

# Sanitary status of 47 pig manures in Brittany: comparison of the effectiveness of manure treatments on the levels of indicator bacteria and two pathogenic bacteria

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## Abstract

The hygienic performance of three manure treatment systems (simple storage, biological treatment or thermal treatment) was evaluated for effluents collected from 47 piggeries across Brittany, France. Microbial analyses were carried out on raw manure, on the sludge stored in a tank after biological treatment and on the liquid phase stored in a lagoon after sludge settling or after thermal treatment. The effect of the treatments on *E. coli*, enterococci, *Salmonella* and *Listeria monocytogenes* was evaluated. The concentrations of indicator bacteria were highly variable regardless of the farm or the manure management. The biological treatment had only a small effect on *E. coli* and enterococci (average reduction between raw manure and sludge  $\approx 2 \log_{10}$ ). *Salmonella* were present in 50% of the raw manures, 14.8% of the sludges and in 7.4% of the lagoons. Despite their high prevalence in raw manure, their concentrations remained low and did not exceed 11 bacteria per gram of manure. The prevalence of *L. monocytogenes* was lower. However, this pathogenic bacteria was detected in 21% of the raw manures, in 15.4% of the sludges and in 28.6% of the lagoons. *Salmonella* Derby and *L. monocytogenes* serotype 4b each accounted for 50% of the serotypes identified in the samples. Although the biological treatments make it possible to decrease the level of *E. coli* and enterococci, they do not achieve complete sanitisation of the by-products. As a consequence, there remains a significant risk of spreading the pathogenic bacteria during the land application operation.