



Technical University of Moldova

**GASTROINTESTINAL TRICHOSTRONGYLIDS
SHEEP, DIAGNOSIS AND TREATMENT OPTIONS**

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Chisinau, 2026

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TRICHOSTRONGILIDELE
GASTROINTESTINALE LA OVINE, DIAGNOSTIC
ȘI POSIBILITĂȚI DE TRATAMENT

Teză de absolvire a studiilor superioare integrate
Specialitatea 841.1 Medicină Veterinară

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
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MINISTRY OF EDUCATION AND SCIENCE OF THE
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Faculty of Veterinary Medicine
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**GASTROINTESTINAL TRICHOSTRONGYLIDS IN
SHEEP, DIAGNOSIS AND TREATMENT OPTIONS**

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

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Chisinau, 2026

ADNOTARE

Autor: **ZOUBI Hamdan**

Tema: **Trichostrongilidele gastrointestinale la ovine, diagnostic și posibilități de tratament**

Locul și anul perfectării tezei: **Chișinău, 2026**

Structura și volumul lucrării:

Lucrarea cuprinde 86 pagini de text de bază și este structurată în următoarele capitole: Introducere, Revista literaturii, Materiale și metode de cercetare, Rezultatele cercetărilor proprii, Concluzii, Recomandări și Bibliografie. Lucrarea include 23 figuri, 10 tabele și 5 diagrame. Lista bibliografică este alcătuită din 28 surse științifice.

Cuvinte-cheie: ovine, trichostrongilide gastrointestinale, helmintoze, diagnostic coproparazitologic, tratament antihelmintic, rezistență antihelmintică, *Haemonchus contortus*.

Scopul lucrării:

Evaluarea prevalenței trichostrongilidelor gastrointestinale la ovine, aplicarea metodelor moderne de diagnostic coproparazitologic și aprecierea eficienței tratamentelor antihelmintice utilizate în controlul helmintozelor la ovine.

Obiectivele principale:

- Studierea particularităților biologice, epidemiologice și patogenetice ale trichostrongilidelor gastrointestinale la ovine;
- Evaluarea metodelor coproparazitologice utilizate pentru diagnosticul infestațiilor helmintice;
- Determinarea prevalenței și intensității invaziilor cu trichostrongilide la ovine din diferite sisteme de întreținere;
- Evaluarea eficienței preparatelor antihelmintice utilizate în tratamentul infestațiilor;
- Identificarea factorilor implicați în dezvoltarea rezistenței antihelmintice;
- Elaborarea recomandărilor privind prevenirea și controlul helmintozelor gastrointestinale la ovine.

Lucrarea reprezintă un studiu complex privind trichostrongilidele gastrointestinale la ovine, incluzând aspecte clinice, epidemiologice și terapeutice. Cercetările au fost efectuate în Republica Moldova și comparativ într-o fermă de ovine din Israel. Au fost utilizate metode coproparazitologice precum Willis, Darling și McMaster pentru identificarea și evaluarea gradului de infestare. Rezultatele obținute demonstrează importanța monitorizării parazitologice periodice și a utilizării raționale a preparatelor antihelmintice pentru reducerea pierderilor economice și îmbunătățirea stării de sănătate a efectivelor de ovine.

ANNOTATION

Author: **ZOUBI Hamdan**

Topic: **Gastrointestinal trichostrongylids in sheep, diagnosis and treatment options**

Place and year of thesis completion: **Chişinău, 2026**

Structure and content of the thesis:

The thesis consists of 86 pages of main text and includes the following chapters: Introduction, Literature Review, Materials and Methods, Results of Own Research, Conclusions, Recommendations, and Bibliography. The paper contains 23 figures, 10 tables, and 5 diagrams. The bibliography consists of 28 scientific references.

Keywords: sheep, gastrointestinal trichostrongylids, helminthiasis, coproparasitological diagnosis, anthelmintic treatment, anthelmintic resistance, *Haemonchus contortus*.

Aim of the research:

To evaluate the prevalence of gastrointestinal trichostrongylid infections in sheep, to apply modern coproparasitological diagnostic methods, and to assess the efficacy of anthelmintic treatments used in the control of helminth infections in sheep.

Main objectives:

- To study the biological, epidemiological, and pathogenic characteristics of gastrointestinal trichostrongylids in sheep;
- To evaluate coproparasitological methods used for the diagnosis of helminth infections;
- To determine the prevalence and intensity of trichostrongylid infestations in sheep from different management systems;
- To assess the efficacy of anthelmintic drugs used in treatment;
- To identify factors involved in the development of anthelmintic resistance;
- To formulate recommendations for the prevention of gastrointestinal helminthiasis in sheep.

The thesis presents a complex study on gastrointestinal trichostrongylids in sheep, including clinical, epidemiological, and therapeutic aspects. The research was conducted in the Republic of Moldova and comparatively on a sheep farm in Israel. Coproparasitological methods such as Willis, Darling, and McMaster techniques were used for parasite detection and evaluation of infestation intensity. The obtained results emphasize the importance of regular parasitological monitoring and the rational use of anthelmintic treatments in reducing economic losses and improving the health status of sheep flocks.

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INTRODUCTION

Sheep production plays a crucial role in global livestock systems, ensuring meat, milk, wool, and by-products that sustain both commercial farming and small-scale rural households. One of the major constraints to efficient sheep production worldwide is the impact of parasitic infections, particularly those caused by gastrointestinal nematodes (GIN), with the family *Trichostrongylidae* being among the most prevalent and pathogenic parasites (Popescu, I., 2019). These nematodes include species such as *Haemonchus contortus*, *Trichostrongylus colubriformis*, and *Ostertagia (Teladorsagia) circumcincta*, all of which contribute significantly to economic losses through reduced body weight gain, decreased wool production, anemia, diarrhea, and, in severe cases, mortality (Taylor, 2020).

Trichostrongylid nematodes are responsible for chronic parasitism, often subclinical, and the damage they cause is typically cumulative. Animals may show only subtle clinical changes until the parasite burden becomes critical (Urquhart et al., 2019). The parasitic effect arises mainly from blood-feeding (as in *Haemonchus contortus*) or from the destruction of the abomasal and intestinal mucosa (as in *Ostertagia* and *Trichostrongylus*) (Soulsby, 2018). These pathogenic mechanisms lead to protein loss, hypoproteinemia, impaired digestion and absorption, and immunosuppression (Jackson & Miller, 2021). Consequently, trichostrongylid infestations reduce productivity and raise production costs due to increased veterinarian interventions and the need for anthelmintic treatments (Popescu, I., 2019).

Several environmental factors such as temperature, humidity, pasture rotation, stocking density, and grazing management influence the epidemiology of trichostrongylid infections (Sanchez et al., 2022). Climate change, especially increasing temperatures and prolonged grazing seasons, has been correlated with higher prevalence and a more rapid development of anthelmintic resistance (Charlier et al., 2020).

Early diagnosis and monitoring of parasitic burdens are essential for reducing the negative impact on herd health and productivity. Traditional diagnostic tools include fecal egg count (FEC), flotation techniques, and larval culture (McMaster and coproculture methods). In recent years, molecular methods such as PCR and immunological assays (ELISA) have been increasingly used to confirm species identity and detect anthelmintic resistance (Kotze et al., 2020). The accurate identification of infecting species is critical for designing an appropriate control strategy (Taylor, 2020).

Chemotherapeutic treatment remains the main control method. However, the long-term and excessive use of anthelmintics has led to widespread drug resistance in nematode populations, particularly against benzimidazoles, macrocyclic lactones, and levamisole (Popescu, I., 2019). Anthelmintic resistance is currently considered a major global threat and a limiting factor in sheep farming sustainability (Kaplan, 2021). For this reason, modern control strategies focus on integrated parasite management (IPM), combining selective treatment, pasture management, nutritional supplementation, and alternative parasite control methods such as phytotherapy and bioactive forages (Waller, 2019).

The **overall purpose** of this thesis is to investigate gastrointestinal trichostrongylid infections in sheep by evaluating diagnostic methods and assessing potential treatment options to improve parasite control and reduce losses in sheep production systems.

Objectives:

- To review the scientific literature regarding the biology, epidemiology, and pathogenic mechanisms of gastrointestinal trichostrongylid nematodes in sheep.
- To describe and compare diagnostic techniques used for identifying trichostrongylid infections, including conventional and molecular methods.
- To evaluate the effectiveness of different anthelmintic treatments used in sheep, focusing on therapeutic outcomes and possible resistance.
- To formulate recommendations for integrated parasite management strategies suitable for sheep farms.

The study aims to contribute to better decision-making in parasite control and to promote sustainable livestock management. Ultimately, understanding the epidemiology and improving treatment strategies may reduce economic losses and increase animal welfare.

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