

SUMMARY
of the doctoral thesis entitled:
RESEARCH ON THE QUALITY OF BUFFALO SEMEN

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Over the last two decades, significant progress has been made in buffalo scientific and technological research. Numerous scientific and technological advances have been made and a wealth of scientific data has been accumulated in the fields of breeding improvement, genetics and breeding, physiology and biochemistry, feed and nutrition, reproductive technology, embryo biotechnology, dairy processing and disease prevention and treatment.

The present thesis is structured in two parts: the first part presents the bibliographical study of the chosen topic, the second part reports on the own research carried out.

Part I of the thesis begins with the first chapter, entitled THE GLOBAL, EUROPEAN AND NATIONAL SITUATION OF WHEAT WATLAND GROWTH. In the course of this chapter, data on the importance of bubaline rearing at world, European and national level are presented, together with numerical data on the bubaline herds at different levels, as well as the hierarchy of countries with bubaline herds, and it is structured in three sub-chapters. The historical evolution of bubaline rearing at both world and national level is also highlighted. The second chapter of the thesis, entitled MORPHOPHYSIOLOGY OF THE REPRODUCTIVE APPARATUS AND ARTIFICIAL INSEMINATION IN BUBALINES, is structured in five sub-chapters, including data on the anatomy and physiology of reproduction in buffalo, the seasonality of reproduction, the anatomy and physiology of reproduction in buffalo, the manifestations of sexual life in buffalo, the sexual cycle in buffalo, followed by semen control and insemination of buffalo.

Part II of the thesis begins with the third chapter, which describes the PURPOSE AND OBJECTIVES OF THE RESEARCH. The aim of this doctoral thesis is to conduct a well-founded research on the quality of semen semen in the bubaline species in Romania, in the European and world context of the growth and development of this

species, with the objective of using the use of high-quality semen in order to increase the number of herds and improve bubaline production in Romania.

Thus, the research undertaken in the realization of this PhD thesis aimed to assess the quality parameters of buffalo semen existing in Romania, in relation to the age of the animal, origin and time of harvesting. The following major objectives were set: Evaluation of the quality of semen obtained from young buffaloes, Evaluation of the quality of semen obtained from domestic and imported adult buffaloes and Comparative evaluation of the quality of semen from domestic and imported buffaloes. Three experimental groups were organized, containing data representing semen parameters from a total of 372 samples/ejaculates/pairs belonging to the species *Bubalus bubalis*, as follows:

1. experimental lot 1, with 42 semen samples from the ejaculates of young buffaloes, 8 individuals aged up to 3.5 years, of the breed Bivol Bivol Românesc, belonging to S.C. SEMTEST-BVN S.A. TÂRGU MUREȘ.
2. experimental lot 2, with semen from 165 ejaculates of two adult buffaloes, autochthonous, of the breed Bivol Bivol Bivol Românesc, with the names Ioni and Fani, belonging to S.C. SEMTEST CRAIOVA S.A.
3. experimental lot 3, with 165 samples of frozen semen imported from Italy by S.C. SEMTEST CRAIOVA S.A., belonging to 13 male animals of the Mediterranean Bison breed.

Within each experimental batch, for each sample, the values of semen quality parameters (volume, mobility before freezing, concentration, mobility after freezing and number of doses obtained from each ejaculate) were recorded. Statistical analysis of the data involved in the present research was performed using Medcalc software (MedCalc® Statistical Software version 22.023 (MedCalc Software Ltd, Ostend, Belgium; <https://www.medcalc.org>; 2024)).

On the basis of the data obtained from semen processing and laboratory analysis of the semen, the following statistical analyses were performed: statistical characterization of the performance of both the batch and each individual for each semen parameter;

- analysis of the influence of the harvesting season in correlation with: age category (under 3.5 years and over) or provenance (domestic or imported).
- comparisons between the quality of semen from imported and domestic males.

The fourth chapter entitled ASSESSMENT OF THE QUALITY OF SEMINAL MATERIAL OBTAINED FROM YOUNG BEEVALS includes results and discussion of the performance of the young buffalo herd, as well as their individual performance on the main semen quality parameters: ejaculate volume, mobility after collection, sperm concentration, mobility after freeze-thawing and the number of doses obtained from each ejaculate. Results were expressed both as individual values and as batch mean values. The chapter concludes with partial conclusions based on 20 graphical illustrations.

The fifth chapter, entitled **EVALUATION OF THE QUALITY OF SEMINAL MATERIAL QUALITY OBTAINED FROM SELF-HERALONIZED AND IMPORTED ADULT BIVOLES** is the largest chapter of the second part of the thesis and details 3 large sub-chapters: Evaluation of semen quality obtained from indigenous adult buffaloes during the observation period, Evaluation of semen quality obtained from imported adult buffaloes, Comparative research on semen quality obtained from imported and indigenous adult buffaloes and concludes with Partial conclusions on the comparative results on semen quality of imported and indigenous adult buffalo semen. This chapter concentrates 22 graphs and 37 statistical tables and analyzes the main quality indices of buffalo semen in terms of seasonal variation, taking into account the origin or provenance of the buffalo bulls, the sample to which they belong and also presents results of individual performance.

The sixth chapter concentrates Conclusions and recommendations for specialists in the field. This chapter is followed by a bibliography and appendices containing lists of figures, graphs and tables.