

# WayScience



12th International Scientific and  
Practical Internet Conference

**«Modern Movement of Science»**



# WayScience

XII Міжнародна науково-практична  
інтернет-конференція

**«Сучасний рух науки»**

Editorial board of International Electronic Scientific and Practical Journal «WayScience»

The editorial board of the Journal is not responsible for the content of the abstracts and may not share the author's opinion.

**Сучасний рух науки: тези доп. XII міжнародної науково-практичної інтернет-конференції, 1-2 квітня 2021 р. – Дніпро, Україна, 2021. – Т.1. – 493 с.**

**(Modern Movement of Science: abstracts of the 12th International Scientific and Practical Internet Conference, April 1-2, 2021. – Dnipro, Ukraine, 2021. – P.1. – 493 p.)**

12th International Scientific and Practical Internet Conference "Modern Movement of Science" is devoted to the main mission of the International Electronic Scientific and Practical Journal "WayScience" - to pave the way for development of modern science from idea to result.

Topics cover all sections of the International Electronic Scientific and Practical Journal "WayScience", namely:

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**Dnipro, Ukraine – 2021**

**REDUCING ENERGY EXPENSES IN THE PRODUCTION OF PORK****Boltianska N.I.**

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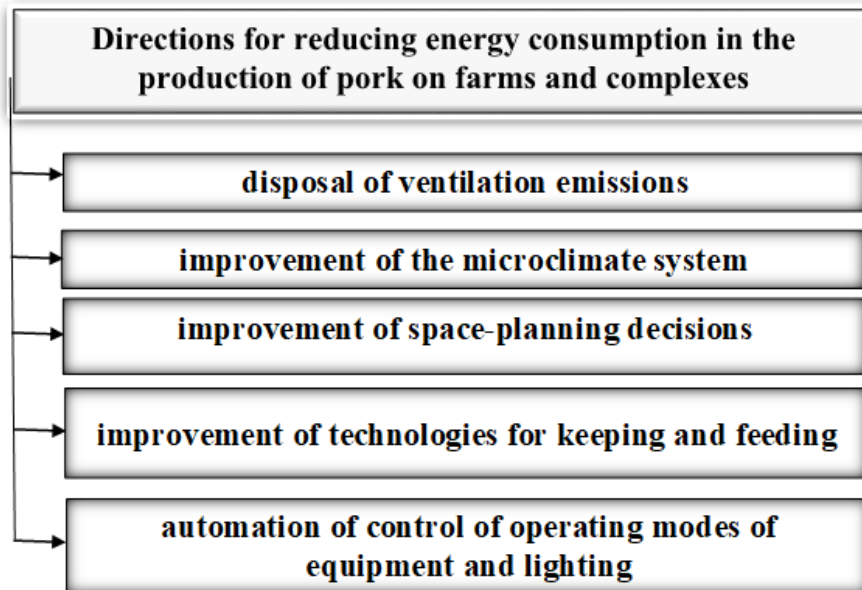
The agrarian sector remains one of the largest consumers in Ukraine. Therefore, in terms of the strategy of sustainable development and rational use of material and energy resources and improving energy efficiency of the agrarian sector of Ukraine, in particular, the field of animal husbandry, it is necessary to carry out an appropriate economic substantiation of the power savings strategy, as well as to develop a modern scientific and regulatory framework for the design of energy-efficient livestock premises, to carry out thermomodernization of existing ones. buildings, to bring modern innovative construction systems to the Ukrainian agrarian market; technologies and materials; Determine the directions of possible use of non-traditional renewable energy sources in the livestock industry [1-3]. The main reason for the high energy intensity of domestic national income is the low technological and technical level of the economy, the use of ineffective energy-cost technologies, both in the production and energy consumption in industrial and agricultural enterprises. In this case, the extent of the use of achievements of scientific and technological progress in Ukraine significantly lags behind the use of similar technologies in developed countries of the world. In livestock production, energy consumption is about 35% of electricity and about 30% fuel from the total amount used in rural areas. Therefore, the task of finding new technological approaches, which allow to reduce electricity, fuel materials and other material resources for livestock production [4,5].

In the conditions of pigs, natural or forced ventilation is used in the premises for the retention of animals. The principle of natural ventilation is that the air is fed into the room and removed from it on specially equipped channels due to the difference in pressure from the outside and inside the building. In terms of energy consumption, this ventilation is most economical, but its efficiency depends on the temperature difference inside and outside the room, which should be at least 8-10°C. At a lower temperature difference, the air movement sharply decreases and even stops. Therefore, natural ventilation is ineffective at high external air temperatures in transitional and summer periods of the year [6].

The analysis of heat losses from the premises for the maintenance of pigs showed that the power of equipment for maintaining the required microclimate and its energy intensity depend on the air temperature from the outside and within the premises, the degree of heat protection of premises, air exchange and other factors [7,8]. Therefore, the main areas of energy saving are the reduction of energy consumption for ventilation and heating of inflow air and rationalization of volumetric planning decisions. It is possible to distinguish a number of directions to reduce energy costs during the production of pork on farms and complexes (Fig. 1).

The creation of a microclimate involves carrying out operations of air exchange, heating, cooling of air, ultraviolet-irradiation, infrared-heating of animals.

The most widespread system of compulsory ventilation, which do not depend on meteorological conditions and allow to automate the process of creating a microclimate indoors. The coercive ventilation systems are divided into exhaust or negative pressure, tidal (injection) and combined. Technically, they are implemented in the installations of three types: inflow-exhaust, inflow-heating and exhaust to remove air from gnoye channels.



**Fig. 1. Directions of reduction of energy expenses during the production of pork on farms and complexes**

The inflow-exhaust plants with a mechanical drive have an axial fan in a exhaust mine, which is a heat-insulating metal tube, protected at the top with a cap and a compressed valve with a mechanical drive. As a rule, they are used in conjunction with tidal-heating plants in which air is heated with calorifiers, heat generators and other similar devices. The inflow-heating plants depending on execution have one or two centrifugal fans. In the latest version, one of the fans are installed in parallel calorry. Applicable method for removing manure of pigs affects their microclimate. When using slit floors, enhance forced ventilation from gnogging channels. The installation for the removal of air from the gnostic channels consists of an absorbent air duct with nozzles and adjusting washers, a injection air ventilation and an electric power plant.

In ventilation systems, both separate technical means and special equipment kits are used. Separate technical means include heat generators, fans and heat-fans, electric calibrifiers, gas heating. In systems of micro-climber pigs can be used kits of equipment type "climate".

In modern economic conditions, a sharp reduction of the nomenclature of equipment produced. At the same time, the equipment produced by the nomenclature and high-quality parameters does not satisfy the requirements for the creation of an optimal microclimate, especially by automation of regulation, economical use of energy resources and environmental protection.

The use of one or another type of heating of a pigs depends on the gender and age of pigs, as well as the configuration of the room. In a considerable degree, the choice of the heating system is associated with the presence of certain energy resources on the farm. In modern pig breeding, the devices of direct burning of fuel indoors (gas, liquid fuel) are most economical. However, due to technological features, they can be successfully applied only in premises for the maintenance of soup sows, knars and pigs on fattening. They create an intense air movement that is unacceptable in the premises of matrix and adhesion. In other premises, the well-heating registers of the type of delta tube, the ribbed trumpet of general heating and water mats (or floor sections) for heating the league of pigs, water in which fed from the boiler.

Existing energy-saving microclimate systems to date are based mainly on reducing heat loss with ventilation emissions and through enclosing structures, as well as to use non-traditional

energy. The most effective technical solution to the problem of reducing energy consumption to ventilation is the recovery of heat of air that is removed from the premises. To date, more than 70% of heat is removed with ventilation air. Works conducted on the creation of heat utilizers of various types (regenerative, recuperative, based on thermal pumps, heat pipes) allowed to conclude that for pig breeding is the most acceptable heat exchangers with intermediate heat carrier, since they can be completed with water calorifiers, fans, pumps and armature. The main elements of ventilation systems offered by foreign firms ("Big Dutchman" (Germany), VDL Agrotech (Netherlands), Skov (Denmark)) for pigs, are exhaust mine, tidal mine and tidal valves. They are supplemented by the heating system, the main elements of which are aluminum delta tubes or gas convective heat generators. These ventilation systems allow to reduce electricity consumption by 30-50%.

A distinctive feature of the microclimate systems offered by foreign firms is that mainly used exhaust ventilation systems, with which indoors are created, reduced pressure and fresh external air enters from the outside due to various designs: channels, valves, tidal mines or perforated ceiling. Acquain and system of equal pressure, but their disadvantage is high cost.

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