



OPINION

By: Assoc. Prof. Dr. Nikola Todorov Metodiev, Institute of Animal Science - Kostinbrod, professional direction 6.3 Animal Breeding, scientific specialty "Breeding of farm animals, biology and biotechnology of reproduction"

Subject: dissertation work for awarding the educational and scientific degree "Doctor" in the field of higher education 6. Agricultural sciences and veterinary medicine, professional direction 6.4. "Veterinary medicine", scientific specialty "Breeding of farm animals, biology and biotechnology of reproduction", on the topic: "Analysis of selection criteria for natural resistance to nematodes in sheep", presented by Master Victoria Emilova Marincheva, with a scientific consultant Assoc. Prof. Dr. Andrey Kurtenkov.

Reason for presenting the opinion: participation as a member of the scientific jury for the defense of a dissertation according to Order No. ZPS - 607/19.12.2023 of the Rector of LTU.

The presented dissertation work is written on 195 pages, including 74 tables and 16 figures, represented in a literature review, purpose and tasks, material and methods, results, discussion, conclusions, contributions, recommendations for practice, used literature consisting of 395 titles, of which 17 in Cyrillic and 378 in Latin. The scientific work is properly structured in terms of individual sections and meets the requirements for a doctoral dissertation. Three scientific publications related to the dissertation are presented, one of which is independent, and the other two are co-authored, in which the PhD student is the lead author.

Relevance of the topic

The topic of the dissertation is actual and dedicated to gastrointestinal nematodes in sheep and the ability of the host to fight infection, depending on genetic predisposition and immune reactivity. The actuality of the topic is also reinforced by the development of antihelmintic resistance of the parasites to the drugs aimed at combating them, as well as by the modern requirements of the market for the production of clean and healthy food.

Aim and tasks of research

The aim of the dissertation is an analysis of some selection criteria for natural resistance to gastrointestinal nematodes in sheep and an assessment of their applicability in practice. To fulfill the goal, 9 tasks have been set, which guarantee its fulfillment.

Material and research methods

One experiment was conducted with a total of 46 animals, of which 25 multiparous ewes, 9 rams, 12 nulliparous ewes, randomly selected from a herd of approximately 800 animals, of which approximately 450 multiparous ewes, 15 rams and 250 nulliparous ewes. An individual animal study protocol was performed - ear tag number, sex, age, breed, health status, FAMACHA score, body condition score (BCS), body measurements, degree of fecal contamination (Dag score), blood and fecal samples were taken. The same animals were also subjected to: exterior measurements; hematological tests - complete and differential blood count and biochemistry; parasitological examination - a modified McMaster method for

counting parasitic eggs (FEC); correlation analysis was performed to establish a relationship between FEC values and a number of clinical and hematological parameters.

The conducted experiment is a proof that the PhD student has mastered various methods for conducting scientific experiments. This, as well as the very well-made literature review, are a prerequisite that the PhD student has completed the first part (the educational) for acquiring the educational and scientific degree "Doctor".

Research results and conclusions

The results are presented in 13 figures and 68 tables, which well reflect the solutions to the tasks. The discussion and commentary on the results are correct and presented in good scientific language. The Results and Discussion section concludes a summary analysis of the results and discussion, which is an original solution by the PhD student. A good interpretation of results and their comparison with the results obtained by other authors, shows that the PhD student has also achieved the second (scientific) part for acquiring the educational and scientific degree "Doctor".

19 conclusions were drawn which clearly and accurately reflect the main results obtained by the study. Based on the obtained results, eight recommendations for practice are also presented.

Evaluation of the dissertation abstract

The abstract is prepared according to the requirements and objectively reflects the structure and content of the dissertation.

Critical notes, questions and recommendations

Critical notes

No introduction. The introduction is a mandatory part of any scientific work (dissertation, book, publication, etc.) which should introduce the reader to the problem/research.

In the "Material and methods" section, the rations and the way of rearing the animals are not specified. The dates and drugs with which the animals were last treated against parasites are not indicated (they are indicated, but in the section "Results discussion", p. 125 and p. 126). The number of ewes by lambing order is not indicated, but the results show a correlation between lambing order and FEC. It would be good if the birth dates of the specific ewes were indicated, as well as the length of the lactation period. On page 64 it is written "The analysis of the species composition was carried out in the parasitological laboratory of the FVM, Forestry University, by Assoc. Dr. K. Kanchev, but it will not be included in the present study, since the assessment of the indicator of natural resistance to GIP in sheep requires information only on number of parasite eggs and not specifically on a specific parasite species", which contradicts the facts stated in the literature review on page 27 "Interpretation should take into account the parasite species, the prevalence of infection, pasture conditions and individual variability (Abbott et al., 2012)." I consider the omission of species composition of gastrointestinal parasites to be a significant omission. The statistical procedures in processing the experimental data are incorrectly described.

There are too many tables and figures in the Results section, some of which could have been merged. Moreover, when there are significant differences, they should be noted in the relevant

tables and figures, but in this case there aren't. On page 109, the section "Statistical analysis" begins, and it should be named correlation analysis, since it presents the results of interrelationships between indicators.

The conclusions are too many and some of them could have been combined.

I consider it a significant omission to conduct only one experiment and that in a herd with heterogeneous breed status, regardless of the fact that the animals are from one productive (dairy) direction.

Questions

1. Why was such a number of experimental animals chosen - 25 multiparous ewes and 12 nulliparous ewes, out of about 800 animals, of which approximately 450 multiparous and 250 nulliparous ewes, considering what is stated in the literature review on page 26 "In such a case, it is necessary around 10% of the herd (20 - 40 animals or more in larger herds) should be examined so that the result reflects the group situation."?
2. What is the relationship between exterior body measurements and natural nematode resistance?
3. Why were the nulliparous ewes studied only once?

Recommendations for future work

I advise the PhD student to continue her research by covering a larger number of animals of different breeds and productive areas. To establish contact with breeding organizations and present to them her research and to propose to them a plan for the inclusion of the trait "natural resistance to gastrointestinal nematodes" in their breeding programs.

Conclusion

The presented dissertation work in terms of relevance, volume, methodological setting, level of research work and interpretation of the obtained results fully meets the requirements for a dissertation work. This gives me a reason to give my **positive opinion** on the presented dissertation work with complete conviction. I recommend to the respected Scientific Jury to award Victoria Emilova Marincheva the educational and scientific degree "Doctor".

07.02.2024

Member of the Scientific Jury:

/ Assoc. Prof. Dr. N. Metodiev/