SUMMARY

Of the doctorate thesis **"Contributions to the study of precocity and productive longevity of the cattle from the breed Romanian Pied in the area of Bistrita-Nasaud**", drawn out by *Eng. Popsor Petrica Napolion,* under the scientific supervision of *Prof.Univ.Dr.Eng. Vasile Ujica* from the University for Agricultural Sciences and Veterinarian Medicine "Ion Ionescu de la Brad" Iasi, Faculty for Zooculture.

The thesis is structured in two parts, divided in six chapters and several under-chapters.

First part comprises an elaborated bibliographical study concerning the generic biological properties of the cattle, with special reference to the precocity and productive longevity. At the beginning of this part, the actual situation is analyzed, as well as the trends and prognosis for cattle breeding on national and international level. A special chapter is dedicated to he study of Simmental breed, and of its derivated types in different countries in which Romanian Pied is to be found too. Then, there are analyzed the precocity and productive longevity attributes, the results of the scientific researches on different breeds and populations, and the importance of these attributes at the improvement programs.

In the second part of the thesis, there are presented the working protocol and the research results (cap. IV and V), and in the chapter VI "General Conclusions and Recommendations" for production.

Own research regarding precocity and longevity of the breed Romanian Pied in the area of Bistrita –Nasaud

Necessity and goal of research

In making the decision to study the precocity and productive longevity of the breed Romanian Pied in this area, I guided after what, several years ago, the great genetician and zooculturist Prof. Dr. Gh. K. Constantinescu said: "*In order to improve an animal breed, you have first of all to know it, to be aware of its qualities and lacks, to know what is hereditary and what is impermanent, under what conditions it was formed, and how it reacts at the variations of these conditions etc., in order to give you the possibility to decide what is the direction for the improvement and what are the most efficient zoocultural methods."*

Taking into account that the breed Romanian Pied owes the majority in the breed structure of the cattle in the county Bistrita –Nasaud, I thought it opportune to

start researches on the productive performances taking into account the precocity and longevity under variable environment conditions and exploitations technologies applied within this area.

The research were conducted with the purpose to evidentiate the actual improvement stage, the productive level, and especially the longevity and precocity, offering in this way, useful data for conducting and applying the area program for improving this breed.

Motivation for these research is due to the fact, that although in Transylvania the breed Romanian Pied is being breeded for more than a century and it contributed to the improvement of the autochthon breeds, in Bistrita – Nasaud there were conducted up to the present time, no researches to evidenciate the economical and genetical effect of exploiting over a long period of time, this breeds' cows with special genetical value. We must mention, that studies about precocity and productive longevity of the cattle Romanian Pied are few and incomplete both for the populations from Transylvania, and for populations from other areas of the country. The improvement programs did not include in the selection the criteria of productive longevity, and there is no estimation for any selection coefficient for longevity and productive precocity.

Studied biological material

The researches concerning longevity and precocity were conducted on the cattle effectives Romanian Pied, that closed up their productive career in three farms, former IAS, and in the houses of the population from the area, as follows:

- IAS Bistrita 90 capita
- IAS Livezile 96 capita
- IAS Lechinta 58 capita
- Population households 150 capita

We must underline that these farms owed the most valuable biological material of Romanian Pied, that is why they were nominated to be elite farms that produced a great number of animals for reproduction (steers and babybeef) both in Transylvania and in the rest of the country.

Within the studied population, during the analyzed period, there actioned a total number of 38 bulls form the country, form Germany, Austria and Switzerland.

The synthetic scheme, with the experiment protocol , research objectives, biological material and working methodology are presented all along the thesis.

Research Methodology

Concerning the research methodology, we must underline that in writing this thesis and the present summary, we used the primary data bank of the official production control from UARZ Bistrita – Nasaud for the period 1985-2005, completed

with observations and personal determinations during this period of time, as the candidate has been working in the field of zooculture for more than 20 years.

In a first phase, all primary data have been ordinated on farms, lactations, genetical groups on paternal half-breeds, total population. The data were elaborated statistically, using the methodology indicated in the special literature concerning the zoocultural research (*Snedecor, Tacu, Sandu Gh., Horea Grosu, Ujica V, etc)*.

There were estimated the average values and the variability of the analyzed features, the data were synthesized in tables, completed with the graphical representation and photography when necessary.

Genetic quantitative parameters (heritability, repeatability, phenotypic and genetic correlations, improvement value) were estimated by means of modern methods (variation analysis, BLUP and REML) adapted to our country conditions by means of a program elaborated by *V. Ujica and V. Maciuc* from the Faculty for Zooculture Iasi.

The methodology specific to the criteria and goal objectives is to be found in details in the documentary part of the thesis.

Average values and age variability at the first calve (VPF)

The research results concerning the age at the first calve, as basic indicator for appreciation the precocity at cattle, are presented in table 115 and figure 73.

The analysis of this reproduction criteria, shows us that at the population of Romanian Pied from the area of the county Bistrita – Nasaud, the age of the first calve was of 1049, 69 ± 7,52 days (34 months and 29 days), with limits between 471 and 1524 days (15 months and 21 days – 50 months and 24 days)

These average values demonstrate that the population of Romanian Pied studied in this area, is characterized by a certain tardily, if we take into account the country average, that in 2006 registered 31 months.

The variability of this criteria was very pregnant, with limits between 471 and 1524 days, which means that some animals calved for the first time at 15 months and 21 days, and some others at 50 months and 24 days, that is from 1.29 to 4.17 years. These extreme values are not characteristic to the studied Romanian Pied, but, they represent technological mistakes that frequently show up in the cattle farms.

Out of our experience, we came across, that in the private households, there is the tendency to use for reproduction too young babycalfs, that calve for the first time before the age of 2 years, fact that does not indicate precocity. Isolated cases appear in the big farms too, where the first calve takes place too late, because of neglecting the youth for reproduction and because of imbalanced food of the babycalfs in the growing period.

Out of the variation chain analysis for the age of the first calve (fig. 73), we can come across that 57.87 % out of the studied population, calved for the first time at an age between 962 and 1173 days (32 months and 2 days – 39 months and 3 days).

The analysis of this indicator, according to the farm, we can observe that between the units researched there were registered significant differences (table 115-116 and figure 73). In this way, the cows form the farm Bistrita, had an average age of the first calve of 1096.30 ± 17.54 days, that means 36 months and 16 days, the difference to the average population being significant (figure 116).

A similar situation was registered at the farm Lechinta too, while the cows from the farm Livezile, had at the first calve, an age nearer to the average population , but significant from statistical point of view.

The most precocious were the animals from the private households, that had the first calve age of 996.73 ± 10.78 days (33 months and 6 days), the difference of 52.96 days to the average population being highly significant.

The first calve age is genetically determined, the male reproductors having a decisive influence. Technological exploitation factors and their management are also highly decisive too.

Analyzing the inter-population structure, there were identified 23 genetic groups of paternal half-breeds, that comprise 5-49 individuals (table 118). We must underline that in this study, there were not studied genetic groups with a number of less than 5 individuals.

Out of the analysis of the data in the table, we can observe that there existed 9 genetic groups with first calve age smaller than the average population, proving this way a reproductive precocity. Among these genetic groups, one can observe a good precocity in the daughters of the bulls code 50794, code 50694, code 50865, originated in Germany, but also in the daughters of some autochthons bulls with Fleckvieh ascendancy from Germany and Austria, the most representative being the bulls code 8875, code 17124, code 45057, code 8272 and 14677. Out of the autochthons bulls, the most tardily ones, have proven to be the daughters of the bulls code 6626, code 15390, code 8601, code 8547, code 6612, code 10261, code 4672, code 45075.

The data obtained by us, demonstrate that the majority of the bulls had a bad influence on the age at the first calve, as it resulted from the presentation of the improvement value for this criteria.

Correlated to the first calve age, there were analyzed some other reproduction criteria: mammary recumbency, interval between calves, service-period on entire population (table 119) and on each farm (table 120).

Mammary recumbency – according to the lactation had average values between 100.54 days (lact III) and 71.20 days (lact VIII), overpassing in all lactation the optimal value. The variability of this criteria was extremely high, the variation coefficient overpassing sometime 100. Concerning this maximal limits - they are due to untrue registrations, as some cows were considered to be in mammary recumbency after they have wean and did not get pregnant. According to the actual practice to register the selection data for this criteria, we consider it to be a technical mistake to

register the cows as “infertile” while they are in mammary recumbency until they get pregnant again and calve.

Interval between calves - overpassed in all lactations the value of 400 days, considered the maximal acceptable limit for this reproduction criteria.

The variability of the interval between calves was bigger at firsts calves, and with a normalizing tendency in lactations V-IX, the variation coefficient reaching values between V% = 22.18 and V% = 17.90, and standard deviation between s = 92.54 days and 73.90 days.

Service-period in all lactations overpassed the optimal value, the cows from the studied population getting pregnant after 109.33 days (minimal value) and 168.14 (maximal value).

In a fair exploitation and with a good management of the reproductive function, the service-period may not overpass for sexual cycles, that means, the cows should get pregnant after no longer than 84 days from the previous calve. Overpassing these limits means economical losses, found in a smaller number of calfs, production losses, higher consume of forages and higher sustenance costs. From this point of view, the management of the reproduction function in the studied exploitations was improper, as it resulted from the average values of the main reproduction criteria.

The analysis of the reproduction criteria, according to the exploitation, evidenciate highly significant differences between the analyzed farms. An almost optimal situation is to be found for the mammary recumbency and the interval between calves at the cows from the private households (table 120), but not was the service – period concerns. The most unfavorable situation was registers at farm Livezile, where the reproduction function was done at an improper level, with negative influences on the milk production and economical results.

The variability of the main morphological and body shape characters according to the exploitation function is presented in table 125 and in figure 78-84.

Out of the analysis of the average values for body weight and size, we can observe that the cattle of the three farms do not significantly differentiate from the point of view of the body development. The average values of the main body dimensions, at first lactation, demonstrate a body development that does not come near to the optimal values for the breed Romanian Pied, fact that underline some imperfections in breeding the reproduction youth and a weak somatic precocity.

The second criteria by means of which it was analyzed the productive precocity of the cows belonging to the breed Romanian Pied in the area of the county Bistrita – Nasaud, is the milk production at the first lactation in comparison to the maximal lactation, and which is the maximal lactation realized during life course.

The results concerning this criteria of the productive precocity are presented in table 128 and figure 87-88.

Precocity analysis on milk production during life course

In table 129-133 and figures 89-92 there is presented the evolution of the milk production indicators according to the lactation.

The milk quantity at first lactation was of 2673.84 kg, representing 72.81% of the maximal lactation. The value of this indicator evidentiate a good precocity of the studied population, that overpasses the lower limit (65%) that is being quoted by the specialized literature.

In comparison to the first lactation, in the second lactation the milk quantity registers a growth of 5.52%, and the third lactation of 10.47%. The milk production indices register maximal values in the fifth lactation, the studied population situating itself within the parameters of the breed Romanian Pied for this criteria.

The evolution of the milk, grease and protein quantity is represented in figures 90-93.

The quantitative milk, grease and protein production indices follow the same curve for the total lactation as it results from table 130-132 and figure 88-91.

If we analyze the evolution of the milk production, on successive lactations during life course, according to farm, one can observe some significant deviations (table 133 and figure 93).

So, both for the farm Bistrita and for the private households, the evolution of the milk production during life course has a normal trajectory, the maximal production being registered during the fifth lactation. For the animals in farm Bistrita, during the first lactation there was realized 76.29% of the maximal lactation, fact that proves a good productive precocity. During second lactation, there was registered a growth of only 1.87%, and during third lactation of 22.05% in comparison tot eh maximal lactation. In case of animals in private households, the lactation curve has a trajectory much closer to the optimal values, the rise during the second lactation being of 8.38% and of 11.38% during third lactation in comparison to the first lactation.

These data prove a good productive precocity, similar to the one registered at farm Bistrita.

In case of farms Lechinta and Livezile, the evolution of milk production during life course is atypical, proving severe deficiencies in the technologies of these farms.

For farm Lechinta, the maximal production was attained during first lactation, fact that equivalates to a special precocity of the studies nucleus. This situation can not be considered normal, as the maximal production could be appreciated to be registered during fourth lactation (2561.9 kg milk), that would mean a good productive precocity.

A special situation is represented by the evolution of the milk production in the farm Livezile. Out of the aspect of lactation curve, there comes out a planeity during the four lactations, then, the maximal production during fifth lactation, after which the milk production decreases normally up to the end of the productive life. This lactation

curve planeity during the first four lactations does not represent a normal situation, but more several sample errors or an insufficient exploiting technology.

Following the milk production evolution on successive lactations, one can observe significant differences in the milk and grease quantity, but not significant for the proteins content and proteins quantity (table 134-139).

♠ the conclusion drawn out form the analysis of these aspects, is that the population of Romanian Pied in the studied area, is characterized by a good productive precocity, that situates it among accepted limits for this breed, even for the situations in the farms from Livezile and Lechinta.

A big influence on the productive precocity had both the reproduction bulls, that were imported, and the environment factors and the exploitation technology.

♠ The population of Romanian Pied in the area of Bistrita – Nasaud is not characterized by a good reproduction precocity, the age at the first calve being of 1049.69 days (34 months and 29 days)

♠ The variability of the three basic indicators for the appreciation of the precocity of the Romanian Pied cattle in the area of Bistrita – Nasaud was especially underlined, with extreme values for the amplitude of the variation chain.

♠ Among the farms in the study, there were registered significant differences, both for the age of the first calve and for the precocity of the milk production, the best values being obtained for the Romanian Pied cows, exploited by private households.

♠ Under the aspect of the somatic precocity at the population of Romanian Pied in the studied area, it reveals a weak precocity, because of some deficiencies in breeding the reproduction youth, especially concerning the feeding on ratios that should satisfy both quantitatively and qualitatively the physiological demands specific to the growing period.

♠ Among the studied population there were identified more genetic groups of paternal half-breeds, for whom the genetic value for precocity clues, presents special interest, that must be taken into account for the genetic improvement of the Romanian Pied population in this area.

♠ The productive performances and the quantitative genetic parameters are elements that evidentiate the genetic value and the possibility for accomplishing the objectives of the area improving program, by means of improving the exploitation technology and exploitation management, and also by using for reproduction of several imported and autochthones improving bulls. In this way, there is to be noted the contribution of the company SEMTEST Tg. Mures, where there live bulls belonging to the breed Fleckvieh, resulted from genetic lines of the breed that is internationally recognized.

Longevity study on Romanian Pied cattle population from the area of Bistrita – Nasaud

Studied groups and their farm repartition

In order to accomplish the study on longevity, we used the data existing in the data bank of UARZ Bistrita – Nasaud and ANARZ Bucharest, from which we extracted the official control data of the productive performances during a 15 years period (1990-2005). Using these data that were statistically manufactured and ordered in synthetic tables, we analyzed first of all the productive performances, body development, conformation – shape and the main reproduction indicators for a group of 394 Romanian Pied cows, that were divided in three farms (former IAS) and the private households in the area (table 98).

Out of the analysis of the study group data, one can observe that in the studied population there were intensivly used for reproduction some bulls resulted from related genetic groups (paternal half-breeds), whose dimensions were between 5-49 daughters.

One can evidenciate the intensive use of the bulls code 14493 that had 49 daughters, code 45057 with 29 daughters, code 8601 with 23 daughters and code 91.4 with 20 daughters. There were some other bulls that hat a greater number of daughters in the studied farms, the total number of genetic groups studied for morpho – productive characters were 23.

Average values and productive longevity variability on the Romanian Pied population in the county Bistrita – Nasaud

From the good start we must accept that the majority of reforms concerning cows are represented by the necessity reforms, and less by selective reforms. Out of the study performed by C. Velea and Col. (1988), on Romanian Pied, but also from other researches conducted by V. Ujica, Gh. Georgescu, I. Fisteag, G. Stanciu, etc, one can observe that together with growing the cow effective in a farm, there is a rise in the number of reformed cows. This aspect leads to a decrease in cows' productive longevity. As consequence this has as effect, a milk production decrease for every cow from the effective, and implicitly of the calf number. The mentioned aspect, reflects upon the attaining the programmed effective by the end of the year, in that exploitation group. Another aspect that is in contradiction to a normal flow of activity is the moment and cause in which the taking out of the reformed cows is performed.

Many times the animals are eliminated from the effective because of accidental causes, at a too early age, before they could have attained the maximum production potential. As such, these animals attain a smaller life course production that the genetic material they have at their disposal.

Research concerning productive longevity at Romanian Pied in Moldavia were conducted by V. Ujica and Geluca Grigoroscuta , and at Brown by V. Ujica, V.

Silistru, Margaret Mihailescu etc. The study conducted on the breed BNR from Moldavia, by D. Pantazi (2000) reveals following:

Productive life course of the 2744 cows that ended up their production career in the studied farms was of 931.53 days, with limits between 90 and 2649 days, so with a broad variability (V% 54.49). This cows' population were exploited, in average, only during 3.05 normal lactations (of 305 days), without reaching the maximum production potential during life course. For the 144 genetic groups analyzed, the productive life course was between 200 and 1999 days.

Life course was of 2138.12 days, with limits between 844 and 4184 days. It results, that the cows were maintained in the population, during an average of 5.85 years, with limits between 2.31 and 11.46 years.

The variability of the life course was especially underlined, being much influenced by exploitation technology and farms' management.

Based on these data, there was estimated the cows usage duration, by calculating the usage coefficient (IU%). One can observe the usage coefficient had an average value of 43.56%, with limits between 10.66 and 63.31%, according to the farm.

The analysis of these data shows that the BNR cows were used in the production a much to shorter period of time, compared to the optimal value for this breed (83% after Draganescu IC.) There existed cows that had an organic resistance, and a state of health that permitted their keeping alive up to an age of 8.7 years, but these one were not the most productive ones. Out of the presented study, there resulted that in the majority of cases, the performant cows were taken much too early from the effective, either because of genital affections, or in majority of cases because of the udder affections and weakening the limbs resistance.

The results obtained on Romanian Pied, in the study conducted in the area of Bistrita -Nasaud can be compared to the researches results presented on BNR breed or on other breeds and populations in different areas of the country.

The next steps will be the presentation of our researches results concerning the population of Romanian Pied, for which there is a synthesis in table 100.

The analysis of life duration according to farm or to the private owner, evidencitate several extremely important aspects. Life duration in the farm Bistrita was of 6.58 years, while in farm Livezile was of 7.02 years and in farm Lechinta was of 7.40 years. What the private owners concerns, the life duration was of 8.65 years, fact that shows significant differences (table 101-106). We must underline, that in the private households, the cows are only taken out of the effective when they are close to the end of their productive career, even if their productive performances are sometime modest, while, in the big farms of the former IAS, with grater effectives, the cows have a much shorter life duration because they are taken out of the effective on human intervention or on accidental causes, and not on biological causes.

Productive life duration at the 394 cows that have closed their productive career in the studied farms was of 1579.08 ± 42.13 days, with limits between 267 and 4173 days and an important variability (s= 836.30 days and V% = 52.96). The cows from this population were exploited, in average only during 5.17 normal lactations (each 305 days), without reaching the maximum productive potential during their life course. The lower limit was of 0.87 lactations and the upper limit was of 13.68 lactations.

According to the farm in which they were exploited, the cows from the farm Bistrita, were maintained in the effective for 3.93 lactations, the ones from the farm Livezile for 4.19 lactations, the ones from the farm Lechinta for 4.16 lactations, and the ones from private households for 6.93 lactations. Between farms there consist significant differences concerning duration of the productive life, and very significant differences in comparison to the private households (table 101-106).

In comparison to the average population, the cows from the farm Bistrita were exploited with less than 377.88 days (-24.94%), in the farm Livezile and Lechinta with less than 299.62 days (-19.92%), respectively 308.32 days (-19.53%), while the cows in private households were exploited with more than 537.06 days (+34.01%).

Based on these data, there was estimated the cows' usage period by means of calculating the usage coefficient (IU%), for which the values are presented in the table below.

According to the value of the usage coefficient the Romanian Pied cows from the analyzed farms, had a exploitation duration, much under the optimal value. The weakest usage was registered in the farm Lechinta (IU= 47.01%), as the technological and management deficiencies were more evident in this farm. The cows exploited in the private households had an usage period significantly longer than in the state farms, but still under the optimal value of the usage coefficient.

The average milk production, during productive life course, was of 12569.96 ± 491.17 kg of milk, with limits between 1643 kg and 72455 kg.

The analysis of the variation chain for the milk quantity during productive life course (fig. 63) evidentiate 5 cows (1.27%) with productions between 44130 kg and 53571 kg of milk, one cow with 63013 kg of milk and one cow with 72455 kg of milk. The existence of these plus-variants demonstrate the production capacity of Romanian Pied and the productive longevity close to the breeds Simmental and Fleckvieh.

Figure 64 represents the same appreciation for the quantity of grease + proteins during productive life course.

The productive longevity coefficients are significantly different from one farm to another, as it results from the data presented in table 42 and fig. 66-69. The cows from the farm Bistrita produced with 41.84% less milk during their productive life, in comparison to the average population, the ones from Livezile with 43.59% less milk, the ones from the farm Lechinta with 29.58% less milk, while the ones from private

households produced 64.86% more milk than the average population, the differences being highly significant.

If we analyze these values in correlation to life duration and duration of the productive life, the cows from the studied farms, reached modest performances with significant differences. In this way, for the entire population, it came out for life-day, a quantity of 4.53 kg of milk, 0.18 kg grease and 0.15 kg of proteins, and for exploitation – day a quantity of 7.96 kg of milk, 0.32 kg of grease and 0.26 kg of proteins. The best performances were registered at the cows in the private households with a quantity of 6.56 kg of milk, 0.28 kg of grease and 0.13 kg of proteins on life-day, respectively 9.79 kg of milk, 0.42 kg of grease and 0.19 kg of proteins on exploitation – day. What the farms concern, the cows in the farm Livezile had the weakest results, the production being of only 2.76 kg of milk on life-day and 5.53 kg of milk on exploitation-day.

If we take into account the two longevity parameters (life duration and productive life duration), there results a weak usage efficiency of the cows in all studied farms (table 108). So, the **usage coefficient** in all three studied state farms was under 50%, while in private households, the usage coefficient was of 66.98%, a value above the average population that was of 56.91%. All these values are much smaller in comparison to the ones reached by BNR breed, and far from the optimal values quoted by specialized literature, values that would bring along a profit and would represent an efficient exploitation of the milking cows.

As a conclusion, the long duration of the unproductive period, evidenciated by the age of the first calve, by the prolonged mammary recumbency and by the interval between calves, all correlated to a reduced exploitation period (3-4 lactations) and a small milk production during the productive life, demonstrate a weak efficiency of cows exploitation in the cattle farms, with negative implications on the costs and obtained profit.

Based on these results obtained from the studied population, there appears the necessity of conducting such studies and the necessity of genetic improving of the Romanian Pied breed by means of optimizing the exploitation duration together with improving the management and exploitation technologies.

The weak productive usage of the studied effectives determined both undesired economical effects by means of registering some losses, and the false conclusion of the weak profitability in breeding the milking cows.

The results obtained by us concerning the exploitation period of the Romanian Pied cows, are the scientific basis for the breed optimization, but they still require a completion with elements of economical value. That is why, as goal for the selection of this population, should be considered the maximization of milk production and of netto life profit.

In this way, the optimization of the exploitation period must take into account the age of the first calve, the breed and the exploitation period as essential limitative factors.

Longevity analysis by "Survival Analysis" method

Taking into account the survival percentage (table 114) among Romanian Pied in the area of the county Bistrita –Nasaud, one can notice that, after the first lactation, the population decreased to 83.9% , and after the first four lactations, it decreased to 51.6%.

Out of the total of 394 cows in first lactation, only 0.7% of the initial effective (that means three cows) survived up to the ninth lactation. A strong influence on the survival duration, in all farms, was exercised by the technological and management exploitation factors, but also by the genetic factors and individual particularities.

There are significant differences among farms, but also within the farms, according to the paternal genetic group (origin), as it can be noticed in table 14 and figure 72.

The researches concerning precocity and productive longevity in the cattle population, with implication of genetic, technological and economical nature in the milking cows farms management, constitute another imbalanced chapter in the special literature, both for the autochthones and for imported breeds. From here, there comes the necessity for large studies on these general biological traits (fitness) and their inclusion in the programs for improving the cattle population.

Out of the analysis of the bibliographical sources about longevity and precocity in cattle population, and after interpreting the results of different bibliographical sources, there resulted some conclusions that may be generalized for all cattle population in our country.

Concerning the study about productive longevity of Romanian Pied in the county Bistrita-Nasaud

The study conducted by us about productive longevity in the population of Romanian Pied cattle in the area of Bistrita –Nasaud, reveals following:

♠ the bulls used for reproduction among the studied population, were both imported and autochthones and had an improving value that influenced the cows' longevity within this population

Out of the analysis of the male reproductors' influence on the milk quantity on productive life, there resulted that 17 bulls improved the milk production with values between +164.78 kg (bull code 16406) and +8223.10 kg (bull code 11493). The majority of the bulls (55.26%) had a negative influence on this main selection coefficient. Among these bulls there were the imported bulls code 50794, code 50694 and code 50865 tested as improvers in the origin countries.

♠ Life duration was of 2774.55 ± 42.2 days, with limits between 543 and 5254 days. There results that the cows were maintained in the population, for an average duration of 7.60 years, with limits between 1.48 years and 14.39 years, fact that shows a weak efficiency of Romanian Pied cows' exploitation among the studied population.

The life duration analysis according to the farm or to the private owner evidentiate a very interesting aspect, precisely, that the cows of the private owners were exploited 8.65 years, much over the maintaining duration of the cows in the big state farms.

♠ Productive life duration at the 394 cows that closed their productive career was 1579.08 ± 42.13 days, with limits between 267 days and 4173 days. This means that the cows had been exploited, an average of 5.17 lactations (305 days) with significant differences between state farms and private owners.

♠ In the studied population, the usage coefficient (IU%) for production had an average value of 56.91% with limits between 47.01% in the farm Lechinta and 66.98% at the private owners.

♠ The longevity analysis by "Survival Analysis" method underlines differences among the farms, according to the origin of the effective, genetic group, lactation succession and technological exploitation factors.

♠ The average milk production, during productive life, was of 12569.96 ± 491.17 kg, with limits between 1643 kg and 72455 kg. Among the studied population there existed 5 cows with productions during the productive life between 44130 kg and 53571 kg of milk, one cow with 63013 kg of milk and one cow with 72455 kg of milk. The existence of these plus-variants demonstrate the production capacity of Romanian Pied and the productive longevity close to the breeds Simmental and Fleckvieh.

♠ Taking into account the exploiting duration, and total milk production, there results that for the Romanian Pied population in the county Bistrita – Nasaud, it came out an average of 4.53 kg of milk, 0.18 kg of grease and 0.15 kg of proteins on life-day, respectively 7.96 kg of milk, 0.32 kg of grease and 0.26 kg of proteins on productive life-day (exploitation-day). The best performances were registered at the cows in the private households with a quantity of 6.56 kg of milk on life-day, respectively 9.79 kg of milk on productive life-day.

♠ If we take into account the two longevity parameters (productive life duration and life duration), there results a weak cows' usage efficiency in all studied farms.

The weak usage in production of the studied cows, by too early elimination from the effective, determined unwanted economical effects by registering of too great production losses. From here there was drawn out the false conclusion of a weak profitability in the breeding of milking cows.

♠ The results obtained by us concerning the exploitation period of the Romanian Pied ows, are the scientific basis for the breed optimization, but they still require a completion with elements of economical value. That is why, as goal for the

selection of this population, should be considered the maximization of milk production and of netto life profit. In this way, the optimization of the exploitation period must take into account the age of the first calve, the breed and the exploitation period as essential limitative factors.