

Capture and reuse of CO₂ at a pig slaughterhouse: from the WWTP to the stunning process

Summary

The project consists of developing a pilot system to capture the gases emitted by the slaughterhouse's wastewater treatment plant (WWTP) and separating the CO₂ in order to reuse it to stun the pigs prior to slaughter.

The aims are to reduce the greenhouse gas emissions from the slaughterhouse's wastewater treatment plant, reduce the CO₂ to be acquired by the slaughterhouse for the stunning phase, and transfer the technology for application in the entire slaughter industry and in other types of industries that use WWTPs.

The actions that this project is based on are: 1) development of a pilot system to capture the gases emitted in the reactor of the slaughterhouse's WWTP; 2) determination of the composition of the captured gases; 3) testing of various techniques to recover the CO₂ present in the gases emitted by the WWTP in order to determine the optimal method; 4) determination of the maximum production of recoverable CO₂ and analysis to assess its validity for use in the stunning of pigs; 5) experiments on the stunning of pigs with CO₂ recovered from the WWTP, discarding any possible sanitary incompatibilities of this CO₂ with the animals, and analysis of the quality of the meat obtained in order to determine possible differences with respect to the meat obtained using normal commercial CO₂. Dissemination and knowledge transfer actions will also be undertaken throughout the course of the project.

Objectives

Capture the carbon dioxide produced at the wastewater treatment plant (WWTP) of a pig slaughterhouse to reuse it in the stunning of the pigs prior to slaughter.

The specific objectives are:

- Capture the gases emitted in the reactor of the WWTP of the slaughterhouse and determine their composition.
- Separate the CO₂ from the rest of the gases.
- Determine the quantity of CO₂ that can be recovered from the gases emitted by the WWTP and its validity for application in stunning at the slaughterhouse.
- Test the stunning of pigs with the recovered CO₂ and analyse the product obtained.

Description of initiatives outlined in the project

1. Capture of the gases emitted in the reactor of the slaughterhouse's WWTP.
2. Determination of the composition of the gases emitted in the slaughterhouse's WWTP reactor.
3. Separation of the carbon dioxide present in the gases emitted in the WWTP.
4. Determination of the production of recoverable CO₂ and analysis of the same in order to assess its validity for use in the stunning of pigs.
5. Experiments on the stunning of pigs with the CO₂ recovered at the WWTP.

Expected results and practical recommendations

- Pilot system that enables WWTP emissions to be captured.
- Classification of the gases emitted in the WWTP.

- Determination of the optimal CO₂ separation system.
- The quantity and purity of recovered CO₂ are sufficient for a large-scale capture system to allow the slaughterhouse to supply its own CO₂ for stunning.
- No incompatibilities between the use of the recovered CO₂ and the animals, and the animal welfare and meat quality parameters do not present differences with respect to the CO₂ that is normally used.

Task force leader

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 Typology of entity: **Agri-food company**

Task force coordinator

Other task force members (grant beneficiaries)

Other task force members

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Subject area(s) of application

Animal husbandry and welfare
 Waste, by-products and residues management

Geographical area(s) of application

Province(s)	Region(s)
Barcelona	Moianès

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

The main dissemination activities to be carried out by the members of the task force are:

- Publications on websites.
- Demonstrations for the dissemination of knowledge garnered from the project to veterinary students at the Autonomous University of Barcelona (UAB).
- Technical publications.
- Participation in technical seminars.

Project website

More information on the project

Project dates

Starting date (month-year): June 2018
Completion date (month-year):
Current status: *Underway*

Budget approved

Total budget:	€197,848.00
<i>DARP funding:</i>	€78,941.35
<i>EU funding:</i>	€59,552.25
<i>Own funding:</i>	€59,354.40

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Resolution ARP/1868/2017, of 20 July, calling for applications for grants for the year 2017.

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