

Prenamjena pulpe buče u sirovinu za proizvodnju zelene energije

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Sažetak

Buča se uzgaja prvenstveno s ciljem proizvodnje bučinog ulja. Udio sjemenki za proizvodnju bučinog ulja, u odnosu na cijelu buču iznosi 3%, dok se 97% od ukupne mase odnosi na puplu i koru. Dio pulpe koja čini najveći dio ostatka proizvodnje bučinog ulja samo se manjom mjerom koristi u neposrednoj hranidbi svinja. Iz tog razloga zbrinjavanje tih ostataka zahtjeva upotrebu novijih tehnologija. Jedna od takvih je anaerobna fermentacija koja predstavlja način obrade poljoprivrednih ostataka s visokim udjelom organske tvari. Prema legislativi EU, poljoprivredna biomasa se suprotno dosadašnjoj praksi (zaoravanje), više ne smije ostavljati neposredno na tlu. Slijedom navedenog, pulpa buče mogla bi se koristiti kao sirovina za proizvodnju bioplina procesom anaerobne fermentacije, čime bi se iskoristila cjelokupna masa buče. Nadalje, nakon procesa anaerobne fermentacije ostati će fermentirani ostatak, koji je u skladu s legislativom Europske unije. Anaerobna fermentacija provesti će se u laboratorijskom bioplinskom postrojenju u Sloveniji, nakon čega će se izraditi krivulje proizvodnje bioplina. Kao sirovine koristiti će se: zelena masa buče i nedozreli plodovi buče te pulpa dozrelih buča. Za proizvodnju bioplina biti će korišten mezofilni proces anaerobne fermentacije. Od kemijskih analiza digestiranog ostataka odrediti će se pH uzoraka, elektroprovodljivost, ukupni dušik, kalij i natrij te mikro, makroelementi i teški metali (Ca, Mg, Mn, Zn, Cu, Fe, Pb, Cd, Ni, As, Hg, Co, Cr).

Ključne riječi: pulpa buče, anerobna fermentacija, fermentirani ostatak.

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Utilization of pumpkin pulp as raw material in green energy production

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Abstract

Cultivation of pumpkins is primarily carried out for the purposes of pumpkin seed production for pumpkin seed oil production. When talking about cultivation of pumpkin for seeds, it should be noted that the proportion of seeds for further processing in respect of the entire pumpkin is only about 3%, whereas 97% is the remaining pulp. In addition, pumpkin fruit can be used in the juvenile stage as vegetable, and in the ripe stage for animal feed. Since it represents a potential threat to the environment, there is a need for finding the proper solution for processing and quality disposal of such waste. In addition, due to increasingly stringent environmental regulations, the disposal of organic waste. Thus, anaerobic digestion is a technology that could solve problems concerning organic waste disposal, and could lead to achieving a sustainable utilization of agricultural biomass as a RES. Given the above, but also from the aspect of its composition and potential, pumpkin pulp could be suitable raw material for the process of anaerobic digestion, and biogas production. Anaerobic digestion will be carried out at the University of Ljubljana Faculty of Biotechnology, in mesophilic conditions, for a period of 21 or 30 days at T=37°C in a temperature-controlled incubator and will be give full-scale production of biogas from pumpkin pulp. Grinded pumpkin pulp and immature fruits of pumpkin will be used as substrate. Analysis of fermented residue will be carried out at the University of Zagreb Faculty of Agriculture. Determination of pH, electrical conductivity, total nitrogen will be conducted as well as spectrophotometric and determination of potassium and sodium using atomic absorption spectrometry will be conducted. The content of trace elements and heavy metals will be determined by atomic absorption spectrometry (Ca, Mg, Mn, Zn, Cu, Fe, Pb, Cd, Ni, As, Hg, Co, Cr).

Key words: pumpkin pulp, anaerobic digestion, fermented residue.

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