

Processes and Quality in the Food Industry

CHALLENGE 1: Organic and Local Food

Marketing and Logistics in the Food Industry (16 h)
Quality and Environmental Management in the Food Industry (16 h)
Integrated Processes in the Food Industry (20 h)
Food Innovation (8 h)

Duration: 60 h

Organization: groups of 4 people



BRIEF DESCRIPTION OF THE CHALLENGE: Execute the production of vegetable and fruit preserves using organic and locally sourced products.

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Consortium partners: CIFP Don Bosco LHII · Ciofs/Fp Puglia · Zembul Kadın Girişimi Üretim İşletme Kooperatifi · ABARKA ONGD. Methodological reference: ETHAZI (Tknika, FP Euskadi).

CHALLENGE 1: Organic and Local Food

1. Presentation of the Challenge

An organic fruit and vegetable producing cooperative has communicated the following: part of the production is not sold, and therefore their goal is to develop new products using the surplus. They typically sell their products at local markets in the region and in a direct-to-consumer shop. The products that are not sold at the market tend to deteriorate quickly, and they often have to lower prices to sell them.

Recently, they have been thinking about giving a new life to the fruits and vegetables that don't sell, processing them to create organic preserves. In this way, they reduce the amount of waste generated in the food industry and aim for zero waste.

On one hand, the cooperative tells us that they often have many apples piled up, as production is very seasonal. On the other hand, they want to provide a new market alternative for peppers, zucchinis, and pumpkins, which are harvested at the end of the summer, and not sold.

In the direct sales pavilion, besides having a section to organize and condition fresh vegetables, they have a space where they want to design a transformation area. This same space will be used to produce preserves of both apples and vegetables.

The company has turned to Don Bosco for help in designing the project. Our task will be to determine the production stages and select the necessary machinery and tools for the process. Finally, they also asked for help designing the labels for the new transformed products (apples, zucchini, peppers, pumpkins, etc.).

2. Objectives/Learning Outcomes and identified competencies

➤ Technical Competencies

Quality and Environmental Management in the Food Industry

1. Applies quality management systems, describing the standard on which they are based and its requirements.
2. Applies environmental management systems, describing the standard on which they are based and its requirements.

Food Innovation

1. Supervises the production of foods with a longer shelf life, describing the technological foundations.

Integrated Processes in the Food Industry

4. Leads the production of a plant-based food product, describing the production activities, equipment, and automatic process systems.

Marketing and Logistics in the Food Industry

4. Promotes manufactured products, characterizing and applying advertising techniques.
5. Applies information and communication technologies in logistics and commercial management, characterizing the main software tools.



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Identified Competences

1. Environmental Awareness

- Understands and applies sustainability principles in production, minimizing environmental impact and promoting responsible resource usage.

2. Waste Management

- Develops skills for reducing, reusing, and recycling waste in the production process, contributing to zero-waste production.

3. Innovation in Sustainable Processes

- Utilizes innovative technologies and methods that support organic production and continuous improvement of processes, ensuring long-term sustainability.

4. Circular Economy Strategies

- Promotes and applies circular economy principles, maximizing resource utilization, minimizing waste, and encouraging reuse in the food industry.

Identified Competences rubrics

1. Environmental Awareness

Level 1 - Basic: the individual demonstrates limited knowledge of sustainability principles and does not apply responsible resource usage practices.

Level 2 - Intermediate: they have a basic understanding of sustainability and apply some responsible practices, though their application is inconsistent.

Level 3 - Advanced: they have a good understanding of sustainability principles and apply responsible practices in most activities.

Level 4 - Expert: they demonstrate a high level of understanding and application of sustainability principles, consistently integrating them into all activities.

2. Waste Management

Level 1 - Basic: the individual does not identify or apply strategies for waste reduction, reuse, or recycling.

Level 2 - Intermediate: they recognize the importance of waste management but apply only limited strategies for reduction or recycling.

Level 3 - Advanced: they effectively apply some waste management strategies, contributing to waste reduction in the process.

Level 4 - Expert: they implement a comprehensive and effective waste management strategy, achieving zero waste production.

3. Innovation in Sustainable Processes

Level 1 - Basic: the individual shows little interest or knowledge in adopting sustainable technologies or processes.

Level 2 - Intermediate: they show interest in innovation but apply only limited and sometimes inefficient solutions.

Level 3 - Advanced: they apply innovative and sustainable technologies in most processes, striving for continuous improvement.

Level 4 - Expert: they demonstrate advanced capability in innovating, consistently implementing efficient sustainable solutions in all processes.

4. Circular Economy Strategies

Level 1 - Basic: the individual does not understand or apply circular economy principles in the production processes.

Level 2 - Intermediate: they have a basic understanding of circular economy and apply limited strategies.

Level 3 - Advanced: they apply circular economy principles in several stages of the process, maximizing resource utilization.

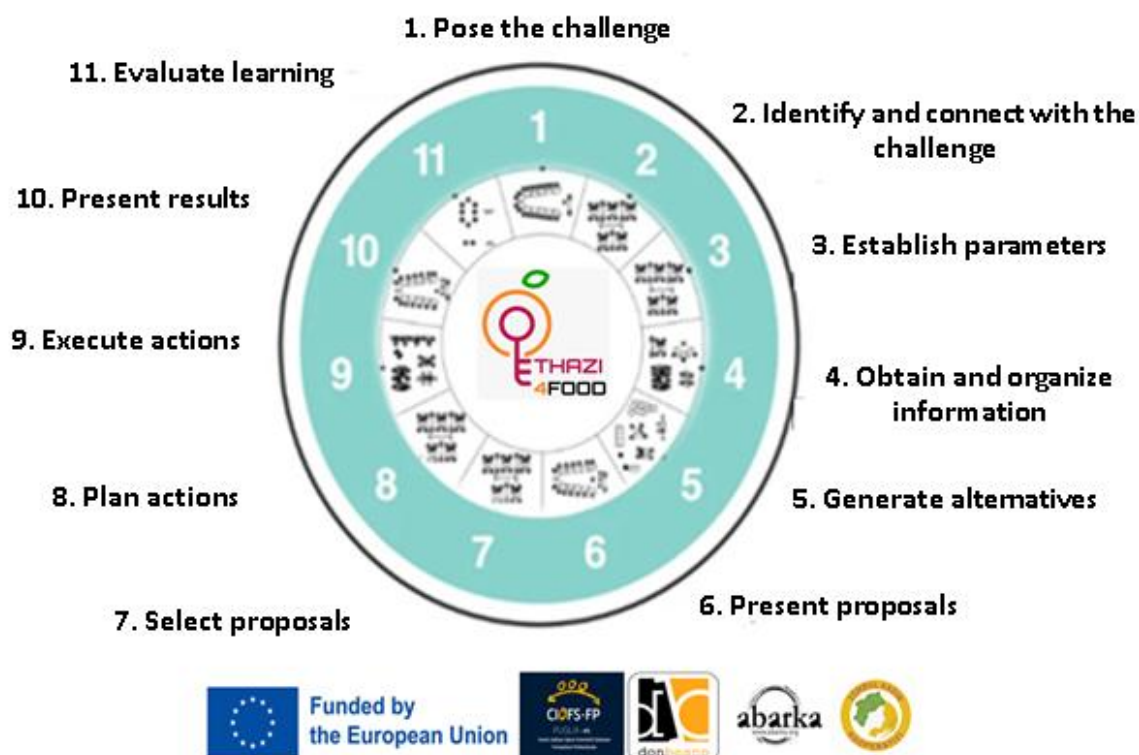
Level 4 - Expert: they successfully implement comprehensive circular economy strategies, maximizing resource reuse and significantly reducing waste throughout production.

3. Tasks

The tasks to be carried out are:

1. Form groups and create the group contract.
2. Respond to the challenge, following and applying the 11 steps required to solve the problem and explaining everything that has been done (documents, graphics, mind maps, etc.). Read the challenge statement.

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4. Evaluation Criteria

The evaluation process will be as follows:

4. 1. Based on competencies

Technical Competencies – 70% Rubrics will be used.

The evaluation will be based on the specified learning outcomes (IE/RA).

- 20% of the indicated percentage corresponds to the exam.
- 50% corresponds to section 4.2 and the other indicators specified in that section.

Soft skills – 30%



In relation to the Soft Skills, each team of teachers will decide which ones are evaluated in each challenge.

Self-assessment

Peer assessment will be calculated based on the teachers' evaluation, multiplied by the group factor.

The **group factor** will be decided among the team members and must be between **0.5 and 1.5**.

→ Attendance:

Attendance of **at least 80%** of the challenge hours is required to pass. If absences exceed **20%**, the student will not pass the transversal competencies.

Lack of attendance will impact engagement. The following factors will be applied:

0% – 5% absences → factor = 1

5% – 10% absences → factor = 0.9

10% – 20% absences → factor = 0.8

> 20% absences → factor = 0

4. 2. Based on Technical Competencies

When assessing the learning outcomes (IE/RA), the following activities will be taken into account:

1. **QUIZ** on organic production and labeling (Task)
2. **Presentation** of the labeling and flowchart of the processed foods (Result)
3. **Labels** of the produced product (Result)
4. **Quality records:**
 - 4.1. **Reception records** (Task)
 - 4.2. **Product data sheet** (Task)
5. **Quiz** on thermal treatments (Task)
6. **Design the production plant** (Result)
7. **BRIX calculations exercise** (Task)
8. **Challenge exam (20%)**
9. **Comparative table of jams** (Task)
10. **Spectrophotometric determination of sugars** (Task)

5. Group Dynamics

Group Dynamics

- You will form **small groups** of four members. (*Roles: secretary, coordinator, time manager, materials manager*)
- **Three small groups** will form a **medium-sized group**: The coordinators of the small groups will meet to agree on the conclusions of the medium-sized group. You will need to select a **group leader** for the medium-sized group.
- **Two medium-sized groups** will form the **full group**: The coordinators of the medium-sized groups will meet to agree on the conclusions for the entire group.

6. Resources

Equipment/Materials:

- Reagents
- Laboratory equipment and materials
- Safety data sheets
- Computers (Internet access)
- Personal protective equipment (PPE)
- Waste management

Experts:

- **Commercialization and logistics in the food industry** – *Teacher name*
- **Quality and environmental management in the food industry** – *Teacher name*
- **Integrated processes in the food industry** – *Teacher name*
- **Food innovation** – *Teacher name*

7. Scheduling

Monday	Tuesday	Wednesday	Thursday	Friday

8. Feedback

Once the challenge is completed, feedback will be conducted with the students. Additionally, the teaching team will carry out a global assessment of the challenge.



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