ЛЕСОТЕХНИЧЕСКИ УНИВЕРСИТЕТ
ФАКУЛТЕТ „ВЕТЕРИНАРНА МЕДИЦИНА"
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ACADEMIC STATEMENT

Assoc. Prof. PhD. Kalin Yordanov Hristov

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Faculty of Veterinary Medicine, University of Forestry

Scientific specialty: "Obstetrics and gynecology of animals and diseases of newborn animals", professional field: 6.4. Veterinary Medicine

Regarding: PhD thesis for obtaining of PhD degree in scientific specialty „Farm animal breeding, biology and reproduction biotechnology", professional field: 6.4. Veterinary Medicine

Author of the PhD thesis: Victoria Emilova Marincheva

Title of the PhD thesis: „Analysis of selection criteria for natural nematode resistance in sheep"

Scientific consultant: Assoc. Prof. Andrey Kurtenkov

Grounds for presenting the opinion: member of the scientific jury for the defense of the PhD thesis according to Order № ЗПС-607/19.12.2023 of the Rector of University of Forestry

1. Information about the PhD student

The PhD student Victoria Emilova Marincheva, studied in a PhD program in the scientific specialty „Farm animal breeding, biology and reproduction biotechnology" to the Department of "Anatomy, Physiology and Animal Breeding Sciences" of the Faculty of Veterinary Medicine at the University of Forestry. The training was carried out in an „self-study form" during the period 20.03.2023 - 19.10.2023.

2. General characteristics of the presented dissertation (PhD thesis)

Relevance of the topic: Selection in the breeding of farm animals reflects the efforts of mankind to improve the available potential of animals in order to satisfy its needs for food and production. Often, however, this leads to the emergence of problems, often related to the health status and disease resistance of the animals. One of the main problems in modern sheep breeding, related precisely to the occurrence of health problems, is the parasitism with gastrointestinal nematodes, leading to serious economic losses. In connection with this, the emerging anthelmintic resistance is an increasingly important factor in this direction. Additionally, the problem is exacerbated by environmental regulations limiting the use of medicinal products due to the expected residual amounts in water, soil and food.

One option to address the problem is aimed at breeding animals with resistance to gastrointestinal nematodes, after studying the ability of the host to fight the parasitosis depending on genetic predisposition and immune reactivity. Genetic variability can be found both within and between breeds. Resistance to gastrointestinal parasites in sheep has been found to be multifactorial but also heritable, although the polygenic nature of the trait has limited the development of a commercial test. The efforts of scientists are aimed at establishing genetic markers associated with resistance, but this type of research is still too specific, expensive and difficult to apply in practice. Currently, the selection standard is mainly based on the parameter of fecal egg count (FEC), hematocrit, examination systems such as body condition score (BCS), conjunctival color chart evaluation (FAMACHA system), evaluation of the degree of fecal pollution (Dag score), indicators

of the degree of immune response (eosinophils, immunoglobulins). When all these indicators are considered together, they can be used for the selection of resistant individuals and herds.
Therefore, the topic of the dissertation work is relevant and a more detailed and complex study of these relatively easily applicable methods will be extremely useful for veterinary science and practice.

Structure and volume: The PhD thesis is written on 195 pages, divided as follows parts: List of abbreviations - 1 page, Literature review - 54; Purpose and tasks - 1 page; Materials and methods - 13 pages; Results - 49 pages; Discussion - 38 pages; Conclusions - 3 pages; Implication – 2 pages; Contributions - 1 page; Recommendations - 1 page and References – 31 pages. To visualize the methods used and the results obtained in the dissertation, 74 tables and 16 figures have been prepared. The dissertation uses literature from 395 sources, of which 17 are in Cyrillic and 378 are in Latin, and about 29% (115/395) of the literary sources are from the last 10 years.

Review of the literature: The literature review includes comprehensive information on sheep domestication and the state of sheep farming in Bulgaria. Etiology, pathogenesis, clinical signs, epidemiological aspects, pathoanatomical findings and differential diagnosis in gastrointestinal nematode infection, as well as the economic aspects of this infestation, are discussed in detail. Attention is drawn to the anthelmintic agents applied in practice. The mechanisms for the development of anthelmintic resistance and immune defense have been extensively reviewed. The available literature are reviewed in relation to systems for the interpretation of clinical signs in gastrointestinal nematode infection and the possibilities for selection of sheep for resistance to gastrointestinal nematodes.

The literary review is competently written in a good literary Bulgarian language with an easy-to-read and easy-to-understand scientific style. It clearly shows the in-depth knowledge and acquired awareness of Viktoria Marincheva on the topic of the dissertation work. As a result, I believe that the skills for analytical summary of the scientific literature are built. The goal well and fully defines the essence of the work developed, and the tasks are set in a logical sequence and are specifically formulated, which helps to achieve the set goal.

Materials and methods: The studies included 46 animals, of which 25 ewes, 9 breeding rams, 12 ewes pregnant for the first time. Individuals were randomly selected from a herd of about 800 animals, of which approximately 450 ewes, 15 breeding rams and 250 young ewes. The experimental design and experimental setups are properly selected. To fulfill the set goal, 6 groups of research methods were used (hematological, parasitological, exterior measurements, assessment of body condition, assessment of fecal contamination and assessment according to the FAMACHA system), all of which are up-to-date and adequate to achieve the set tasks.

3. Evaluation of the results

The results of the conducted research are presented on 49 pages, including 8 figures and 63 tables. The visualization methods used allow tracking of changes and features. In addition to the presentation of all the results of the conducted research, in a separate point an in-depth statistical processing and analysis of the data was made. A good impression is made by the simultaneous presentation in general tables of the statistical processing of the data from the three experimental groups - mother ewes, rams and ewes pregnant for the first time, which allows an easy and quick comparison between the groups.

4. Evaluation of the discussion, scientific and scientific-applied contributions

The discussion thoroughly and competently interprets the obtained results with the data of other authors. This is an indicator of analytical, thoroughness and good preparation of the PhD student. Based on the results and the discussion, are formulated 19 conclusions. Five original and 8

confirmatory contributions are defined. I believe that contribution No. 4 of the group of "originals" formulated in this way should be considered as a recommendation for practice. I accept the remaining contributions as presented. I positively appreciate the prepared recommendations for the practice.

5. Evaluation of the publications associated with the dissertation

In connection with the dissertation, 3 articles in English have been prepared and published so far. Two of the publications are in a journal included in the NACID list of contemporary Bulgarian scientific publications, referenced and indexed in world-renowned databases with scientific information, and one is in a foreign journal, outside Web of Science and SCOPUS. The doctoral student has provided an opinion on the fulfillment of the minimum national requirements, issued by the University of Forestry.

6. Evaluation of the abstract of the PhD thesis

I am familiar with the abstract and I find that it reflects fully and adequately the content and achievements of the dissertation.

7. Critical remarks, recommendations and questions

I find it inappropriate and unnecessary to separate point in the literature review for reference values for blood parameters. Regarding the results, I think their performance could be improved. They should follow the same sequence as the tasks in the dissertation, which will facilitate their understanding and analysis. I find the results of the analysis of the blood samples too "fragmented" at individual points. The diagrams presented in the Discussion section, largely overcome the difficulty in interpretation, as they allow direct comparisons to be made between groups and sampling periods for individual indicators. However, it would be more appropriate if they were part of the "Results" section and replaced some of the tables used.

I accompany and positively evaluate the "conclusion" by the dissertation, which briefly summarizes the research conducted, the results obtained and their clinical and scientific value.

8. Conclusion

The merits of the PhD thesis, the publication activity, the personal contribution of the doctoral student and the fulfilled requirements for the necessary quantitative and qualitative criteria give me full reason to give my positive assessment of the presented PhD thesis and I propose to the respected scientific jury to award Victoria Emilova Marincheva the educational and scientific degree "PhD" in field of higher education 6. Agricultural sciences and Veterinary medicine, professional direction: 6.4. Veterinary medicine, scientific specialty "Farm animal breeding, biology and reproduction biotechnology".

02.02.2024 г. Signature:

Sofia /Assoc Prof. PhD. Kalin Hristov/