

Project code:

Project acronym: Smart Food Supply Chains

Internal template:

Template for good practice cases

Work package number: T2

WP leader: CBHU

Work package title: Technological and non-technological innovations

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| Dissemination Level | | |
|----------------------------|--|-----------|
| 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 | CO |

1. Title of the case description

DISINFECTIONS SYSTEMS FOR THE FOOD SECTOR

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

The majority of food comes and is being offered pre-packaged. Packaging and sealing is the last step of fresh food processing, which affects the hygiene and with that the microbiological stability of the final product.

The requirement is that food (especially fresh products, such as cold cuts, sausages, break-bulk, fresh bakery products and etc) is stable in the final packaging. Prerequisite for this is a hygienic packaging and a hygienically secure packaging process.

Innovative solution is a compatible, antimicrobial liquid that consists of naturally raw materials. This system implies using of carefully chosen ingredients, without components containing alcohol and other chemical substances which application is questionable. The antimicrobial effect results from the specific properties of these ingredients and their synergetic interaction. Due to these synergetic interactions, the innovative solution ingredients are highly effective in very low concentrations.

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

With the continuous use of the this innovative solution in filling and sealing systems, the final products are significantly less contaminated by yeasts and mould and will stay stable for a long-term basis. This leads to a long-term and sustainable hygiene security. Consequently, above-mentioned significantly secures the “best before date” and can even extend it.

This technology has already improved and helped secure hygiene in: cold stores/cooling towers, production/packaging areas, ripening rooms, clean rooms and so on.

In stabilizing the hygienic status of various products, the filling of the final packaging and the sealing significantly affect the overall product hygiene.

- **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.**

To stabilize the “best before date”, this hygiene technology has been successfully used. The principle is based on ultrasonic nebulization. Nebulization modules are installed in the filling systems and specific solution is being emitted. In order to eliminate germs in indoor air and on surfaces, solution has to be emitted in form of very fine “fog”. The micro-fine fog of the active ingredient is emitted continuously during the whole process and spreads evenly everywhere. The microorganisms on the surface of the packaging materials and in the headspace are directly targeted and destroyed.

This way the active ingredient has an optimal concentration in the air and spreads evenly, like air-borne particles. The active ingredients as components of this solution are highly effective already in very low concentrations. It makes microorganisms harmless by

penetrating them and impairing their metabolism. The antimicrobial efficacy against bacteria, yeasts and mould and especially against pathogens (e.g. *Salmonella* sp. and *Listeria* sp.) has been already tested and confirmed.

technological x

non-technological

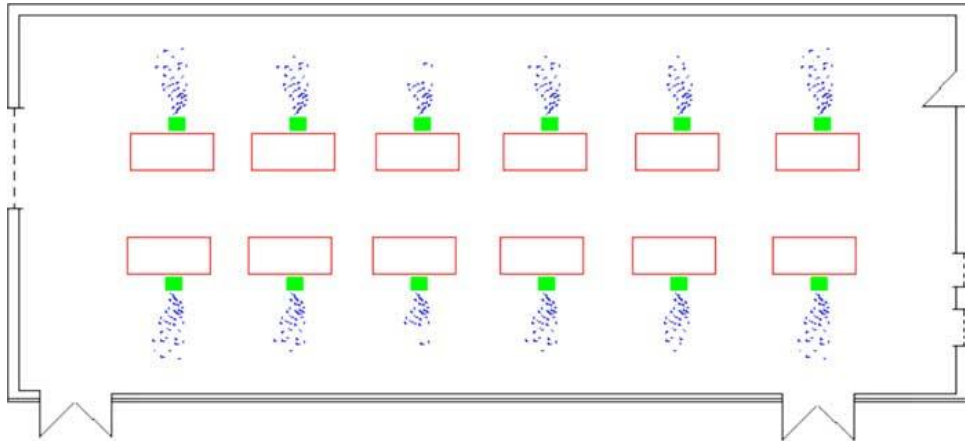


Figure 1. Schematic arrangement/plan of nebulization modules in front of the cooling units or air discharge points (air-solution.com)



Figure 2. Germ elimination modules in front of circulating air cooling units (air-solution.com)



Figure 3. Germ Nebulization module at the slicer knife and at conveyor belts (air-solution.com)

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

This novel technology can be used for small- and medium-sized companies as well as for big business. The capacity and type of required systems depends on the production specifics. Country, region and location are not limiting factors for this solution and system implementation in some company. In the production of various types of food innovated solution can be applied or has been already applied. Some of them are: yogurt, cream cheese products, desserts, delicatessen salad, beverages etc.

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

After the application of this solution, food products can be distributed all over the world market, due to their stabilization and microbial reduction. Shelf-life of food product depends of type and properties of certain product.

- **Describe what makes the innovation work**

- Natural ingredients – analytically the same as they are found in foodstuffs
- Absolute exclusion of alcoholic and other questionable chemical substances
- Compatible with all types of materials and non-corrosive
- No risk to operators, employees or other types of users
- Non-allergenic
- Highly effective in very low concentrations
- Environmentally friendly
- Clear, water-based liquid (neutral odour, slightly fruity-sour)
- Non-toxic
- There are different types, size and capacities of this system so it can be adopted to specific production
- One or two person(s) can control the process

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

- List the relevant necessary resources (including the estimated cost) for the specific innovation. Please list the relevant ones only**

MATERIALS:

- Raw material, food products
- Packaging

HUMAN:

- Human resource for operation, 1 or 2 person (it depends on capacity and needs). Supplier or technological center usually develops procedure for each type of food product. No intervention of operators during production.

INFRASTRUCTURE, EQUIPMENT, FACILITIES:

- installation into existing and new air conditioning plant
- installation outside the ventilation system
- installation in front of (cooling) ventilators

FINANCIAL:

b: List the relevant necessary capabilities for the specific innovation. Please list the relevant ones only

FOOD SAFETY:

- Food safety culture and basic skills for the implementation of HACCP
- Basic skills to comply with the EU food safety regulations
- Ability to understand what makes the product safe

FOOD QUALITY:

- Ability to access the consumer willingness to pay for specific products of SFSCs
- Food quality culture

TRUST:

- Application of labeling rules and branding
- Ability to meet third party certification requirements

INPUT FOR R+D:

- Ability to develop new products, processes, packaging, preservation technologies, systems and access to new markets, including in other categories
- Access to innovative technologies

ACCESS TO MARKET AND MARKET SUCCESS:

- Effective promotion, customer service, efficient and innovative sales methods
- Ability to organize logistics efficiently and to exploit innovative solutions and distribution channels

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

NAME: AirSolution GmbH ·

ADDRESS: Walther-Jacobs-Str. 7 · 28309 Bremen · GERMANY

DEALER AND SERVICE POINTS: Directly available at following manufacturers:
TREPKO, Grunwald, Novapac, Galdi

6. Describe the results, achievements and typical failures

- Shelf life prolonged
- Germ elimination in air
- Packaging eliminated of microorganisms
- Used for different types of food
- Save on energy costs
- No need for thermal processing
- Application available in mobile form
- Natural ingredients –exclusion of alcoholic and other different chemical substances
 - Compatible with all types of materials and non-corrosive
 - No risk to operators, employees or other types of users
 - Non-allergenic and Non-toxic
 - Environmentally friendly
 - Clear, water-based liquid
- There are different types, size and capacities of this system so it can be adopted to specific production

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

This system is applicable to numerous SFSC members and offers final product of high level safety. Namely, this technology ensures the microbial safety of air-space and food packaging without the addition of chemicals. Depending on needs of each member different system can be used (e.g. Germ elimination at filling and sealing systems or Mobile germ elimination), filling systems (round or linear) etc.

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

This innovative solution is applicable to numerous SFSC members. Due to investment costs, some types of cooperation and association can be considered. This solution relies only on purely natural ingredients, which are used in a preventive manner in all sensitive areas of hygiene. This way it delivers a true added value to the society, economy and environment. This innovative solution is active in more than 20 countries.

8. Recommendations for members of other SFSCs for further applications

This innovation provides solutions and services in order to bring hygiene standards to a whole new level and secure these on a long-term basis and in a sustainable manner – completely without regular and usually used chemicals.

Furthermore, hygienic packaging and a hygienically secure packaging process is Prerequisite for stable food in the end packaging. This applies to fresh products, cold cuts, sausages, break-bulk, fresh bakery products and many others.

This solution can be used for small and medium as well as for big companies where the goal is to improve or keep high level of safety, extending its shelf life at the same time.

9. More information, if it is relevant

<https://www.air-solution.com/en/>

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.