speed of cutting)
- Hygienic cut, no physical contact between sample and cutting element
- Saving labour cost compared to the traditional process

7. Summarize what makes the case to a good practice for the members of the SFSCs (e.g. lessons learned)

The innovation proposed make possible to increase the productivity of the cutting operation in tuna loins dur to the less percentage of crumb formation during the cutting and the higher speed of the cutting element in comparison with the traditional cutting method.

8. Aspects, methods for transfer of methods for other SFSC members

This technology is mainly recommended to be applied for primary producers and first transformation industries, so an aspect that could be taken into account could be to construct a shared platform in which some member could access to the technology in order to share cost of the inversions.

9. Recommendations for members of other SFSCs for further applications

Ultrasound cutting technology can be used for small-medium businesses where it is necessary to improve the productivity of the process.

The capacity of the technology can be adjusted to the productivity of the companies but another option is to share the technology in order to share the investment to increase the profit obtained, even if one of them alone find the business profitable. Collective financing, scheduled operation can be effective for the small businesses. Small and high capacity equipment are available.

10. More information is available at (web), if it is relevant

<https://bakon.com>

Annex

1. Checklist for necessary resources (tangible and non-tangible):

- materials (access to: raw materials/ ingredients - including volume, land – including size, packaging materials)
- human: labour force: size, knowledge & skills (production, technical, marketing, managerial, ICT, financial, etc.)
- technology: patents, know-how, trademarks, copyrights, trade secrets
- infrastructure, equipment, facilities, - size, minimum volume of production/sales, IT infrastructure
- information, reputation, brand, trust
- financial*

*: estimated cost:

0 -	10 000 Eur
10 001 -	50 000 Eur
50 001 -	100 000 Eur
100 001 -	300 000 Eur
300 001 –	1 000 000 Eur
1 000 000 Eur above –	

- other specific necessary resources for the application of the specific innovation

2. Checklist for the necessary capabilities

- **food safety:**
 - basic skills to comply with the EU food safety regulations
 - ability to understand what makes the product safe (the key controls, which ensure the safety of the product – biological, chemical and physical hazards, providing the safety shelf life of perishable products)
 - food safety culture (motivation, responsibility for food safety) and basic skills for the implementation of HACCP

- **food quality:**
 - ability to define the target segments of consumers for SFSCs
 - ability to define the product characteristics which are (tacit) basic requirements for the target segment(s) of consumers;
 - ability to define which product attributes/levels and augmented services represent an added value for the target segments of consumers;
 - food quality culture (motivation, responsibility for food quality);
 - production experiences which help to provide the expected quality reliably, uniformly;
 - ability to provide distinguishable quality which meets the needs of the targeted consumer segment;
 - meeting (local) legal requirements, application of the labelling rules;
 - ability to access the consumer willingness to pay for specific products of SFSCs.

- **trust:**
 - ability to ensure product integrity, authenticity and transparent information for the consumers (including systems, tools);
 - ability to access external trust enhancers (third party certification, internal certification system, participatory guarantee systems);
 - application of the labelling rules and branding (mandatory and voluntary);
 - ability to meet third party certification requirements

- **ethical aspects**
 - ability to understand consumer needs for ethical behaviour related to the specific product(s) of the SFSCs;
 - culture for ethical food production and supply;
 - ability to implement necessary measures to ensure ethical food production and supply;
 - ability to access the consumer willingness to pay for products meeting ethical aspects

- **accessibility to consumers:**
 - ability to organize logistics efficiently and to exploit innovative solutions and distribution channels;
 - efficient, innovative sales methods;

- ability to develop and implement new business models for ensuring access of consumers to products and augmented services;
- **fair price:**
 - collecting marketing information;
 - ability to enhance and maintain cooperation among chain actors including the combined use of available complementary resources, capabilities, competences of SFSCs actors, networking, understanding the principles of food value chain management;
 - ability to define, develop or maintain unique quality of products and augmented services;
 - ability to develop and implement new business models;
 - ability to access the consumer willingness to pay for fair price
- **increased negotiation power:**
 - collecting marketing information;
 - ability to enhance and maintain cooperation among chain actors including the combined use of available complementary resources, capabilities, competences of SFSCs actors, networking, understanding the principles of food value chain management, cooperation culture;
 - ability to define, develop or maintain unique quality of products and augmented services;
 - ability to develop and implement new business models;
- **shared use of available resources:**
 - ability to enhance and maintain cooperation among chain actors including the shared and combined use of available complementary resources, capabilities, competences of SFSCs actors, networking, understanding the principles of food value chain management, cooperation culture;
 - the level of value chain management culture;
 - ability to access the consumer willingness to pay for food with reduced environmental impacts

- **input for R+D:**
 - ability to monitor, research, evaluate, and understand the needs and wants of customers and consumers;
 - ability to develop new products, processes, packaging, preservation techniques, systems and access to new markets, including in other categories;
 - access to innovative technologies; distribution and marketing solutions and methods. management systems;
 - access to local input for R+D covered by other aspects

- **access to markets: and market success**
 - effective promotion, customer service, efficient and innovative sales methods;
 - ability to understand consumer's needs;
 - ability to organise logistics efficiently and to exploit innovative solutions and distribution channels,
 - unique value propositions;
 - ability to develop and implement new business models for ensuring access of consumers to products and augmented services, develop the market accessibility for the suppliers.
 - stock control;
 - ability to access to required raw materials within a restricted geographical area

- **access to infrastructure:**
 - ability to use existing own infrastructure in a focused way to serve consumer needs or to combine it with complementary infrastructures of other SFSC actors, cooperation culture;

- **management:**
 - to implement management systems for vision, planning, implementing), coordinating, controlling, monitoring, continuously;
 - improving; ability to motivate, authorize staff;

- **production, processing:**
 - management system, production experience, specific controlling, monitoring, continuously;
 - willingness to consider and ability to evaluate the adoption of TECI and NTI in the current production processes;
 - any additional specific resources necessary for the application of the specific innovation.