

Valorization of pig carcasses through their transformation into biofuels.

D. Díez^{1,2}, A. Urueña^{1,2}, G. Antolín^{1,2,3}.

¹CARTIF Centro Tecnológico, Boecillo, Valladolid, 47151, Spain

²ITAP Institute, University of Valladolid, Valladolid, 47010, Spain

³University of Valladolid, Valladolid, 47010, Spain

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Presenting author email: davdie@cartif.es

Introduction.

Current processes to manage animal by-products from the pig sector, specially animal carcasses, involve a serious environmental problem, as they represent high amounts and they are not valorized since they are mostly disposed in landfills or incinerated.

In this situation, the goal of the LIFE + VALPORC is to demonstrate a sustainable alternative to the management of pig carcasses, focusing on the environmental problems derived from its current management and valorizing these wastes by transforming them into biofuels (biogas and biodiesel), with the corresponding environmental and socio-economic added value. To achieve this goal, the following specific objectives have been identified:

- Production of high quality meal and fat for their later valorization as biofuel, through an energy efficient treatment process of pig carcasses that meets the health and safety requirements of current legislation for this type of wastes.
- Production of a second generation biodiesel from animal fats from category 2, by demonstrating an innovative and efficient process based on cavitation technology.
- Use of meat and bone meal from category 2 and glycerin as new substrates for biogas production by their co-digestion with pig manure.
- Implementation of new pre-treatment systems, based on ultrasonic technology, that improve the efficiency of the anaerobic digestion from the substrates used in the project Obtaining a high quality organic fertilizer

Figure 1. Scheme of the Project LIFE + VALPORC



In the transesterification reaction stage, the fat is converted into methyl esters and glycerin, using a catalyst (NaOH) and methanol. In order to reduce energy consumption at this stage, mass transfer improvement technologies have been developed based on the intensification of this transfer. This improves the reaction rate, reduces the required molar ratio of alcohol / oil, reduces the necessary energy and facilitates the separation of the final product. Within these technologies, it has been demonstrated that the hydrodynamic cavitation reactor is the most efficient in the production of biodiesel.

From the biodiesel analyzes obtained it can be concluded that the plant is able to process the fat oil from the pig carcasses in a satisfactory way

Figure 2. Cavitation Biodiesel plant

