

THE APPRECIATION OF THE SPECIAL COMBINATIVE CAPACITY AT THREE RABBIT POPULATIONS FROM TIMIS COUNTY, FOR NESTS AVERAGE WEIGHT AND AVERAGE BODY MASS OF THE RABBITS AT THE AGE OF 14 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 combinative capacity for nests average weight and average body mass of the rabbits at the age of 14 days, in a specific crossing scheme combining three rabbit breeds common in Timis county breeders New Zealand White, Large Chinchilla and Californian. The data obtained, statistically analyzed, proves a good special combinative capacity for this characters, for which reason this 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% 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 nonadditive 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 nests average weight and average body mass of the rabbits at the age of 14 days, of a crossing scheme, from the three rabbit breeds common used by the breeders in Timis county: New Zealand White (NZW), Large Chinchilla (CHL), Californian (CAL) and their hybrids.

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.

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].

In table 1 there are presented the absolute values, average values and the dispersion indicators for nests average weight and average body mass of the rabbits at teh age of 14 days.

Table 1. Average nests weight at the age of 14 days [g] and dispersion indicators for the five rabbit lots

Mean values and dispersion indices	NZW	CHL	CAL	F1	F2
n (nests)	11	9	8	5	5
\bar{X} (grams)	1761.90 ^{Aa}	1344.99 ^b	1454.20 ^c	2133.92 ^{aA}	2147.06 ^{aA}
Sx	126.15	64.39	66.11	140.13	210.66
S	418.41	193.16	186.99	313.34	471.04
S ²	175063.98	37308.92	34964.67	98183.79	221881.43
C.V. %	23.75	14.36	12.86	14.68	21.94
Sx %	7.16	4.79	4.55	6.57	9.81
Min.	1263.50	1085.00	1159.00	1705.20	1666.00
Max.	2430.00	1610.72	1720.00	2440.00	2800.05

Test „ t” A-a p≤0.001; A-b p≤0.01; A-c p≤0.05 a-a p>0.05

From table 1 it can be noticed that at the age of 14 days the F2 hybrids register the highest value of mean nest weight 2147.06±210.66 g, followed by F1 hybrids with a mean weight of 2133.92±140.13 g. The pure

breeds registered the following values. The pure breeds registered the following values: the New Zealand White 1761.90±126.15 g; Californian 1454.20±66.11 g and rasa Chinchilla 1344.99±64.39 g.

For the mean weight of the nest at the age of 14 days, the differences registered between the five lots studied are: significant ($p < 0.01$) for New Zealand White and Chinchilla; insignificant ($p \geq 0,05$) for the F1 hybrids F1(NZWxCHL) and their maternal form (New Zealand White breed); distinctly significant ($p \leq 0,01$) between the simple hybrids F1(NZWxCHL) and their paternal

form (Chinchilla breed); insignificant ($p \geq 0,05$) between the simple hybrids F1(NZWxCHL) and the double hybrids F2(F1xCAL); significantly ($p \leq 0,05$) between the double hybrids F2(F1xCAL) and their paternal form (Californian breed).

In figure 1 we represented graphical the mean weight of the nests at 14 days.

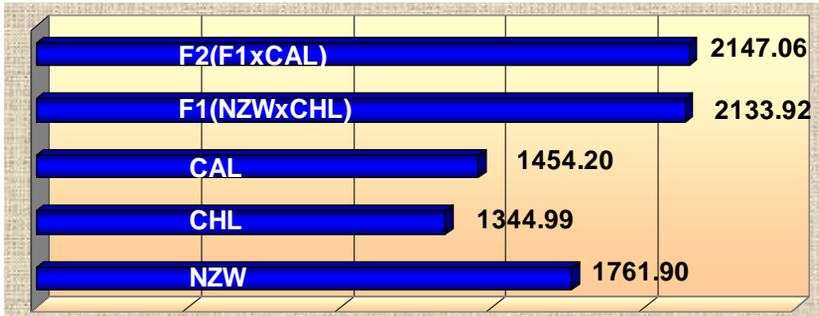


Figure 1. Average nest weight [g] at the age of 14 days

The heterosis of the mean weight of the nests at the age of 14 days for the lot constituted from simple hybrids F1(NZWxCHL) was 37.36%, and the heterosis effect estimated for mean weight of the nest at 14 days for the lot constituted

from double hybrids F2(F1xCAL) was 19.67%.

In table 2 there are presented the mean values and dispersion indices from body mass of the rabbit young from the five lots taken in study at the age of 14 days.

Table 2. Average body mass of the descendants at the age of 14 days [g] for the five study lots

Mean values and dispersion indices	NZW	CHL	CAL	F1	F2
n [nest]	11	9	8	5	5
\bar{X} [grams]	222.16 ^{Ac}	186.05 ^{ba}	224.25 ^c	253.88 ^A	254.99 ^a
Sx	11.19	6.05	3.85	5.78	6.54
S	37.10	18.15	10.90	12.92	14.62
S ²	1376.67	329.51	118.75	166.83	213.83
C.V.%	16.70	9.76	4.86	5.09	5.73
Sx%	5.04	3.25	1.72	2.28	2.56
Min.	180.50	155.00	213.40	243.60	238.00
Max.	270.00	207.70	245.08	270.00	274.19

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 table 2 it can be noticed that the highest value of the average body mass of rabbit young at 14 days was registered for F2 hybrids (F1xCAL), its value was 254.99±6.54 g/individual.

Mean body weight of rabbit young from F1 (NZWxCHL) was 253.88±5.78 g/individual, with 0.43% smaller than F2 (F1xCAL) hybrids, but with 12.49% bigger than the one registered at New Zealand

White young with 26.71% bigger than Chinchilla and with 11.67 % higher than Californian breed.

The lower body weight/ individual at the age of 14 days were registered at Chinchilla breed it's value being 186.05±6.05 g.

The differences between the five lots studied with respect to mean body weight of the rabbits at 14 days are: statistically distinctly different ($p \leq 0.01$) between New Zealand White and Chinchilla; statistically significantly different between simple hybrids F1 (NZW x CHL) and maternal breed (New Zealand White) ($p \leq 0.05$); statistically very significant different between

F1 (NZW x CHL) and their paternal form (Chinchilla breed) ($p \leq 0,001$); insignificant between the simple F1(NZWxCHL) and double F2(F1xCAL) hybrids ($p \geq 0,05$); significantly different between the double hybrids F2(F1xCAL) and their paternal form (Californian breed) ($p \leq 0,05$).

The variability for this character, in the lot constituted from New Zealand White breed was medium, the variability coefficient was between 10% and 20% and for the other lots studied $CV < 10\%$, so the variability was low. In figure 2 we represented graphically the mean body weight of the rabbits at 14 days old.

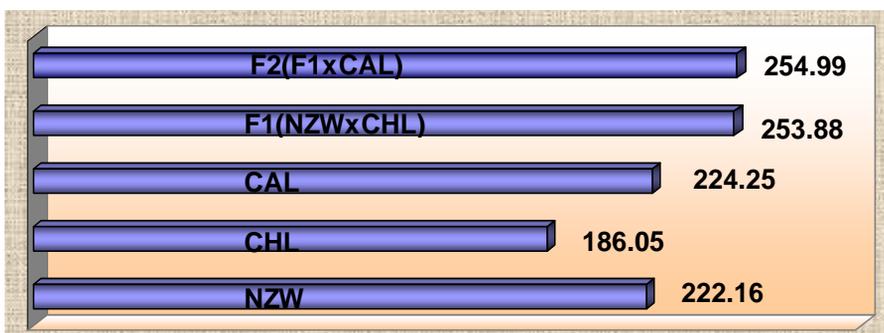


Figure 2. Graphic representation of the average body mass [g] at the age of 14 days for the five rabbit lots that were study

The heterosis effect estimated for body weight of rabbit at the age of 14 days for the lot constituted from F1 hybrids was 24.38%, and for the lot formed from double hybrids F2(F1xCAL) 6.66%.

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 nests average weight and average body mass of the

rabbits at the age of 14 days, and can be efficiently used in production, for producing individuals for slaughterhouses

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