SMARTCHAIN
SMART SOLUTIONS IN SHORT FOOD SUPPLY CHAINS

# IntelliFood

# innovative solutions for Short Food Supply Chains

## Campden BRI Hungary

**December 2019**

**Project code: 773785**

**Project acronym: Smart Food Supply Chains**

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**Internal template:**

**Template for good practice cases**

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**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** | |

1. **Title of the case description**

   IntelliFood

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 | | | | | | |
| | trust | | | X | | X | X | X | X | | | | | | |
| | ethical aspects | | | | | | | | | | | | | | |
| | accessibility | | | | | | | | | | | | | | |
| **Needs of the chain actors** | fair price | | | | | | | | | | | | | | |
| | increased negotiating power | | | X | | X | X | X | X | | | | | | |
| | shared use of available resources | | | | | | | | | | | | | | |
| | product development support | | | | | | | | | | | | | | |
| | 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**

  Certain materials (commodities) and their mixes delivered or produced by business partner are fastidious about temperature, light and humidity. For example:
  • Vegetable cream, vegetable foams: temperature, sun protection
  • Fruit fillings: humidity, temperature (have to store in a dry and cool place)
  • Powder shaped emulsifier: humidity, temperature, light
  • Margarines: temperature (both the too high and the too low temperature are unfavorable) • Sweetening mix (sugar alcohol): humidity

  The storage of these materials needs specific parameters, otherwise waste product will be generated, which must be removed or destruct. In case of mixtures containing sensitive material is the storage really important as well, because the waste material has impact on the product, however the monitoring of the mixture making is essential..

- **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)**

  Development and implementation of Intelligent Process Monitoring and Control system for perishable foods in bakery/food industry
  Special hardware-software architecture
  Low level: foolproof sensor network which can be maintained with ultra low energy
  Top level: intelligent information software system for supply chain providing complex analysis, controlling software based on objective measurements
  Objectives
  • Food safety
  • Quality assurance and tracebility
  • Comprehensive visualization, intelligent analyses
  • Optimization of food production and storage (transport)
  • Cost-cutting
  • FIWARE based application

- **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 prepared solution is a system based on wireless sensor network, which is made up of temperature and humidity measurement units (approximately 12-15 sensor points) which are able to communicate with each other. The wiring is not required, the easy to deploy mobile sensors measure the values of the parameters scheduled and communicate the results to a central data store. The processing application operating in the same place evaluates the measurements and sends alerts for the responsible people according to the rules are set. If the rate of temperature or humidity comes near to a lower or upper limit, an email or an SMS can start a manual intervention. The regular measurements allow the precise storage of the storage and mixing parameters along the given particular materials and mixes, and in this way the quality management becomes verifiable beside the identification of the product. The customer can get information about the ordered product right from the delivery date. Mixing of materials depends on the temperature. The using and monitoring of the relevant rules can ensure that all material will be mixed between the corresponding temperature ranges based on objective measurements. Beside the simple statements based on binding of basic substance / mixture and measured temperature / humidity values, complex information can be prepared as well, which takes account of other factors such as seasonality, storage time, suppliers, etc.

technological ☒ non-technological ☐

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

  IntelliFood is a specific project but we will target the next customer types:
  • commodities, raw material, product suppliers
  • transport/service providers
  • farmers • producers, manufacturers
  • bigger customers covered more phases of the supply chain

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

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

- **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 (access to: raw materials/ ingredients - including volume, land – including size, packaging materials
- infrastructure, equipment, facilities, - size, minimum volume of production/sales, IT infrastructure
- financial*

**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
- 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.

## 6. Describe the results, achievements and typical failures

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

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

9. **Recommendations for members of other SFSCs for further applications**

.....

10. **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;<br>- 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;<br>- ability to define, develop or maintain unique quality of products and augmented services;<br>- ability to develop and implement new business models;<br>- ability to access the consumer willingness to pay for fair price |
| • **increased negotiation power:** | - collecting marketing information;<br>- 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;<br>- ability to define. develop or maintain unique quality of products and augmented services;<br>- 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;<br>- the level of value chain management culture;<br>- 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.