Abstract

In this work, the activities of hydrolytic enzymes, functioning in the hydrolytic stage of the production of biogas, have been determined. The activities of α-amylase, β-xylanase, and β-glucosidase have been measured in five samples collected from the following steps of biogas production:. cow dung from the adjacent cowshed, cow manure from the homogenization tank for dosing biogas plant, digester sludge from the outside biogas fermenter, degister sludge from the inside biogas fermenter, and sludge of digestate from digestate tank. Samples for measurement of enzyme activities were provided by agricultural biogas station AGRI FAIR in Deštná, which uses for biogas production cow manure and corn silage The activities of hydrolytic enzymes in the production of biogas are crucial, because degradability of feed material is the limiting factor.

Activity of a amylase had highest value in cow dung and cow manure due to food containing high levels of starch. In subsequent phases falls evenly. In the indoor digester and digestate is already depleted substrate and the activity is at zero level. Its activity is almost three times higher than β-glycosidase in cow dung and cow manure, but in the last three stages of β-glycosidase activity exceeds α – amylase and its value is nearly stable. β-xylanase has negligible activity values first, then activity increased consistently and is highest in the outer fermenter. Activities β-glycosidase and β-xylanase in the digestate are relatively high, suggesting that the digestate is still possible to result in the production of biogas.