



FAO European Cooperative
Research Network



Recycling of Agricultural, Municipal and Industrial Residues in Agriculture

Network Coordinator: José Martinez, Cemagref, Rennes (France)

RAMIRAN 2002

**Proceedings of the 10th International Conference
of the RAMIRAN Network**

General Theme: Hygiene Safety

**Štrbské Pleso, High Tatras, Slovak Republic
May 14 - 18, 2002**

Edited by Ján Venglovský and Gertruda Gréserová

ISBN 80-88985-68-4



University of Veterinary Medicine
Research Institute of Veterinary Medicine
Hlinkova 1/A
040 01 Košice
Slovak Republic

THE EFFECT OF PASTEURISATION IN BIOGAS PLANTS: A LABORATORY STUDY

Leena Sahlström, Elisabeth Bagge and Ann Albihn.

Corresponding author: Leena Sahlström, National Veterinary Institute, 75189 Uppsala, Sweden, +46 18 674000, Fax: +46 18 674445, E-mail: Leena.Sahlstrom@sva.se

Swedish biogas plants (BGPs) treating animal low risk waste must pasteurise the incoming substrate at 70°C for 60 min prior to digestion in order to produce a hygienically acceptable product. The aim of this study was to evaluate the hygienic effect of pasteurisation in BGPs. In a laboratory experiment pasteurisation at 70°C and 55°C were studied for 30 and 60 min. The pathogens in focus were: *Salmonella*, *Listeria*, *Campylobacter* and *E. coli* O157. Indicator bacteria studied were Enterococci, *Clostridium perfringens* and coliforms (37°C and 44°C). The study will be enlarged with viral pathogens as will be further discussed at the conference.

Unpasteurised substrate consisting of animal waste, source separated household waste and manure from a full-scale BGP was used. Pathogens were inoculated prior to the pasteurisation, which was performed in a water bath with continuous mixing of the substrate. Sampling was performed after 30 and 60 min of pasteurisation in 70°C and 55°C. The experiment was repeated three times.

The results demonstrated that pasteurisation at 70°C for 30 and 60 min were effective in reducing pathogenic bacteria and indicator organisms, except for spore forming Clostridia. Pasteurisation at 55°C is not as effective. Both *Salmonella* and *E. coli* O 157 were able to survive 30 min at 55°C, and enterococci survived 60 min at 55°C.

In conclusion, pasteurisation in 55°C for 60 min was not sufficient to achieve a hygienically acceptable product. Considering safety margins, there may be problems in full-scale BGPs to achieve an even temperature level in the whole substrate compared to the ideal circumstances in a laboratory experiment. Pasteurisation at 70°C for 60 min is therefore recommended to achieve a good hygienic level in the digested residue. This applies to geographic areas where prions are not present in the substrate, and spore forming bacteria are not likely to constitute health problems for animals.