

## Absract

This paper studies a faecal [sludge treatment](#) process, LaDePa (Latrine Dehydration and Pasteurization), which includes: (i) the characterization of the rheological and plastic behaviour of faecal sludge in the feeding section; (ii) the study of the drying and pasteurization performance of the process using a laboratory-scale prototype; and (iii) an evaluation of the processed faecal sludge for reuse in agriculture or as a biofuel.

Experiments conducted using a rheometer show that the faecal sludge exhibits shear thinning behaviour, i.e. viscosity decrease with shear rate increase. Plasticity tests in a cone penetrometer showed that the faecal sludge has a more liquid than plastic behaviour, which may affect extrusion quality, unless a plasticizer is added, as sawdust in this study.

The extent of drying and pasteurization of the samples was determined based on moisture content and the presence of viable *Ascaris* eggs respectively. As the intensity of infrared radiation was increased, drying was faster and more efficient in terms of energy consumption. However, the pellets were thermally degraded at temperatures above 200 °C. After processing in the LaDePa, *Ascaris* eggs were deactivated or severely damaged so that they would be not able to develop.

The last part of the study was conducted by determining the content of nutrients (C, N, P, K) and calorific value. The results showed that the processed pellets have suitable characteristics for reuse in agriculture and as a biofuel: similar nutrient content to manure and compost, and similar calorific value to wood. Drying did not affect the nutrient content and calorific value of the dry bone of faecal sludge.