REVIEW

on a dissertation work for obtaining the educational and scientific degree "PhD" in: field of higher education 6. "Agricultural sciences and veterinary medicine: professional direction 6.3 "Livestock breeding" the scientific specialty "Breeding of agricultural animals, biology and biotechnology of reproduction"

Author of the dissertation: Zornitsa Boykova Petkova extramural PhD student at the Department of Animal Husbandry at the Agricultural University, Plovdiv

Topic of the dissertation: Modern trends in creating a high-milk sheep population in Bulgaria and opportunities for using the Pleven Black-headed sheep in the breeding process

Reviewer: Prof. Dr. Stayka Staneva Laleva, Agricultural Institute - Stara Zagora, field of higher education 6. "Agricultural sciences and veterinary medicine: professional direction 6.3 "Livestock breeding" scientific specialty "Breeding of agricultural animals, biology and biotechnology of reproduction" appointed as a member of the scientific jury by order No. RD-RD-16-779/07.05.2022 by the AU Rector.

1. Brief introduction of the candidate.

Zornitsa Boykova Petkova was born on 28.06.1984 in Pleven. In 2003 she graduated from the Vocational High School of Veterinary Medicine "Prof. Dr. Dimitar Dimitrov" in Lovech, majoring in "Veterinary Technician". In 2007 she graduated from the Agricultural University, Plovdiv, majoring in "Agronomist-Animal Breeder". She completed her master's degree in 2008 at the Thracian University, Faculty of Agriculture, and was awarded the educational and qualification degree "Master" with acquired professional qualification in the specialty: "Animal Breeding-Equestrian Sport". From 2008 to 2012 she worked as a zoo engineer at the National Horse Breeding Association, Sofia. From 2012 to this moment she has been working as a zoo engineer at the Association of Horse Breeders in Bulgaria. In 2017, after successfully passing the exam, she was appointed as an assistant at the Institute of Forage Crops, Pleven. By order No. RD -26-107/ 18.12.2018, Zornitsa Petkova was enrolled in doctoral studies, part-time study at the Department of Animal Sciences, Agricultural University, Plovdiv, scientific

specialty "Breeding of farm animals, biology and biotechnology of reproduction", professional direction 6.3. "Animal breeding".

2. Relevance of the problem.

The dynamics of the socio-economic development of Bulgaria brings to the focus of society some significant problem areas, which are becoming increasingly relevant and represent a scientific interest with a high potential for creating new knowledge based on traditions and natural factors. The favorable natural and climatic conditions/givens for the development of agriculture define Bulgaria as an agrarian country, with deep socio-cultural traditions and rich generational experience in animal husbandry. As an example in this regard, the potential of sheep breeding can be highlighted, in particular of autochthonous breeds. Their breeding as a motivation and practice is a hereditary mark of socio-cultural traditions on the one hand, and an opportunity to rediscover their potential as a working solution for creating a better economic situation, livelihood, mitigating demographic processes and reviving the Bulgarian village, on the other. The variety of intangible benefits that people receive from indigenous breeds of animals includes contributions to cultural heritage, identity, existence, legacy and spiritual values, as well as important roles in education, recreation and landscape aesthetics. In addition, the adaptability, vitality and resistance to various diseases of indigenous breeds are increasingly important for the potential impact of climate change on current livestock systems worldwide. The geographical location of Bulgaria and the climatic features are prerequisites for the significant number of indigenous sheep breeds in our country. Of these, only two are dairy - Pleven Blackhead and Local Stara Zagora, which are the basis for creating a dairy sheep population in Bulgaria. The Pleven Blackhead sheep, as a breed with high adaptability and vitality, participates in all schemes in the selection process for creating a high-milk sheep population in our country.

Zornitsa Petkova's dissertation is a comprehensive study of the Pleven Black-headed sheep breed and the possibilities for its use in creating a sheep population combining high milk yield and fertility. It can be the basis of a selection process for transforming the Pleven Black-headed sheep breed into a specialized milk breed and for the production of specific dairy products with high added value and farm efficiency.

3. Purpose, tasks, hypotheses and research methods.

The purpose is clearly and precisely formulated, and the five main tasks set ensure its implementation. For greater precision, subtasks have been formulated for each task. For the development of this dissertation work, data from the reports of the "Association for Breeding Dairy Sheep Breeds" and the "Association for Breeding Pleven Black-headed Sheep" were used, as well as the pedigree records of the two breeding organizations since their establishment; analyses and reports of the Agency

for Animal Health and Welfare; data from the information systems of the Bulgarian Food Safety Agency; annual reports of the Ministry of Agriculture and Food.

The study included 30 herds of the SPBM breed. 23 of the farms are located in Northern Bulgaria, with 4 regions being distinguished –1. Ruse and Razgrad, 2- Pleven and Lovech, 3- Veliko Tarnovo, 4- Montana In Southern Bulgaria, 7 farms were included in the analysis - 5 in Haskovo region and one each in Stara Zagora and Kardzhali. Additionally, the milk yield of the entire population controlled by the Association for 2019 was studied, and 10,281 records of ewes from 132 flocks were processed.

Of the Pleven Black-headed sheep breed, 5 model farms were included in the study - two in Pleven region, one in Pazardzhik region, one in Sliven region and the herd of the Agricultural Institute - Stara Zagora. For the period 2020 - 2023, a total of 1,544 sheep in the first and second lactation were controlled.

To study the possibilities of using high-blood crosses of the Pleven Black-headed breed with the Asaf breed, an experiment was conducted with 85 sheep / F4 -crosses / at Galina Mircheva's sheep farm in the village of Petarnitsa, Pleven region in 2021.

Laboratory tests for the chemical composition and technological properties of milk, as well as blood analyses, were carried out with modern equipment, guaranteeing accuracy and precision in the relevant analyses. Statistical processing was carried out with mathematical models and software that are used by leading scientists in this field. The methodological approaches used by the doctoral candidate in the development of the dissertation work are correct, which in my opinion is an indicator of her very good theoretical preparation, acquired skills for planning and conducting experiments, and for analyzing and interpreting the results obtained.

5. Discussion of the results and used literature.

The results of the large number of methodologically correct studies are directed towards the main goal of the dissertation work, namely the assessment of the population structure and characterization of the genetic diversity of local Bulgarian sheep breeds. The interpretation of the data is done professionally, thoroughly and very accurately. The results of the various analyses are discussed and supported by data from leading scientists in recent years.

The results of the large number of methodically correctly conducted studies are aimed at the main goal of the dissertation, namely the assessment of the population structure and characterization of the genetic diversity of local Bulgarian sheep breeds. The interpretation of the data is done professionally, thoroughly and very accurately. The results of the various analyzes are discussed and supported by data from leading scientists in recent years.

6. Contributions of the dissertation work.

With the development of this dissertation work, Zornitsa Petkova makes a number of scientific and scientific-progressive contributions. I would like to note the following:

Scientific contributions

1. Significant differences have been established in the fatty acid profile of milk and dairy products from Pleven Black-headed sheep and its high-blooded crosses with Asaf.

2. Non-linear changes have been established in the production of dairy products from the milk of purebred animals and crosses. It has been established that the milk of sheep of the Pleven Black-headed sheep breed increases its biological completeness when processed into Bulgarian white brine cheese, and of crosses with Asaf - when producing yogurt.

Scientific and applied contributions

1. An analysis of the state and development trends of a separate, in terms of selection, part of the Synthetic Bulgarian Dairy Population has been carried out. It has been established that in recent years there has been a stabilization of the population in terms of the number of herds and controlled animals.

2. An analysis of the state and development trends of the Pleven Black-headed sheep has been carried out. It has been established that over the past 7 years the controlled part has had a steady tendency to decrease.

3. It has been established that the crossing of the Pleven Black-headed sheep with East Friesian rams does not lead to an increase in milk yield.

4. The use of ASAF rams in animals of the Pleven Black-headed sheep breed is effective and the high-blooded crosses have a high potential for milk yield and, with intensive breeding technology, can be successfully used for year-round milk production in our country.

7. Critical notes and questions.

The dissertation candidate has taken into account my critical notes from the preliminary judgments, therefore I do not have any for the dissertation submitted to me for review.

8. Published articles and citations.

Zornitsa Petkova has presented four scientific publications, in three of which she is the lead author.

The articles reflect part of the results obtained from the research in the presented dissertation. With the indicated scientific publications, the doctoral student exceeds the requirements of a minimum of 30 points, according to the LDASRB and the Regulations of the Agricultural University for its application.

The presented abstract objectively reflects the structure and content of the dissertation.

CONCLUSION:

Based on the different research methods learned and applied by Zornitsa Boykova Petkova, the correctly performed experiments, the generalizations and conclusions made, I believe that the presented dissertation meets the requirements of the LDASRB and the Regulations of the Agrarian University for its application, which gives me the reason to rate it POSITIVELY

I allow myself to propose to the honorable Scientific Jury to also vote positive and award Zornitsa Boykova Petkova the educational and scientific degree "PhD" in the scientific specialty: "Breeding of agricultural animals, biology and biotechnology of reproduction", professional direction: 6.3. Animal husbandry, field of higher education: 6. Agricultural sciences and veterinary medicine.

Date: 25.06.2025
Stara Zagora

REVIEWE