Appreciation of Special Combinative Capacity at Three *Oryctolagus Cunicullus* Populations from Timis County, for Average Nest Weight and Corporal Mass of the Descendants at the Age of 7 Days

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Abstract
Non additive genetic component that is the base of a quantitative character has no predictability, this is the reason for which the present paper is proposing to appreciate the special combinatory capacity for corporal mass of the descendants at birth in a specific crossing scheme combining three rabbit breeds common for average nest weight and corporal mass of the descendants at the age of 7 days, in Timis county breeders New Zealand White, Large Chinchilla and Californian. The data obtained, statistic presented prove a good special combinative capacity for this character, reason for which the crossing scheme is recommended for producing meat individuals destined for slaughterhouses. This scheme provides an exploitation of the high fervency of the heterozygote at maternal forms and at the final hybrids.

Key words: special combinative capacity, crossing, hybrids

Introduction

Breeding the domestic rabbits is an old occupation. In antiquity, the rabbits were breed for sport, later they were breed for research animals or for meat, fur or hear [1].
In the last decades there were registered in most of the countries in the world special efforts for development of this economical branch because of the good reproductive capacities it can provide rapidly a large part of the meat necessary for human population.
Some breeders with experience have the entire necessary premise to be extremely profitable soon, because the rabbit meat is not affected by the diseases that affect all the other (cows, pigs. poultry), more common, domestic species. Plus the rabbit meat is easy, tasty and different from the other meat types more commonly consumed.
The structure of the production shows that on a world scale, 40% of the rabbit meat is produced in traditional farms, 33% with intermediary rise and 27% is produced in commercial farms [1].
The highest production of meat in Europe is produced by Italy. France the county with the oldest traditions in the production and the consumption of meat, and Spain is the second in production, according to FAO STAT.
In Romania in 1990 the rabbit meat production was 10625 tones, and this dropped rapidly, so in 2000 it was 71.77% lower, in 2007 it was 97.5%

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lower comparative to the production registered in 1999 [FAO, 2009].

In breeding domestic rabbits, the amelioration genetic presents a great importance because they target the continuous increase of the production, and reducing the specific consumption and the costs with the production. This works include complex preoccupations for maximum usage of the genetic potential of the populations and for continuous improvement of this potential in the succession of the generations.

The crossing constitute the main way to determine the manifestation of the heterosis effect, tidily depended of the existence of the interactions between the nonaditive genetic and the genetic diversity pronounced by the populations that are crossed [2].

The aim of the present paper was to appreciate the special combinative capacity for the average nest weight and corporal mass of the descendants at the age of 7 days, of a crossing scheme, at the three rabbit breeds used by the breeders in Timis county: New Zealand White (NZW), Large Chinchilla (CHL), Californian (CAL) and their hybrids.

2. Materials and methods

The biologic material used in the experiment was represented by domestic breeds from the New Zealand White (NZW), Large Chinchilla (CHL) and Californian (CAL) breeds, randomly purchased from different breeders. The animals were representative for the genetic structure of the three pure breeds from Timis county.

The crossing scheme used in the experiment had the following formula: the first generation of hybrids F1 (NZWxCHL) resulted from the crossing of the New Zealand White (NZW) as mother breed and Large Chinchilla as paternal breed, the second generation F2 (F1xCAL) had resulted from F1 hybrid as maternal component and Californian breed (CAL) as paternal breed. There were special attention given to assure a fairly comfort state for all individuals taken into study thought the entire study period, in order to fully express the genetic potential. There were also taken measurements to reduce at minimum the special environment influence, so that the differences noticed will be due to the different genetic structure of the individuals in the 5 lots.

All the rabbit acquired ere vaccine and treated for parasitizes, and all were selected from micro farms with no contagious dieses.

The data recovered was statistically analyzed.

3. Results and discussion

It is known that the general combinative capacity due to the additive genetic can be predicted with a degree of probability in function of the information sources used. The combinative special capacity has no such quality reason for which it appreciation can be performed only by trial crossing between the populations taken into study [3].

Table 1 presents average weight of the nests at the age of 7 days [g], mean values and dispersion indicators.

Table 1. Average weight of the nests at the age of 7 days [g], average values and dispersion indicators

Mean values and the dispersion indices	NZW	CHL	CAL	F1	F2
n [nests]	11	9	8	5	5
$\overline{X}$ [g]	953.96^{aA}	739.98^{bc}	693.38^{bc}	1171.85^{aA}	1113.25^{aA}
Sx	88.80	22.92	37.77	104.75	119.26
S	294.53	68.76	106.82	23.,22	266.67
S^2	86747.64	472.66	11410.49	54860.67	71114.55
C.V.%	30.87	9.29	15.41	19.99	23.95
Sx%	9.31	3.10	5.45	8.94	10.71
Min.	588.00	642.00	536.50	784.00	854.00
Max.	1512.00	862.40	878.40	1346.00	1555.40

Test „ t" A-a $p \leq 0.001$; A-b $p \leq 0.01$; A-c $p \leq 0.05$ a-a $p > 0.05$

From the analysis of Table 1 is observed the mean weight of the nests at 7 days expressed as mean nest size at 7 days, was 953.96±88.80 g/nest for New Zeeland breed 739.98±22.92 g/nest for Chinchilla breed, and in the case of Californian breed it was 693.38 g.

The F1 (NZWxCHL) hybrids registered a mean weight at 7 of 1171.85±104.75 g, and in the case of double hybrids three breed F2(F1xCAL) it was 1113.25±119.26 g.

Variability regarding the mean weight of the nests at 7 days for the New Zeeland White was high: C.V.> 20%.

The variability coefficient for Chinchila breed, Californian and simple hybrids F1 (NZWxCHL) for the nest weight at 7 days was low C.V.< 10%, for the double hybrids F2(F1xCAL) the variability coefficient was mean having a value comprised between 10-20%.

The heterosis effect for mean weight of the nests at 7 days for the lot constituted by simple hybrids F1 (NZWxCHL) was 38.35%, and for the lot constituted by double hybrids F2 (F1xCAL) was 1.36%.

Table 2 presents average body mass of the rabbit descendants at the age of 7 days**.**

Table 2. Average body mass of the rabbit descendants at the age of 7 days [g]

Valorile medii şi indicii dispersiei	NZW	CHL	CAL	F1	F2
n [cuiburi]	11	9	8	5	5
$\overline{X}$ [g]	120.52^{a}	102.57^{ab}	106.65^{c}	138.86^{Aa}	132.50^{Aa}
Sx	9.68	1.61	1.79	7.96	7.25
S	32.12	4.83	5.05	17.80	16.22
S^2	1031.57	23.36	25.49	316.75	262.98
C.V.%	26.65	4.71	4.73	12.82	12.24
Sx%	8.04	1.57	1.67	5.73	5.47
Min.	82.25	96.00	100.41	112.00	121.05
Max.	168.00	110.00	114.08	160.10	157.00

Test „t" A-a $p\leq0.001$; A-b $p\leq0.01$; A-c $p\leq0.05$ a-a $p>0.05$

Form the analysis of table 2 there can be noticed that the highest value of the mean body weight calculated for the rabbit young at the age of 7 days was registered at F1(NZWxCHL) hybrids, it was 138.86±7.96 g/young. The body weight of the hybrids F2(F1xCAL) was 132.50±7,25 g/young, with 4.58% lower than for F1(NZWxCHL) hybrids, but with 13.20% higher than the weight of New Zeeland White young's, with 26.13% higher than the one of large Chinchilla and with 23.19% higher than the young belonging to Californian. The lowest value for mean body weight at 7 days was noticed for Large Chinchilla, it having a value of 102.57±1.61 g/young.

Following the statistic analyze for the body weight of the rabbits at 7 days we noticed: the difference between New Zeeland White and Large Chinchilla is not significant ($p\geq0.05$); the difference between the simple hybrids F1(NZWxCHL) and New Zeeland White is not significant ($p\geq0.05$); the difference between the simple hybrids F1(NZWxCHL) and Large Chinchilla is distinctly significant ($p\leq0.01$); the difference between the simple hybrids F1(NZWxCHL) and the difference between the double hybrids F2(F1xCAL) is not significant ($p\geq0.05$); the difference between the simple hybrids F1(NZWxCHL) and Californian is significant ($p\leq0.05$); the difference between the double hybrids F2(F1xCAL) and their parental forms is significant ($p\leq0.05$).

The estimated heterosis effect for body weight of the rabbits at 7 days for the lot formed by simple hybrids F1(NZWxCHL) was 24.48%, and for the lot formed from the double hybrids F2(F1xCAL), the heterosis effect for mean body weight of the young at 7 days was 7.93%.

4. Conclusions

The three rabbit breed used in our study, New Zealand White, Large Chinchilla and Californian crossed according the hibridation scheme used in experiment, has a good special combinative capacity for average nest weight and corporal mass of the descendants at the age of 7 days, can be efficiently used in production, for producing individuals for slaughterhouses. This scheme provides an exploitation of the high fervency of the heterozygote at maternal forms and at the final hybrids.

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