

قسم : رعاية الحيوان •

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تأثير السلالة والخصى للماعز على نسبة التصافي وصفات الذبيحية

خيري البيومي ، أحمد الشيخ

- استخدم في الدراسة ١٦ جدى ذكر في سن حوالي ستة شهور تمثل كل سلالة من سلالتي الماعز المصري البلدي والزرايبي بثمانية جديان لدراسة تأثير السلالة والخصى على الصفات عند الذبح وكذلك صفات الذبيحة ، وتم الحصول على بيانات الذبح من كل حيوان وكانت النتائج التي تم الحصول عليها كمايلي =
- (١) لم تختلف نسبة التصافي معنويا نتيجة تأثير السلالة أو الخصى بينما اختلفت متوسط نسبة التصافي المعدله معنويا نتيجة تأثير السلالة ، وكانت نسبة التصافي المعدلة في الماعز البلدي (المتوسط المعدل: ٥١%) أفضل من الزرايبي (المتوسط المعدل: ٤٧,٩%) •
 - (٢) وزن الذبيحة ومقاييس الذبيحة والتي تشمل طول الذبيحة وعمق الصدر وطسول الكعبرة والزند لم تتأثر معنويا باختلاف السلالة أو الخصى •
 - (٣) بينما كان تأثير السلالة على أجزاء الذبيحة غير معنوي فقد أدى الخصى السى انخفاض معنوي في نسبة الرقبة والكتف والظلع •
 - (٤) كانت أوزان السقط الخالي والعليقة والكليتان والدهن المحيط بينهما أكبر معنويا في الماعز الزرايبي عنها في البلدي • بينما كان الرأس والجلد أكبر والطحال أصغر في الماعز المخصية عنها في الذكور •

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**EFFECT OF BREED AND CASTRATION OF GOATS
ON DRESSING PERCENTAGE AND CARCASE TRAITS**
(With 8 Tables)

By

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SUMMARY

Sixteen six-month old male kids, eight of each of the two breeds (Egyptian Baladi and Zaraibi goats), were used in the present investigation in order to study the effect of breed and castration on slaughter and carcass traits.

Dressing percentage did not differ significantly due to breed or castration. However, adjusted mean dressing percentage revealed a significant breed effect. Baladi goats dressed better (adjusted mean percentage: 51.8) than Zaraibi goats (adjusted mean 47.9%). No significant breed effect was observed on dressing percentage based on empty body weight.

Neither carcass weight nor carcass dimensions were significantly affected by breed or castration.

The effect of breed on percentages of carcass wholesale cuts was non-significant. However, castration caused a highly significant reduction in the percentages of neck, shoulder and rack cuts.

The weight of empty tripe, bluck and kidneys with their fat was significantly affected by breed. Zaraibi had heavier weights of these components. Castrated males had significantly smaller head, hide and larger spleen than entire males.

INTRODUCTION

In general, external carcass measurements describe skeletal development. Moreover, it may be of value in predicting important carcass characteristics such as meatiness.

Goat carcasses differ in amount and distribution of the body tissues and so vary in the relative proportion of various cuts. These differences are very important in the evaluation of the carcasses of animals.

As the carcass yield (dressing percentage) is expressed in different ways. It may be expressed as the proportion of hot or cold carcass weight to the live weight. A much more useful measure is empty body weight (ebw), live weight less the weight of the contents of gastro-intestinal tract. Accordingly, carcass yield may be expressed as the proportion of carcass weight to ebw. Some authors reported many factors influencing carcass dimensions, dressing percentage and wholesale cuts (AHMED *et al.*, 1978; PRABHAKARAN *et al.*, 1979; BABIKER *et al.*, 1985 and MISHRA *et al.*, 1986).

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EL-BAYOUMI & EL-SHEIKH

Therefore, the present investigation was planned to study the effect of breed (Egyptian Baladi and Zaraibi goats) and castration on slaughter and carcass traits.

MATERIAL and METHODS**A) Animals management :**

Sixteen male kids, eight of each of the two breeds (Egyptian Baladi and Zaraibi goats) were used in this study. The two breeds were of similar age (about 6 months) and weight (12-16 kgs).

The experiment was preceded by a preliminary period of four weeks, during which the animals adapted to their new environment.

Three males from each breed were castrated by the open method.

The fattening concentrate ration consisted of whole millets (66%), wheat bran (33%) and common salt (1%) and was offered at the rate of 300-400 gm/head daily with barseem hay ad libitum.

B) Slaughter data :

At the end of the fattening period (25 weeks), animals were fasted for 10 hours prior to slaughtering. Pre-slaughter live weight (slaughter weight) was recorded for each animal immediately before slaughter.

After slaughter, skinning and evisceration, the dressed hot carcass was weighted as well as empty body weight. The weights of head (skin not removed), hide, liver (gall-bladder removed), spleen, testes, pluck (trachea, lungs and heart with its associated large blood vessels), tripe (stomach and intestine) with contents and then empty tripe, kidneys with their associated fat, omentum, metacarpals and metatarsals with hooves were noted.

C) Carcass measurements :

Hot carcasses were split carefully into two sides, and three carcass measurements were recorded in centimeters on the left side as follows:

a- **Length of body:** From the anterior edge of the symphysis pubis to the end of the anterior edge of the first rib.

b- **Depth of the chest:** From the external edge of the anterior corner of the spinous process of the third rib to the ventral outer edge of the point of maximum width of chest.

c- **Radius-ulna length:** From the angle of the olecranon process of the ulna to the distal edge of the inner side of radial carpal.

D) Wholesale cuts :

Both sides of the carcass were divided into wholesale cuts. The cutting procedure adopted was that described by KEMP (1952) with some modification to meet local practice. The modification was the loin was separated between 12th and 13th rib; the foreleg and the shank were not considered as separate cuts. The half carcass, therefore, was dissected into six cuts namely.

- i- neck: was separated at the 1st rib,
- ii- shoulder: was separated between 5th and 6th rib.

DRESSING PERCENTAGE, CARCASE TRAITS

- iii- rack: was separated between 12th and 13th rib,
- iv- loin: was cut from the upper end of the cut between 12th and 13th rib to the end of the pelvic bone (hip end), excluding the flank.
- v- flank: the lower portion of the previous cut, along the free end of the last rib and the external lumbar processes.
- vi- leg: was separated at the end of the pelvic bone (hip end).

E) Statistical analysis :

The factorial experimental design was adopted and the analysis of variance was followed according to SNEDECOR and COCHRAN (1971).

Moreover, in order to avoid bias due to differences in initial body weights and measurements, the analysis of covariance was adopted (SNEDECOR and COCHRAN, 1971) which allowed testing the significance of variation in treatment effects after adjusting for the initial measurements.

RESULTS

Are tabulated in tables 1 - 8.

DISCUSSION

The results in table (1) revealed that dressing percentage did not differ significantly due to breed or castration. On the other hand, the covariance analysis of this character with initial body weight showed a significant breed effect-table (3) Baladi goats dressed better (adjusted mean dressing percentages: (51.8%) than Zaraibi goats (adjusted mean 47.9%) as in table (4). When dressing percentage was based on empty body weight, breed effect was found to be non-significant (table 3). This indicates that the difference between the two breeds is mainly due to differences in relative weights of gut contents. Significant breed effect on dressing percentage was reported by PRABHAKARAN et al. (1979); GALL (1982) and KANAUIA et al. (1985).

Meanwhile, the effect of castration on dressing percentage was similarly found to be non-significant (AHMED et al., 1978). However, a favourable and significant effect of castration on dressing percentage was reported by KUMAR et al. (1980 and 1981); SMITH et al. (1982); HASSANEIN et al. (1983); BABIKER et al. (1985) and MISRA et al. (1986).

Carcase weight was neither affected by breed nor castration (table 1). Similarly, non-significant breed effect on carcass weight of goats was reported by KANAUIA et al. (1985). Conversely, castrated goats were found by SMITH et al. (1982) to have significantly heavier carcasses than entire.

Carcass dimensions, including carcass length, chest depth and radius-ulna length were not found to be significantly affected by breed or castration (table 1).

While the effect of goat breed on percentages of wholesale cuts was non-significant (table 5), castration caused a highly significant reduction in the percentages of neck, shoulder and rack cuts. The relatively larger proportions of these cuts in entire males (table 6) is evidently associated with the generally greater development the fore parts of entire males as an effect of testicular hormones. However, CHAWLA and IQBAL NATH (1980) reported significant differences in neck, loin and flank cuts of different breeds of goats.

EL-BAYOUMI & EL-SHEIKH

Various non-carcase components were affected significantly by breed and castration (table 7). The weight of empty tripe, pluck and kidneys were significantly heavier in Zeraibi than goats (table 7 and 8). Meanwhile, castrated males had a significantly smaller head and hide and larger spleen than entire males. The relatively larger head and hide of entires are probably due to hormonal effect. PRABHAKARAN *et al.* (1979) reported significant breed differences in kidney weight of goats, while MISRA *et al.* (1986) did not observe any significant difference in non-carcase components of different goat breeds. Castration caused a significantly smaller head (BABIKAR *et al.*, 1985). However, KUMAR *et al.* (1981) reported significantly heavier abdominal fat and kidney fat in castrates than entire male goats.

From the previous results, it may be concluded that the relatively high and significant dressing percentage (adjusted to initial weight) of Baladi goats reaching over 51% is a good indication of the meat producing ability of this breed. The effect of castration on carcass traits was significant in many characters and generally agreed with the expected effects. The reduced weight of neck, shoulder and rack cuts as well as the weight of head and hide in castrates as compared to entires may not be considered a disadvantage as these represent parts that are of less value than the rest of the carcass.

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DRESSING PERCENTAGE, CARCASS TRAITS

Table (1) Analysis of Variance of Carcass Weight, Dressing Percentage and Carcass Measurements.

S.O.V.	D.F.	Mean square					
		Carcass weight	Dressing % I	Dressing % II	Carcass CL	Carcass CD	Carcass RUL
Between Breeds	1	5.92	5.32	2.14	62.01	3.52	0.01
Between Sexes	1	1.64	1.02	5.14	5.86	1.75	0.46
Breed x Sexes	1	0.15	1.00	1.29	2.11	9.01	0.13
Experimental Error	12	6.17	4.11	5.18	24.50	6.86	1.22

Table (2): Average Carcass Weight (in Kgs), Dressing Percentage and Carcass Measurements (in cms).

Trait	Breed	Item	Entire	Castrated	Means
Carcass weight	Baladi		12.49	11.60	12.16
	Zaraibi		13.56	13.10	13.39
	Means		13.02	12.35	---
Dressing percentage	Baladi	D% I	49.48	49.15	49.36
		D% II	52.92	53.16	53.01
	Zaraibi	D% I	48.01	48.70	48.27
		D% II	51.97	53.47	52.53
	Means	D% I	48.74	48.92	---
		D% II	52.44	53.32	---
Carcass Measurements	Baladi	CL	59.50	59.00	59.30
		CD	27.90	25.70	27.10
		RUL	21.50	21.30	21.40
	Zaraibi	CL	64.00	62.00	63.20
		CD	25.80	26.70	26.10
		RUL	21.70	21.20	21.60
	Means	CL	61.80	60.50	---
		CD	26.80	26.20	---
		RUL	21.60	21.20	---

D% I: based on slaughter weight.

CL: carcass length

D% II: based on body weight.

CD: chest depth.

RUL: radius ulna length.

EL-BAYOUMI & EL-SHEIKH

Table (3): Analysis of Covariance of Carcase Weight and Dressing Percentage with Initial Body Weight.

S.O.V.	D.F.	Mean Square (deviation for regression)		
		Carcase weight	Dressing% I	Dressing%II
Adjusted breed	1	0.70	10.23*	5.85
Adjusted sex	1	0.18	2.30	7.55
Adjusted breed x sex	1	0.37	0.16	0.11
Experimental Error	11	1.36	2.48	2.69

* ($P < 0.05$).

Dressing % I: based on slaughter weight.

Dressing % II: based on empty body weight.

Table (4): Adjusted Mean Dressing Percentages.*

Breed	Entire	Castrated	Means
Baladi	52.88	49.86	51.75 ^a
Zaraibi	47.50	48.49	47.87 ^b
Means	50.19	49.18	---

* Adjusted dressing percentage in based on live weight at slaughter (adjusted to intial body weight).

a,b

Means within the same calcumn with different superscripts differ significantly from each other.

DRESSING PERCENTAGE, CARCASS TRAITS

Table (5): Analysis of Variance of the Percentages of the Carcass Wholesale Cuts.

S.O.V.	D.F.	Mean Square					
		Neck	Shoulder	Rack	Loin	Flank	Leg
Between Breeds	1	0.004	0.012	0.16	0.0600	0.026	0.70
Between Sexes	1	26.020 ^{HR}	35.940 ^{HR}	3.84 ^{HR}	0.0001	0.570	31.99
Breed x Sex	1	0.180	0.058	0.35	0.0290	0.380	16.19
Experimental Error	12	1.930	2.970	0.62	0.3300	0.510	19.06

^{HR} (P < 0.01).

Table (6): Average Percentages of the Carcass Wholesale Cuts.

Breed	Item	Entire	Castrated	Means
Baladi	Neck	10.92	8.50	10.01
	Shoulder	33.38	30.17	32.18
	Rack	13.55	12.84	13.28
	Loin	5.23	5.31	5.26
	Flank	3.67	3.74	3.70
	Leg	31.05	30.21	30.74
Zaraibi	Neck	11.05	8.20	9.98
	Shoulder	33.36	30.38	32.24
	Rack	13.98	12.66	13.48
	Loin	5.41	5.32	5.38
	Flank	3.52	4.23	3.79
	Leg	32.19	27.19	30.32
Means	Neck	10.98 ^a	8.35 ^b	
	Shoulder	33.37 ^a	30.28 ^b	
	Rack	13.76 ^a	12.75 ^b	
	Loin	5.32	5.32	
	Flank	3.60	3.98	
	Leg	31.62	28.70	

a, b Means within the same row with different superscripts are significantly different from each other.

EL-BAYOUMI & EL-SHEIKH

Table (7): Analysis of variance of non-carcase components.

S.O.V.	D.F.	M.S.									
		Head	Hid	Legs	Full tripe	Empty tripe	Pluck	Oment-um	Liver	Spleen	Kidneys, K. fat.
Bet. Breeds	1	0.0040	0.02	0.070	4.450	1.020*	0.1100**	0.06	0.018	0.0001	0.0500***
Bet. Sexes	1	0.4600***	1.55***	0.010	0.710	0.220	0.0002	0.03	0.002	0.0019**	0.0020
Breed X Sex	1	0.1600	0.15	0.003	0.005	0.005	0.0018	0.01	0.001	0.0003	0.0012
Error	12	0.0600	0.20	2.170	1.340	0.290	0.0056	0.11	0.006	0.0002	0.0089

* P < 0.01
 ** P < 0.05

DRESSING PERCENTAGE, CARCASE TRAITS

Table (8): Average Weight (in kg) of Non-Carcass Components.

Breed	Item	Entire	Castrated	Means
Baladi	Head	2.08	1.52	1.87
	Hide	2.06	1.62	1.90
	Legs	0.65	0.63	0.64
	Full trips	4.61	5.00	4.76
	Empty trips	2.97	3.23	3.07 ^b
	Pluck	0.53	0.52	0.53 ^b
	Omentum	0.50	0.60	0.54
	Liver	0.45	0.48	0.46
	Spleen	0.03	0.06	0.04
	Kidney and K. fat	0.24	0.25	0.24 ^b
	Zaraibi	Head	1.89	1.74
Hide		2.29	1.44	1.97
Legs		0.75	0.81	0.77
Full trips		5.64	6.11	5.82
Empty trips		3.49	3.71	3.57 ^a
Pluck		0.57	0.59	0.58 ^a
Omentum		0.58	0.79	0.66
Liver		0.53	0.53	0.53
Spleen		0.04	0.06	0.05
Kidney and K. fat.		0.34	0.39	0.36 ^a
Means		Head	1.98 ^a	1.63 ^b
	Hide	2.18 ^a	1.53 ^b	
	Legs	0.70	0.72	
	Full trips	5.12	5.56	
	Empty trips	3.23	3.47	
	Pluck	0.55	0.56	
	Omentum	0.54	0.70	
	Liver	0.49	0.50	
	Spleen	0.04 ^b	0.06 ^a	
	Kidney and K. fat.	0.29	0.32	

a,b Means within the same row or column with different superscripts are significantly different from each other.