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ІННОВАЦІЙНІ ТЕХНОЛОГІЇ ТА ПЕРСПЕКТИВИ

FEATURES OF CREATING AN OPTIMAL MICROCLIMATE IN THE POULTRY ROOM

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Introductions. Due to unsatisfactory zoohygienic conditions, the potential productivity of poultry is often used only by 20...30%, their life span is shortened. Therefore, the creation of an optimal microclimate in industrial poultry farming is the most important reserve for increasing the production of high-quality products [1]. In addition, it is important for extending the service life of buildings and technological equipment, as well as for improving the working conditions of service personnel.

Aim. The purpose of this article is to substantiate technical and technological solutions for creating an optimal microclimate in a poultry house.

Materials and methods. The optimal microclimate in poultry houses promotes the most complete manifestation of the physiological capabilities of the bird's body and obtaining maximum productivity. The optimal or permissible values of microclimate indicators are regulated: the amount of fresh air supplied to the poultry house in the cold and warm periods of the year; temperature, humidity and speed of air movement; concentration of harmful gases, dust and bacterial cells; noise pressure level; illumination and duration of illumination.

Results and discussion. Air exchange in poultry houses is carried out with the help of ventilation, which ensures the standard speed of air movement in the premises. *Ventilation* is the main factor in controlling the microclimate of the poultry house. Ventilation maintains satisfactory air quality in the poultry house and a temperature comfortable for the bird's body [2, 3]. Ventilation provides access to

fresh air and also removes excess moisture, potentially harmful gaseous substances, and airborne waste products from the poultry house.

Installation of the ventilation system in the poultry house is a necessary and important condition during its construction. Of all animals, it is especially important for birds to provide the room where they will be kept with a significant amount of oxygen-enriched air, free from various pollutants. Equally important is the maintenance of optimal humidity and temperature in the poultry house, which significantly reduces their morbidity [3, 4].

The system for maintaining optimal conditions for keeping poultry is not limited to supply-exhaust ventilation. It includes such integral components as equipment for heating (heating) in the cold season and cooling in the heat, as well as electronic controllers that allow automating the operation of all equipment located in the poultry house [5].

During the initial period of the bird's life, ventilation provides heating of the house to maintain the comfort of the chickens, while creating a sufficient volume of fresh air to maintain optimal air quality in the house. As the bird grows, it begins to release more metabolic heat and respiratory products (moisture), which must be removed from the house with a higher ventilation mode.

Heating, cooling and air humidification. The optimal temperature regime is of great importance for productive birds, especially in the first weeks of life, and is ensured by heating and cooling systems. The entire hall is heated, or in combination with local heaters. Electricity, natural gas or propane, sometimes diesel fuel, peat, brown coal are used as energy carriers [3, 5].

Electricity is used when using electric heaters for heating the entire room and electric brooders for local heating of young animals in the early growing period. Recently, heating systems using natural gas or propane have become more and more popular.

Portable heaters are equipped with an exhaust pipe and a built-in burner. Such heaters can be equipped with axial or radiator fans [5]. Heaters with axial fans come with a hose, the maximum length of which is 6 m. Models with radiator fans are very

effective for use in a set with splitters and a hose, through which the heat can be directed in different directions in the poultry house area.

There are three main methods of local heating: infrared, contact and combined [5, 6]. Infrared heaters warm the air similarly to the sun's rays. Thermal rays give off thermal energy with almost no loss. The system is active only where it meets the object of heating (chickens, turkeys, ducklings), and light energy is transformed into tangible heat. The fresh air necessary for combustion is drawn in from the outside. The built-in fan evenly distributes warm air throughout the room.

Gas brooders that provide local directional heating are quite widely used. Gas brooders are used for poultry located in a limited area, where intensive heating must be provided for a certain time. This applies, first of all, to chickens, turkeys and young birds of other types of poultry. In the cold and warm periods of the year, there is a need to increase the humidity of the air for poultry, and for young birds in the first week of growing it is always necessary regardless of the season.

For the purpose of comprehensive cleaning and disinfection of air in poultry houses, electric filters are used. Compared to other filters (fibrous, fabric, mechanical, oil, etc.), they are characterized by low aerodynamic resistance, high cleaning efficiency, the ability to capture particles 0,01...0,25 mm in size [3, 4], the ability to regenerate the filter element, and low cost of cleaning. the ability to enrich the air with light negative aeroions.

Lighting in the aviary. Intensification of egg (and broiler meat) production technologies led to the isolation of poultry from the natural environment and content in windowless poultry houses with regulated microclimate and artificial lighting [3, 5]. For room lighting, the most common lighting sources are incandescent and fluorescent lamps. Incandescent lamps with a voltage of 220 V have a service life of up to 1000 hours; 230-245 V lamps with a longer service life - up to 3000 hours are also produced. The advantage of incandescent lamps is the ability to smoothly adjust the illumination within the required limits. Lighting costs in poultry farming account for more than 20% of consumed electricity. Therefore, at present, the lighting industry offers new sources of lighting, in particular, low-power fluorescent and LED

lamps of various spectrums.

Advantages of LED lamps: adjustable illumination, resistance to turning on and off the light (a factor that affects the length of the lamp's service life), lack of sensitivity to voltage changes in electrical networks, fire safety [1, 3]. The undoubted advantage is environmental safety, since there are no mercury-containing elements and electromagnetic radiation. Despite the higher cost, LED lamps as a source of light over a long period of operation provide significant cost savings.

Removal of litter. Gone is the scraping system for removing litter when keeping birds in cage batteries, when multiple scrapers moved the accumulated litter to the end of the battery. Instead, a tape system is used, which is more efficient and allows to reduce the costs of maintenance and electricity [6, 7].

V-shaped scrapers made of high-quality steel are installed near the front rack of the battery on each tier, the scrapers carefully remove the litter from the belt conveyors [8]. Next, the droppings that fell from all tiers onto the transverse rubber fabric belt of the horizontal conveyor are removed from the poultry house building.

Tape removal with a litter-receiving shaft at the end of the poultry house is the most acceptable and effective way of cleaning litter when caged birds are kept. The installation of a receiving shaft under the building of the poultry house for the accumulation and drying of litter excludes the occurrence of dust and ensures the cleanliness of the completion of work at the site of litter removal [9]. A cross conveyor from the mine feeds the dried litter to storage facilities or vehicles for removal outside the poultry farm.

Conclusions. The substantiation of the existing technical and technological solutions for creating an optimal microclimate in the poultry house made it possible to identify the most highly productive and less energy-consuming installations for ventilation, heating, cooling and air humidification; lighting and litter removal.

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