**Technical University of Moldova**

# EVALUATION OF THE EFFICACY OF BENZIMYDAZOL ANTHELMINTICS IN SHEEP

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**Chisinau, 2025**

**MINISTERUL EDUCAŢIEI ȘI CERCETĂRII AL REPUBLICII MOLDOVA**

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**„____”_____ 2025**

# APRECIEREA EFICACITĂȚII ANTIHELMINTICELOR DIN GRUPA BENZIMIDAZOLI LA OVINE

**Teză de absolvire a studiilor superioare integrate**
**Specialitatea 841.1 Medicină Veterinară**

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**Chișinău, 2025**

**MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF MOLDOVA**

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**Faculty of Veterinary Medicine**
**Department of Food Safety and Public Health**

**Admitted to defense**
**Head of Department:**
**Golban Rita PhD, Associate Professor.**

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**"_____" _____ 2025**

# EVALUATION OF THE EFFICACY OF BENZIMYDAZOL ANTHELMINTICS IN SHEEP

**Diploma Thesis at the End of Integrated Higher Education**
**Specialty 841.1 Veterinary Medicine**

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**Chisinau, 2025**

## ANNOTATION

Helminthiasis poses a significant challenge in sheep farming, affecting their health and productivity while causing substantial economic losses. Anthelmintics from the benzimidazole group, such as Alvet and Vermicid 10, are widely employed due to their broad-spectrum activity. This study assesses the efficacy of these preparations in combating helminthiasis in sheep, within the context of rising parasitic resistance, providing critical data for optimizing therapeutic strategies.

The research focused on analyzing the sheep's maintenance conditions, determining the extensivity (E.I.) and intensity (I.I.) of gastric helminth infections, and comparing the extensive efficacy (E.E.) and intensive efficacy (I.E.) of Alvet and Vermicid 10.

Methodologically, the study was conducted on a flock of 30 sheep from the „Malanețchi Iurie" farm in Criuleni, Republic of Moldova. The animals were divided into three groups: two treated groups (with Alvet and Vermicid 10) and one control group. Diagnosis was established using coprological methods (Fulleborn, Willis, Darling, Baermann), with treatment efficacy evaluated 14 days post-administration.

The prevalence of helminthiasis across the 30 sampled animals revealed that 80% exhibited digestive strongyloses (E.I. = 53.33%, I.I. = 7.16 eggs/microscopic field) and 40% showed respiratory strongylidoses (E.I. = 26.66%, I.I. = 15.61 eggs/microscopic field).

Efficacy in digestive strongyloses: Both preparations achieved an E.E. and I.E. of 100%, completely eliminating the infestation.

Efficacy in respiratory strongylidoses: Alvet recorded an E.E. of 93.4% and an I.E. of 96.0%, while Vermicid 10 achieved an E.E. of 94.6% and an I.E. of 97.0%, with infestation persisting in 6.6% and 5.4% of the animals, respectively.

Both preparations demonstrated maximum efficacy against digestive strongyloses. However, the incomplete results in respiratory strongylidoses may be attributed to larval stage resistance or rapid reinfestation. Vermicid 10 exhibited a slight advantage in treating respiratory strongylidoses, possibly due to differences in composition or bioavailability. These findings highlight the need for ongoing resistance monitoring and the development of integrated management strategies.



**Keywords: Sheep, parasites, efficacy, benzimidazoles.**

## ADNOTARE

Helmintozele reprezintă o problemă semnificativă în creșterea ovinelor, afectând sănătatea și productivitatea acestora și generând pierderi economice importante. Antihelminticele din grupa benzimidazolilor, precum Alvet și Vermicid 10, sunt utilizate pe scară largă datorită spectrului lor larg de acțiune. Studiul evaluează eficacitatea acestor preparate în combaterea helmintozei la ovine, în contextul creșterii rezistenței parazitare, oferind date esențiale pentru optimizarea strategiilor terapeutice.

Cercetarea a vizat analiza condițiilor de întreținere a ovinelor, determinarea extensivității (E.I.) și intensității (I.I.) invaziei cu helminti gastrici, precum și compararea eficacității extensive (E.E.) și intensive (I.E.) a preparatelor Alvet și Vermicid 10.

Metodologic studiul s-a desfășurat pe un efectiv de 30 de ovine din gospodăria „Malanețchi Iurie", Criuleni, Republica Moldova. Animalele au fost împărțite în trei grupuri: două tratate (cu Alvet și Vermicid 10) și unul de control. Diagnosticul a fost stabilit prin metode coprologice (Fulleborn, Willis, Darling, Baermann), iar eficacitatea tratamentelor a fost evaluată la 14 zile post-administrare.

Răspândirea helmintozelor în loturile formate din 30 de probe, 80% au indicat strongilatoze digestive (E.I. = 53,33%, I.I. = 7,16 ouă/câmp microscopic) și 40% strongilidoze respiratorii (E.I. = 26,66%, I.I. = 15,61 ouă/câmp).

Eficacitatea în strongilatozele digestive: Ambele preparate au atins E.E. și I.E. de 100%, eliminând complet infestația.

Eficacitatea în strongilidozele respiratorii**:** Alvet a obținut E.E. = 93,4% și I.E. = 96,0%, iar Vermicid 10 E.E. = 94,6% și I.E. = 97,0%, cu o persistență a infestației la 6,6% și, respectiv, 5,4% dintre animale.

Ambele preparate au demonstrat eficacitate maximă împotriva strongilatozelor digestive, însă rezultatele incomplete în strongilidozele respiratorii pot fi atribuite rezistenței stadiilor larvare sau reinfestării rapide. Vermicid 10 a arătat o ușoară superioritate în tratarea strongilidozelor respiratorii, posibil datorită diferențelor de compoziție sau biodisponibilitate. Rezultatele subliniază necesitatea monitorizării rezistenței și a strategiilor integrate.



**Cuvinte cheie: Oi, paraziți, eficacitate, benzinilamide.**

# CONTENT

# INTRODUCTION

Parasitosis is one of the most common and important diseases encountered in animal husbandry, with a significant impact on their health, productivity and well-being. In the case of sheep, helminth infestations, especially gastrointestinal nematodes and trematodes, are responsible for considerable economic losses, manifested by decreased production of meat, wool and milk, as well as costs associated with treatment and mortality. Effective management of these parasites requires the use of effective anthelmintic-based therapeutic strategies that ensure optimal control of infestations while minimizing the risk of parasitic resistance.

In this context, anthelmintics of the benzimidazole group occupy a central place in veterinary medicine due to their broad spectrum of action and proven effectiveness against a varied number of internal parasites. Compounds in this class, such as albendazole, fenbendazole or mebendazole, act by inhibiting the polymerization of tubulin in parasitic cells, which disrupts energy metabolism and leads to their death. Although their use is widespread, the effectiveness of benzimidazoles can vary depending on several factors, including the species of parasite, the degree of resistance developed, the dose administered, as well as the physiological peculiarities of the host. In recent decades, the phenomenon of anthelmintic resistance has become a major challenge in animal husbandry, including in the sheep sector, which requires periodic evaluations of the effectiveness of these substances in order to adapt treatment strategies.

Sheep, as a species of major economic interest in many regions of the world, including the Republic of Moldova, are frequently affected by mixed parasitosis, which complicates the therapeutic approach. The high prevalence of infestations with nematodes such as *Haemonchus contortus*, *Trichostrongylus spp*. or *Ostertagia spp*., together with trematodes such as *Fasciola hepatica*, underlines the need for studies to confirm the effectiveness of anthelmintic treatments under specific environmental and management conditions. In addition, regional differences in breeding practices, climatic conditions and exposure to parasites can influence the therapeutic response, which justifies local research to optimize deworming protocols.

***The aim of the study*** is to evaluate the efficacy of anthelmintics from the Benzimidazole group in combating parasitosis in sheep, with a focus on determining the degree of reduction of the parasite load and identifying any signs of resistance. The choice of this class of drugs is motivated by their frequent use in veterinary practice, but also by the need to update data on their performance in the current context of parasitic resistance.

***The objectives of the research include:***

1. The objectives of the research include:Analysis of the conditions of maintenance and rearing of sheep, with determination of the epizootological situation;
2. Determination of I.E. and I.I. of gastric helminthiasis in sheep on the farm.....
3. Determination and comparative analysis of E.E. and E.I. of antiparasitic preparations.

The relevance of this study is supported by the economic importance of the sheep sector in the Republic of Moldova, where sheep breeding contributes significantly to agricultural production and to the support of rural communities. With anthelmintic resistance threatening the sustainability of animal production, the results of this research can provide valuable information for veterinarians and farmers, helping to develop more effective and sustainable parasite control strategies. The study also aligns with global trends to promote animal health and food safety by reducing the risks associated with the inappropriate use of antiparasitic drugs.

Methodologically, the research is based on an experimental approach that combines coproparasitological diagnosis, controlled administration of anthelmintics and statistical analysis of results. This work aims not only to confirm the efficacy of benzimidazoles, but also to provide concrete data to support decision-making in current veterinary practice. Thus, the graduation thesis of the integrated higher education, specialty 841.1 Veterinary Medicine contributes to the enrichment of scientific knowledge in the field of veterinary parasitology and to the improvement of sanitary management in sheep breeding.

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