

SUMMARY

of the doctor's thesis entitled:

“Contributions to the study of cattle breeding in the private farms from Câmpulung Moldovenesc and Vatra Dornei Basins”

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The paper entitled ***“Contributions to the study of cattle breeding in the private farms from Câmpulung Moldovenesc and Vatra Dornei Basins”***, coordinated by Prof.dr.eng. Vasile Ujică, comprises 2 parts and 13 chapters.

Representing a major source for the main food products (milk and meat), with a high biological value and for other products that are useful to man, cattle breeding and genetic improvement has always been a permanent major concern for animal breeders and specialists.

Cattle's breeding is an intensive branch of agricultural production, a mean to turn the fodder resources into account and to provide the basic existential means for humans.

Due to demographic growth and consumers' preferences for animal products, almost everywhere in the world cattle breeding has been one of the most important human activities. Currently, the cattle account for 65% (UVM) of the world's total number of domestic animals and represent the main source for milk and meat, accounting for more than 95% of the milk production, 33% of the meat production and about 90% of the production of skin used in the light industry, plus other important products (non-conventional energy, organic fertilizers and so on).

Considering the increased demand for milk and meat, we can do this by increasing the number of cattle and by genetically improve them through science and better technologies.

Starting from these remarks and considering the fact that in Bucovina (Câmpulung Moldovenesc and Vatra Dornei Basins being part of this historical region) animal breeding has always been more developed than other agricultural fields and

cattle's breeding has always been more developed than other species, I think that this area offers enough reasons for this work.

One more reason is the fact that the inhabitants of this area are good animal breeders, especially cattle. Also, in the structure of the agricultural lands from Câmpulung Moldovenesc and Vatra Dornei Basins, the grasslands and hayfields, which provide relatively cheap food for this species, are predominant.

In Câmpulung Moldovenesc and Vatra Dornei Basins cattle are mainly represented by two populations: Pinzgauer breed and its half-breeds, which has the most significant share (more than 60%) and the Brown breed and its half-breeds.

The challenge for this work has been represented by the necessity to have a study on the Pinzgauer breed that has this important share in these areas – the attempt to conceive an improvement program and by studying the way the Austrian Brown, which was brought here in 2004, has adapted itself.

People's interest in Pinzgauer breed comes to support the current concerns to preserve this breed in areas where it is spread (FAO's initiative and program). As far as the Austrian Brown is concerned, it is regarded as an alternative to the milk cows adapted to mountain area, with its restrictions as far as the breeding and using conditions are concerned.

Also, this paper wants to emphasize the economical efficiency of cattle breeding in Bucovina, depending on the breeding system and the system for turning the productions into account.

The research methods used were:

- ❖ Data collecting – using the following as methods: investigations, questionnaires, data bases;
- ❖ Creation of experimental plots;
- ❖ Calculation of variability, parameters and statistics regarding the production and reproduction characteristics, using the usual zootechnics methods and following a program conceived for the subject called “The technology of cattle breeding” by Prof.dr.Eng. Vasile Ujică and head of works, dr. Vasile Marciuc, adapted to the use of modern calculation techniques, with the help of computer.

After processing, the results have been compared to the ones obtained by these breeds in their origin countries, namely in Austria and to research data from the specialized literature.

Summarizing the results obtained and their interpretation, we can come to the following conclusion:

- Starting from the current situation and considering the lack of a clear orientation in the last years regarding the general development of economy and the prognosis by fields and activity branches, to make prognosis in the sector of milk production require some possible prevision for the main factors of influence, differentiated by hypothesis and alternatives for the dynamics of the general evolution.
- As in the past, the total demand for milk and dairy products supplying in the Central and Eastern European countries will continue to increase. Between 2002 and 2009 the human consumption should increase by 2.6 million tones, namely from 23.1 million tones to 25.7.
- At the level of the national economy, the production by animals have increased year after year, until 1997, when a slight decrease has been recorded, a decreased that, according to preliminary data, continued until 2000.
- In Europe, in the last 40 years, the total milk production has increased by more than 50%, growth which is mainly represented by the increase of the average production per capita, due to the genetic improvement of animals (selection, genetic engineering), prevention measures and improvement of exploitation technologies (food, reproduction, health), but also to a very competitive marketplace.
- The zootechnics patrimony of Romania, comprising mainly cattle and sheep, although reduced in number after 1989, continues to take the second place, among the Central and Eastern European countries from the former socialist type of agriculture, after Poland (192).
- The level of milk production per cow reflects the extensive character of exploitation in our country.

- The total milk production is affected by the slaughtering of young cattle of a very low, uneconomical weight and also, which is even more serious, many heifers able to reproduce are also slaughtered.

- Analyzing the average meat and meat products consumption per inhabitant and per total species, we notice a decrease compared to 2000, a phenomena also recorded for pork and poultry. A high decrease can also be noticed in the case of beef, from 12.8 kg in 1990 to just 7.0 kg in 2003 (194).

- The European Union records a high decrease of the number of agricultural farms and farmers (194).

- Therefore, we could say that most of the EU's countries perform a highly-industrialized agriculture, which implies high intermediary consumption of fertilizers, pesticides, energy and other (194).

- The current situation of the Romanian agriculture is characterized by many economical-social problems, the land being crumbled in more than 40 thousand parcels, as well as by the existence of many farms economically not viable. The main type of agricultural exploitation is the small farm, having an average surface of 1.8 ha of agricultural land (or 2.3 ha if we include the forest lands as well) and a share of 53% of the country's agricultural surface (192).

- Mainly cattle and sheep are bred in the hill-mountain area of Suceava county, because they can be fed from the natural reserves provided by the natural grasslands, including the alpine ones.

- In the areas studied, corresponding to the space used for cattle breeding, the milk production is exclusively obtained in the private farms.

- By tradition, in the mountain area almost every family has at least one cow, but the number may go up to 20, in the cases of the breeders that have larger surfaces of grasslands.

- The very different pedo-climatic conditions, as well as the ancient concerns for this, make cattle breeding in this area an occupation with totally different aspects, compared to lowlands;

- For the mountain area, the best results can be obtained from the mixed breeds, either milk-meat or meat-milk, such as: Romanian Spotted, Maramureş Brown of Transylvanian Pinzgauer, but also from the breeds already imported;

- The geographical positioning of human communities and agricultural farms, at high altitudes, as well as sheepherding as occupation during the warm but with abundant rainfalls season, together with the large surfaces of natural grasslands, allowed the development of nucleus of Pinzgauer cattle in the population's farms, their breeding becoming a traditional occupation;

- The environmental conditions and the traditional technologies of extensive breeding from Câmpulung Moldovenesc and Vatra Dornei Basins recommend the breeding of Pinzgauer cattle in this area;

- The share of this breed, together with its half-breeds, of more than 60% in the studied area, recommend measures for improvement of the breed and the continuation of zoning;

- In the country of origin (Austria), this breed is bred in the mountain area, in small family farms (10 capita), who also perform tourism activities, being certified as organic farms;

- At European level, by a FAO project, initiated by Slovakia and implemented in partnership with Austria and Romania they are trying, for biological, economical, genetic and historical reasons to actively preserve this breed. They also think that this breed is on the verge of extinction, due to its crossing with other breeds. The immediate objectives regarding the active preservation aim at adapting it to mechanized milking, a living weight of 450-500 kg, a milk production of 4000-5000 kg/normal lactation and a live weight of 350-400 kg, upon delivery. The period of time for the genetic progress is 15-20 years, otherwise it will not survive as breed (the Brown breed is considered to be as direct competitor for Pinzgauer);

- The Pinzgauer population from the studied area is different from the one in Austria, being less developed as far as the corporal size is concerned and also less productive, due to the exploitation conditions.

- Due to the limited productive performances, the number of Pinzgauer cattle has decreased from 9.4% in 1969 (national level) to 3.8% in 1981. This breed has been

“removed” from State Agricultural Enterprise and from Agricultural Production Cooperative but has been bred in the individual farms, who actually saved the breed (according to C. Drăgănescu);

- The genetic progress must aim at the intra-breed BLUP method, with emphasize on the rigorous selection of bulls, IA promotion in the mountain areas as well and the improvement of characteristics for mechanized milking;

- In Câmpulung Moldovenesc and Vatra Dornei Basins the average production set for normal lactations was of 3062 kg and 112.59 kg of fat, but we noticed the existence of some plus-variants with productions of more than 4000 kg of milk, aspect that show the future possibilities to improve this breed, by breeding pure breeds and by selection, using improving tested bulls;

- The Pinzgauer breed in the studied area, resulted from the transformation crossings, are different from the improving breed, by the size of the body, which is smaller with about 4%, as a consequence of the breeding conditions and lack of selection;

- Major differences can also be noticed when it comes to the height of the croup (smaller with 4.2%), the width of the croup (18%) and the depth of the thorax (5%);

- According to the study made by Fisteag and collaborators (1956), the body weight (480.6) noticed during research is lower than in other regions of the country, with up to 13.9% but higher for the same area (396 kg), with up to 21%;

- The value of the average interval between giving births (377 days), the value of the mammal rest (43 days) and the average value of the duration of lactation (333.5) shows that under the current feeding and maintenance conditions from the two studied basins the reproduction function is at a superior level;

- Over viewing the results of the research, we notice that the Pinzgauer population studied represent a valuable genetic material from the point of view of its improvement, by proper technical measures, its main strong point being the fact that this material is adapted to the current breeding areas and proper for the conditions of extensive exploitation for which it was created.

In order for us to conceive a program for improvement of Pinzgauer breed we must take into consideration the previous concerns and studies made for this breed and the current study which makes us reach the following conclusions:

- The expression of the characteristics of adults bodies is determined by their genetic structure and at the same time by the environmental conditions in which the genotype has to exteriorize itself;

- Achieving the objectives of improving the cattle breeds is conditioned, besides providing the proper environmental conditions, by the establishment of an hereditary base necessary for a high potential;

- In the country of origin – Austria, as a result of the decrease of quotation of this breed, they have launched a program that offers possibilities to improve a small number of cattle. That program aims at performing a fast genetic progress, based on advanced technologies, respectively the transfer of embryos, by which the test of origin for the milk production is eliminated, thus shortening the period necessary for homologating the bulls;

- In Romania, beginning with 1969, the programs for improvement have systematically excluded the Pinzgauer breed from the official technical actions, not taking the specificity of the breeding areas into consideration, where other breeds could not adapt themselves as well as Pinzgauer;

- The program for improvement implies the appearance of a mixed “desired type”, with equal share of milk and meat production or even 55% milk and 45% meat; (155)

- The milk production of the Pinzgauer population from Câmpulung Moldovenesc and Vatra Dornei Basins shows a pretty high variability that can be explained by the great differences in the genetic potential on one hand and by the diversity of exploitation conditions on the other;

- For the genetic improvement of the Pinzgauer population from Câmpulung Moldovenesc and Vatra Dornei Basins they are using and they should keep on using imported seminal material, from bulls with very good results;

- The genetic improvement of this population implies several factors to join their efforts: governmental institutions, by the network of specialists, various types of

associations of animal breeders and last but not least the animal breeders who are the exponents of the family farms;

- The proposed improvement program implies that in 2010 the “desired type” would produce on average: 4200 kg of milk, 164 kg of fat and 137 kg of proteins; (155)
- The program also implies correcting the utter and increasing the body size, by increasing the body to 130 cm and the body weight to 520 kg

The analyze made for the first lactation of the Austrian Brown breed under the circumstances of the semi-intensive breeding from Bucovina, as well as the analyze made on the ascendance of the imported cows that are at their first giving-birth show us the followings:

- The Austrian Brown breed, under the conditions existing in Câmpulung Moldovenesc and Vatra Dornei Basins, has recorded between 3475.54 kg and 5238.63 kg of milk, 132.04 kg and 200.57 kg of fat and 128.12 kg and 163.06 kg of proteins at the first normal lactation;

- The inheritability of the production indexes – h^2 has values between 0.16 (duration of the normal lactation) and 0.67 (the content of fat);

- The inheritability (h^2) of the production indexes at the ascendance of Austrian Brown cows has values between 0.26 (quantity of milk per maximum lactation of father’s mother – MT) and 0.37 (the quantity of fat + proteins per maximum lactation of mother’s mother – MM);

- In Austria, Brown breed is bread in farms that most of them have between 10 and 19 cows, the size of farms being comparable to the farms analyzed in Campulung Moldovenesc and Vatra Dornei Basins;

- In Austria, Brown produces between 6011 and 7085 kg of milk, between 250 and 292 kg of fat and between 205 and 240 kg of proteins/normal lactation, the results being superior to the ones from Câmpulung Moldovenesc and Vatra Dornei Basins;

- The best 10 Brown breed cows from Austria have produced in 2005 between 9938 of milk, with 4.73 %of fat, 3.88%of proteins, summing up 855 kg G+P and 12283 kg of milk, with 3.85 kg of fat, 3.59 kg of proteins, summing up 914 kg G+P;

- Analyzing the evolution of the milk production in the last 10 years (1995-2005) at the Austrian Brown breed one can notice an increase from 5549 kg of milk in 1995 to 6651 kg of milk in 2005 and in the case of cows that are at their first giving-birth from 4928 to 6001 kg of milk;

The analyzed and interpreted economical results tell us that:

- For an average production of 3900 kg of milk/cow/year, under the circumstances when 10 cows are bred in a farm, the profit can have different values, depending on how the production is turned into account, the profit being almost double when the direct sell is combined with sell through agri-tourism;

- The analyzed economical indicators have superior values in the case of semi-intensive exploitation of milk cows, compared to the extensive exploitation (this is valid from the average productions obtained and to work's productivity);

- The profit is almost zero in the extensive system of breeding and using cows only for milk production;

- Work productivity is 3.3 times higher in the case of the semi-intensive use of milk cows, compared to the extensive system;

The improving (amelioration) system we are proposing implies a genetic gain possible to obtain, which will be transposed into an extra quantity of 540.27 kg of milk, 16.51 kg of fat and 24.02 kg of proteins (155).