

REAQUA. Innovative strategies for water reuse in the meat industry: assessment of technical, economic and regulatory constraints to ensure safe use and creation of a reference technical guide

Summary

The increasing demand for freshwater due to population growth and high consumption in the agricultural and industrial sectors, linked to the water stress affecting an increasing number of countries in the world, has led to the reuse of treated wastewater being seen as a promising solution to tackle this major challenge. Proof of this is the recent entry into force of the new regulation on minimum requirements for water reuse for agricultural irrigation in the EU (EU 2020/741), which will apply in all EU member states from June 2023.

Although reuse in the industrial sector represents 11% of the scenarios evaluated, this is one of the sectors with the highest water consumption, especially the agri-food industry. This high use by this type of industry is reflected in a study carried out by the National Statistics Institute (INE), which shows that in 2013 the agri-food industry consumed 12% of the total water used in European industry, showing that it is one of the sectors with the highest demand for this resource.

Focusing on the **meat sector**, the water used in abattoirs is mainly destined for production processes where the water used is directly in contact with the meat product (washing of carcasses and sanitisation), but there is just as significant a part where the water used is classified as non-contact water that is used outside the meat processing environment, such as in the cleaning of trucks and pens. Effluent from abattoirs is characterised by a high content of organic matter, with a significant nutrient load that must be removed for discharge into surface water.

It is therefore important to determine where and how water is used in the process in order to identify possible collection points for the possible reuse of water in the production process. In this regard, and in view of the need to adopt reuse practices, the current Royal Decree RD 1620/2007 establishes not only quality criteria for water reuse for agricultural uses, but also for urban and industrial uses.

Unfortunately, despite having established criteria for a more sustainable use of water resources, this management strategy is not promoted in the food industry, possibly due to lack of knowledge on their part of the criteria established by the public administration or due to legislative barriers that currently hinder the regeneration and reuse of this water in abattoirs.

Therefore, the challenge for the sector is not only to comply with the law established by the Royal Decree, since there is a wide range of technologies available for obtaining high quality effluents, but also to understand what the requirements established by the Administration are in order to be able to use treated water and to fulfil them; without posing a risk to human health or the environment.

Objectives

The main objective of this project is **to demonstrate the feasibility of being able to reuse wastewater generated in abattoirs**. In this regard, the aim is to be able to detect those limiting factors that currently exist for companies in the meat sector in the field of water reuse and, once identified, to be able to apply and validate innovative technologies at the pilot level that enable them to comply with the requirements

established by the Administration in order to be able to use treated water in activities outside the production process.

Description of the actions planned in the project

- ACTIVITY 1. Characterisation of effluents from industrial WWTPs.
 ACTIVITY 2. Identification and assessment of risks associated with the presence of chemicals and pathogens detected in abattoir WWTP effluents.
 ACTIVITY 3. Application of post-treatment technologies to improve the quality of reclaimed water.
 ACTIVITY 4. Verification of the quality of reclaimed water for potential uses.
 ACTIVITY 5. Technical, environmental and economic assessment of technologies through LCAs and CCAs.
 ACTIVITY 6. Drafting of a practical guide for the reuse of recovered water in abattoirs.
 ACTIVITY 7. Dissemination and communication of results.

Expected results and practical recommendations

- Draw up a detailed characterisation of water from different abattoirs and to check its variability over time.
- Verify that the potential risks associated with abattoir wastewater for reuse are very low or non-existent.
- Ensure the utmost efficiency in disposal for all parameters evaluated by optimising the operational conditions of the proposed post-treatments.
- Obtain very high quality effluent that enables water reuse for a wide range of water uses.
- Obtain a detailed technical, environmental and economic assessment to determine the ultimate feasibility of the water reclamation process in abattoirs using the proposed technologies.
- Draft a practical guide to enable companies in the meat sector to select the most appropriate post-treatment technologies to be implemented in their facilities in each case depending on the characteristics of the WWTP effluent and the intended end use of the reclaimed water. This practical guide will be used to promote the application of post-treatment technologies to improve the quality of treated water and propose strategies to increase water reuse in the meat sector, taking into account Public Administration considerations.

Leader of the Operational Group

ORGANISATION: OLOT MEATS, SA

Coordinator of the Operational Group

ORGANISATION: INNOVACC CATALAN MEAT AND ALTERNATIVE PROTEIN CLUSTER

Other members of the Operational Group (grant recipients)

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Other members of the Operational Group (not recipients of the grant)

ORGANISATION: BALMES UNIVERSITY FOUNDATION (UNIVERSITY OF VIC - CENTRAL UNIVERSITY OF CATALONIA)

ORGANISATION: CATALAN INSTITUTE FOR WATER RESEARCH

Subject area(s) of application

<input type="checkbox"/>	Agricultural production system
<input type="checkbox"/>	Agricultural practice
<input type="checkbox"/>	Agricultural equipment and machinery
<input type="checkbox"/>	Livestock farming and animal welfare
<input type="checkbox"/>	Vegetable production and horticulture
<input type="checkbox"/>	Landscape / Territorial management
<input type="checkbox"/>	Pest and disease control
<input type="checkbox"/>	Fertilisation and nutrient management
<input type="checkbox"/>	Soil management
<input type="checkbox"/>	Genetic resources
<input type="checkbox"/>	Forestry
<input checked="" type="checkbox"/>	Water management
<input type="checkbox"/>	Climate and Climate Change
<input type="checkbox"/>	Energy management
<input checked="" type="checkbox"/>	Waste and by-product management
<input type="checkbox"/>	Biodiversity and environmental management
<input type="checkbox"/>	Food quality/processing and nutrition
<input type="checkbox"/>	Supply chain, marketing and consumption
<input type="checkbox"/>	Competitiveness and agricultural and forestry diversification
<input type="checkbox"/>	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
BARCELONA GIRONA	BAGES OSONA GARROTXA

Dissemination of the project (publications, conferences, multimedia, etc.)

<https://www.innovacc.cat/2022/07/27/7-projectes-aprovats-de-la-linia-grups-operatius-2021-projectes-amb-ajut-dacc/>

Project website

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More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	Total budget: €214,157.74
	DACC funding: €99,037.85
Current status: Under way	EU funding: €74,712.77

Own funding: €40,407.12

With funding from:

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Order ARP/113/2021 of 20 May, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ACC/1660/2021, of 27 May, announcing the call for the grant.



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