

THE EVALUATION OF THE QUALITY OF THE ENERGY PHYTOMASS FROM INDUSTRIAL HEMP *CANNABIS SATIVA* GROWN IN MOLDOVA

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Abstract

Plant biomass, phytomass, is an important source of renewable energy, and its importance has increased in regional and national energy strategies. The goal of this research was to evaluate the quality of energy phytomass from industrial hemp, *Cannabis sativa*, grown in the experimental plot of the National Botanical Garden (Institute), Chișinău, Republic of Moldova, as feedstock for the production of biogas and solid bio-fuel. The analysis of the biochemical composition indicated that the dry matter of the hemp plants harvested in the full flowering period contained 141 g/kg CP, 424 g/kg CF, 457g/kg ADF, 704 g/kg NDF, 82 g/kg ADL, 247g/kg HC, 375 g/kg Cel, 88 g/kg ash, 506.7 g/kg carbon and 22.5 g/kg nitrogen, with biochemical methane potential 280 l/kg. The prepared hemp silage was characterized by specific smell, 14.0 g/kg DM lactic acid, 7.7 g/kg DM acetic acid, 146 g/kg CP, 443 g/kg CF, 468 g/kg ADF, 716 g/kg NDF, 79 g/kg ADL, 248g/kg HC, 389 g/kg Cel, 134 g/kg ash, 481.0 g/kg carbon and 23.4 g/kg nitrogen with biochemical methane potential 286 l/kg. The hemp solid bio-fuel, pellets, was characterized by high net calorific values (17.9 MJ/kg), specific density (1012 kg/m³), durability (94%) and optimal ash content. Industrial hemp, *Cannabis sativa*, may be use as multi-purpose feedstock for renewable energy production.

Key words: biochemical composition, biochemical methane potential, *Cannabis sativa*, pellets, physical and mechanical properties