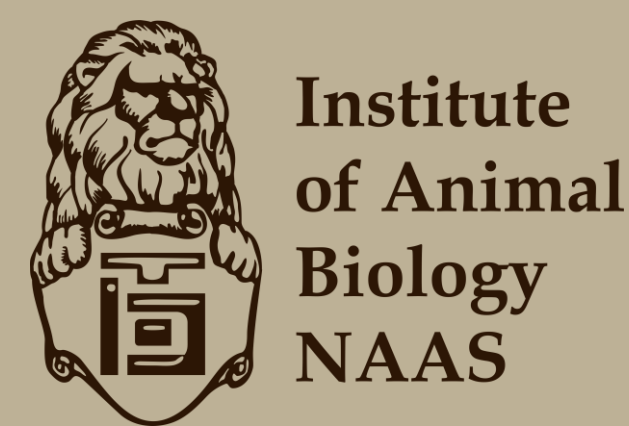


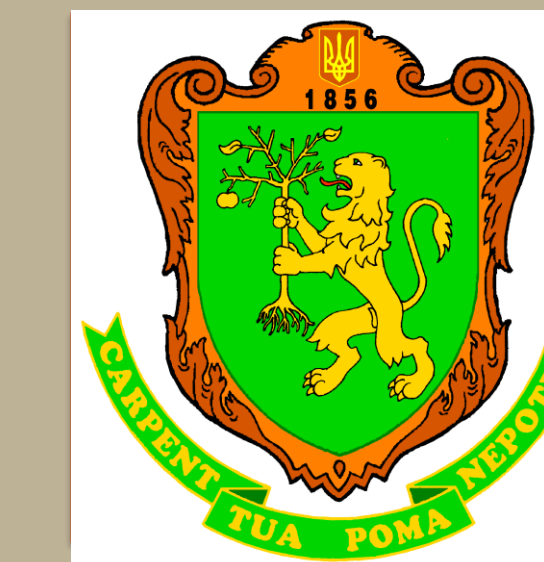
BIOENERGY POTENTIAL AND TECHNOLOGICAL FEATURES OF ANIMAL WASTE UTILIZATION



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Introduction

The energy potential of biomass of Lviv region was assessed by scientists of LNAU in terms of the level of biogas substitution of natural gas as the main type of fuel in the settlements of the region. The results of the calculations show that the possible replacement of traditional fuel by 2.2 times is exceeded due to the conversion of biomass above the level of its consumption. Moreover, it should be noted that the volume of substitution of natural gas by biogas from livestock waste is 14% of the total, giving way to the volume of energy crops (52%).

Material & Methods

In Ukraine today there are no strict requirements for methods of utilization (composting, anaerobic biological, physicochemical or mechanical-biological treatment) of such waste by farms. A large amount of organic livestock waste (manure) remains an unresolved environmental problem.

The use of existing devices for natural gas for biogas combustion is impossible for the following reasons: reduction of the combustion device capacity by almost 1.9 times and change of conditions for mixing gas jets with air.

Results

The most important calculated value in the conversion of boilers from natural gas to biogas is the diameter of the nozzle holes. When converted to biogas, the range of the biogas jet will be 1.38 times greater than the natural gas jet, which leads to a violation of the distribution of jets in the air stream, reducing the already low resistance to combustion and the tendency to flare.

The main disadvantage of biogas combustion in the furnaces of powerful units is the instability of the volumes of fuel produced, the narrowed limits of regulation of biogas combustion. To ensure reliability due to the variable amount of biogas produced, it is desirable to have a reliable heat supply and the ability to operate boilers on both natural gas and biogas.

When converting natural gas burners to biogas combustion, it should be borne in mind that the normal rate of biogas flame propagation is significantly lower than when burning natural gas.

The following types of burners can be used for biogas combustion: hearth burners for ДКБР-6,5-10 boilers, or vortex burners for burning biogas and natural gas in steam boilers type ДЕ-16.



Conclusions

One of the significant advantages of biogas is the reduction of emissions of harmful substances during its combustion than during the combustion of natural gas. In particular, emissions of nitrogen oxides in the products of natural gas combustion during the transition to biogas combustion is reduced by 40..50%.