

Intensyvaus ūkio sistemų, mažinančių šiltnamio efektą sukeliančių dujų emisijas, įgyvendinimas

1. Keywords: Emitted gas, Manure, Ammonia, Greenhouse effect, Gas emissions

2. Area: Livestock farming, Organic Farming, Agro-environmental protection

3. Subarea: Emission reduction

4. Theme: Implementation of intensive farm systems that reduce greenhouse gas emissions

5. Year: 2020

6. Summary: EU agriculture emits more than 90% of ammonia, an important atmospheric pollutant that affects water, soil and the atmosphere. It also determines the acidification and eutrophication of natural ecosystems, contributing to the formation of solid particles that have a negative impact on human health. The animal husbandry sector is responsible for as much as 8-11% of global greenhouse gas (GHG) emissions such as ammonia, methane and nitrous oxide. The intensity of the animal husbandry farming is increasing every year. It is projected that by 2050 demand for milk and beef will increase by 72% and 82% respectively. Without any additional measures, greenhouse gas emissions could increase. Therefore, great attention must be paid to the largest source of ammonia in animal husbandry - animal excrements.

7. More detailed version of the summary: It also determines the acidification and eutrophication of natural ecosystems, contributing to the formation of solid particles that have a negative impact on human health. During the storage, handling and application of manure, nitrous oxide is released during nitrification / denitrification processes. Evaporation of ammonia and nitrous oxide from manure can lead to additional amounts of nitrous oxide gas due to atmospheric processes, the release of which depends on the type of manure storage systems, manure storage time, manure composition and climatic conditions. The technologies of feed production, the quality of the produced feed and the organization of animal feeding were analyzed on the selected 6 farms - those are the factors influencing the composition of manure, which respectively determines the amounts of pollutants. Most methane gas is produced in the rumen of ruminants by the breakdown of carbohydrates caused by microorganisms. The amount of methane released from manure is determined by the amount of manure, depending on the type and number of animals, the quality, amount and digestibility of feed fed, and manure storage methods. The use of liquid manure storage methods creates the possibility of anaerobic conditions, which result in the release of large amounts of methane, and the low release of methane from solid manure. Silage feed was used to feed the animals and it was found that the feed quality was not good enough on 2 farms. It was decided to use the innovative bacterial additive Biomin BioStabil Plus and the film in feed preparation for the production of bales, sealing of silage and covering of trenches. It was found that the addition of live lactic acid-producing bacteria in the production of grass silage significantly reduced the pH of silage, stimulated the production of useful lactic acid and at the same time fermented the optimal amount of acetic acid while accelerating the final fermentation of silage. It significantly reduced the formation of volatile organic compounds, such as ammonia and alcohols in silage. It was found on the remaining farms, that the silage used was quite high in crude fiber. In order to improve the absorption of feed nutrients, it was decided to use the biotechnology product Biogrom SC, and in order to reduce GHG emissions and nitrogen losses in the form of gaseous compounds - to use ProbioStopOdor to bind the gases. It was found that its use for 4 days had no effect on ammonia emissions in barns and a statistically significant effect on manure composition parameters. On the fifth day of the study, ammonia emissions began to decline. Subsequently, emissions decreased steadily over the whole study period by 2.5 - 18.5%. The measures used in the study had a positive effect on the productivity of the cattle.

8. Technology readiness level: TRL 3 - experimental proof of concept

9. Effect: Agro-environmental protection, Sustainable Farming

10. Argumentation: The use of an innovative bacterial additive and film for feed production increased the feed energy value by 4-5% and the protein content by 7-8%. Compared to silage without additives, the dairy cow productivity increased from 8 to 12%. The use of the biotechnology product in rations increased cow productivity by 6.3%. The calculated emission per 1 kg of milk has been reduced by 35 g, i.e. more than 3000 t per year.

11. Project description: -

12. Project: Implementation of intensive dairy farming systems that reduce greenhouse gas emissions

13. Education institution : -

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16. Images:

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17. YouTube: -

18. Documents: -