

An Analysis of the Economic and Ecological Effect on the Management of Livestock Waste Resources

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Abstract: With the continuous expansion of livestock and poultry industry in China, the pollution of livestock manure in farms has become a serious problem restricting the ecological development of breeding industry. Under the guidance of the economic ecological goal, the farm should make full use of the modern technical means to effectively carry out the management of livestock manure, improve the economic benefits of the farm, but also achieve the purpose of environmental ecological protection. This paper analyzes the ways of livestock manure management in livestock farms, aiming at improving the economic and ecological effects of livestock farming and promoting the healthy and sustainable development of livestock farming industry in China.

1. Introduction

The traditional livestock farming industry in China has focused its development goals mainly on the expansion of the scale and output value, but has not paid full attention to the problem of fecal pollution caused by livestock. Many livestock manure in the farm is directly discharged into the natural environment, and a lot of it has not been passed through Any degradation and conversion measures Livestock manure can cause great pollution to the environment. Under the guidance of China's green sustainable development policy, all levels of government and farmers should have a deep understanding of livestock manure resource utilization Governance the significance of the use of scientific governance technology to form an economic ecological effect.

2. Contamination of Livestock Waste in Farm

2.1. Water Pollution of Livestock Manure in Farms

Livestock manure contains a large amount of nitrogen, phosphorus, potassium and other elements, and a large number of untreated poultry manure in the farm is discharged directly into the natural water resources such as rivers and lakes, which will lead to the serious over-standard of nitrogen, phosphorus, potassium and other elements in the water resources, which will lead to the eutrophication of the water body, and the algae and other microbial communities in the water resources will multiply in large numbers, resulting in a sharp decrease in the oxygen content in the water resources and the death of fish and other large areas. And fish and other aquatic organisms will continue to pollute water resources after death, resulting in a serious vicious circle [1]. In addition, some farms do not directly discharge livestock manure into the water, but the anti-fouling measures on livestock manure are not complete. In the course of rainfall, livestock manure will become the main source of water pollution with the rain.



Figure 1 Livestock manure contamination

2.2. Soil Contamination of Livestock Manure in Farms

Livestock feed is used by farmers in the livestock feeding process. The current livestock feed manufacturers will add copper, zinc, phosphorus and other substances to improve the nutrients of the feed to promote the growth of livestock. The ingredients in the feed will enter the livestock with the digestive system of the livestock and be excreted with the metabolism of the livestock. If livestock manure is not effectively and harmlessly treated, the matter in the manure will be incorporated into the soil to contaminate the soil when it is dumped and buried directly. In addition, salt is also the main composition of livestock waste. A large amount of salt carried by livestock manure in farms will cause salinization of soil in long-term contact with soil, which is not conducive to the optimization of soil quality [2]. Nitrogen, phosphorus, potassium and other substances in livestock manure also react with the soil, resulting in the accumulation of organic matter in the soil.

2.3. Air Pollution of Livestock Manure in Farms

Livestock manure will also cause serious pollution to the atmosphere after excretion. Some organic substances in livestock manure will have a great smell of decay after prolonged exposure to the air. These odors are due to the decomposition of substances such as methane in feces and other chemical reactions that form gases with a polluting and odorous effect on the atmosphere and reduce atmospheric quality. In particular, the atmosphere with the wind is more fluid, will spread to the area near the farm, resulting in air pollution throughout the region. Among them, ammonia gas is the main forming factor of haze, when people or other animals absorb the air with large ammonia content for a long time, it will cause the disease of respiratory system.

2.4. Biological Contamination of Livestock Manure in Farms

Livestock manure grows large quantities of bacteria and parasite eggs when untreated. It has been found that there is a significant increase in the number of flies in the vicinity of livestock manure compared with other areas, which not only causes great damage to environmental hygiene, but also increases the spread of infectious diseases and poses a threat to the surrounding situation and the health of livestock.

3. Management of Livestock Manure in Farm under the Goal of Economic Ecological Effect

3.1. Feed control of Livestock Manure Resource in Farms

In the course of raising livestock, feed and other foods are rich in calcium, protein, fat, vitamins and carbohydrates, which are essential nutrients for the growth of livestock. In the process of resource management, the reuse of these nutrients cannot only avoid the pollution of water, soil and atmosphere, but also reduce the cost of livestock farming and improve the economic benefits. When reusing the beneficial substances in livestock manure, we should take care to isolate and eliminate harmful substances such as bacteria in feces [3]. At present, we can use high temperature drying method, chemical reaction method and microwave method to remove harmful substances in

livestock manure. The principle of high temperature drying method is to kill microorganisms and viruses in feces through high temperature technology, and recycle the treated livestock manure after drying. The chemical method uses formalin, ethylene, sodium hydroxide and other chemicals to deoxidize the microorganisms in livestock manure to make it inactive and realize the harmless treatment of feces. The silage method can be used in the preparation of treated livestock manure. The silage method is to silage the treated sterile livestock manure together with the green feed. In the silage process, the proper amount of water can be added and the proportion of the manure to the green feed can be adjusted to make the animal feed. The important advantage of the silage production method is that it can improve the fecal protein, supplement the lost nutrients in the harmless treatment of feces, and improve the nutrition level of fecal feed.

3.2. Fertilizer Treatment of Livestock Manure in Farms

In traditional agriculture, there has been a history of changing livestock manure into fertilizer to improve land fertility. However, traditional manure has not been treated by sterilization and antivirus, and it is not good for the healthy development of agriculture to transfer microorganisms and parasites into soil or crops when using traditional livestock manure. In the modern livestock manure disposal technology, the above defects can be effectively avoided, and the large-scale fertilizer transformation process of livestock manure can be realized. Composting is an effective technique for handling livestock manure. By controlling the moisture, pH and temperature of livestock manure, the ratio of carbon to nitrogen in manure can be optimized, and the application effect of fertilizer can be improved [4]. The treatment and processing process of livestock manure fertilizer is as follows: centralized fermentation of livestock manure, disinfection and sterilization of manure fertilizer, drying and cooling of manure fertilizer, crushing of feces, the pellets of crushing should be as small as possible, so that livestock manure fertilizer can be fully combined with soil, and the manure after crushing should be mixed with a certain amount of organic fertilizer composition, such as nitrogen, phosphorus and potassium, and finally made into organic fertilizer. The large amount of livestock manure produced in farm-scale farming has the effect of increasing soil organic matter, promoting crop growth and increasing production and income after good composting.



Figure 2 Livestock manure production

3.3. Energy-based Approaches to Livestock Manure Resource Management in Farms

1) Biogas production in livestock manure resource management

Livestock manure has a good burning characteristics, which can improve the economic ecology of manure by energy treatment. Livestock manure produces a large amount of methane gas during fermentation, the main component of biogas, which can cause serious air pollution when discharged into the air without treatment. However, using modern fermentation and gas collection techniques, methane gas can be converted into gas for production and living purposes. The current farm belongs to centralized culture, which lays the foundation for the effective collection of methane gas. Anaerobic bacteria can be used as decomposers in the decomposition of livestock manure, which converts fermented gases into methane and oxygen. Methane can be used for combustion, while

oxygen can be released into the atmosphere. Methane gas, as an important clean energy source, can be used for burning and heating, but at present, the engineering quantity of fecal fermentation conversion energy in our country is large, which is more suitable for large comprehensive energy projects.

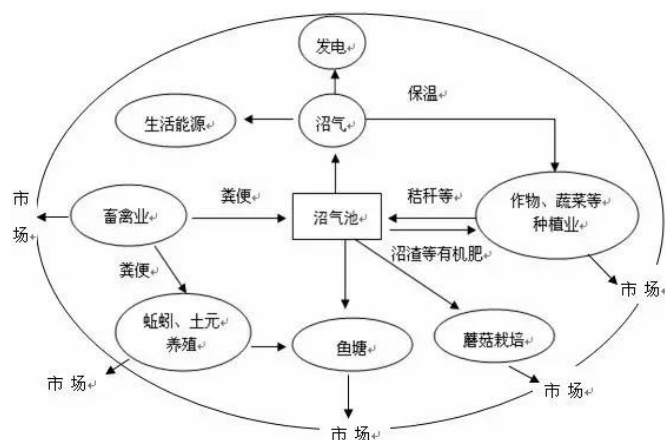


Figure 3 Livestock manure production

3.4. Production of Ethanol in Livestock Manure Resource Management

The feed of livestock and poultry is rich in fiber, which makes the feces also rich in cellulose, which is used as the raw material of ethanol. Therefore, the characteristics of livestock manure can be fully utilized in the development of livestock manure economy for ethanol development. The process of producing ethanol from livestock manure is to separate the plant fiber from livestock manure, use biological method to transform plant fiber into sugar, and use fermentation principle to convert sugar into ethanol. Using livestock manure as a new raw material for ethanol production has a good development prospect and is also an important way to control fecal resources and economic ecology.

4. Conclusion

Most livestock farms in China are built near the water source for the convenience of breeding, which has a great adverse effect on the safety of groundwater use. In addition, many components of livestock manure also bring harm to soil, atmosphere and other animal populations around them, such as the spread of germs, which makes livestock manure in farms one of the main pollution sources of the environment. Livestock manure disposal is not only an environmental protection, but also an important way to solve the shortage of energy and resources in the future.

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