1501
Arab Univ.
J. Agric. Sci.,
Ain Shams Univ., Cairo
Special Issue, 26(2B), 1501-1506, 2018

THE EFFECT OF CROSSING BOUSCAT WITH GABALI RABBITS ON BODY WEIGHT AND CARCASS TRAITS

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Keywords: Body weight, Carcass traits, Crossing, Heterosis

ABSTRACT

Data on rabbits produced from a total number of 518 parities were analyzed to evaluate crossing effects among two breeds of rabbits. The breeds tested were Gabali (GAB) and Bouscat (B). sex effects on post weaning body weight were also studied. A total number of 80 rabbits at marketing age were slaughtered to evaluate effects of mating type and sex on some carcass traits. Mating type affected significantly (P ≤ 0.001) progeny weight from weaning up to marketing age and preslaughter, carcass, slaughter weight, hot carcass weight, fore legs weight and hind legs weight at marketing age. Meanwhile, the effects were not significant on loin weight and dressing percentages . Sex insignificantly affected body weight although body weights of female rabbits were slightly heavier than those of male rabbits. Effects of sex on carcass traits were not significant. Heterosis % and superiority % of body weight estimates were positive for all post weaning weights. Positive heterosis was shown for some carcass traits.

INTRODUCTION

Rabbits provide an excellent source of protein for human consumption and may play a significant role in solving a part of meat shorting in developing countries such as Egypt. Rabbit meat is characterized by a high protein and low fat and cholesterol content and it is considered as a delicacy and a health food product **(Dalle Zotte 2000).** Body weight as an economic important character in the commercial meat rabbit industry was found to be improved by crossing of local breeds with exotic standard breeds **(Nofal et al 1995; Afifi et al 2000; Piles et al 2004 and Saleh et al 2005)**. Similarly, **Ozimba and Lukefahr (1991) and Szendrô et al (1994)** reported that crossbred rabbits had a significant advantage for lean yield. However, **De Paula et al (1996); Espinoza-Flores et al (1997) and Ghosh et al (2004)** found no significant differences among breeds in body weight at different ages. Crossbreeding is one of the fast tools offered to the breeders to improve many traits in farm animals **(Nofal et al 1997, Oseni et al 1997)**. The present investigation aimed to evaluate one genotype of rabbits including B breed (which is considered as important exotic breed in Egypt) and the GAB breed is an Egyptian rabbit breed well adapted to hot climates **(Galal and Khalil, 1994)** and their crosses. Sex effects on body weight from weaning up to marketing and carcass traits were also. Further, heterosis % and superiority % of body weights of crossbred rabbits were calculated, under Egyptian environmental conditions.

The aim of the study was to determine the effect of crossbreeding on the growth and slaughter traits in rabbits.

MATERIALS AND METHODS

Location and duration of the study: The present study was carried out at the Experimental Unit of the poultry production Department, Faculty of Agriculture, Ain sums University, Egypt during spring and summer (march to August) of 2017.

Experimental animals and management

The Experimental work of this study was carried out on the Experimental rabbit flock main-

(Received 31 December, 2017)
(Revised 14 February, 2018)
(Accepted 25 February, 2018)

tained by the Department of poultry production, Faculty of Agriculture, Ain sums University, Egypt. during spring and summer (march to August) of 2017. One local Egyptian breed of rabbits (Gabali, GAB) and one exotic breed (Bouscat, B) were used. Does and bucks of the exotic breed used were descendent of the B rabbits raised under the Egyptian conditions. The managerial procedure, housing system. Number of bucks, does and litters are presented in **Table (1)**.

Table 1. Data structure of mating groups (Bouscat, B; Gabali, GAB and their corosses) and number of buck, doe and rabbits used in different genetic groups of the study

No. of Genetic group	Breed of			No. of		
	Buck	Doe	rabbits	buck	doe	Rabbits
1	B	B	B	10	20	165
2	GAB	GAB	GAB	10	18	85
3	B	GAB	1/2B 1/2GAB	10	18	90
4	GAB	B	1/2GAB 1/2B	8	20	178

The rabbits were weaned at 28 days from birth, sexed and ear tagged by permanent marker and retagged each (20-30) days of age. Males were tagged in the right ear and females were tagged in the left ear, sexed and housed in cage in wire netted hutches with suitable space in the second row of batteries (40 cm × 50 cm × 50 cm) to complete their growing period of 2 months. Kits were individually weighed weekly from weaning up to marketing (12 weeks) during the fattening period. The cages were provided with a nipple system for watering and manual trough feeder. The rabbits were fed on commercial pellets (17.5% crude protein, 14-16% crude fibre and 2300-2500 kcal/kg diet digestible energy). The feed and the water were offered ad libitum. All the animals were grown under identical environmental and feeding conditions as well as the same stocking density. A 12L:12D photoperiod (from 0900 to 2100 h) was used throughout the experimental period. The temperature inside the house was maintained at a range of 28-32ºC. The animals were exposed to some attacks of hot waves during the experimental periods where the temperature jumped over 40°C.

Carcass traits

Carcass performance of 518 rabbits were recorded at 12 wk of age. Each of these rabbits were fasted for approximately 16 hours. Just prior of slaughtering, the rabbits were weighed, and the jugular veins were severed, and the rabbits were lifted for complete bleeding. After complete bleeding, the carcass was weighed again, and the difference between the two weights was considered as the blood weight. slaughter weight, hot carcass weight, fore legs weight, hind legs weight, loin weight and dressing percentage [(hot carcass weight + giblets weight) / slaughter weight]* 100.Slaughtering and dissection were carried out according to World Rabbit Science Association (WRSA) recommendations **(Blasco and Ouhayoun, 1996)**. Hot carcasses were chilled at 4ºC for 24 h. After chilling, the carcasses were dissected into three anatomical parts (between the 7th and 8th thoracic vertebrae, and between the 6th and 7th lumbar vertebrae) and head was separated. Then head, fore part, intermediate part and hind part were weighed.

Data

Progeny traits were individual body weight at weaning and after weekly.

The data for carcass traits studied (Slaughter weight, SW; Hot carcass weight, HCW; Fore legs weight, FLW; Hined legs weight, HLW; Lion weight, LW Dressing Percentage, D%)

Statistical analysis:

General Linear Model (GLM) procedures of SAS were used to determine the effects of breed and sex on the carcass traits using the following model:

$$Yijk = U + Bi + Sj + (BS)ij + Eijk$$

Where: Yijk: An observation of each trait.
U: The overall mean.
Bi: effect of breed
Sj: effect of sex.
(BS)ij: effect due to interaction between breed and sex.
Eijk: random deviation due to unexplained source.

Differences among means were compared statistically using Duncan's multiple range tests **(Sokal and Rohlf, 1969)**. For carcass traits, day of slaughter and slaughter weight were used as a covariate.

RESULTS AND DISCUSSION

Progeny weight

Mating type affected significantly (P≤0.001) in progeny weights from weaning (28 days) up to marketing (12 weeks of age) as shown in **Table 2**. Such results confirm the findings of **Nofal et al (2000); Prayaga and Eady (2003) and Saleh et al (2005)**. The litters produced from mating BB X BB recorded the heaviest weight from 4 weeks up to marketing (12 weeks of age). The litters produced from mating B X G were significantly heavier t than those of the other purebred litters from 8 weeks up to 10 weeks. The lowest body weight at different ages from weaning up to marketing was recorded in litters produced from mating G X G.

The highest body weight of crossbred litters from weaning to marketing (12 weeks) in was recorded in litters produced from mating B X B and B X G mating types. The insignificant difference in body weight appeared between litters produced from G X B mating types. The highest body weight at marketing was produced from B X B (2074.66 ±46.62 g), B X G (1831.43 ± 91.63 g), GXB (1650.± 76.6g) and G X G (1566.±57.34 g). In general, crossbred litters were the heaviest at different ages studied from Gabali. Superiority of crossbred litters weight may be due to hybrid vigour which, appeared at different ages of kits **(Rashwan et al 1995)**.

Sex insignificantly affected body weight at the different ages studied, although females were of slightly heavier body weights than in males.

Table 2. Actual means of Gabali breed and Bouscat and their crosses for post-weaning growth traits

Traits	BB		BG		GB		GG		Prob
	Mean±SE		Mean±SE		Mean±SE		Mean±SE		
	Male	Female	Male	Female	Male	Female	Male	Female	
BW4	630.66± 27.98	648.48± 22.29	525.31± 25.08	545.88± 21.15	449.41± 22.40	483.80± 21.69	354.33± 19.22	364.78± 16.75	0.0001
BW6	892.41± 33.52	877.96± 26.19	882.3± 29.97	823.82± 23.01	692.35± 38.4	708.23± 34.66	538± 28.48	534.77± 25.07	0.0001
BW8	1252.07 ±37.09	1219.03± 30.65	1378.± 36.92	1322.67± 36.59	1038.08 ± 48.44	1012.50± 43.24	894.66± 42.96	850.± 33.88	0.002
BW10	1691.38 ± 38.55	1561.77± 43.96	1737± 36.92	1681.67± 36.59	1321.54± 51.79	1293.89± 49.21	1262.67± 57.30	1259.25± 44.56	0.002
BW12	2074.66± 46.62	2016.56± 43.79	1831.43± 91.63	1805.67± 44.69	1650± 76.6	1633.61± 59	1566± 57.34	1539±	0.02

Carcass traits

Mating type means and SE for various carcass traits are presented in **Tables 3**. Mating type effects were highly significant (P≤0.001) for preslaughter, SW, HCW, FLW, LW, HLW and D% were 1949.09 gm, 1133.64 gm, 282.72 gm, 318.63 gm, 385 gm and 58.35% for Bouscat rabbits, while they were 1533.21 gm, 851.42 gm, 207.5 gm,313.21 gm, 273.57 gm and 55.61% for Gabali rabbits. The means of carcass traits studied in the present study were slightly higher than those noted by **Abd El-Aziz (1998)** whit Gabali rabbits who found that means of carcass traits at 14 weeks of age were 1611 gm, 282 gm, 176 gm and 267 gm for SW, HCW, FLW, LW and HLW, respectively. **Afifi et al (2002)** found that means of carcass traits at 12 weeks of age were 1971 gm, 1022 gm, 125 gm, 131 gm, 340 gm and 343 gm for SW, HCW, FLW, TCW, LW AND HLW, while D% was 58.2%. In the present study obtained in **Table (3)** indicated that carcass traits in B were higher than those in

GAB rabbits. Means of carcass traits are within the range noted in the literature by **Gad (2007); Afifi et al (2002) Abd El-Aziz (1998); Gad (1998); Yossef (1992) and Hassan(1988)** on different breeds of rabbits at different ages.

Means of body weights for Gabali and Bouscat rabbits in the present study fall within the range of reports of **Khalil et al (1995); Abd El-Aziz (1998); Gad (1998); Khalil and Afifi, (2000); Youssef (2004) and Abou Khadiga (2004).**

Table 3. Actual means (gm) and standard errors for carcass traits in Bouscat and Gabali rabbits

Traits	BB		BG		GB		GG		pro
	Mean	Std Error	Mean	Std Error	Mean	Std Error	Mean	Std Error	
HCW	1133.64 a	56.8	1087.61 a	12.45	837.72 b	36.24	851.42 b	26.35	0.0001
HLW	385.0 a	22.71	420.43 a	7.58	297.27 b	12.99	273.57 b	14.64	0.0001
LW	318.63 a	25.10	263.478 b	2.46	194.545 b	11.89	313.21 a	16.42	0.0001
FLW	282.72a	14.86	293.04 a	3.62	250.00 b	9.97	207.5 b	5.85	0.0001
SW	1949.09 a	102.58	1892.39 a	28.92	1597.27 b	60.47	1533.21 b	50.83	0.0001
D%	58.35 a	0.98	55.36 b	0.58	50.65 c	0.70	55.61 b	0.51	0.0001

SW= Slaughter weight, HCW= Hot carcass weight, FLW= Fore legs weight, HLW= Hind legs weight, LW= Loin weight and D%=Dressing percentage.

CONCLUSION

The Bouscat breed has higher post-weaning growth traits than Gabali. Moreover, the values and sign of the average of individual and maternal heterosis; and the complementarity between Bouscat, that is better in growth traits.

It could be concluded that bouscat sires and dams could be used in crossbreeding programmes when we used this breed for producing broiler rabbits at 12 weeks of slaughter age

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