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Studies on Carcass Characteristics of Egyptian Local Baladi Goats and Their Crosses with Anglo-Nubian

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THE PRESENT study was conducted to evaluate the carcass characteristics of kids of three genotypes., Baladi (B), 1/2 Anglo-Nubian (AN) 1/2 B and 1/4 AN 3/4 B. The kids were slaughtered at 18-month old. The study was carried out on 32 male kids reared during the period of 1987 to 1989 in the experimental Animals Farm, Faculty of Agriculture, El-Minia University. Data were analyzed to study the effect of breed, castration and slaughter weight on certain carcass traits.

Breed group and castration had significant effects ($P<0.05$) on weight at slaughter. Slaughter weight of the crossbred kids (1/2 AN 1/2 B and 1/4 AN 3/4 B) or entire male kids were heavier than Baladi and castrated kids, respectively. The effects of breed and castration on carcass weight, fast and emtpy dressing % and boneless meat % were not significant. The effect of slaughter weight on carcass weight was significant ($P< 0.01$). The percentages of dressing and boneless meat of the Baladi or castrated kids were superior to the crossbred kids and entire ones, respectively.

Neither breed nor castration had a significant effect on carcass cuts weights or boneless meat % of carcass cuts, except the effect of castration on boneless meat % of leg cut and sets cut weight which was significant ($P < 0.05$). Boneless meat % of all cuts of castrated kids was higher than entire ones. Leg cut had the highest boneless meat percentage (74.97 %) while ends cut had the lowest value (65.27 %). Slaughter weight had a significant effect ($P< 0.01$) on carcass cuts weights, while this effect was nonsignificant for boneless meat % of carcass cuts.

Breeding groups did not show significant differences in lean and bone weights and percentage of lean in the cut of 9-10-11 rib.While this effect was significant ($P < 0.01$ or < 0.05) on fat and bone percentages. Castration had a significant effect ($P < 0.01$ or < 0.05) on fat and bone percentages., while this effect was non-significant for lean percentage. Castrated kids had the higher percentage of fat

(21.5%) and lower percentage of bone (21.1 %) than entire ones. Neither breed nor castration had a significant effect on fat thickness above Longissimus dorsi or its area, except the effect of castration on eye muscle area was significant (P< 0.05).

The crosses kids (1/2 AN 1/2 B and 1/4 AN 3/4 B) had more kidney fat and lower bowel fat than Baladi kids. But, the differences were not significant. Castrated kids had significantly (P< 0.01) heavier weight and higher percentages for kidney and bowel fats compared to entire ones. Regression coefficients of bowel's fat or total dissected fat weights on slaughter weight were positive and significant (P< 0.01). They were 0.04 and 0.05 kg/kg for bowel and total dissected fats, respectively.

Significant breed type differences in the chemical composition of the ribs 9,10 and 11 of the carcass were noted for percentages of moisture and fat, but it was not significant for protein and ash percentages. Whereas, crossbred kids deposited significantly more fat (P< 0.05) and less moisture than local Baladi kids. Carcasses of entire male kids contained higher percentages of moisture, protein and ash (P< 0.01, P< 0.05) and >0.05, respectively). While, those of castrated kids had a higher (P< 0.01) percentage of ether extract.

Key Words : Goats, Crossbred, Carcass characteristics, Castration.

The goat is a hardy and prolific animal with excellent foraging ability. It is adapted to wide climatic conditions and can successfully survive in hot, arid and semi-arid zones unsuitable for other livestock. The world goat poulation is estimated to be 446 million, 0.79 of which in habit Africa and the Far East (Food and Agriculture Organisation, 1979). The goat population in the Egypt is about 1.5 million head. Mainly used for meat production, milk production being of secondary importance. About 50 percent of these are raised in upper Egypt (Ministry of Agriculture, Egypt, 1981). Goat's meat is a cheap source of animal protein which can be utilized to satisfy the increasing demand for food in developing countries. The local Baladi strains are the main goats raised by small holdersin El-Minia Governorate. These goats are small sized animals with different colours and show poor performance as compared to the standard foreign breeds raised for milk or meat production. Crossing between the Egyptian local goats and exotic breeds is one of the methods used for improving the efficiency of both meat and milk production. crossing of tropical goats such as the Malabori with temperate goat breeds such as the sa men and Alpine was found to improve the growth rate and meat production (Mukundan and Bhat, 1978 and Mukundan *et al..*, 1982). Castration is widely used all over the world as a mean of improving meat quality.

The objective of this study was to evaluate the results of crossing local Baladi goats

with Anglo-Nubian breed on carcass characteristics of male kids. Also, the effects of castration and slaughter weight on carcass characteristics were studied.

Material and Methods

Thirty two of male kids were used in this study. These kids were born in 1987 at the experimental farm, Animal Production Department, Faculty of Agriculture, El-Minia University. They belonged to three gentoypes; Local Baladi (B), 1/2 Anglo-Nubian (AN) 1/2B and 1/4 AN 3/4B goats. Surgical castration was carried out at one month of age for almost half the number of kids of each breed.

The male kids representing the above three different breed types were involved in fattening trial at 16 months of age. The fattening trial began on the first of April 1989 and extended until the end of May. The kids were given fattening rations consisting of a pelleted concentrate mixture and bean straw. They were fed according to Morrison's fattening standard (Morrison,1956). The concentrate mixture used composed from 25% decorticated cotton seed meal, 26 % wheat bran, 20 % cotton seed hulls, 17 % corn, 7% rice bran, 2 % molasses, 2 % calcium carbonate and 1 % common salt. The kids from each breed group (castrated and entire males) were managed and reared as one group in barn. They were fed and watered twice a day along the fattening period until slaughter.

Fifteen castrated and 17 entire male kids were slaughtered at 18 months of age. The kids were fasted for 18 hr. prior to slaughter and the fast live weight was recorded. After bleeding, they were weighed and the dressed carcass was split into two equal sides. The right side was divided into several cuts according to Gerrard (1953). The cuts are: Leg (hind Limb cut straight), chine (Lumbar region plus one pair of ribs), shoulders (scapula, humerus, radius, ulna, carpals), ends (4pair of ribs) and sets (chest, neck). The cuts were weighed and dissected to determine the meat: bone ration. The fast (based on fast live body weight) and empty dressing % and boneless meat % were computed. The 9, 10 and 11th ribs of the right side carcass were weighed and dissected. Lean, fat and bone were weighed separately. After chilling, fat thickness over the eye muscle was estimated as the average of the fat thickness at both 9th and 11th ribs of the right side and the area of eye muscle was calculated.

For chemical analysis, the components of 9 , 10 and 11th ribs (lean and fat) of each carcass were mixed and dried at 60° for 48 hours for determining moisture after a constant weight was reached. Samples from the mixture were analyzed according to AOAC (1970) for ether extract, crude protein and ash. Crude protein was determined as N x 6.25.

All percentages of characters studied were transfered by arcsin transformation before statistical analysis was done. The statistical analysis was performed by the application of the least squares procedure for analysing the data with unequal numbers described by SAS (1989). The following models were used.

$Y_{ijk} = U + B_i + C_j + (BC)_{ij} + e_{ijk}$ (Model 1)

$Y_{ijl} = U + B_i + C_j + (BC)_{ij} + b\,(X_{ijl}\ X_{ijl}) + e_{ijl}$ (Model 11)

where :

Y_{ijk} = an observation of slaughter weight.

Y_{ijl} = an observation on carcass traits.

U = a common element to all individuals;

B_i the effect due to ith breeding group, i = 1, 2, 3 ;

G_j = the effect due to jth state of castration, j = 1 (castrated male kids) , 2 (entire male kid) ;

$(BC)_{ij}$ = the effect due to interaction between breed and state of castration;

$b\,(x_{ijl} - x_{ijl})$ = regression coefficient of carcass traits on slaughter weight;

$x_{ijl} - x_{ijl}$ = the deviation of the body weight at slaughter from its mean ;

e_{ijk}, e_{ijl} = random errors associated with the indidividaul observation.

Factors under investigation were assumed to be fixed, except the error term which was assumed to be random and normally distributed (O , O^2_e).

significant differences among sub-classes were detected using Tukey test (1949).

Results and Discussion

Least squares means of slaughter weight, fast and empty dressing %, boneless meat % and tests of significance are presented in Table 1 . Significant differences ($P<0.05$) in slaughter were detected between the genotypes studied. The first cross (1/2 AN 1/2 B) had the heaviest slaughter weight, while the Baladi kids had the lighest value (32.13 vs. 26.68 kg). Singh *et al*.., (1985) on Jammapari x Black Bengal (BB) and BB, found that the differences in slaughter weight at one year of age due to breed group were significant (14.1 vs. 10.8 kg). The entire kids were significantly superior ($P< 0.05$) to the castrated ones in final live body weight at 18-month old (31.4 vs. 24.1 kg). Turton (1969) indicated that entire males grow faster and achieve heavier final livebody weights as compared to castrated. Also, Chopra (1988) on Beetal goats, reported that body weight at one up to 6 months of age was significantly higher for intact than for castrated goats. He was concluded that there is no benefit in castrating market goats.

The differences between Baladi and its crosses with Anglo-Nubian in carcass weight, fast and empty dressing % and boneless meat % were not significant. The Baladi kids had the highest mean values for carcass weight, fast and empty dressing % and boneless meat %, while 1/4 AN 3/4 B had the lowest values (Table 1). The superiorty of Baladi goats over their crosses with Anglo-Nubian in above mentioned

traits, may be attributed to more of the digestive tract contents and heavier weights of head, skin and legs in the crosses. Castration effect on carcass weight, fast and empty dressing % and boneless meat % was also not significant. However, the castrated male kids were slightly superior in these traits than entire males (Table 1). The present results are consistent with those reported by Misra *et al.* (1986) studying Sirohi and Beetal x Sirohi kids which were slaughtered at 6 months of age. They reported that castration had no significant effects on carcass weight, dressing percentage and the percentage of lean in the carcass. Also, Babiker *et al.*. (1985) on Sudanse Desert kids,. found that castrates and entire males did not differ significantly in carcass weight and dressing percentage.

Regression coefficients of carcass weight, fast and empty dressing % and boneless meat % on slaughter weight are presented in Table 1. Regression coefficient between carcass weight and slaughter weight was psitive (0.46 kg/kg) and significant ($p< 0.01$). while, those relationships between slaughter weight and each of fast dressing %, empty dressing % and boneless meat % were non-significant (Table 1).

Least squares means and regression coefficient of carcass cuts on slaughter weight are presented in Table 2. Boneless meat percentage of leg cut had the highest value (74.97 %). while ends cut had the lowest values (65.27 %). The differenceds in carcass cuts (weight or boneless meat %) due to breed group effects were non-significant. These results agree with those reported by Bello and Babiker (1988) on desert goat does with the temperate Saanen x Toggenburg buck. They found that breed types did not significantly differ in the weights of individual wholes sale cuts. Also, this confirmed the earlier finding of Goll *et al.*. (1961) that genetic differences effects on the yield of whole sale cuts is small or non-existent.

Castration had no significant effects on carcass cuts, except for the boneless meat percentage of leg cut and weight of sets cut, which was significant ($p<0.05$). Castrated kids scored heavier weights for the leg and chine cuts, while entire kids scored heavier weights for the ends, shoulder and sets cuts. This phenomenon may be attributed to the action of sex hormones which play a major role in accelerating growth in fore quarters. Boneless meat percentage of all carcass cuts of castrated kids were higher than entire ones (Table 2) . Similar results were reported by Misra *et al.*. (1986) on Siorhi and Beetal x Siorhi kids. They found that genotype and castration had no significant effects on carcass cuts, except for the percentage of neck + shoulder, which was significantly lower in castrated kids. The percentage of bone in all cuts was significantly lower in kids castrated at 30 days (15.07 %) than in the entire male kids (18.68 %).

Regression coefficients of carcass cuts on slaughter weight were positive and highly significant ($p<0.01$). They ranged between 0.03 and 0.05 kg/kg for ends and leg cuts, respectively. These relationships between slaughter weights and boneless meat percentage of carcass cuts were positive, but not significant (Table 2).

TABLE 1 . Least squares means ± S.E., regression coefficients and test of significance of factors affecting slaughter weight and some carcass trais of kids.

Classification	No.	Slaughter. wt. kg.	Carcass wt. kg.	Fast dressing %	Empty dressing %	Boneless meat %
		L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.
Overall mean	32	29.27 ± 0.83	12.76 ± 0.13	43.6 ± 0.23	49.2 ± 0.37	72.7 ±0.61
Breed group :		*	+ NS	NS	NS	NS
Baladi (B)	12	26.68 ± 1.37 a	13.09 ± 0.24 a	44.6 ± 0.43 a	50.6 ± 0.69 a	73.0 ± 1.12 a
1/2 A N 1/2 B	12	32.13 ± 1.44 b	12.65 ± 0.25 a	43.4 ± 0.44 a	48.9 ± 0.71 a	72.9 ± 1.16 a
1/4 A N 3/4 B	8	29.00 ± 1.67 ab	12.53 ± 0.26 a	42.8 ± 0.47 a	48.1 ± 0.75 a	72.3 ± 1.23 a
Castration treatment :		*	NS	NS	NS	NS
Castrated	15	27.14 ± 1.27 a	12.81 ± 0.22 a	44.3 ± 0.39 a	50.4 ± 0.62 a	73.4 ± 1.02 a
Entire	17	31.39 ± 1.18 b	12.70 ± 0.20 a	43.0 ± 0.35 a	48.4 ± 0.57 a	72.1 ± 0.93 a
Regression of carcass traits on slaughtor weight	- -	- - - -	** 0.46 ± 0.04	NS 0.07 ± 0.07	NS 0.10 ± 0.11	NS 0.14 ± 0.17
Intercept	- -	- - - -	-0.81 ± 1.21	39.10 ± 0.16	42.51 ± 0.38	64.22 ± 0.98

* = (P< 0.05) ** = (P< 0.01) NS = (P<0.05)

+ = Means within a column and within the same classification followed by different letters are significantly different (P<0.05) (Tukey, 1949).

AN = Anglo - Nubian

The same notations are followed in similar tables.

Interactions between breed groups and castraction treatment was small and insignificant in this table and in the other tables.

TABLE 2. Least squares means ± S.E., regression coefficients and test of significance of factors affecting carcass cuts of right side in kids.

Classification	No.	Leg cut		Chine cut		Ends cut		Shoulder cut		Sets cut	
		Total wt.(kg.)	Boneless meat %	Total wt.(kg.)	Boneless meat %	Total wt. (kg.)	Boneless meat %	Total wt. (kg.)	Boneless meat %	Total wt. (kg.)	Boneless meat %
		L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.
Overall mean	32	1.67 ± 0.03	74.97 ± 0.34	0.97 ± 0.03	74.13 ± 0.74	0.79 ± 0.02	65.27 ± 0.63	1.34 ± 0.02	76.00 ± 0.44	1.10 ± 0.03	69.33 ± 0.68
Breed group :		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Baladi (B)	12	1.64 ± 0.05 a	74.50 ± 0.63 a	0.95 ± 0.05 a	76.20 ± 1.34 a	0.83 ± 0.04 a	63.70 ± 1.15 a	1.36 ± 0.04 a	74.10 ± 0.80 a	1.14 ± 0.05 a	68.60 ± 1.23 a
1/2 A N 1/2 B	12	1.70 ± 0.05a	74.50 ± 0.65 a	0.98 ± 0.05 a	73.40 ± 1.39 a	0.78 ± 0.04 a	65.20 ± 1.19 a	1.32 ± 0.04 b	77.50 ± 0.82 a	1.05 ± 0.05 a	69.60 ± 1.28 a
1/4 A N 3/4 B	8	1.67 ± 0.05 a	75.90 ± 0.69 a	0.97 ± 0.05 a	72.80 ± 1.47 a	0.75 ± 0.05 a	66.90 ± 1.26 a	1.34 ± 0.04 a	76.40 ± 0.88 a	1.12 ± 0.05 a	69.80 ± 1.36 a
Castration treatment :		NS	*	NS	NS	NS	NS	NS	NS	*	NS
Castrated	15	1.68 ± 0.04 a	76.40 ± 0.57 a	1.02 ± 0.04 a	75.90 ± 1.22 a	0.78 ± 0.04 a	66.70 ± 1.05 a	1.31 ± 0.04 a	76.80 ± 0.74 a	1.02 ± 0.04 a	71.10 ± 1.12 a
Entire	17	1.67 ± 0.04 a	73.60 ± 0.52 b	0.91 ± 0.04 a	72.20 ± 1.11 a	0.79 ± 0.03 a	64.00 ± 0.95 a	1.37 ± 0.03 a	75.30 ± 0.66 a	1.18 ± 0.04 b	67.60 ± 1.02 a
Regression of carcass cute on slaughtor weight		**	NS	**	NS	**	NS	**	NS	**	NS
		0.05 ± 0.01	0.14 ± 0.09	0.04 ± 0.01	0.25 ± 0.21	0.03 ± 0.01	0.04 ± 0.19	0.04 ± 0.01	0.06 ± 0.12	0.04 ± 0.01	0.18 ±0.19
Intercept		0.23 ± 0.25	66.20 ± 0.31	-0.40 ± 0.24	59.61 ± 1.41	-0.06 ± 0.22	68.51 ± 1.11	0.09 ± 0.20	73.13 ± 0.05	-0.04 ± 0.25	60.50 ± 1.21

* = (P< 0.05)   ** = (P< 0.01)   NS = (P<0.05)

+ = Means within a column and within the same classification followed by different letters are significantly different (P<0.05) (Tukey, 1949).

Least squares means and reagression coefficients of the 9-10-11 rib Cut on slaughter weight are presented in Table 3. The importance of the 9-10-11 rib cut analysis as an indicator to the carcass composition was shown by the work of Latham *et al.*. (1466) in sheep and crown and Damon (1960) and Bracklesberg *et al..*, (1968) in beef animals. Amount and percent of lean, fat and bone in chilled 9-10-11 rub cut were calculated. Breeding groups did not show significant difference in lean and bone weight and percentage of lean in the cut of 9-10-11 rib. While, this effect was significant ($p<0.01$ or $p<0.05$) on fat weight and fat and bone percentages (Table 3). The first cross (1/2 AN 1/2B) had the highest fat percentage (21.8 %), while Baladi kids had the lowest value (16.3 %). The Baladi kids had higher percentage of bone (28.3 %) than those of 1/2 AN 1/2 B and 1/4 AN 3/4 B kids (23.2 % and 21.8 %, respectively). Similar results were reported by Galal *et al.* (1975) on sheep. They showed that breeding groups did not differ significantly in lean percentage, while they differed in bone percentage, of the 9-10-11 rib cut (according to the physical separation analysis) as found in dissection data.

Castration had a significant effect on fat and bone weights and percentages for the 9-10-11 rib cut. while this effect was non-significant on lean weight or percentage (Table 3). Castrated kids had heavier weight for the fat compared to entire kids (58. vs. 45 g), while entire kids scored heavier weight for the bone compared to the castrated ones (77.0 vs. 59.4 g). Also, castrated kids had the higher percentage of fat (21.5 %) and lower percentage of bone (21.0 %) than entire ones (16.4 and 27.7 %for fat and bone respectively). El-Bayomi and El-Sheikh (1989) in their study on Baladi goats reported that castrated kids had higher percentage of carcass fat and lower percentage of lean and bone then those of entire kids.

Differences in fat thickness above eye muscle due to breed group or castration treatment were not significant. However in this trait castrated kids had a higher fat thickness above eye muscle (Table 3). The effect of breed group on eye muscle area was not significant, while the effect of castraion was significant ($p<0.05$). The first cross (1/2 AN 1/2 B) kids possess larger area of eye muscle than Baladi kids, while 1/4 AN 3/ 4B being intermediate. Superiority of the crosses or entire kids in the Longissimus dorsi measurements is mainly due to heavier body weights at slaughter. Biswas and Koul (1989) on Cheghu goats (slaughtered at 18-month old, 25.06 kg body weight), found that area of eye muscle was similar to the figure of computed from this research (7.13vs. 7.46 cm^2).

Regression coefficients of the weight and percentage of the 9-10-11 rib cut on slaughter weight are presented in Table 3. The relationship between slaughter weight and each of lean and fat weights were significant ($p<0.01$). It was positive and being 5.66 and 1.39 g/kg for lean and fat weights, respectively. While the realationships between slaughter weight and each of bone weitght and lean, fat and bone percentages were not significant. Regression coefficient of the eye muscle area on slaughter weight was positive (0.17 cm^2/kg) and significant ($p<0.05$).

TABLE 3. Least squares means ± S.E., regression coefficients and test of significance of factors affecting content of the ribs 9,10 and 11 of the carcass and the area of eye nuscle and thickness of fat covering it for kids.

Classification	No.	9-10-11 rib-cut wt. (g)	9-10-11 rib-cut Boneless meat%	9-10-11 rib-cut wt. (6) Lean (g)	9-10-11 rib-cut wt. (6) Fat	9-10-11 rib-cut wt. (6) Bone (g)	9-10-11 rib-cut Lean %	9-10-11 rib-cut Fat %	9-10-11 rib-cut Bone %	Eye auscele Thick. of the fat	Eye auscele Area (cm^2)
		L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.
Overall mean	32	270.7 ± 9.46	75.7 ± 0.55	151.7 ± 4.82	51.5 ± 2.03	68.2 ± 3.79	56.3 ± 0.40	18.9 ± 0.30	24.4 ± 0.57	0.16 ± 0.01	7.46 ± 0.27
Breed group :		NS	*	NS	**	NS	NS	**	*	NS	NS
Baladi (B)	12	267.3 ± 17.26 a	72.1 ± 1.00 a	147.9 ± 8.79 a	43.9 ± 3.71 a	75.2 ± 6.91 a	55.2 ± 0.74 a	16.3 ± 0.55 a	28.3 ± 1.03 a	0.15 ± 0.02 a	6.88 ± 0.51 a
1/2 A N 1/2 B	12	283.6 ± 17.85 a	76.8 ± 1.03 ab	154.2 ± 9.10 a	62.5 ± 3.83 b	69.3 ± 7.15 a	54.7 ± 0.76 a	21.8 ± 0.57 b	23.2 ± 1.07 b	0.15 ± 0.02 a	8.43 ± 0.49 a
1/4 A N 3/4 B	8	261.2 ± 18.96 a	78.1 ± 1.10 b	152.9 ± 9.66 a	48.1 ± 4.07 a	60.1 ± 7.59 a	59.0 ± 0.81 a	18.7 ± 0.61 ab	21.8 ± 1.14 b	0.18 ± 0.02 a	7.08 ± 0.54 a
Castration treatment :		NS	**	NS	**	*	NS	**	**	NS	*
Castrated											
Entire	15	267.3 ± 15.67 a	78.8 ± 0.91 a	151.2 ± 7.98 a	58.0 ± 3.37 a	59.4 ± 6.28 a	57.2 ± 0.67 a	21.5 ± 0.50 a	21.1 ± 0.94 a	0.18 ± 0.02 a	6.83 ± 0.49 a
	17	274.1 ± 14.32 a	72.6 ± 0.83 b	152.2 ± 7.29 a	45.0 ± 3.07 b	77.0 ± 5.73 b	55.5 ± 0.61 a	16.4 ± 0.46 b	27.7 ± 0.86 b	0.14 ± 0.01 a	8.10 ± 0.41 b
Regression of carcass traits on slaughter weight		**	NS	**	**	NS	NS	NS	NS	NS	*
		8.76 ± 2.68	0.05 ± 0.15	5.66 ± 1.36	1.39 ± 0.57	1.60 ± 1.07	0.11 ± 0.11	-0.07 ± 0.09	-0.06 ± 0.16	0.001 ± 0.002	0.17 ± 0.07
Intercept		37.83 ± 87.61	69.8 ± 0.77	-0.73 ± 44.63	6.75 ± 18.83	35.19 ± 35.10	50.21 ± 0.43	19.00 ± 0.24	30.51 ± 0.48	0.12 ± 0.09	2.73 ± 2.51

Least squares means, regression coefficients of kidney and bowel fats or total dissected fat (kidney and bowel fats) on slaughter weight and tests of significance are presented in Table 4. Fat quantity and distribution are of significant importance in determining carcass quality. The crosses (1/2 AN 1/2 B and 1/4 AN 3/4 B) had more kidney fat and lower bowel fat than Baladi kids, but the differences were not significant. However, there was no significant difference among breeding groups in total dissected fat (Table 4). Bello and Bebiker (1988), reported differences in bowel fats among different genotypes studied but it was non-significant.

Castration had a significant effect ($p< 0.01$) on the weights of kidney, bowel and total dissected fats. Also Castration had significant effects ($P< 0.01$) on the kidney, bowel and total dissected fats as percentage of live body weight or carcass weight. Castrated kids had scored heavier weights and higher percentages for the kideny and bowel fats compared to the entire ones (Table 4). These results indicate that castrated kids were more able to deposit more fat in the omentum and above kidney than the entire ones. Previous reports have indicated that wethers usually have more fat cover on their carcasses (Bradford and Squrlock, 1964) and more weight of fat trim (Ray and Mandigo, 1966 and Younis *et al* ., 1972) compared to the entire ones.

Regression coefficients of bowel fat or total dissected fat weights on slaughter weight were positive and significant ($p<0.01$). Values ranged from 0.04 to 0.05 kg/kg for bowel fat and total dissected fat,respectively. while these relationships were not significant for kidney fat weight or percentages of body weight or carcass weight.

Breed type of kids had significant effects ($p<0.05$) on the chemical compsition of the ribs 9,10 and 11 of the carcass for moisture and fat percentages, while this effect was not significant for protein and ash percentages (Table 5). The Baladi male kids had the highest moisture, protein and ash percentages, while the crossbred kids had the highest ether extract percentage (Table 5). Similar results were reported on breed differences according to the chemical composition of lamp carcass. Hassan (1984), reported that carcass of the fist cross (1/2 Saidi 1/2 Ossimi) was significantly higher in ether extract than those of either of two parents.

Carcasses of entire male kids contained higher percentages of moisture, protein and ash, while carcasses of castrated male kids had a higher ($p<0.01$) percentage of ether extract. These results agree with those reported by Sallam *et al.*, (1990). They found that carcasses of entire male kids contained significantly higher percentages of moisture, protein and ash and lower percentage of ether extract compared to castrated ones. Regression coefficients of chemical composition of carcass on slaughter were not significant (Table 5).

TABLE 4. Least squares means ± S.E., regression coefficients and test of significance of factors affecting kidneys bowels and total dissected fats of kid carcasses.

Classification	No.	* Kidney fat wt. (kg.)	+ Kidney fat %	μ Kidney fat %	Bowel fat wt. (kg)	+ Bowel fat %	μ Bowel fat %	* Total dissected fat wt. (kg)	+ Total dissected fat %	μ Total dissected fat %
		L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.	L.S.M ± S.E. or b ± S.E.
Overall mean	32	0.30 ± 0.02	0.96 ± 0.17	2.23 ± 0.27	0.73 ± 0.27	2.40 ± 0.29	5.53 ± 0.45	1.05 ± 0.12	3.35 ± 0.29	7.87 ± 0.47
Breed group :		NS	*	*	NS	NS	NS	NS	NS	NS
Baladi (B)	12	0.24 ± 0.03 a	0.74 ± 0.32 a	1.60 ± 0.50 a	0.81 ± 0.09 a	2.70 ± 0.53 a	6.10 ± 0.83 a	1.05 ± 0.12 a	3.42 ± 0.54 a	7.90 ± 0.87 a
1/2 A N 1/2 B	12	0.32 ± 0.03 a	1.00 ± 0.33 ab	2.40 ± 0.52 ab	0.67 ± 0.09 a	2.10 ± 0.54 a	4.90 ± 0.86 a	0.99 ± 0.12 a	3.12 ± 0.55 a	7.40 ± 0.89 a
1/4 A N 3/4 B	8	0.34 ± 0.04 a	1.15 ± 0.35 b	2.70 ± 0.55 b	0.71 ± 0.10 a	2.40 ± 0.58 a	5.60± 0.91 a	1.06 ± 0.13 a	3.51 ± 0.59 a	8.30 ± 0.95 a
Castration treatment :		**	**	**	**	*	**	**	**	**
Castrated		0.43 ± 0.03 a	1.40 ± 0.29 a	3.20 ± 0.46 a	1.03 ± 0.08 a	3.42 ±0.48 a	7.90 ± 0.75 a	1.45 ± 0.11 a	4.80 ± 0.49 a	11.20 ± 0.79 a
Entire	15	0.18 ± 0.03 b	0.61 ± 0.26 b	1.40 ± 0.42 b	0.43 ± 0.08 b	1.50 ± 0.44 b	3.60 ± 0.69 b	0.61 ± 0.10 b	2.20 ± 0.45 b	5.10 ± 0.72 b
	17									
Regression of dissected fat on slaughtor weight		NS 0.001 ± 0.001	NS -0.02 ± 0.05	NS -0.03 ± 0.08	** 0.04 ± 0.01	NS 0.11 ± 0.08	NS 0.16 ± 0.13	** 0.05 ± 0.02	NS 0.08 ± 0.08	NS 0.12 ± 0.13
Intercept		0.06 ± 0.03	1.21 ± 0.08	2.74 ± 0.20	-0.78 ± 0.01	0.45 ± 0.22	1.15 ± 0.54	-0.78 ± 0.60	1.40 ± 0.23	3.31 ± 0.58

+ as percentage of live body weight μ as percentage of carcass weight.
* Total dissected fat = kidney fat + bowel fat .

TABLE 5. Least squares means ± S.E. regression coefficients and test of significance of factors affecting composition of the ribs 9,10 and 11 of the carcass.

Classification	No.	Moisture %	Protein %	Fat %	Ash %
		L.S.M ± S.E. or b±S.E.	L.S.M ± S.E. or b± S.E.	L.S.M ±S.E. r b±S.E.	L.S.M ± S.E. or b± S.E.
Overall mean	32	56.00 ± 0.29	17.00 ± 0.11	25.70 ± 0.39	0.83 ± 0.07
Breed group :		*	NS	*	NS
Baladi (B)	12	58.20 ± 0.52 a	17.30 ± 0.21 a	23.10 ± 0.71 a	0.96 ± 0.13 a
1/2 A. N 1/2 B	12	54.80 ± 0.54 a	16.90 ± 0.21 a	26.90 ± 0.73 a	0.92 ± 0.13 a
1/4 A. N 3/4 B	8	55.00 ± 0.58 a	16.80 ± 0.23 a	27.10 ± 0.78 a	0.88 ± 0.14 a
Castration treatment :		**	*	**	NS
Castrated	15	51.15 ± 0.48 a	16.60 ± 0.19 a	31.20 ± 0.64 a	0.88 ± 0.12 a
Entire	17	60.80 ± 0.43 b	17.43 ± 0.17 b	20.56 ± 0.59 b	0.96 ± 0.11 a
Regression of carcass composition on slaughtor weight		NS 0.06 ± 0.08	NS 0.03 ± 0.03	NS 0.11 ± 0.11	NS 0.003 ± 0.02
Intercept		55.90 ± 0.22	16.20 ± 0.04	27.30 ± 0.40	0.87 ± 0.01

Out of this research it could be concluded that cross-breeding between Anglo-Nubian and Local Baladi goats was not advisable for meat production. It did not improve the carcass traits. The Baladi kids were superior to the crossbred kids in dressing and boneless meat percentages. Also, the results indicate that castrated kids were more able to deposit more fat in the omentum, over kidney and had higher fat percentage in the carcass than the entire ones. Castration of kids improved fast and empty dressing and boneless meat percentages, but the difference between castrated and entire kids was not significant.

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دراسات على صفات الذبيحة فى الماعز البلدى المصرى وخلطانه مع سلالة الانجلونوبيان

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اجرى هذا البحث بمزرعة الانتاج الحيوانى بكلية الزراعة جامعة المنيا على ٣٢ رأسا من الجداء الذكور والتى تتبع سلالة الماعز البلدى واثنين من الهجين الناتجة من خلط ذكور ماعز الانجلونوبيان وعنزات بلدى وتلقيح إناث الجيل الأول الخليطة مع ذكور بلدى حيث كانت الهجن الناتجة هى (٢/١ بلدى ، ٤/١ نجلونوبيان و ٤/٣ بلدى) وقد تم اجراء عليه خصى جراحى لنصف هذا الحملان تقريبا عند عمر شهر.

وقد غذيت الجديان على مقررات مورسن للتسمين لمدة ٨ أسابيع قبل الذبح حيث ذبحت الجديان عند عمر ١٨ شهرا وذلك بهدف دراسة تأثير عملية الخلط والخصى ووزن الذبح على أداء وخصائص الذبيحة المختلفة.

وقد حللت النتائج بالحاسب الآلى وأظهرت نتائج البحث مايلى:

١- كان تأثير السلالة وعملية الخصى جوهريا على الوزن عند الذبح حيث تفوقت الجديان الخليطة على الجديان البلدى فى الوزن عند الذبح وكذا كانت الجديان غير المخصية أثقل وزنا من الجديان المخصية عند الذبح.

٢- كان تأثير كل من السلالة وعملية الخصى والوزن عند الذبح غير جوهرى على وزن الذبيحة ونسبة التصافى العادية ونسبة التصافى للوزن الفارغ ونسبة التصافى - فيما عدا تأثير وزن الذبح - فقد كان جوهريا جدا على وزن الذبيحة.

٣- تفوقت الجديان البلدى على الجديان الخليطة وكذا الجديان المخصية على الجديان غير المخصية فى نسبة التصافى العادية ونسبة التصافى للوزن الفارغ ونسبة التصافى.

٤- كان تأثير كل من السلالة وعملية الخصى غير جوهرى على وزن قطعيات الذبيحة المختلفة أو نسبة التصافى لكل قطعة فيما عدا تأثير الخصى فقد ظهر له تأثير جوهرى على نسبة التصافى فى قطعة الفخذ وكذلك على وزن منطقة القطعة الخامسة (الرقبة والصدر) فقد كانت أثقل وزنا فى الجديان الغير مخصية.

٥- كانت نسبة التصافى فى كل قطعيات الذبيحة المختلفة من الجديان المخصية أعلى منها فى الجديان غير المخصية وقد أعطت منطقة الفخذ أعلى نسبة تصافى (٧٤ر٩٧ ٪) فيما كانت نسبة التصافى فى منطقة الأضلاع هى أقلها (٦٥ر٢٧٪) .

٦- كان تأثير السلالة غير جوهرى على كل من وزن العضلات والعظم ونسبة العضلات فى منطقة الأضلاع ٩-١٠-١١ فى حين كان تأثيرها جوهريا جدا على وزن ونسبة الدهن وكذا نسبة العظم .

٧- كان تأثير عملية الخصى جوهريا أو جوهريا جدا وزن ونسبة الدهن ونسبة العظم فى منطقة الأضلاع ٩ ، ١٠ ، ١١

فى حين كان تأثيرها غير جوهرى على وزن ونسبة العضلات وكانت ذبائح الجديان المخصية تحتوى على نسبة دهن أعلى ونسبة عظم أقل.

٨- كان تأثير كل من السلالة والخصى غير جوهرى على سمك الدهن المغطى للعضلة العينية وكذلك على مساحة العضلة العينية - فيما عدا تأثير عملية الخصى فقد كان جوهريا على مساحة العضلة العينية .

٩- وجد أن ذبائح الجديان الخليطة كانت أعلى فى محتواها من دهن الكليتين فى حين كانت ذبائح الجديان البلدى أعلى فى محتواها من دهن الأمعاءولكن كانت الاختلافات غير جوهرية - ووجد كذلك أن ذبائح الجديان المخصية أعلى فى محتواها من دهن الكليتين والأمعاء وكان تأثير الخصى جوهريا جدا .

١٠- وجدت علاقة انحدار موجبة وجوهرية جدا بين الوزن عند الذبح ووزن دهن الأمعاء وكذا وزن الدهن الكلى (دهن الكليتين + دهن الأمعاء) وكانت هذه العلاقة تتراوح ما بين ٠,٤ ، ٠,٥ كجم /كجم لكل من دهن الأمعاء والدهن الكلى على التوالى.

١١- وجد من التحليل الكيماوى للحم الأضلاع ٩ ، ١٠ ، ١١ أن تأثير السلالة كان جوهريا على نسبة الرطوبة والدهن فى حين كان غير جوهرى على نسبة البروتين والرماد - وكانت نسبة الدهن فى الجديان الخليطة أعلى منها فى الجديان البلدى.

١٢- وجد أن ذبائح الذكور غير المخصية تحتوى على نسبة جوهرية من الرطوبة والبروتين بينما ذبائح الذكور المخصية تحتوى على نسبة عالية وجوهرية جدا من الدهن فى حين كان الفرق فى محتوى الرماد غير جوهرى .