

Changes in microbiota and parasitic load of poultry manure undergoing value addition through different techniques for their safe disposal or utilization

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There is scanty information about the microbial composition of poultry manure processed through several bioprocessing interventions such as anaerobic digestion (AD) and vermicomposting. Here, we investigated the changes in microbial population and parasitic load of poultry manure (both litter and excreta separately) undergoing AD and vermicomposting. The study was conducted for a period of three months. Six biogas digesters and seven vermicompost units were used comprising of different treatments. Broiler litter was pretreated with 0.1 and 0.2 mol/L NaOH prior to AD while the layer excreta was subjected to different dilutions in water (1:6, 1:8, 1:10) for the production of biogas. Further, the substrates were also used for vermicompost production wherein similar treatment was given to the broiler litter while different carbonaceous materials (16-20 kg of leaves, rice husk, saw dust and wheat straw per 100 kg of poultry waste) were incorporated to the layer excreta. The microbiota changes were studied which comprised of changes in total bacterial count (TBC), coliform count and *Salmonella* spp. count in all the treatments at regular intervals. The parasitic load was also measured by counting eggs per gram (EPG) in all the treatments at regular interval. The results of the study showed a significant ($P < 0.01$) reduction in the microbial populations of pathogens (upto 44-54%) as well as parasitic load (92-100%) with the advancement in time and proved AD and vermicomposting of broiler litter and layer excreta at the defined pretreatment conditions as an effective technique to treat poultry waste prior to safe disposal and utilization.

Keywords: Anaerobic digestion, Broiler industry, Excreta, Litter, Vermicomposting