

SOME FACTORS AFFECTING BODY WEIGHT AND DRESSING OUT  
PERCENTAGE IN TWO BREEDS OF RABBITS

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INTRODUCTION

Several genetical and environmental factors affect live body weight and dressing out percentage in rabbit such as breed, sex litter size, season of kidding, nutrition and disease. Breed difference in these traits were observed by El-Bendary, 1961, Kawinska, 1965, and Zelnik *et al.*, 1977. In the rabbit, most workers agreed on the absence of sex difference in body weight. Shawer, 1963. However, sex was affected dressing out percentage as reported by Matassins *et al.*, 1966. There is a depressing effect of litter size on body weight. Wanis, 1958, Mahmoud, 1959 and Shawer, 1963. Komow, 1966, obtained a positive correlation (0.63) between weight and its litter size. While it was (- .517) as found by Kawinska, 1967. Among the various environmental factors that affect body weight in the rabbit is the month of kidding which is considered an important factor Wanis, 1968 and Shawer, 1963. Carcass composition of rabbits was studied by Zelnik *et al.*, 1977 and Parillo, 1977.

MATERIALS AND METHODS

This experiment was conducted on the rabbit flocks at the Poultry Research Center of Alexandria University. These flocks comprised of the Flemish and the Baladi ( Native breeds ).

Mating season started in September and ended in May. This period is considered the most suitable breeding season

for rabbits in lower Egypt. The young suckled their mothers for about one month, when they were weaned and moved to raising hutches. The common practice was to keep the individual of each litter in a separate hutch after tattooing.

During the winter, from October to May, rabbits were fed only Berseem while in the summer, from June to September, a dry mash consisted of barley (45%), wheat corn (15%), yellow corn (30%) and undecorticated cotton seed cake (5%) beside little amount of green fodder were introduced to them.

Body weight of the young in grams at monthly intervals between the age of one and nine months was recorded. Dressing out percentage was calculated in the two breeds at two ages; 5 and 9 months. A random samples of seven males of the two breeds were slaughtered and dressing out percentages for each were estimated. Before killing, the live weight, body length, chest and loin width were recorded. After bleeding the animals were weighed again, and the weight of the blood was estimated. The following organs and parts were weighed, feet, the pelt and ears, excreta, liver, heart, lungs and trachea, kidneys, head and the carcass.

The carcass was divided into three parts as following :

- (I ) The front part which comprised the fore legs, the shoulders and the breast up to the last rib.
- (ii ) The middle part or the loin was separated from third part by cutting at the loin-thigh connection.
- (iii) The remaining part of the carcass comprised the hind part.

Statistical analysis were used after Sendecor, 1961.

#### RESULTS AND DISCUSSION

- Effect of breed and age on body weight :

The results summarised in Tables 1 showed that the two experimental breeds; differed significantly in body weight at any age from one to nine months. In general, the Flemish was heavier than the Baladi. Breed differences in body weight during the growing period in rabbits were demonstrated by El-Bendary, 1961, Kawinska, 1965 and others. It could be stated that the differences in body weight among different strains of standard breeds of rabbit are more obvious than those between

the different strains of the Baladi under the same environmental conditions. It is clear that such differences in body weight between the Flemish and Baladi may be due to inherit strain differences and environmental conditions.

2- Sex differences in body weights :

Differences between the two sexes in body weight at different ages are shown in Tables 1. Regardless of breed, the average body weight of the females was slightly lower than that of males at all ages. However, sex differences were statistically insignificant at all ages studied. Our results are in agreement with those reported by El-Bendary, 1961, and Damjonova, 1966, dealing with different breed of rabbit.

3- The effect of litter size on body weight:

Observation on the relationship between litter size and body weight at 1,2 and 3 months of age are summarized in Table 2 for the Baladi and the Flemish breeds.

In the Baladi, at one month of age, average body weight was 367 g. in litters of 4 young, while it was 210 g. in litters of 9. While body weight of the Flemish at the above mentioned ages was 358 in litters of 4 and 365 in litters of 9. The corresponding body weights for the two at ages of 2 and 3 months of age with litter size of 4 and 9 showed also that individual body weight decreased with the increase of litter size (Table 2), and difference in body weight due to litters size at the ages of one, two and three months were highly significant. Wanis, 1958, Mahmoud, 1959 and Shaver, 1963, working on different breeds of rabbit came to the same conclusions.

There was nonsignificant difference between the mean body weights of litters of 8 and 9 youngs at the age of one months, but the difference became highly significant at three months of age in favour of the former. On the contrary, while the difference between the mean weights of litters of 4 and 5 youngs were significant at one month of age, it became insignificant at 3 months. However, the difference in mean body weight between litters of 6 and 7 youngs was statistically significant at ages of 1,2 and 3 months in favour of the first group. Shaver, 1963 and komova, 1966, dealing with various breeds of rabbit,

concluded that young in litters of 5 or 6 had significantly heavier body weights than those in litters of 7 and 8.

#### 4- Effect of month of kidding on body weight:

The effect of the month of kidding on body weight from December to April is summarized in (Table 3) for the Flemish breed. It could be seen that during the growing period from 1 to 9 months of age, the rabbits born in December have heavier body weight than those born in January, February, March and April and the difference between the first group and any of the other groups in that respect was highly significant at comparable ages. While there were insignificant differences in mean body weight among young born in January, February, March and April at comparable ages up to the age of 8 months.

At the age of nine months, body weight of the rabbit born at April was significantly heavier than that born at March. Wanis, 1958, dealing with Giza rabbits, found significant differences in birth and weaning weights due to month of kidding.

However, since, the interaction between month of birth and age proved to be insignificant, it seems that young of different ages between 1 and 2 months have almost similar pattern of body weights when born in the four months from January to April. This may be attributed to the fact that abundant green fodder ( the Berseem ) is available during these four months beside the mild climate conditions.

#### 5- Dressing out percentage and Meat Quality:

The mean dressing out percentage; which is the total weight of the heading empty carcass; was 47.1 and 49, 47.8 and 48.5% for the Baladi and Flemish at age of 6 and 9 months, respectively (Table 4). This was almost on the lower limit of the range reported by many authors such as Matassino et al., 1966, Zelnik et al., 1977, dealing with various breeds of rabbit. Data produced in the present study indicated that breed differences in this respect were insignificant but there were Baladi and Flemish; did not followed similar pattern at each of the two studied ages. Dressing out percentage of the two breed did not increase with the increase of age from 6 to 9 months though live body weight of the two breed increased with advance

of age. Carcass measurements for the Baladi and Flemish males at the age of 6 and 9 months were shown at (Table 5). The Baladi was shorter than Flemish in all estimate at the two ages.

In the rabbit, the front and hind parts of the carcass are almost equal in proportion to the live body weight. These once again confirm the previous finding that dressing out percentage did not increase with the advance of age. Similar results were reported by Shawer, 1963, Matassino et al., 1966, Zelnik et al., 1977, Parillo, 1977.

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Table 1: Mean body weight for the males and females at different ages (grams).

Age months	Baladi		Flemish	
	No.	$\bar{x} \pm$ S.E.	No.	$\bar{x} \pm$ S.E.
1	93	331 $\pm$ 11.4	96	366 $\pm$ 11.3
2	82	600 $\pm$ 17.2	87	679 $\pm$ 18.1
3	60	885 $\pm$ 25.5	76	1019 $\pm$ 26.7
4	48	1119 $\pm$ 36.9	59	1352 $\pm$ 40.6
5	35	1271 $\pm$ 45.6	42	1576 $\pm$ 35.8
6	28	1370 $\pm$ 57.8	27	1792 $\pm$ 58.4
7	26	1518 $\pm$ 46.3	22	1955 $\pm$ 67.5
8	19	1661 $\pm$ 82.6	21	2144 $\pm$ 51.2
9	18	1741 $\pm$ 85.0	13	2203 $\pm$ 69.4
2- <u>Females</u>				
1	86	282 $\pm$ 9.4	89	358 $\pm$ 9.9
2	73	529 $\pm$ 14.9	81	695 $\pm$ 17.3
3	50	824 $\pm$ 25.9	67	1018 $\pm$ 24.8
4	42	1059 $\pm$ 35.1	59	1295 $\pm$ 14.5
5	36	1219 $\pm$ 57.9	51	1489 $\pm$ 38.7
6	31	1365 $\pm$ 38.5	46	1644 $\pm$ 44.3
7	30	1466 $\pm$ 45.1	41	1797 $\pm$ 45.5
8	28	1565 $\pm$ 50.1	32	1959 $\pm$ 48.4
9	26	1657 $\pm$ 55.5	16	2090 $\pm$ 77.0

Table 2: Mean body weight of Baladi and Flemish rabbits of different litter size up the age of three months ( Grams ).

litter size	Age months					
	1		2		3	
	No.	$\bar{x} \pm S.E.$	No.	$\bar{x} \pm S.E.$	No.	$\bar{x} \pm S.E.$
4	35	367 $\pm$ 14	30	624 $\pm$ 20	22	901 $\pm$ 35
5	33	259 $\pm$ 8	32	510 $\pm$ 22	25	769 $\pm$ 33
6	49	333 $\pm$ 18	42	678 $\pm$ 26	32	923 $\pm$ 42
7	13	291 $\pm$ 12	13	562 $\pm$ 22	9	796 $\pm$ 31
8	16	208 $\pm$ 3	12	421 $\pm$ 5	8	671 $\pm$ 17
9	11	210 $\pm$ 6	11	348 $\pm$ 20	10	641 $\pm$ 21
Mean	157	300 $\pm$ 8	140	548 $\pm$ 13	106	826 $\pm$ 19
2- <u>Flemish</u>						
4	21	358 $\pm$ 22	21	716 $\pm$ 37	18	1123 $\pm$ 45
5	32	354 $\pm$ 16	29	732 $\pm$ 26	28	1040 $\pm$ 37
6	14	334 $\pm$ 29	13	650 $\pm$ 47	11	969 $\pm$ 35
7	49	420 $\pm$ 14	47	717 $\pm$ 24	36	975 $\pm$ 48
8	13	244 $\pm$ 5	12	526 $\pm$ 15	11	842 $\pm$ 8
9	30	365 $\pm$ 10	25	713 $\pm$ 21	25	1105 $\pm$ 29
Mean	159	366 $\pm$ 8	147	698 $\pm$ 13	129	1018 $\pm$ 19



**Table 3: Effect of month of kidding and age on body weight in the Flemish breed.**

		Mean body weight in grams									
Age	December		January		February		March		April		
months	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	Mean
1	43	408	34	331	49	345	8	290	42	393	353
2	35	793	31	633	46	673	8	623	39	690	682
3	34	1182	27	934	35	953	8	868	32	1009	989
4	33	1530	22	1198	26	1289	6	1068	27	1264	1270
5	25	1774	20	1423	21	1481	6	1235	19	1506	1484
6	7	1958	19	1595	16	1674	5	1441	15	1650	1664
7	15	2084	17	1772	13	1825	4	1595	13	1825	1820
8	14	2245	17	1921	10	1992	3	1677	10	2015	1970
9	5	2378	11	2059	10	2104	2	1893	3	2490	2185

**Table 5: Body measurements in males Baladi and Flemish at two different ages.**

Body measurements	6 Months		9 Months	
	Baladi cm.	Flemish cm.	Baladi cm.	Flemish cm.
1. Body length	23.4	27.4	26.1	28.7
2. Chest width	21.7	23.1	24.3	26.4
3. Loin width	4.6	5.1	5.4	5.4

Table 4 : Weights of the Different Body Parts in Percent of Live Body Weight in the Males Baladi and Flemish at Two Different Ages.

Body Parts	6 Months		9 Months	
	Baladi	Flemish	Baladi	Flemish
1. Front part	18.9	20.4	18.8	20.2
2. Middle part	9.4	10.2	10.3	9.9
3. Hind part	18.8	18.4	18.7	18.4
4. Carcass <sup>(1)</sup>	47.1	49.0	47.8	48.5
5. Liver	3.1	2.6	3.1	2.5
6. Heart	0.5	0.3	0.6	0.5
7. Kidneys	0.9	0.9	1.0	1.0
8. Edible parts <sup>(2)</sup>	51.6	52.8	52.5	52.5
9. Head	7.1	6.5	6.8	6.7
10. Lungs	0.9	0.9	0.8	0.9
11. Blood	2.0	1.9	1.6	1.9
12. Fur and ears	11.4	12.5	12.9	12.7
13. Feet and tail	4.7	4.6	3.6	4.2
14. Excorta	22.3	20.8	21.8	21.1
15. Offals <sup>(3)</sup>	48.4	47.2	47.5	47.5
16. Vital Parts <sup>(4)</sup>	52.9	51.0	52.2	51.5

(1) Dressing out Percentage. (Total of 1, 2 and 3).

(2) Total of 1 - 7. (3) Total of 9 - 14.

(4) Include 5, 6, 7, 9, 10, 11, 12, 13 and 14.

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SUMMARY AND CONCLUSION

A study on meat production was made on the rabbit flocks of the Poultry Research Center of Alexandria University. Observations were taken on body weight and dressing out percentages during the growing period for the Baladi and the Flemish. The results were discussed and the main conclusions were the following:

- 1- The Flemish was significantly heavier than the Baladi at almost all ages from kidding to 9 months. Regardless of breed; the weighed average of females was slightly lower than that of males.
- 2- Large litters had detrimental effect on body weight. Young born in litters of 4 and 5 had significantly heavier individual body weight than those in litters of 8 or 9 up to the age of 3 months.
- 3- It seems that rabbits born in December had highly significant heavier mean body weight than those born in January, February, March and April.
- 4- The dressing out percentage of the experimental rabbits was similar and about 48.5%.
- 5- In the Baladi, the average front part of the carcass amount to 18.9 the middle 9.9 and the hind part 18.7% of the live body weight, while in the Flemish these figures were 20.3, 10.1 and 18.4, respectively.

EINIGE FAKTOREN BEINFLUSSEN AUF DIE KÖRPERGEWICHT  
UND SCHLACHTKÖRPER IN ZWEI NACHKOMMENSCHAFTEN VON KANINCHEN

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ZUSAMMENFASSUNG

In der Geflügel Versuche Zentrum von Alexandria Universität ist eine Untersuchung über Fleisch Produktion auf Kaninchen Herde gemacht. Die Beobachtungen über Körpergewicht und Geschlachtskörper werden im Verhältnisse zu Prozenten innerhalb Die Wachstum Periode von Baladi und Flemish übergenommen. Die Ergebnisse werden diskutiert und die wichtige Auszüge sind:-

- 1- Flemish war schwerer als Baladi in alle Alter von Kindheit bis 9 Monate. Unachtsam von Nachkommenschaft, ist die weibliche Gewicht Durchschnitt leichter als die männliche Tiere.
- 2- Große Wurfgrösse haben große Einfluß auf die Körpergewicht. Ab 3 Monate von Alter sind die Wurfgrösse die von 4 oder 5 Tiere bestehen, der einzelne davon ist wesentlich schwerer als die Wurfgrösse die von 8 oder 9 Tiere bestehen.
- 3- Die Kaninchen, die in Dezember geboren sind, haben einen wesentlichen schwerer Körpergewicht als die in Januar, Februar, März und April geboren sind.
- 4- Die Schlachtkörper von Versuch Kaninchen waren gleich und 48 % in Verhältniss zu Prozenten.
- 5- In die geschlachtete Baladi, ist die Durchschnitt von der vorderst Teil 18,9 % und die mittlere Teil 18,7 % 9,9% und die hintere Teil 18,7 %.  
Da in die Flemish sind die Figuren 20,3 %, 10,1 % und 18,4%.

