STUDY PHYSICAL AND MECHANICAL CHARACTERISTICS NATIVE CATTLE OF WASTE AND WASTE HELD ANAEROBIC PROCESSING IN BIOREACTORS

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The development of agriculture of Ukraine leads to the need to examine how thermal characteristics of organic waste (manure, dung etc.) And their physical and mechanical properties.

The purpose of investigations – to obtain comprehensive quantitative variables to changes in physical and mechanical characteristics of manure effluents that are required for the selection, design and improvement of hydraulic cattle farms and biogas facilities. Conducted series of studies will compare the content of organic substances native solutions and cattle manure fermented solutions after anaerobic treatment in biogas plants.

Materials and methods of investigations.

Samples for the study were selected from existing biogas complex, located on the farm of cattle "Ukrainian dairy company" in. V. Krupil, Kyiv region.

The initial solution from the container prior vibration maintenance bioreactor, which comes manure runoff from cattle farms, fermented solution vibration with drain pipes that are located in each bioreactor. With pipes drain waste effluents fall in capacity maintenance (lagoon) for later use, such as fertilizers.

The investigations shear stress, shear and dynamic viscosity solutions of organic materials carried on rotary viscometer "Reotest 2.1" with cylindrical measuring device.

During the investigations was used inner cylindrical measuring device to the standard radius was involved external R/r = 1,24. Dung solutions have volume 50 ml ± 5%, and the value of distance between the measuring cylinder was greater size of the manure solids in solution.

Results. Analysis of the curves shows that at a certain humidity and temperature of the manure solutions and different speeds of movement dimensional cylinder offset voltage varies from 0 to maximum value, so by changing the frequency of rotation from 0.333 to 145.8 s-1 shear stress increases from 25.5 to 31.1 Pa for native solution and from 22.3 to 26.9 Pa for fermented solutions. After reaching a maximum offset voltage decreases to equilibrium. Having explained the maximum elastic properties of the solution, and further decline bias voltage to equilibrium indicates destruction of structural connections in manure mass. The largest offset voltage corresponds to the maximum strength liquid structure intact.

Conclusions

Analysis of experimental investigations shows that the amount of organic matter in the substrate $1m^3$ weight during the fermentation decreased by 34% (biogas formed). The content of organic substances in fermented mass allows us to recommend it as a raw material in the creation of organic fertilizers.

Quantitative characteristics change dynamic viscosity native and fermented waste keeping cattle in humidity solutions 95.05% and 96.08% respectively in the range of shear rate change in the range of 0.166...148.8 s^{-1}.

The results necessary for the selection and design of process equipment, transportation manure runoff in channels for collecting and transferring them to the design of bioreactors and designs solutions with stirring agitators in bioreactors.