SUMMARY

of doctorate thesis entitled ‘**’Contributions to the improvement of meat production at cattles by using industrials crosses with specialized meat breeds’**’,elaborate by PhD student engineer *Constantin VIZITEU* , coordinated by professor doctor engineer *Mr. Vasile UJICA,* scientific leader in specialty Technology exploitation of cattles and horses, Faculty of Zootechny from University of Agricultural Sciences and Veterinary Medicine Iasi, Romania.

Employment of industrials crosses as a means to increase production of meat by increasing and exploitation to heterozis phenomenon, remain one of the big current issues and for perspective of bovine growth on global and national plane.

Answer to demand of world market for a less meat, with a more favorable proportion protein-fat, breeders of major countries producing beef meat use more intense the industrials crosses to cows and heifers from mixed breeds or milch breeds with bulls from modern breeds of meat: Aberdeen–Angus, Charolaise, Limousine, Blonde d’Aquitaine, Blanc Belgian Blue, Piemontese, Simmental (meat type).

Using this type of crossing is particularly present and from Romania to capitalize the herd of over one million cows of peasant household which not participate in the quota milk imposed by the EU.

Study of specialized literature show that in the Romania have been few studies to test the mix capacity of local breeds with specialized breeds in meat production, especially with modernes breeds.

For this we proposed for know the capacity combination to the local breeds with Charolaise and Limousine, to use cows from breeds Baltata romaneasca and Baltata cu negru romaneasca at the industrial crosses in an local programme of improving production of meat at bovines in Bacau.

This research is included in current guidelines at the national level for implementation of a National Programme at production of beef recently developed by ANARZ using the industrial crossing between local breeds and bulls of the modern breeds meat.

Experience has been making in two private farms in Bacau between 2006-2007, right as scheme of organization of research played in figure 1.

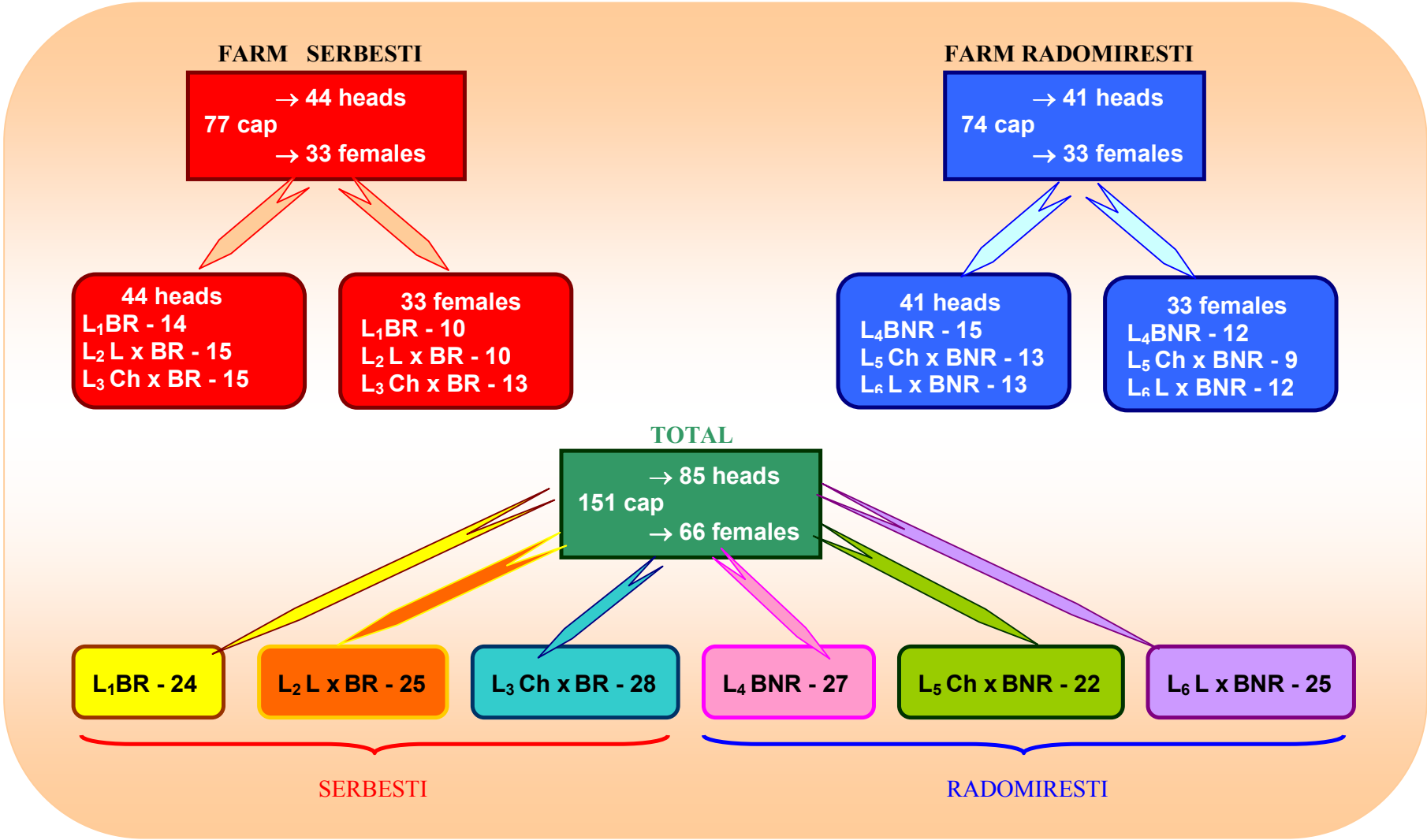

Fig. 1. The biological material studied

For obtain the metis were used adult cows who had the reproductive function unaltered and without events at previous calving. They were sown with semen from bulls Julian code 51686, breed Limousine and Jim cod 51527 breed Charolaise, resulting 100 metis (males and females), which 53 in farm Serbesti and 47 in farm Radomiresti.

Experience during 547 days (18 months) were followed only male on stage age (birth, 6 months, 12 months, 18 months) in semiintensive system of maintenance. Ration were balanced in relation to daily increase in weight corresponding to that stage of growth.

The main objectives of the research is :

▪ Tracking results at artificial sowings with semen from bulls at meat breeds: index sowing, conception rate, index pregnancy, pregnancy duration, percentage of non return, calving, loss of calves, health of calves.

▪ Technological factors on the feeding and maintenance at animals of experimental plots

▪ Increasing appreciation based on indices of growth and the main body dimensions, on lots, on sexes and on phased on growth.

▪ Analysis of body development based on the main body indices.

▪ General analysis of meat production and the assessment aspect of commercial consignments before slaughter.

▪ Analysis of slaughterhouse aptitude to metis comparated to materrnal race: assessment of carcasses, yield to cutda

, increase average daily.

● From analysis of performance productive of cows used to cross as a result had a good production of milk at cows from Baltata romaneasca breed and a very good production of milk at cows from Baltata cu negru romaneasca, the situation is logic thanks to the race which they belong, ensure the necessary quantity of milk to cattle for the suckling period.

● Following the pregnancy duration at the females who was inseminates with semen to the breeds Charolaise and Limousine, comparated with breeds Baltata romaneasca and Baltata cu negru romaneasca, is considered that the average values for the six lots indicate insignificant differences, even if at lot L_4 BNR the average was by 284,56 days and at lot L_2 LxBR by 286,24 days. Individual variability in lots was reduced with the maximum standard deviation of 4.52 days for lot 1 BR and the coefficient of variation of 1.59 % at same lot. The lots were very similar on the pregnacy duration, with limit by 270 days and 297 days.

●Analyzed the body weight at birth, according to sex and the variant of crossing, observed that metis F_1 Ch x BR had a body weight by 42,66 kg compared with male from BR breed who was a average weight by 38,42 kg. The metis females from the lot L_3 Ch x BR had a average weight by 38,4 kg compared with those of BR breed who had a average weight by 38,4

kg. Metis from the crossing variantes L x BR had the intermediates values, respectively 40,33 kg at males metis L x BR and 37,00 kg at females metis Lx BR.

In crossing breed BNR with bulls Charolaise and Limousine, the products results had lower average weights compared with those resulted by the fitst variant of crossing from breed BR with meat breeds. Between the experimental lots of the two farms the differents was very significant, as result of Fischer test. The metis Ch x BR and Chx BNR had a superior weight at birth comparated with maternals breeds; the metis L x BR and L x BNR had intermediate values. For all categories of metis not have been difficult calving and caesarian cases.

● Following the body development at metis from experimental lots at 6 months, 12 months and 18 months have the following result :

At 6 months, except lot L4 BNR all males from experimental lots exceeded the average weight of 200 kg, the best development was to the metis from lot L_3 Ch x BR with a average weight by 245,0 kg, next was the metis from lot L_2 Lx BR, then L_5 Ch x BNR and L_2 Lx BR.

On the analysis of average values for body weight at experimental lots at 12 months age is found that lots L_3 Ch x BR, L_2 L x BR and Ch x BNR excedeed the weight of 400,0 kg, the lots L_1 BR and L_6 Lx BNR had realised the weight near 400,0 kg. The most low development was at case of lot L_4 BNR: only 332,14 kg the value is lower than other experimental lots.

On the comparative analysis from the body weight at 18 months is found that metis from lot L_3 Ch x BR realised the greatest weight (657,5 kg) while the metis from lot L_6 L x BNR realized the smaller weight (573,13 kg). Compared with males from maternal breeds, the metis Lx BR and Ch x BR relised superior body weight as well the metis L x BNR and Ch x BNR differences being very significant as result of the test Tukey.

After presenting the results on the evolution of body weight from birth to 18 months results as metis from breed BR with breeds for meat Limousine and Charolaise had a high energy growth compared with metis from BNR breed with same meat breeds.In both cases, the metis had a superior body weight compared with maternal breeds (BR and BNR) these justify the use of these types of cross in order to improve meat production at cattles.

Similar results for local breeds were obtained by other authors (*Ujica, 1974, Pipernea, 1972, 1976, Temisan, 1972, Georgescu, 1969, Velea, 1985, Pantea, 1998*).

Analyzed the dynamics of the body size note that have a growth rate similar to body weight.Still, are some differences of energy increase of some dimensions from other, depending on age and lots. At youth there is a chronological order of increasing intensity for the main dimensions: height, length and width.

Analyzed the average values and the variability for body sizes for the experimental lots, at differents ages is found that lots was homogeneous, values of standard deviation and the

coefficient of variation argues this statement. In some situations can be observed values of the coefficient of variation over 5 % and even 10 %, especially for the body length and chest size.

The amplitude of variability is small ,this demonstrates that body size are homogeneous morphological characters with a genetic determinism sufficiently strong, but being influenced by environmental conditions more than heredity.

Comparing new results with data from specialized literature is found that at our research the metis were differentiated very significantly in terms of weight and and main body size comparated with maternal breeds (BR and BNR), the metis have body and a muscles development which demonstrated a special quality for that animals with improved amplitudes for production of meat.

The growth process is not uniform and he is takes place in different rhythms and different ways, is necessary to be follow under many aspects so they followed the main indices of growth: energy of growth, rate of growth, intensity of growth and coefficient of growth whose values are presented and analyzed in the study.

Analyzed the body weight increase based on coefficient of growth (C %), is found that the values increase steadily from birth at 18 months.

So, the growth coefficient from body weight at 1 year go at 78,38% for the metis L_3 Ch x BR and 76,43% for lot L_5 Ch x BNR , the metis from Limousine breed realized 71,75% for lot L_2 L x BR, respectively 71,04% for lot L_6 L x BNR. The males from the maternal breeds realized at some age 64,38% for Baltata romaneasca and 61,46% for breed Baltata cu negru romaneasca.

At 18 months age, the metis from breed Charolaise exceed the the values for increase to maternal breed reaching at 113,58 % for L_3 Ch x BR and 112,18% for Ch x BNR. Superior values at maternal breeds is registred for the metis from Limousine breed who realized one coefficient of growth by 107,09 % for L_2 L x BR and 106,06% for L_6 Lx BNR.

Compared with metis, the maternal lots have at same age a smaller percentage of adult weight (inferior coefficient of growth) for BR breed and BNR breed. These values and the values results of other indices, demonstrates the superior precocity at metis and the visibles aptitudes for the meat production.

Analyzed the main body size is found that these had in generally a growth rate similar to body weight.

●After estimate the commercial aspect from lots before slaughter is found that:

Analyzed the live weight before slaughter (18 months) is found that the highest values (over 600 kg) have recorded the metis from lot L_3 Ch x BR and lot L_2 L x BR who had a good development of muscles and a superior body ponderosity compared whith other lots. The poor results had registred by lot L_4 BNR , follow by L_6 L x BNR, L1 BR and L_3 Ch x BR. We

observed a very good development from metis Ch x BR and L x BR, but a favorably influence from breeds Charolaise and Limousine for improvement to production of meat at metis with Baltata cu negru romaneasca.

The metis had a degree of development higher of the posterior train comparated with maternal breed and the event of type "culard'' is the most obviously for the metis with the body weight over 400,0 kg, the lot and Ch x BR and L x BR have the score for live weight between 13,5 and 16,5 points.

The animals from the experimental lots have a good body harmony and valuable characteristics under commercial aspects. All 4 groups of metis had a good development for dimensions of length, width and depth, especially at posterior train and a good muscle development with a higher commercial after volume, lenght ad weight.

●The weight of carcass and the weight of adherent suet as index for appreciation for meat production is very significant for our research. The best results were obtained in case of lots L_2 L x BR and L_3 Ch x BR from which resulted carcasses by over 400 kg (at warm), follow by lots L5 Ch x BNR and L6 Lx BNR who realized carcasses by a superior weight with 38,06% respectivelly 28,23% maternal breed (BNR).

The poor results was obtained from bulls from breed BNR who realized carcasses by 263,57 kg and the bulls from lot L1 BR realized carcasses by 336.33 kg close to the carcass weight obtained from the lot L_6 Lx BNR (338,0 kg), the different by 1,67 kg is insignificant.

● Appreciation to the yield cut at experimental lots emphasize the superiority of metis from breeds Charolaise and Limousine with local breeds Baltata romaneasca and Baltata cu negru romaneasca.

For lots L_2 Lx BR and L_3 Ch x BNR the yield cut at warm is over 60%. At metis from lot L_5 Ch x BNR, the yield to cut is 60,1 % and 59,21% for metis from lot L_6 L x BNR.

The differences between lots are significant and show the superiority of breed Charolaise and Limousine to the BR and BNR. The results of yield to cut show the superiority of crossing breed Charolaise to breed Limousine and the superiority of breed BR to breed BNR.

The metis of lot L_2 L x BR obtained an average daily growth higher by 259,24 g to lot L_4 BNR.

●The analysis of growth to youths from the experimental lots, from birth to 18 months reveals the following :

The absolute values and the relative values show the metis F_1 studied in the two farms (Serbesti and Radomiresti) have at birth a good body development comparated with maternal breeds. Remark is especially the metis from variantes of crossing Ch x BR and L x BR, and the metis from Ch x BNR.

At birth the most developed size in relation to maternal race (adult animals) were: perimeter of whistle, for all lots, next is height, lenght and width.

Between the dimensions analized, the highest intensity of growth are the dimensions of width, next is lenght, height and the last place is taken by perimetres.

Intensity of growth and the coefficient for growth for all body dimensions measured is bigger to metis from breed Charolaise with BR and Limousine with BR.

Body development to metis from experimental lots is superior to maternal breeds, they have aptitude for meat production, especially the metis Ch x BR and L x BR.

The results obtained from the research of crossing to breed Baltata romaneasca and Baltata cu negru romaneasca with specialized breeds for meat (Limousine and Charolaise) justify the usefulness of these industrial crosses to improve meat production at cattle.

The metis from breed BR, especilally with breeds Charolaise and Limousine realized increases the average daily over 1000g/day, and at 18 months they realized the body weight over 600 kg, fall in the morphological type of animal meat.