Livestock effluents: Farm scale effluent management towards agronomic and energetic valorization

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Measure 1. Promotion Innovation

Action 1.1. Innovation by Operational Groups

Domain 1. Increase of resources efficiency in agriculture and forestry production
Practical Problem:

➢ Livestock production is concentrated in certain regions, some without enough area for land spreading valorisation of effluents.

➢ Therefore, in order to be competitive and comply with legal requirements, the sector should promote a circular economy, pursuing new alternatives for effluents management.
Objectives:

➢ Valorise livestock effluents as a resource, focusing on the production and integrated management of the different flows generated;

➢ Optimize effluents use as secondary raw materials, recovering energy and nutrients, improving farm nutrient balances and promoting sustainable management.

➢ CIRCULAR ECONOMY

➢ ZERO WASTE

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GoEfluientes – flows in the farming activity

PARTNERSHIP

➢ 4 Research/Teaching

➢ 3 Agri Associations

➢ 6 Agri Enterprises
ACTION PLAN

Action 1. Characterization of intensive livestock systems
➢ State of the art
➢ Surveys

Action 2. Mitigation measures for gaseous emissions and primary livestock effluent treatment

Action 3. Valorisation of livestock effluents as a resource
➢ Composting of dairy cattle manure
➢ Anaerobic digestion of livestock effluents
➢ Biodegradation of livestock effluents by BSF larvae
➢ Agronomic valorisation
➢ Bio energy production

Action 4. Socioeconomic impact studies

Action 5. Demonstration and Dissemination
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Task 1.2

➢ Surveys

✓ Identification and general information about the farm
✓ Energy and water use
✓ Feeding and drinking conditions
✓ Edification conditions
✓ Effluent management indoors
✓ Effluent management outdoors
✓ Final destination of the effluents

✓ Portuguese Environment Agency
✓ Planning Office of the Ministry of Agriculture
✓ Partners

Livestock Systems

➢ Dairy cattle
➢ Pigs
➢ Poultry
Task 3.2/3.5

✓ Selection of the demo farm (for AD mobile unit deployment)

Closed cycle farm with 900 sows and 5,000 finishing places
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Task 3.2/3.5

Slurry from all stages

Equalization tank

Slurry management practices

Solid/liquid separation

Liquid phase

Storage in Lagoons

Solid phase

Soil amendment
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Task 3.2/3.5

☑ Characterization of the pig farm (type and performance)
☑ Slurry collection and characterization

Different production phases

Slurry with different volatile solids content

Different energy potential
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Task 3.2/3.5

Growing/finishing pigs

Total solids = 50-80 g/L
TVS/TS = 75-85

Future

Deployment of the AD mobile unit on farm for growing/finishing phase

Ongoing

Lab-scale AD trials
FINAL REMARKS

➢ Expected results

✓ A roadmap for effluents management, including technology portfolio, linked to farm characteristics and regional constraints;
✓ Support decision making on centralized/decentralized solutions;
✓ Contribute to sustainable livestock intensification and landscape planning, to face climate change and resources scarcity.

➢ Results so far/first lesson

Recognition of the need for:
✓ Integration of livestock production data at local/regional/national scale;
✓ Landscape planning for livestock production towards environmental sustainability, sector competitiveness and rural development.

➢ Who will benefit?

✓ The beneficiaries will be the animal producers and farmers, its sustainability and the image and brand of the sector.
THANK YOU FOR YOUR ATTENTION

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