



“Gheorghe Asachi” Technical University of Iasi, Romania



ENVIRONMENTAL PERFORMANCE OF SEMI-CONFINEMENT AND PASTURE-BASED SYSTEMS FOR DAIRY COWS

Amanda Laca, Natalia Gómez, Alejandro Rodríguez, Adriana Laca*, Mario Díaz

*Department of Chemical and Environmental Engineering, University of Oviedo, C/ Julián Clavería s/n,
33071 Oviedo, Spain*

Abstract

Two dairy farms (one a semi-confinement system and the other a pasture-based system) in the same region of Spain were chosen for comparison from a life cycle assessment perspective. In both cases, cattle feeding was found to be the main contributor to environmental impact in most categories. Additionally, cow emissions to air were the principal contribution to the global warming, fine particulate matter formation and terrestrial acidification categories. Although cow productivity in the pasture-based farm was almost half that obtained in the semi-confinement farm, the impact per 1 kg_{FPCM} in the pasture-based system was notably lower in 12 of the 18 categories analysed, mainly due to the fact that the relative amount of milk and surplus calves and culled cows sold for meat production was higher in the pasture-based farm. Finally, it should be noted that given the scarcity and variability of the data found in the literature, this LCA study contributes much needed knowledge about the effect of the degree of confinement of cows on the environmental impact of milk production.

Key words: environmental impacts, LCA, milk, pasture dairy, semi-confinement dairy

Received: August, 2019; Revised final: February, 2020; Accepted: February, 2020; Published in final edited form: July, 2020

* Author to whom all correspondence should be addressed: e-mail: lacaadriana@uniovi.es; Phone: +34 985102974; Fax: +34 985103434