

R. Revyka, Master student
V. Scherbina, PhD in Agr., As. Prof., research advisor
T. Karaieva, PhD in Pedagogy, As. Prof., language advisor
Tavria State Agrotechnological University

RESOURCE PERSPECTIVES FOR BIOMETHANOGENESIS TECHNOLOGIES INTRODUCTION IN KHARKIV REGION

Biomethanogenesis is the process of biomass organic compounds transformation into biogas by means of methane generating aerobic microorganisms. The coefficient of biomass energy transformation into the methane at this process reaches 80%. The process of biomethanogenesis is being accomplished due to methane generating microorganisms being identified from 30 to 50 kinds. Such a symbiotic group due to its ability to change its fermentation ways functions as self-regulated system maintaining optimal values of pH, redox and thermodynamic potential in reactor.

Biogas generating is effective method of pus and biomass of other origin utilization providing ecological equilibrium. By means of bioconversion it is possible to decrease negative effect of livestock wastes on the environment as well as to get various products being alternative energy source, organic fertilizer, forage additives. Most effective and perspective from the point of view of energy-saving and safety environment safety is complex livestock and plant growing wastes processing, applying biotechnological method - methane fermentation, introducing of which enables to decrease contamination of environment.

The *purpose* of the article is to research technologies of a biomethanogenesis in Kharkiv region.

Major advantage of biogas is in its ability to be a renewable energy source. Its production may be for so long as existence of life itself on the Earth. According to statistic data for recent years the volumes of agricultural crops having been grown as well as the number of farm animals increased. That also testifies the increase of organic wastes of farm production that can be used for production of biogas. Kharkiv region is one of the largest ones in the country as for the volumes of farm crops growing and farm animals raising. Thus, it is expedient to introduce technologies of biomethanogenesis enabling to solve the problem of organic wastes utilization in region. According to statistics data obtained in 2015 total number of livestock made up: for cattle -196000 heads, pigs – 300000 heads, sheep and goats – 74000 heads, poultry -7485 heads. In total - 8055000 heads of farm animals. The output of biogas from pus being formed for a year on livestock farms of region complexes makes up 186374,384 m³. The most profitable trends in the course of biogas producing is poultry farming and pig-raising [1, c. 56].

Plant residues of farm crops can also be used in technologies of biomethanogenesis when producing biogas. Gross yield of basic products of plant-growing in region makes up: for wheat - 2198,6 thousand t, barley- 438,5 thousand t, corn 1427,9 thousand t, sunflower - 1172,2 thousand t, potato -1029,0 thousand t. Having analyzed the results and checked calculations the conclusion was made, according to which the greatest biogas output is being produced by such farm crops as wheat - 1374038,4 m³. Biogas

output in m³ of the whole volume of vegetable residues of basic farm crops , being grown in region, makes up 2080595,5303 m³ [2, с. 225-228; 3, с. 141].

Sludge does not possess smell, being peculiar to outlet fermentation mass. As the result of thermal treatment malignant bacteria and larvae of pests perish. The optimal term of fermentation may bring to disposal of the majority of bacteria makes up 30 days. Less time of fermentation can result in incomplete sterilization of substrate. After treatment in the biogas device it is allowed to take sludge out on the fields as fertilizer as it is then of no bacteriological danger any more. Percentage of sludge, being formed in the course pus use in biomethanogenesis processes, makes up 97%.

In conclusion it should be mentioned that production of biogas by means of methane fermentation of wastes is one of possible ways to solve power and ecological problems in countryside. Analysing statistical data for 2015 year on Kharkiv region the inference can be made, that it is expedient to introduce technologies of biomethanogenesis. The advantages of obtaining biogas are obvious, as the process of biomethanogenesis meet the needs in energy, valuable organic fertilizer and contributes to environmental protection. Ecological safety in its use as well as biogas calorie content in combination with simplicity of technology for its getting receipt and enormous amount of recyclable wastes make up positive 406 factor for further development and dissemination of biogas industry.

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