RETASTE Conference Abstracts
RETASTE-AAF-1503-In-person Poster
Rethymno, September 16-18, 2026
© Author(s) 2026 CC BY 4.0 License
DOI:10.5281/zenodo.23678249

Harnessing Solar Energy for Sustainable Feed Processing: Drying and Fermentation Pathways in the NUTRIFEEDS Project - the HMU Contribution

F. Galliou, A. Papadaki, K. Katrini, N. Markakis, I. Christoforakis, C. Moschou and T. Manios

Hellenic Mediterranean University, Greece

Abstract

The NUTRIFEEDS project (Horizon Europe, 101179992) develops regenerative livestock feed by valorising underutilised local plants and agri-food by-products, combining Black Soldier Fly larvae bioconversion with targeted microbial fermentation to enhance nutritional value. Within this framework, the Hellenic Mediterranean University (HMU) leads the integration of solar-driven drying with fermentation processes to generate distinct, low-energy feed products. Two complementary pathways are implemented and compared. In the first, high-moisture by-products (tomato pomace, wine-fermentation sludge, rye, cucumber, etc.) are solar-dried prior to further processing, preventing spoilage and extending shelf-life ahead of fermentation trials. In the second, a novel containerised solar drying system, combining a solar cover with a solar-powered heat pump circulating hot water beneath drying tanks, is applied either to prepare substrates for direct fermentation or as a post-fermentation preservation step, stabilising fermented feed products for storage. In parallel, solar photovoltaic panels, with and without battery integration, supply the electricity required to operate the fermentation process itself, and energy consumption per tonne of dry feed material is benchmarked against centralised solar drying units in Greece and Germany. Preliminary drying and ensiling trials conducted at HMU using rye as a model feedstock illustrate this combined approach, evaluating solar-driven moisture reduction alongside fermentation quality indicators. This dual pre- and post-fermentation use of solar drying, coupled with solar-powered fermentation, supports NUTRIFEEDS' aim of establishing diversified, low-energy feed processing pathways that reduce the environmental footprint of livestock feed production.

Keywords: alternative feed, solar drying, targeted fermentation, ensiling, energy efficiency, regenerative animal feed

Acknowledgments: This research is funded by the European Union for the project with title “Nourishing Europe's Future through Regenerative Livestock Feed”, project number 101179992 and project acronym “NUTRIFEEDS”.

ACCEPTED