



XVIIth World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)

Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)
Québec City, Canada June 13-17, 2010



ENVIRONMENTAL IMPACTS OF MANURE MANAGEMENT STRATEGIES IN PIG PRODUCTION

F. PELLETIER¹, S. GODBOUT¹, S.P. LEMAY¹, M. BELZILE¹

¹ F. PELLETIER, Research and Development Institute for the Agri-Environment (IRDA), 2700, Einstein Street, Québec City (Québec) G1P 3W8 Canada, frederic.pelletier@irda.qc.ca.

¹ S. GODBOUT, stephane.godbout@irda.qc.ca.

¹ S.P. LEMAY, stephane.lemay@irda.qc.ca.

¹ M. BELZILE, martin.belzile@irda.qc.ca.

CSBE101517 – Presented at Section II: Farm Buildings, Equipment, Structures and Livestock Environment Conference

ABSTRACT A life cycle approach was used to evaluate the environmental impacts of manure management strategies (land application, anaerobic digestion, in-barn solid/liquid separation with land application of the solid fraction or pyrolysis of the solid fraction) in pig production. A simplified life cycle model was developed using local data and local production models. The life cycle boundaries considered in this study included cradle-to-farm gate activities. The considered impact categories were global warming, acidification, eutrophication, energy use and land use. Results were expressed using two functional units: per kg of pig produced and per hectare of land used. Results obtained with the land application scenario (conventional manure management) showed that more than half of the environmental impacts were associated with crop production and land management. The impact of the functional unit chosen to express the emissions and to compare scenarios had an influence on how the results were interpreted. The solid fraction from the in-barn solid/liquid separation scenarios was used on potatoes crop. The remaining liquid fraction was then spread on a smaller surface lowering emissions per kg of pig produced while increasing emissions per hectare of land used.

Keywords: Greenhouse gas, Life cycle assessment, Pig production, Manure management.