

Technical-economic evaluation of manure management in different types of pig farms

C. Gourmelen (1), M. David (1), M. Rieu (2), O. Teffène (1)

(1) Institut Technique du Porc, La Motte au Vicomte, 36651 Le Rheu cedex, France

(2) Institut Technique du Porc, 34 bd de la gare, 31000 Toulouse, France

The good practices and, in certain situations European and French regulations, compel animal producers to limit manure spreading on agricultural lands. In areas with high density of herds, treatment techniques, whose target is to reduce the nutrients charge per acre (mainly nitrogen), can also be necessary. Those practices of manure management lead to different costs levels depending on real herds situations (setting up place, herd size, land surface,...).

Material and Methods

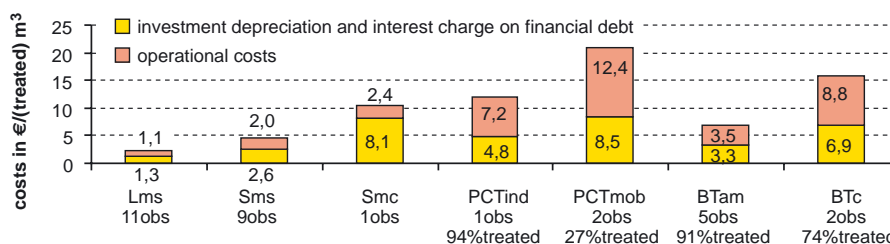
- **objective:** to count the management costs of manure from its emission in barns until its final destination.
- **21 herds inquired in 7 types:** liquid manure spreading (Lms), solid manure spreading (Sms), solid manure composting (Smc), physicochemical treatment in individual unit (PCTind), physicochemical treatment in mobile unit (PCTmob), biological treatment with activated muds (BTam), biological treatment with composting (BTc).
- **recorded costs take into account:** investment levels, financing ways, associated labour costs, operational charges. Savings on mineral fertilizer are calculated giving to the spread manure on farm lands the value of a commercial mineral fertilizer with equivalent nitrogen efficiency and quantity. The herds's choice has been governed by the search for geographical diversity, for different herds sizes and different specialization levels.

Results

- **by type of management:** a cost corresponding to an uniform type of management. The associated cost can be expressed by unit of manure's volume (per m³ of liquid manure or solid manure, under the hypothesis that one tonne of solid manure is equivalent to 1,5 m³ of slurry according to Couvreur and Bailly (2001), or by treated m³ in types with treatment). Average costs are calculated among several herds or parts of herds, depending on the uniform or diversified manure management on the farm (Fig. 1).

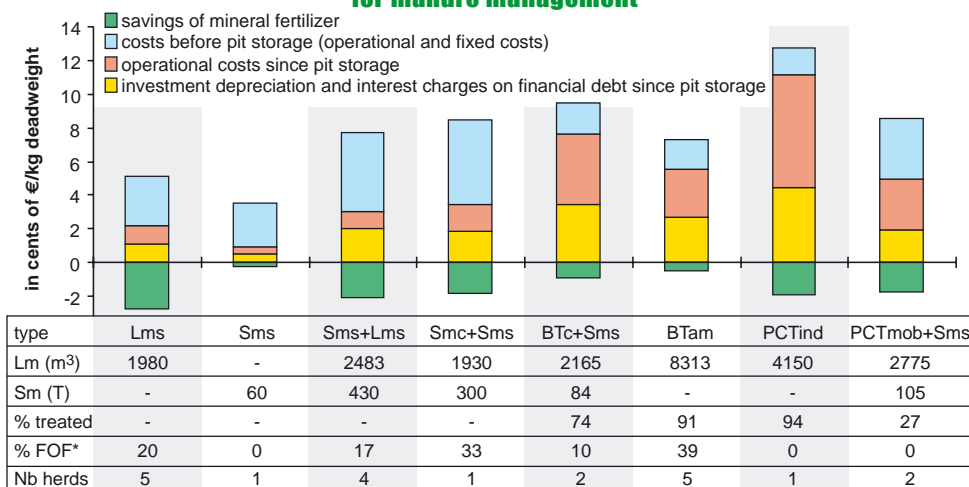
- **by herd:** for a given farm, a global cost of manure management which can be divided by the production unit (kg deadweight) to be compared with the production cost of the herd (Fig. 2).

Figure 1 – Costs since pit storage



The manure spreading cost is the smallest, the physical-chemical treatment's one the highest.

Figure 2 – Total costs from 21 herds according to 8 types of herds organizations for manure management



*FOF=nb pigs Fattened Out of the Farm

The costs reach between 1,8 and 8,4% of the average total production cost of a farrow-to-finish farm.

Conclusions

A variability of situations of costs levels is pointed out in our study inside and between types. Those having enough land use the less costly technique which is spreading, three times less expensive than the types with treatment in our study and which lets recover raw manure. They benefit then of a secure income; but treatment is a condition to exist and to guarantee a kind of perenity of the manure management for some herds. Some use intermediary solutions less durable as making some pigs fattened out of the farm or selling some piglets to reduce the amount of manure to manage and to avoid treatment.