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**USE OF DEJECT POND IN A CONTAINMENT IN DAIRY PROPERTY IN THE MUNICIPALITY OF DOURADINA-MS**

**BENEFÍCIOS DO USO DE LAGOA DE DEJETOS EM UM CONFINAMENTO EM PROPRIEDADE LEITEIRA, NO MUNICÍPIO DE DOURADINA-MS**

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**ABSTRACT:** The correct handling and storage of waste (stool, urine and wasted water from drinking fountains) produced by cattle in feedlots is a concern for producers. This procedure, if performed incorrectly, can cause serious problems for the environment and for the animals themselves. However, when the management is carried out properly, manure can bring many benefits to the property, as they are fertilizers that can be used in grain and forage production, in addition to reducing endo and ectoparasite infestations. In this context, the objective of this work was to characterize the benefits of using a manure pond in a demonstrative unit of milk production in Douradina, MS. The property has a confinement of dairy cows in three covered sheds, kept in the compost barn system. The areas are separated so that the straw bed has no contact with the wet part, in which animal waste is washed and channeled to the ponds through pipes. The lakes are on average 20 meters long, six meters wide and two meters deep, with a capacity of 240m<sup>3</sup>, covered with a plastic blanket to avoid contamination of the soil and water. The wet area is washed daily so that waste does not accumulate in the area. The ponds are emptied approximately every 20 days and the residues are sent to be sprayed on the crops, serving as a substitute for chemical fertilizers. The use of the waste pond resulted in greater well-being for these animals, better environmental sanitation and less risk of disease, with no

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harm to the soil. There was also greater profitability for the producer due to their use as biofertilizers, which resulted in greater pasture production per hectare. It is concluded, therefore, that the use of ponds is an excellent option for the proper destination of manure, which avoids undue disposal, ensuring soil conservation and improving the development of milk production and pasture growth.

**KEY WORDS:** Animal feeding, environmental control, university extension, milk production.

**RESUMO:** O manejo e o armazenamento correto de dejetos (fezes, urinas e águas desperdiçadas dos bebedouros) produzidos pelos bovinos em confinamentos é uma preocupação dos produtores. Este procedimento, se realizado de forma incorreta, pode acarretar em sérios problemas para o meio ambiente e para os próprios animais. Entretanto, quando o manejo é realizado adequadamente, os dejetos podem trazer muitos benefícios para a propriedade, visto serem fertilizantes que podem ser utilizados nas produções de grãos e volumosos, além de reduzir as infestações de endo e ectoparasitas. Neste contexto, objetivou-se, com este trabalho, caracterizar os benefícios do uso de lagoa de dejetos em uma unidade demonstrativa de produção de leite em Douradina, MS. A propriedade possui um confinamento de vacas leiteiras em três barracões cobertos, mantidas no sistema de *compost barn*. As áreas são separadas de maneira que a cama de palha não tem contato com a parte úmida, na qual os dejetos dos animais são lavados e canalizados até as lagoas através de tubulações. As lagoas possuem em média 20 metros de comprimento, seis metros de largura e dois metros de profundidade, obtendo uma capacidade de 240m<sup>3</sup>, revestidas por uma manta plástica para evitar contaminação do solo e das águas. A lavagem da área úmida é realizada diariamente para não ocorrer acúmulo de dejetos no local. As lagoas são esvaziadas aproximadamente a cada 20 dias e os resíduos são destinados a pulverização nas lavouras, servindo como substituto de fertilizantes químicos. O uso da lagoa de dejetos acarretou maior bem-estar para estes animais, melhor saneamento ambiental e menor risco de doenças, não havendo malefícios para o solo. Houve, ainda, maior rentabilidade para o produtor devido ao uso como biofertilizantes, o que resultou em maior produção de pastagem por hectare. Conclui-se, portanto, que a utilização das lagoas é uma ótima opção para o destino adequado dos dejetos, o que evita o descarte indevido, garantindo a conservação do solo e melhora no desenvolvimento da produção leiteira e no crescimento da pastagem.

**PALAVRAS-CHAVE:** Bem-Estar Animal, Fertilizantes, Saneamento.

## INTRODUCTION

Dairy cattle raising is one of the agricultural segments that has shown the most significant changes, due to the use of technology in dairy production and the greater number of



producers seeking options to ensure greater productivity and better sanitation conditions for these animals (OLIVEIRA et al., 2020).

The confinement regime in milk production has gained more space on the properties, which allows for better welfare for the animals, comfort and greater productivity. In this system, the animals receive food in the troughs, which they need, comfortable and functional facilities, which provide a better environment in terms of thermal comfort, to reduce animal stress, which increases the level of well-being and its productive response (GANDRA et al., 2019).

The intensification in the use of feedlots for dairy cattle is due to the need to increase the property, as it is necessary to be productive at low costs. Therefore, producers choose to increase the number of heads in their herds, without expanding the size of their areas, avoiding greater investments, given the current appreciation of land.

The confinement system allows the producer to be able to provide adequate food for each stage of production and provide animal welfare, which supports the animal to be able to expose its full genetic potential, which reflects in the increase in milk production (OLIVEIRA et al., 2017).

One of the biggest problems in cattle confinement management systems is the amount of waste produced daily, which is a major challenge for the disposal of waste from animal facilities, involving technical, sanitary and economic aspects. The total amount of organic effluents produced in dairy cow feedlots varies from 9.0 to 12.0% of the live weight of the herd per day, and also depends on the volume of water used to clean and disinfect the unit's facilities and equipment. of production (DURÃES et al., 2021).

Many producers handle waste inappropriately, throwing it directly onto pastures or plantations, or manure is offered in the soil without any prior treatment. However, this practice is already being changed, even in small properties, as this method used has a great potential for polluting water, soil and air, which causes incalculable consequences for the environment (NICOLOSO and OLIVEIRA, 2016).

Cattle manure has a large amount of nutrients that are considered essential for agriculture, generating a greater amount of forage mass produced per year, which contributes



to a more sustainable production, reducing the use of chemical fertilizers, influencing nutrient recycling (ALBUQUERQUE et al., 2016).

Currently, there are numerous forms of adequate treatment of these residues, such as stabilization ponds, composting, manure dumps, anaerobic digestion. All the methods mentioned are of great economic and environmental importance, as they prevent environmental pollution, which prevents these wastes from having direct contact with the soil, water and crops, before being treated, bringing savings to the producer, in addition to providing sanitation adequate (DURÃES et al., 2021).

In this sense, the objective of this work was to report a university extension action characterized as a demonstration unit, aimed at contributing to the productive potential of families, evaluating the benefits of using a pond for waste storage in a rural property located in the municipality of Douradina – MS.

## **MATERIAL AND METHODS**

This extension work was carried out in a rural property representing the creation of dairy cattle, Sítio Nossa Senhora do Abadia, in the municipality of Douradina-MS. The property has 60 hectares, located in a tropical climate region with latitude 22° 13' 18" South and longitude 54° 48' 23" West.

On the property, the chronological order indicated by Menegat et al, (2019) was followed, which highlight the importance of exchanging knowledge between those involved (academic community and producers).

The main focus of the property is dairy cattle farming, however it also has approximately 40 hectares for agriculture, where there is an average of 3 crops a year (corn for silage, soybeans and oats), in the rotation system and about 10 hectares for pasture. All agricultural production on the property is intended for animal feed.

On the property, the animals are kept in a confinement system, distributed in covered sheds, with average dimensions of 33mx12m, in a compost barn system. These sheds



are divided into two areas, one with a rice bed (dry area) and the other with a cement floor (wet area).

The dry area serves for the animals to rest (Figure 1), containing 40cm of rice straw on its floor. The wet area (Figure 2), on the other hand, has a drinking trough and troughs for feeding the animals, where most of the waste produced by the animals is concentrated. The wet area is washed daily with a high-pressure hose to remove waste, thus reducing the presence of flies and other parasites that can transmit diseases to the animals, in addition to causing annoyance, reducing consumption and consequently production.

**Figures 1 and 2:** Confinement with dry area and wet area, respectively. Images recorded by



students during the extension action, in 2021

The technology was implemented on the property by demand of the producer, who when starting to use the confinement system saw the need to give an adequate destination to the waste produced, since the inadequate destination polluted the soil, in addition to having observed an increase in the number of flies in animals.

All waste from the wetland is channeled to the waste pond, which was covered with a plastic sheet to prevent permeabilization of waste in the soil. On the property there is a set of ponds, each with an average of 20 meters in length, 6 meters in width and 2 meters in depth, thus having a capacity of 240 m<sup>3</sup> each pond. To prevent the entry of animals and consequently

reduce the risk of accidents, the lakes were fenced and a shock system was installed around them as a safety measure (Figure 3).

The effluents remain in the lake for approximately 20 days, so that the biological treatment takes place, until the stabilization of the organic matter occurs, leading to bacteriological oxidation. After this period the residues are sprayed as fertilizer on pasture and grain crops.



**Figure 3.** Waste pond. Images recorded by students during the extension action, in 2021

## RESULTS AND DISCUSSION

In the development of these reflections, with the implementation of the waste containment pond, the property resulted in greater animal welfare, as there was greater milk production by the animals, as they always had a clean, comfortable and fresh environment, with a low rate of contamination, reduction of the incidence of flies, due to daily removal of waste, thus inhibiting the stresses of these animals.

According to Orrico et al. (2016), with the use of proper waste management, there is an increase in the comfort and well-being of the animals, in addition to proper treatment and

disposal as agricultural fertilizer, due to the large amount of nutrients present in the waste. Another advantage mentioned by the same authors is the reduction of pollution, which can be caused by the evaporation of gases such as ammonia and methane.

After the implementation of the waste ponds, there was an improvement in environmental sanitation, reducing the incidence of diseases and also the infestation of flies and ticks on animals. With the lakes in operation, the effluent began to be biologically treated, preventing its penetration into the water body, or even preventing its use in crops with a high organic load (DURÃES et al., 2021).

The producer obtained greater profitability, due to the use of biofertilizers, in the pastures and grain plantations existing on the property, increasing its production. The application of biofertilizer and increased sanitation generates an increase in the economy on the properties, as it reduces the amount of inputs and chemical fertilizers in pastures and plantations (MATOS et al., 2017).

The use of biofertilizers from manure proved to be a viable and easily applicable reality, in view of the reduction of fertilizer costs over time, since the bioavailability and concentration of nutrient is lower in this type of fertilizer, when compared to chemical, in traditional use.

There is currently pressure for a sustainable management of agricultural waste, avoiding possible problems that may be caused by accumulations or inadequate disposal. In this context, its use as a fertilizer in agricultural production has stood out as a viable alternative to reduce pollution, improving soil quality as it keeps the soil covered, which reduces temperature, keeps moisture for longer, as well as activity and microbial biomass, essential for nutrient cycling.

These wastes are being used more and more as sources of forage fertilization, after undergoing adequate treatment, thus reducing environmental problems and problems with proper storage and disposal (ORRICO et al., 2016).

In addition, the animals needed less medication, as it has a low rate of contamination, reduced incidence of flies, due to the cleanliness of the place. It also obtained



an increase in milk production, compared to the daily cleaning of the sheds, due to the better comfort of these animals and increased production of vegetable crops.

With the completion of this extension project at Sítio Nossa Senhora da Abadia, there was an exchange of knowledge between producers and the academic community, in order to understand the importance of proper disposal of waste generated in dairy production. Many producers who do not have access to information are unaware of the importance of proper waste management, which can influence the improvement in the amount of milk and life, as they highlighted (OLIVEIRA, 2019, apud MENEGAT and CENCI, 2019).

The university extension expanding possibilities for student training, with the application of knowledge and, fundamentally, opportunities for exchanging this knowledge. The transfer of knowledge between the university and the community in general is essential for the production development process, in addition to providing knowledge aimed at improving the production base, supporting the academic training of students (MENEGAT, et al., 2019).

In this sense, Menegat et al. (2019), highlighted that university extension has as its central axis the formation of a link between university and community groups, enabling the transfer of academic knowledge and resignification of production procedures in the settlement, in search of new practices for production, with the aim of improving the quality of life of the people who produce and/or those who consume the products, with attention to the environment.

This article highlights the importance of sharing results with the aforementioned extension action, publishing them in an extension journal, thus circulating the knowledge obtained in the application in loco, subsidizing new actions, thus expanding the scope of university extension, which only makes sense when interchanged.

## CONCLUSION

The technology of the waste ponds proved to be an efficient alternative in the management of waste at the Nossa Senhora do Abadia demonstration farm, with positive gains for the producer and the environment, since when treating the waste before using it in the fields, reduces the risk of contamination of soil and watercourses.





However, the cost of acquiring the tarpaulins and the machinery for opening the holes means that this type of technology is not widely used, which makes it difficult to use more ponds on the properties.

Thus, the implementation of waste ponds can favor the development of properties because, in addition to being environmentally recommended, it generates income and favors the settlement of people in the countryside.

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