Duckweed technology for improving nutrient management and resource efficiency in pig production systems

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The main objective of LIFE LEMNA Project is to demonstrate the technical feasibility and sustainability of a system for nutrient recovery from the anaerobic digested swine manure based on the production of duckweed.

**Duckweed (water lentils)**

- Small free-floating macrophyte with worldwide distribution.
- Lemnaceae family with 4 main genera in Europe (Lemna, Landoltia, Spirodela y Wolffia).
- Relatively simple morphology with no stems or true leaves.
- In the environment, it grows in still or slow-moving fresh water.
- High biomass production rate and easy to harvest.
- High capacity for removing dissolved nutrients from water, especially nitrogen and phosphorous compounds.
- **Biomass composition:**
  - High protein and carbohydrates content.
  - High nutritional value of the amino-acids.
  - Low content in lignine y variable en starch and cellulose.

**Expected results**

- Collection of 25 duckweed strains from 3 duckweed species native of Europe.
- Construction of a prototype for duckweed production at demo scale.
- To improve the efficiency of nutrient recovery in intensive pig farms.
- To reduce the pollution caused by the surplus of nutrients (Nitrogen and Phosphorous) from pig manure.
- Production of a bio-fertilizer with high concentration of amino-acids.
- Production of vegetable protein with a low carbon footprint.
- e-LEMMATool for a preliminary assessment of applicability of LEMNA model in pig farms.

**LIFE LEMNA Project** has built the first full scale in EU innovative system for nutrient recovery from swine manure based on the combined AD and duckweed systems.