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Summary

Concerning the doctoral thesis *"Contributions to the study of productive longevity and precocity of the Romanian Black Pied cattle from the Dancu Farm Iaşi*", written by *Ph candidate, economist Raluca Ioana Pântia,* under the scientific coordination of *Prof. Ph. Engineer Vasile Ujică,* from the Faculty of Zootechnics of the University of Agricultural Sciences and Veterinary Medicine Iaşi.

Among the general biological traits (fitness traits) productive longevity and precocity have an outstanding importance in the selection and genetic amelioration of the cattle population being used as essential criteria of selection. These traits are influenced both by intrinsic (genetic) factors and extrinsic factors, namely, technological and managerial ones.

The longevity of the cow is connected to its capacity to delay the reform date which can have different causes. The criteria used for the evaluation of the functional longevity and length of productive life take into consideration the number of days between the reform date and date at first calving.

Precocity represents the ability of some animals to achieve at an earlier age than the usual one, a body development proper to adult age and also the ability to perform as early as possible, in normal conditions, its reproductive function (sexual maturity) and its lactogen function.

n the last years, all over the world, there is the tendency to introduce within the value of the synthetic index of selection of functional traits, both longevity and precocity with a positive effect on the permanent efforts to genetically ameliorate the populations.

Taking into consideration that the Romanian Black Pied is the most frequent in the breed structure of cattle in Moldavia and Iaşi District as well, and the fact that they have been grown since 1967 in the Dancu Farm, over 45 years, we have considered it necessary to undertake studies and research on the precocity of this nucleus of selection in connection with longevity and the environment influence, technology of exploitation and management of these fitness traits.

The motivation for this research is due to the fact that, although in Moldavia, at the Dancu Farm, the Romanian Black Pied has been grown since four decades and contributed to the amelioration of native breeds as well, from large areas of the country, there haven't been developed thorough studies so far to point out the race amelioration in what concerns the precocity aspect, the economic and genetic effect of keeping in exploitation cows with a remarkable genetic value for as long as possible. Moreover, we have to mention that there are few studies, incomplete ones on precocity and longevity for Romanian Black Pied cattle, not only for the population in Moldavia but for other regions of the country and other breeds as well. At he same time, the programs of amelioration neither included in the selection the precocity and longevity criteria nor estimated an index of selection for these general biological traits of dairy cows from the RBP.

The research was performed on the Romanian Black Pied livestock in the Dancu Farm – Iaşi – considering all the cows that entered the livestock between the years 2000-2008. There were studied the precocity traits for all the primiparous that were selected between the years 2000-2008 in connection with the longevity summarizing 999 cows that ended their productive career in this elite farm.

The doctoral thesis is structured in two parts with several chapters and subchapters comprising 215 pages.

Chapter I is dedicated to a synthetic study of documents from the literature concerning the general biological traits of cattle. Chapter I presents the general considerations concerning the precocity and longevity traits of cattle while Chapter II presents new data in the literature on fitness traits for different populations of cattle from our country and abroad.

Part II has six chapters in which there are analyzed the data obtainEditura After the presentation of the experimental protocol, taking into consideration the necessity and the aim of the research, the objectives and the research activities, the biological material and the methodology of research, all included in Chapter III, there are shown the results on productive precocity and longevity.

At the beginning there are analyzed the phenotypic and genetic parameters for the RBP population in the Dancu Farm, on successive lactations and genetic groups of parental half sisters. From the analysis of the phenotypic parameters there can be observed that the RBP population of the Dancu Farm had an average duration of total lactation of 350±1.75 days for ten successive lactations, with extreme limits of variability between 53 and 972 days. During the lactations the duration of the total lactation has a tendency to be close to the normal lactation. From the analysis of the indexes of the milk yield on total lactations, it is noticed that the studied population realized performances of over 5000 kg milk, on each of the tenth successive

lactations, with the exception of the last one when there were obtained only 4031.33 kg milk. If we study the evolution of the milk yield during life there can be observed performances of over 6000 kg milk in the first five lactations, namely over 7000 kg milk in lactations 2 and 3, while the maximum production was realized in the second lactation, 7403.30 kg.

As far as milk quality is concerned, the milk had a content of over 4% fat and even 5.09% in lactation II and also high protein content with an average of 3.42%.

The study of the productive longevity shows the following essential aspects.

The length/duration of productive life of the 999 cows that ended their productive career in the Dancu Farm, between the years 1995-2008, was of 1188.81 ± 18.11 days, with limits between 80 and 3272 days hence a very strong variability (s=572.53 days). The cows of this farm were exploited, in average, 3.89 normal lactations, while 74.22% of the cows that ended their productive career were exploited between 252 days and 410 days namely 1.5 normal lactations. The average milk yield on productive life was of 23031.09±360.21 kg milk, with individual limits between 26400 kg and 77566 kg milk.

Taking into consideration the duration of exploitation and the total milk yield it means that, in the studied population, we have 19.37 kg milk, 0.81 kg fat and 0.61 kg protein on day of productive life and respectively 11.50 kg milk, 0.48 kg fat and 0.36 kg protein on day of life.

If we take into consideration the age at first calving and duration of productive life it means that the cows of the analyzed population had an index of utilization of 68.46%, which is very low in comparison with the optimum value of 83% (after I.C. Drăgănescu).

The research concerning the precocity trait of the RBP cows of the Dancu Farm showed the following essential aspects.

The age at first calving was in average of 813.89±2.70 days with limits between 548 and 1525 days. It was acknowledged that the analyzed livestock was characterized by a good reproductive precocity (27 months and 4 days) but the variability of this reproductive parameter is very strong.

The interval between calving on whole productive life exceeded 400 days at the first seven calvings being of 420-430 days.

The dry period is the index of reproduction that recorded values close to the normal ones in all lactations.

The service period exceeded the optimum values for this indicator of the reproductive function, the cows being inseminated and getting gestant after the fifth heat cycle.

Watching the evolution of the age at first calving for the primiparous born between the 1995-2008 there are noticed the following aspects. The results show a decreasing tendency of the age of first calving namely a tendency of precociosness by the action of genetic factors (bulls

used for reproduction and mother cows selected in the reproduction nucleus as well as the management of technological factors of exploitation (reproduction, diet/feeding, care).

The somatic precocity was appreciated on the basis of body development with the help of the evaluation of main sizes and body weight of the primiparous.

In the analyzed period the height at the withers was between 131.57 cm at the selected primiparous from the 2000 generation and 138 cm at those selected from the 2006 generation with an average of the whole livestock of 135.48 cm.

The body weight was between 474.29 kg for the primiparous of the 2000 and 523.89 kg for the primiparous of the 2002 with an average of 510.8 kg for the whole livestock.

The body development analysis of the primiparous shows good somatic precocity even if in some years the reproductive youth didn't have the best feeding conditions.

The examination of the total score for the body conformation appreciation reveals that the average values were between 83.11 points for the primiparous of the year 2002 and 93.63 points for the primiparous of the year 2004 with an average of of 83.87 points for the whole livestock. These values indicate that the primiparous selected in the Dancu Farm rank within outdoor classes of very good rating.

The genetic parameters of the primiparous, precocity and longevity traits show different degrees of genetic determination as a consequence of the interaction genotype-environment specific to each character and the variability of the genotypes that form the groups of the studied animals.

The weak and negative genetic correlations prove the non-existence of a genetic pleiotropic determination for the analyzed traits.

The phenotypic variability of characters and fitness traits under study is high and the existence of individuals plus variants characterized by high values of maximum amplitude is an important reserve for amelioration.

The share of genetic variant out of the total variant is different for the studied groups and the traits. In the first stage of research there can be anticipated the desired effect of the selection for amelioration objectives on the basis of heritabilily and repeatability coefficients.

The results of our analysis concerning the precocity and longevity of the Romanian Black Pied cows from the Dancu Farm could be the scientific basis in order to optimize the fitness traits that need to be accomplished with value elements of economicity. In this respect the optimization of the duration of exploitation must take into consideration the age at first calving, the production, reproduction and body development indexes and the exploitation system as well, as limiting factors.