Introduction

- Agroindustrial sector is mainly composed by micro, small and medium enterprises (MSMEs).
- Lack of funds or technical human resources to deal or enhance with current and sustainability forthcoming challenges.
- Study shows one approach conducted in Portugal for the quest for sustainable solutions in this sector through the introduction of innovation in MSMEs:
  - circular economy,
  - ecological packaging,
  - active and/or intelligent packaging,
  - industry digitalization - Industry 4.0,
- Concerns are currently highlighted due to:
  - large increase in the purchase/sale of products on online platforms,
  - Requirements of stricter food security & safety measures.
- Aims help increasing productivity, efficacy and efficiency in terms of Industry 4.0 and circular economy to promote sustainability.

Methods

- International Benchmarking for technologies identification.
- Surveys and audits in MSMEs for evaluation of the current state of using these technological solutions.
- Analysis of critical factors.
- Best practices and innovative solutions proposals aiming production, process and environmental sustainability.

Results

Primary packaging

- Best practices using sustainable (eco) packaging:
  - Plant-based fibers, biological waste and fungi, nanomaterials.
  - Prepare companies to comply with future regulations arising from the environmental impact of packaging.

Secondary packaging

- Best practices using sustainable secondary packaging:
  - Recyclable and/or,
  - Reusable.

Intelligent and/or active packaging

- Best practices using intelligent/active packaging to:
  - Help reduce food waste
  - Improve food safety.

Cybersecurity

- Best practices using technologies both at software level and at the operator level.
- Increase the confidence of companies to:
  - Adopt Industry 4.0 technologies,
  - Use of digital environments.

Results (cont.)

Waste

- Identification/characterization of waste sources.
- Development of innovative solutions that engage waste or subproducts reduction/reuse.
- Improvement of production efficiency and reduction of environmental impacts, in a circular economy strategy;

Product and process development

- Enable more efficient and innovative MSMEs through access to training processes for scientific and technological innovation.
- Accelerate the adoption of Industry 4.0, linked to sustainability and preservation of ecosystems:
  - Eco-design of processes and products,
  - Eco-efficiency in a digital economy.

Conclusions

- Increase the global awareness and qualification of agroindustrial MSMEs to adopt innovative and sustainable solutions, fostering their productivity, effectiveness and efficiency in terms of Industry 4.0 and circular economy.

Aknowledgments

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References


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