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## Economic Viability of Biogas Plant Use in Pig Production in Brazilian States of Minas Gerais and Goiás

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### Abstract

The modern pig production chain delivers the most consumed meat type worldwide. During several decades, the economic profits of the activity was more important than the related environmental issues. From the nineties on the environmental impacts of the swine manure became more evident. Actors of the chain were challenged to adjust their production systems due to the negative externalities. Swine manure was endangering the sustainability of the activity in the long run. Thus, the adoption of new treatment forms of manure became compulsory to reduce environmental impacts and to sustain the activity in the involved enterprises. Among the different treatment forms of manure, this study proposed the adoption of biogas plants of the Canadian Type and the use of their byproducts as to enable environmental adjusts and increase income of the pig producing farmers. Three systems were analyzed: **(1)** system located in Uberlândia (Minas Gerais State), with biogas use for thermic energy and combustion, as well as for carbon credits generation; **(2)** system located in Rio Verde (Goiás State), with generation of carbon credits, without farmers' investment; and **(3)** again the system in Rio Verde simulating farmers' investment. The main objective was to assess the economic viability of each system. At the end three different studies were considered, using net present value, internal rate of return, benefit-cost-ratio and payback period. Considering these methods, all considered systems were viable and economically attractive. The best economic performance was obtained with the Uberlândia system, influenced by the effective use of byproducts generated at the biogas plant.

**Keywords:** Biogas plants, economic viability, pig production, swine manure