SUMMARY

of the doctorate thesis

“Contributions to the study of milk production for the cows exploited in some private farms from the eastern part of the country” elaborated by eng. **Rodica Dănăilă**, under the coordination of **Dr. Vasile UJICĂ**, at **“Ion Ionescu de la Brad” University of Agricultural Sciences and Veterinary Medicine – Iaşi, Faculty of Anima Science.**

The paper “Contributions to the study of milk production for the cows exploited in some private farms from the eastern part of the country” is structured in seven chapters.

In the first three chapters, the paper intends to highlight the current situation and the problems in growing the members of the Bovidae family for milk production at world and national levels as well as the perspectives in their growing and exploitation for milk production.

The next three chapters are dedicated to the study of the exploitation conditions and the productive and reproductive performances as well as the genetic parameters for:

- the cows grown in 43 exploitations;
- the milk cows grown in the eastern part of the country;
- the basic breeds for the milk production.

In this context, we considered useful that the themes of this paper should focus on the characterization of the growing technology and the main indices for milk production and the conditions of obtaining milk.

The first three chapters comprise a large study on the current and the future situation characterizing the growing of milk cows at world level and in Romania, through the filter of evolution and development of the human society in time depending on areas and economic situation.

Chapter I presents the social economic importance of the members of the Bovidae family and the role of this category in ensuring of a complex nutrition and better health of this population. Thus, the members of the Bovidae family supply a large and diverse volume of animal productions and products of first need for the consumption of population and raw materials for the processing industry.

Bovines supply 96% from the total quantity of milk consumed on earth, 33% from the meat production and 90% from the total number of skins.

In this chapter we also present the evolution of the family micro-farms for milk cow growing at world and national levels and the milk production at world and national levels.

Following the survey, it resulted that the bovine livestock at world level has known a slight ascendant trend and so have been productions. Large differences are registered among continents and countries depending on the natural conditions, the economic development, the tradition in growing members of the Bovidae family, the existence of the improved breeds and many other factors.

In **Chapter II** we present the factors influencing the individual milk production, the practiced technologies and the management of the technological factors in the private exploitations and the main cow breeds for milk production exploited in family farms in the eastern part of the country Bălţată cu negru românească, Bălţată românească and Brună.

The subject of milk cow growing and management in private exploitations such as family farms has a special importance both at world level and national level since the obtaining of a larger milk production, at minimal costs per product unit, creates the possibility to increase the life standard.

Taking into account that the cow exploitation for milk production in the eastern part of the country is practiced almost exclusively in family farms, we considered necessary and opportune to make studies and researches on the productive performances made in specific conditions of environment and exploitation technologies practiced in some Moldavian counties such as Iaşi, Bacău, Botoşani, Suceava, Vaslui and Vrancea.

Chapter III refers to some results of research and production on the growing of milk cows in private farms from Moldavia.

In **Chapter IV** we present the exploitations making the object of the study and the synthetic scheme for study development with its objectives and research activities, the goal pursued and the work methodology used.

Chapter V comprises the results of the agro-climatic survey for the eastern part of the country, the technologies and management practiced in the exploitations under study.

We have analyzed the production and reproduction performances for the members of the Bovidae family exploited in some private farms from Moldavia.

For this purpose, we have analyzed and researched the cow livestock comprised in COP determining 17 features for milk production (precocity features, milk production and reproduction) by analyzing the official data base for production of active population for the last 10 years, 1995-2006, in 6 counties from Moldavia (Iaşi, Bacău, Botoşani, Suceava, Vaslui and Vrancea), for the 3 basic breeds grown for milk production, Bălţată cu negru românească, Bălţată românească and Brună.

In the study was included a total number of 5033 heads grown in 43 exploitations, for the first 6 lactations. Thus, the cows from BNR breed are in 27 exploitations with 3249 heads,

Bălțată românească breed – 7 exploitations, with 583 heads and Brună breed, in 9 exploitations, with 1201 heads.

The data were obtained by the official control of milk production, from the data bases existing at OARZs (origin, production and reproduction) from the counties in question, they were taken over, analyzed and interpreted statistically.

Though in the Moldavian area there have been so far others researches on the population of members of the Bovidae family from the private-individual sector, we have decides together with our coordinator Dr. Ujică Vasile that they must be completed with data about the current state of improvement, the level of the productive performances, the manner they answer to specific technologies and the management of the technological factors, the genetic effect of maintaining in exploitation for an as long as possible period of time of the cows with very variable productive performances.

As for the **natural environment**, the eastern area of the country offers environment conditions favorable for the growing of members of the Bovidae family. The climate is temperate continental.

From the evaluations of the **production and reproduction performances** for the active population and from the **analysis of the milk production indices**, by successive lactations, by farms and counties, by breeds and genetic groups, it results the following:

- **Duration of total lactation** (DLT) for **Bălțată cu negru românească** population ranged between 365.15 days in 2nd lactation and 336.21 days in 6th lactation. For **Bălțată românească** breed, this period in continuously decreasing from 348.84 days in 1st lactation to 329.42 days in the 6th lactation. A similar situation may be noticed for **Brună** breed, the duration o total lactation decreasing from 339.95 days in 5th lactation to 348.68 days in the 1st lactation, except the 6th lactation that increased to 345.11 days. We may notice the tendency to extend lactation, especially for the cows with good milk productions.
- **Milk quantitative production,** for **Bălțată cu negru românească** breed, by normal lactation, by successive lactations, registers a normal curve of production registering a maximum production in the 3rd lactation, of 5681.91 kg milk, with limits between 2264 kg and 15664 kg, nut the minimum quantity was obtained in the 1st lactation, of 5165.60 kg, with limits between 2218 kg and 12260 kg. For **Bălțată românească** breed, the milk production by successive lactations has an ascendant curve from 3505.45 kg milk in the 1st lactation to over 4200 kg in the 5th and 6th lactations. For **Brună** breed the milk quantity obtained ranged between 3183.04 kg, in the 1st lactation and the maximum production registered 3381.43 kg, in the 5th lactation. From the analysis of the evolution

of milk production, by successive lactations, we notice that **Bălțată cu negru românească** breed and **Brună** breed from the area under study have a good productive precocity, in the fist lactation obtaining 90.91%, respectively 94.14% from the maximal lactation. **Bălțată românească** breed gives in the first lactation 82.30% from the maximal lactation indicating a medium productive precocity.

- **Milk fat contents** ranged between 3.99% in the 4th lactation and 4.04% in the 3rd lactation for **Bălțată cu negru românească** breed. For **Bălțată românească** breed, the lowest fat contents is registered in the 2nd lactation, of 3.88%, in the 4th lactation is 3.95%, with limits between 3.13% and 5.58%. **Brună** breed had medium fat contents that did not exceed 3.84%, in the 5th lactation, the lowest contents being 3.79% in the 1st and 3rd lactations. As for the **fat quantity**, there were + variants reflecting the genetic potential much higher than the one expressed by the medium values of population.
- **Milk protein contents** by successive lactations in the normal lactation registered, for **Bălțată cu negru românească** breed, values between 3.30% in the 3rd lactation and 3.26% in the 6th lactation. For **Bălțată românească** breed the protein contents registers the lowest values in the 5th and 6th lactations, of 3.24%, respectively 3.25%, the highest protein contents being registered in the 2nd lactation, 3.33%. **Brună** breed had a protein contents between 3.28%, in the 1st and 6th lactations, the maximum value being registered in the 2nd and 4th lactations, namely 3,32%, whereas the **protein quantity** in concordant with the milk production and fat contents.

From the analysis of the main **reproduction indices (VP, CI, SP)**, we draw the conclusion that the reproduction function unfolded within acceptable limits, breeders being interested in obtaining one calf from any cow annually.

- **Age of first litter** (VP) for **Bălțată cu negru românească** population was on average 946.99 days (≈31 months), with limits between 702 and 1258 days. For **Bălțată românească** population, the age of first litter was 888.09 days (≈30 months), with limits between 723 and 1246 days. **Brună** population had its first litter at the age of 868.29 days (≈29 months), with limits between 716 and 1261 days. From this viewpoint, the cows grown in private farms from the eastern area of the country have a good precocity, an aspect determined not so much by the genetic fund but by the growing technology of the young stock for breeding.
- **The kindling interval** (CI), appreciated as a synthetic indicator of the reproductive function, for **Bălțată cu negru românească** breed has an average value of 408.27 days for the first five lactations, the length of this interval was 394.53 days between the 5th and 6th lactations. For **Bălțată românească** breed the kindling interval was between 405.11

and 439.23 days. For **Brună** population the kindling interval did not exceed 397.68 days being close to the ideal one (365 days), except the interval between the 1st and 3rd lactations that was 407.32 days with limits between 304 and 690 days.

- **Mammary repose** (RM), depending on lactation, had an average value between 65.69 zile for the 6th lactation and 68.99 days for the 4th lactation for Bălțată cu negru românească breed. For Bălțata românească the mammary repose is continuously decreasing from 64.05 days, in the 1st lactation, to 52.75 days in the 6th lactation. Brună population registered values between 65.12 days in the 1st lactation and 56.60 in the 4th lactation.
- **Service–period** (SP) was considered from litter to first fertile mating having the average value for the entire Bălțată cu negru românească population of 661.29 days (≈22 months), with limits between 415 and 972 days (≈14, respectively 32 months). For Bălțată românească population, this index had the average value of 601.53 days (≈20 months), with limits between 437 and 960 days (≈14.57, respectively 32 months), close to the maximum acceptable limit (120 days). Brună breed registered an average value of 601.05 days approximately equal to the average value for SP 1 for Bălțată românească breed, with limits between 418 and 981 days (≈14, respectively 33 months).

As for the other variable lactations, the values of this index exceed 100 days, the maximum value registered being 124.62 days for the 1st lactation, and to the opposite pole is the 6th lactation with 103.40 days, values that can be found for **Bălțată cu negru românească** population. As for **Bălțată românească** breed, this index varies between 124.19 days for the 3rd lactation and 99.92 days. For **Brună** breed there are values ranging between 93.83 days for the 4th lactation and 99.83 for the 6th lactation, except the 2nd lactation where they register 104.79 days with limits between 36 and 288 days.

The variability of these indices offers the possibility of phenotypic and genotypic selection to genetically improve the population, but the main action must be oriented towards the technology improvement and the reproduction management.

Appreciated as a whole, the activity of reproduction of these populations of members of the Bovidae family is within normal parameters and highlights that Bruna breed has superior qualities to other improved breeds.

As for **heritability (h^2), repeatability (R), phenotypic (rp) and genetic (rG) correlations of the main selection characters,** the average phenotypic values of the production and reproduction features presented in the paper underlined the existence of some subpopulations with a high individual variability.

The **heritability coefficients** of the quantitative milk production indicate a weak hereditary transmission, a fact showing a deficient genetic consolidation of the feature in the population and possibilities to make improvement by a genotypic selection.

The **repeatability coefficients** for the section characters under study have values superior to heritability meaning a more faithful expression of the component genotypes and a better highlighted genetic determinism.

Analyzing the values of the **phenotypic correlation coefficients** between the quantitative milk production and the main productive and reproductive features, it results that in all counties, correlations are given according to the specialized literature.

As for the **genetic correlations,** between the milk production and other analyzed features, it results that they stay at a weaker degree than the phenotypic correlations, of the same sign. There is a tight genetic correlation between the milk quantity and the fat quantity, and protein respectively, a very favorable situation for the improvement of this parameter, taking into account the strong correlations between the milk fat and protein percentage.

The synthesis of the data on the **improvement value of the bulls used for reproduction** takes us to the conclusion that most reproducers had a negative influence on the main selection characters. This is reflected in the production indices much under the genetic potential of the breed and the very slow evolution of improvement of the morpho-productive and reproductive characters for the population from the eastern area of the country.

By synthesizing the results of the researches effectuated, we draw the conclusion that the members of the Bovidae family BNR, BR and Brună are well adapted to the environment conditions specific to the area, but their productive performances are modest and very different from one farm to another.

The large variability of the productive and reproductive features offers increased possibilities of genetic melioration using the modern criteria and methods.

The increase of the genetic productive potential shall be made by the intensive use of the great genetic value bulls as a main source of genetic progress for the populations of members of the Bovidae family. It is necessary to improve the technology and level of growing for the young stock for replacement, the production management, the exploitation technology and the management of the technologic and economic factors. The results obtained and the conclusions drawn from the research effectuated on the populations **Bălțată cu negru românească**, **Bălțată românească** and **Brună** from Moldavia, represent a documentation basis on the current stage of improvement and may be used in the zonal improvement programme making part from the national Programme for the improvement of the members of the Bovidae family.