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POULTRY FARM AS A SOURCE OF ENVIRONMENTAL POLLUTION

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ABSTRACT

The article describes the main problems of the poultry industry that affects environmental pollution. Recommendations to minimize waste generation and protect the environment are made. The main type of waste from poultry farms is bird droppings, waste hazard class 3 and 4.Feed in poultry farming mainly consists of corn and soy, but other legumes, root crops, as well as fat substances can be added-animal origin (for example, dairy products, fish meal, etc.). The litter storage is a source of release of methylamine, phenol, methanol, fur dust, microorganisms. The most significant pollutant in the list of released harmful substances by mass of emission is suspended solids.

KEYWORDS: *Poultry Farm, Environmental Pollution, Waste Products, Harmful Substances.*

INTRODUCTION

Today, in our country, poultry farms and large poultry enterprises are engaged in the production of edible eggs. A poultry farm is a specialized enterprise that produces poultry products on an industrial basis. Poultry farms have a high level of mechanization of production processes. Egg-oriented poultry farms are considered more efficient and cost-effective. There are about 1 million laying hens in large poultry factories, which produce about 450 million eggs per year.

Materials and methods of research

According to environmental legislation, enterprises must develop an environmental safety system aimed at reducing the negative impact of their activities on the environment.

The first thing that is necessary is the assignment of the enterprise to a certain category of negative impact on the OS. It is from this category that the requirements for regulatory and permitting documentation of the enterprise, types of mandatory reporting, environmental payments and environmental protection measures necessary for development will depend.

Poultry farms, depending on the number of poultry farms, belong to the objects of the 1st or 2nd category of NWOS. In the first case, the company is obliged to introduce the best available technologies (BAT) into its activities and develop a comprehensive environmental permit (CER). For objects of category 2 it is permissible, but not necessarily the introduction of BAT. In addition, the company provides a declaration of the negative impact on the OS.

Environmental problems in poultry farming primarily include the following types of pollution:

- feed waste;

- Animal waste;

- Bird carcasses;

- Waste water;

- Emissions into the atmosphere.

The structure of the CER and the declaration includes PDV, VAT and NOOLR. Any enterprise must define a sanitary protection zone.

Poultry farms are most often located outside the city limits or on the outskirts of the city. According to the Sanitary Classification of industrial facilities and productions, poultry farms, depending on the number of chickens, may belong to the 1-3 hazard class of enterprises. The size of the sanitary protection zone, respectively, can be 1000, 500 or 300 m.

On the territory of the enterprise there are usually located: poultry houses, a slaughterhouse, a meat and bone flour workshop, an egg-laying, a feed mill, a litter storage, a laboratory, a laundry, a compressor room, a grain store, warehouses of cake, meal, sawdust. As a rule, the company has its own machine and tractor park, RTM, carpentry site, boiler room, coal and slag warehouse, gas station, car wash, canteen.

Waste management should be reflected in the draft waste management standards and limits on their placement (NOOLR).

Environmental protection measures are being carried out in relation to waste at poultry farms. The main type of waste from poultry farms is bird droppings, waste hazard class 3 and 4.Feed in poultry farming mainly consists of corn and soy, but other legumes, root crops, as well as fat substances can be added-animal origin (for example, dairy products, fish meal, etc.). Feeds are usually supplemented with amino acids, enzymes, vitamins, mineral supplements, while they may contain hormones, antibiotics and heavy metals. Most often, birds are kept indoors, but some of them are sent to open areas. When the content is closed, the bird is fed using manual or mechanical feeders, continuously, or at certain intervals. Feed can turn into unusable waste if it is spilled during storage, loading and unloading, or when feeding poultry. Feed waste together with additives can contribute to additional pollution of storm drains, primarily due to the organic substances contained in them.

During the production of poultry products, a significant amount of animal waste is generated, mainly manure, which also includes other substances, such as litter material.

The litter contains nitrogen, phosphorus and other substances excreted from the bird's body, such as hormones, antibiotics and heavy metals that are part of the feed. These substances can lead to the release of ammonia and other gases into the air and to the risk of contamination of surface reservoirs and groundwater due to leaching and runoff. In addition, the litter contains bacteria and other pathogenic microorganisms that can also potentially have impact on soil, water and food resources, especially if the manure has not been properly treated before being applied to the soil as fertilizer [3, 4].Accordingly, it is necessary to promptly remove bird carcasses, since they are a significant source of diseases and unpleasant odors and can become carriers of infections [5, 6].

An important criterion in assessing the impact of an enterprise on the environment is the characteristic of discharges. When breeding poultry, liquid waste is generated from various sources, including effluents from poultry facilities, as a result of their feeding and watering, as well as from waste storage and disposal facilities. Waste management measures, such as the introduction of manure into the soil, can create sources of discharges into water bodies from polluted areas. Both types of liquid waste are potential pollutants of surface reservoirs and groundwater with biogenic substances, ammonia, sediments, pesticides, pathogenic microorganisms and feed additives such as hormones and antibiotics, as well as heavy metals. Liquid waste from poultry breeding usually contains organic substances in high concentration, so they are characterized by high biochemical oxygen consumption and chemical oxygen consumption, as well as the content of biogenic substances and suspended solids [7, 8].

VAT as part of the CER or declaration is necessarily developed by an enterprise that discharges wastewater into a water body, usually surface. The permissible discharge standard must be established for each pollutant in each wastewater outlet and for the enterprise as a whole.

When wastewater is discharged into the urban sewerage system, a contract is concluded with the organization serving the collector and a permit for the discharge of pollutants is agreed upon, which, among other things, regulates the amount of discharge.

Poultry farms located in rural areas most often discharge into a water body. Enterprises located in the city limits, wastewater drainage is carried out in the city collector.

Emissions into the atmosphere from poultry facilities include pollutants released (when birds are kept): ammonia; methane, nitrous oxide, hydrogen sulfide, methylamine, phenol, methanol, propionic aldehyde; capronic acid, dimethyl sulfide, ethyl formate, fur dust, microorganisms.

During the operation of the boiler house and the waste incineration plant, nitrogen dioxide, nitrogen oxide, carbon oxide, benzapyrene are formed. Coal and slag depots are sources of dust emission [9, 10].Released pollutants of garage, RTM, car wash: hydrocarbons, nitrogen dioxide, soot, sulfur dioxide, carbon oxide. The litter storage is a source of release of methylamine, phenol, methanol, fur dust, microorganisms. The most significant pollutant in the list of released harmful substances by mass of emission is suspended solids. These are fur dust, coal dust, ash, soot [11, 12].

Ammonia and other odour sources are formed primarily during the denitrification of manure and can be released directly into the atmosphere at any stage of the manure processing process, including through emissions through ventilation devices of buildings and at manure storage sites. The level of ammonia emissions is also affected by ambient temperature, ventilation rate, humidity, stored volume, litter quality and food composition (raw protein) [13, 14].

Dust can impair visibility, cause respiratory problems and contribute to the spread of odors and diseases.

Pesticides can be applied directly to birds or premises and used to control pests (for example, parasites and vectors of infections) using antiparasitic baths, sprayers and aerosol generators. Pesticides can also be used to control predators. Possible pollutants from pesticides include active and inert ingredients, diluents and resistant decomposition products. Pesticides and their decomposition products can penetrate into surface and groundwater in the form of solutions,

emulsions or combining with soil particles. In some cases, pesticides can interfere with the use of surface and groundwater [15].

Results

As a result of the increased activity of poultry farms, there is a problem of unreliable environmental protection.

The negative impact of poultry farms can lead to an environmental problem with negative consequences for residents of settlements, to the death of flora and fauna not only near enterprises, but also neighboring territories.

Almost all poultry farms of the Russian Federation found themselves in a difficult ecological situation, as the accumulated bird droppings became a serious source of environmental pollution, because poultry farms do not have even the simplest sets of equipment to dispose of such volumes today.

CONCLUSION

To achieve maximum production efficiency and minimize waste generation, the following measures should be taken:

1. Carry out environmental protection measures.

2. Identify the sources of pollution.

3. Maintenance of storage systems, transportation of feed and feeders in proper working condition.

4. Consideration of the possibilities of mixing feed waste with other recyclable materials for subsequent use as fertilizers.

5. Use of control measures to minimize the amount of animal waste received and minimizes the migration of pollutants into surface reservoirs, groundwater and the atmosphere.

6. Providing structures of industrial premises and manure storage facilities that do not allow manure contamination of surface reservoirs and groundwater.

When identifying sources of pollution, quantifying harmful factors, carrying out environmental protection measures and maintaining environmental impact in accordance with established standards, organizing industrial environmental control, the environmental safety system of a poultry farm can be considered sufficient.

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