

## Biodegradable packaging2

# innovative solutions for Short Food Supply Chains

Campden BRI Hungary

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**Project acronym: Smart Food Supply Chains**

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**Template for good practice cases**

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<b>Dissemination Level</b>		
<b>PU</b>	<b>Public</b>	
<b>PP</b>	<b>Restricted to other programme participants</b>	
<b>RE</b>	<b>Restricted to a group specified by the consortium</b>	
<b>CO</b>	<b>Confidential, only for members of the consortium</b>	

**1. Title of the case description**

Biodegradable packaging<sup>2</sup>

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

Ecobiocap developed ecoefficient biodegradable composit advanced packaging solutions for fresh perishable food products optimized in for food quality and safety.

The problem of the food chain is the accumulation of plastic and the produced waste worldwide.

- **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)**

Strow based packaging is used, which is compatible with the precise, weldable closing, biodegradable foil packaging, which is transparent, so the fresh product inside is visible.

- **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.**

In the Development of Packaging Constituents by Upgrading Food Industry By-products activity, the following three main constituents have been produced, characterised and optimised to be used as formulating packaging in WP3:

1. Microbial polyesters (PHAs) from liquid effluents: PHAs with targeted functional properties have been successfully synthesized from olive mill wastewaters (OMW) and cheese whey (CW), with similar PHA yield. Because OMW requires preliminary phenol recovery, CW was selected for up-scaling the production.
2. Fibre-based fractions from solid by-products were obtained from wheat straw, brewing spent grains and olive pomace. Impact milling process was selected as the best compromise between particle size and energy consumption.
3. Tailored and high-performance additives and adhesives: extraction yield of cellulose nano-cristals from the previous solid by-products suggested a noneconomical viable process. Pure keratin was extracted from chicken feathers. Anti-oxidant nanoclays were successfully developed from polyphenolic extracts of olive waste water and pomace as well as bio-adhesives based on zein and pullulan.

technological

non-technological

- **Describe the business, which implemented the innovated solution (size, country, region, location, type of food)**
- **Describe the distribution channels of the product(s)**
- **Describe what makes the innovation work.**

In the Assessment of Packaging Physical-chemical Stability and Chemical Safety activity, work performed demonstrated an excellent stability of PHBV-based materials during storage, while in contact with microorganisms and all types of food simulants, except with ethanol 95 %, which induced significant swelling as well as excess of overall migration (OM). Introducing wheat straw fibres into the formulation increased OM with polar food simulant only (this still being a work in progress).

- **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
    - technology: patents, know-how, trademarks, copyrights, trade secrets
  - 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

- **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

**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**

[https://ec.europa.eu/budget/euprojects/project/116df8404b6677611210ee2e7e5f298e\\_en?hash=35646565323165393837343566](https://ec.europa.eu/budget/euprojects/project/116df8404b6677611210ee2e7e5f298e_en?hash=35646565323165393837343566)

[file:///M:/smartchain/innovative%20solutions%20for%20SSCs/20200305/EcoBloCap-project\\_summary-of-the-results-of-the-project.pdf](file:///M:/smartchain/innovative%20solutions%20for%20SSCs/20200305/EcoBloCap-project_summary-of-the-results-of-the-project.pdf)



## **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.