

MODIFIED ATMOSPHERE PACKAGING (MAP) – Trufa de Alava

CTCPA

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Project code:

Project acronym: Smart Food Supply Chains

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Template for good practice cases

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

1. Title of the case description

Modified Atmosphere Packaging (MAP)

2. Indicate your role in the Smart Food Supply Chain:

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

3. Indicate the region (if applicable):

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					X			
	food quality				X	X	X					X			
	trust														
	ethical aspects														
	accessibility														
Needs of the chain actors	fair price														
	increased negotiating power											X			
	shared use of available resources														
	product development support											X			
	access to markets and consumers														
	access to infrastructure														

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:**

One of the problems of Trufa de Alava is the short commercial life of its products. It is difficult to meet the demand with a seasonal product with a high variability and a very short shelf life. The modified atmosphere packaging allows to extend this shelf life and to have less economic losses.

This type of packaging allows to limit the bacteriological development or to limit the rancidity of the product.

- **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 main advantages of this innovation are the following:

- A product with a longer shelf life with any food additives
- Easier stock management
- Less losses of product and then less economic losses – more sale opportunities
- Less waste
- More facility to organize the production and the sales

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

The solution is a technological innovation. It consists in packaging the product into a plasticized bag or punnet with a gas or a mixture of gas with certain protective and reactive properties. The gas present into the atmospheric air surrounding the product influence its preservation. The ambient air (oxygen) is replaced by other gases (usually nitrogen and carbon dioxide). The mixture of gases is specific to each type of product. The most common mixture is around 30% CO₂ et 70%N₂. Usually, the goal of this type of packaging is to remove the oxygen from the initial atmosphere because the oxygen is responsible for the development of bacteria. But in some cases, the oxygen can be important to keep the color of the product (for example, red color for the meat).

Each gas presents its own characteristics and effects, and consequently a different use as presented in the following table:

Gas	Effects	Use
Nitrogen	To avoid the oxidation of pigments To avoid the development of anaerobic bacteria To protect products against crushing	Especially on dry products
Carbon dioxide	To avoid the growth and limit the multiplication speed of aerobic bacteria and moisture	
Oxygen	To prevent the red dyeing of the meat To avoid the proliferation of anaerobic bacteria To allows the breathing of fresh vegetables	Fruits and vegetables Meat and fish

Technically, it exists several type of packagings and different of machines.

- A sealing machine packs the product in a punnet. A vacuum cycle allows to remove gas contained between the punnet and the cap. A gas flushing allows to inject other gases instead of the initial gas present in the atmosphere. The cap is welded.

The sealing machine can be automatic or semi-automatic.



- A vacuum bell packs the product in a sachet.



- A bagging machine or a flowpack machine packs the product in a vertical way or in an horizontal way.

This type of technology often requires a multi-layered packaging with barrier properties.

technological

non-technological

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

This type of packaging is adapted to a lot of products: meat, fish, fruits and vegetables (4th range). It is adapted to all types of businesses whatever their size, region or location. The machine can be automatic or semi-automatic. A semi-automatic machine, less expensive, is more adapted to small business. For some products, this type of packaging is not advantageous :it is the case for fruit and vegetables of the 1st range or for bakery products.

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

This type of packaging can be used in all types of distribution channels. It has no impacts on the way of distribution of the product.

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

This type of packaging allows to extend the shelf life of a product. Consequently, it has many advantages since it allows to a producer to have more time to sell the product and to have an offer of products all the year independently from the seasonality of a product. It also allows to decrease the losses of products and so the economic losses.

•... 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:** products adapted to MAP - meat, fish, fruits and vegetables, dry products, brioche, fresh pasta, crepes, pizza, precooked bread, cheese, juice, wine, cooked ham etc. and a barrier packaging.
- **Human:** human resource for operation with technical skills (depends on the production capacity)
- **Infrastructure, equipment, facilities:** automatic or semi-automatic equipment such as a sealing machine, a flowpack machine, or a bagging machine able to modify the gases in the atmosphere of the product.
- **Estimated cost:** the approximative cost for a semi-automatic machine is around 5000-10 000€. It is difficult to know the extra cost of a MAP compared to a standard packaging, but it required a special more expensive packaging (with barrier properties).

**b: List the relevant necessary capabilities for the specific innovation.
Please list the relevant ones only (list is annexed)**

<ul style="list-style-type: none"> • <u>food safety:</u> 	<ul style="list-style-type: none"> - 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)
<ul style="list-style-type: none"> • <u>food quality:</u> 	<ul style="list-style-type: none"> - food quality culture (motivation, responsibility for food quality); - production experiences which help to provide the expected quality reliably, uniformly
<ul style="list-style-type: none"> • <u>input for R+D:</u> 	<ul style="list-style-type: none"> - ability to develop new products, processes, packaging, preservation techniques, systems and access to new markets, including in other categories

- **Describe the results, achievements and typical failures**

Some examples of mixture of gases for several products are presented in the following table:

Product	Mixture of gases (%O2 / %CO2 / %N2)	Shelf life without modified atmosphere packaging (Number of days)	Shelf life with modified atmosphere packaging (Number of days)
Fresh meat	70 / 30 / 0	2	4
Fresh fish	0 / 60 / 40	4	6
Raw fruits and vegetables	5 / 10 / 85	6	8

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

This innovative solution is a good practice for the short food supply chains. It allows to extend the shelf life of products, and then to extend their commercial life and to avoid the losses. It is a good way to simplify the logistic of short food supply chains.

- 6. Aspects, methods for transfer of methods for other SFSC members**

This innovative technology is applicable for different members of SFSC. It required an investment in a specific equipment, and it implies an additional charge of the packaging. This type of packaging needs to be useful and profitable to be implemented.

- 7. Recommendations for members of other SFSCs for further applications**

Members need to insure the cost effectiveness of the packaging and that the packaging is really adapted to the type of product. The extension of the product shelf life allowed by the MAP must be more advantageous than the extra cost caused by the MAP.

- 8. More information is available at (web), if it is relevant**

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.