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THE EFFECT OF CROSSBREEDING BETWEEN CHIOS AND OSSIMI SHEEP ON GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF MALE LAMBS

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SUMMARY

Thirty male lambs of different genotypes; Ossimi (O) and Chios (C) and two crosses (1/2C 1/2O and 3/4C 1/4O) were used in fattening experiment for 120 days. Twelve animals including the different genotypes were slaughtered as they achieved the desired slaughter weight (45 kg body weight). Data were analyzed to investigate the effect of breed group on feed consumption, feed conversion, growth rate and some carcass traits.

Breed group had significant effects on total body weight gain and feed conversion ratio (kg TDN/kg gain), while this effect was not significant for feed consumption, daily gain and length of the fattening period. The corssbred lambs (1/2C 1/2O and 3/4C 1/4 O) were more efficient in feed utilization and grew faster than Ossimi and Chios breeds. The averages were 160, 163, 199 and 175 g daily gain and 4.1, 3.8, 3.1 and 3.4 kg TDN/kg gain for Ossimi, Chios, 1/2C 1/2O and 3/4C 1/4O lambs, respectively.

Breed group had significant effect on carcass weight ($p<0.05$), fast and empty dressing% ($p<0.01$), fore and hind quarters% of the carcass ($p<0.01$), tail fat and total dissected fat ($p<0.01$), but this effect was not significant for boneless meat%. Ossimi lambs had the highest fast and empty dressing% (49.2 and 60.8%, respectively) while Chios and 3/4C 1/4O lambs had the lowest values 42.7 and 52.7; 43.2 and 51.4% for fast and empty dressing%, respectively.

Chios carcasses had the highest fore quarter% (54%) and lowest total dissected fat (tail, kidney and bowel fats) (1.0 kg), while Ossimi carcasses had the highest hind quarter (48.4%) and greatest total dissected fat (2.4 kg).

Significant breed type differences in the chemical composition of 9, 10 and 11 ribs cut were noted concerning fat and ash percentages. Moisture, protein, fat and ash% ranged from 56.8 to 58.0, 15.1 to 16.6, 22.4 to 23.4 and 3.4 to 4.7%, respectibvely.

Keywords: Chios, Ossimi, sheep, crossbreeing, growth, carcass.

INTRODUCTION

Efficiency of meat production in sheep would be improved by increasing litter size weaned per ewe and/or weaning weight of lambs, such advance could be achived by

improvments in conception rate, litter size at birth, milk production, lambs survival rate to weaning or lambs growth rate. Local Ossimi sheep is poor in prolificacy (1.10 lamb/ewe, Marzouk, 1986) and low in milk production (65.5 kg in 79.7 days, Mousa and Shetaewi, 1994). These traits need to be improved to increase the available and marketable mutton. Crossbreeding with prolific breeds of sheep has the potential to increase production through improvment of litter size of crossbred ewes. (Dickerson, 1977, Aboul-Naga, 1983 and Boujenane *et al*, 1991).

Recently, the Chios breed was introduced into Egypt for the purpose of improving prolificacy and milk production of Egyptian local sheep. Therefore, the use of Chios breed in crossbreeding programs should be evaluated more completely before this breed is used extensively in commerial production.

The objectives of this study were to examine the effect of crossing Chios breed with Ossimi on growth performance, feed efficincy during fattening period and carcass traits of male lambs. Also, the effect of slaughter age on some carcass traits was studied.

MATERIAL AND METHODS

Thirty male lambs were used in this study. These lambs were born in February 1992 at the farm of Mallawi Research station, belonging to Animal Production Research Institute, Ministry of Agriculture. They were of four genotypes; 8 Ossimi (O), 6 Chios (C), 7 1/2C 1/2O (F1) and 9 3/4C 1/4O (P1). The animals were divided into four groups according to thier weight at 6 months of age. The four breed groups were represented in each group. They were fed according to their average body weight on the N.R.C (1984), A.R.C. (1982) and Morisson (1956) average standards . The animals were fed on pelleted concentrate diet containing (7% cotton seed meal, 4% soaybean meal, 20% wheat bran, 20% rice bran, 23 % ground mazie, 15% molases, 8% rice glluten, 2.5% lime stone, 0.5% salt), blocks of minerals and vitamins mixture. The feeding value of this mixture was experimently tested and found to be 51.89% TDN and 7.46% DP. Wheat straw was offered in amounts that represent 1% of the animals body weight. They were fed and watered twice a day and were weighed weekly during the fattening period. Feed consumption, feed conversion and daily gain of lambs during the fattening period were calculated.

Twelve of these lambs (three from each breed group) underwent the slaughter traits experiment. They were slaughtered at 45 kg live body weight. The lambs were fasted for 18 hr. perior to slaughter and the fast live body weight was recorded. After bleeding, they were weighed and the dressed carcass was longitudinally split into two equal sides. The right side was cut according to the English method of cutting mutton and lamb (Gerrard, 1953).

The cuts and the 9, 10 and 11th ribs of the right side carcass were weighed and dissected to determine the meat: bone ratio. The fasting and empty dressing percentages and boneless meat percentage were computed. After chilling, fat thickness over the *Longissimus dorsi* muscle was estimated as the average of fat thickness at both 9 and 11*th* ribs and the area of eye muscle was calculated. The 9, 10 and 11*th* ribs of the right side carcass were dissected and lean, fat and bone were weighed separately.

For chemical analysis, the component of 9, 10 and 11*th* ribs of each carcass were mixed and dried at 60^{o}C for moisture determination after a constant was reached (48

hours). Homogenised samples from this cut were analyzed according to AOAC (1984) to determine moisture, ether extract, crude protein and ash.

Data of each trait were analyzed using the least squares procedure described by SAS (1992). The following model was used:

$Y_{ijk} = \mu + B_i + b(x_{ij} - x_{ij}) + e_{ijk}$

where:

Y_{ijk} = an observation on performance or carcass traits;

μ= general mean or a common element to all individual;

B_i= The effect du to the ithe breeding group; I=1, 2, 3 and 4, 1= O, 2=C, 3=1/2C 1/2O and 4=3/4C 1/4 O;

$b(x_{ij}-x_{ij})$= Regression coefficient of performance tarits on initial weight or carcass tarits on slaughter age;

$x_{ij}-x_{ij}$= The deviation of initial weight or slaugter age from its means;

e_{ijk} = random error associated with individual observation and assumed to be independently and randomly distributed (O, S^2e).

Tests of significance for differnces among means of of different levels within each factor or classification were done according to orthogonal contarsts.

RESULTS AND DISCUSSION

Least Squares Means and tests of significance of factors affetcing daily gain, total gain, final weihgt, length of fattening period, feed consumption and feed conversion are presented in Table 1.

Table 1. Least Squares Means ± standard error and regression coefficients of factors affecting growth performance, feed consumption and feed conversion (kg, T.D.N/ kg gain) of lambs in the fattening experiment.

Classific-ation	No	Initial Wt. kg	Final Wt. kg	Total gain Kg	Period day	Daily gain	T.D.N. Intakekg,	Feed conver-sion
Overal		21.8	42.3	20.9	120.4	174.2	73.7	3.6
mean		±1.46	±0.92	±0.91	±5.6	±9.7	±3.45	±0.81
Breed		NS	*	*	NS	NS	NS	*
Ossimi 0	8	20.9	40.7	19.1±	120.0	160.0	78.3	4.1
		±1.40	±0.87	0.87	±5.4	±9.9	±3.29	±0.20
Chios C	6	23.6	41.0	19.3	120.6	162.6	72.4	3.8
		±1.62	±1.03	±1.03	±6.3	±11	±3.87	±0.23
1/2 C	7	20.5	44.4	23.9	120.2	199.0	75.1	3.1
1/2 0		±1.50	±0.94	±0.94	±5.8	±9.9	±3.56	±0.21
3/4	9	22.0	43.1	21.2	120.9	175.0	69.0	3.4
C1/4 0		±1.3	±0.82	±0.82	±5.0	±8.7	±3.09	±0.18
Reg. of performance traits on initial Wt								
		**	NS	NS	NS	NS	NS	
		0.9	0.10	0.1	0.8	0.1	0.0	
		±0.12	±0.12	±0.75	±1.29	±0.46	±0.03	
Intercept		42.4	24.4	123.6	196.2	70.3	3.2	
		±2.78	±1.70	±18	±30	±10.1	±0.62	

Significant differences ($p<0.05$) in final weight, total gain and feed conversion (kg TDN/kg gain)were detected between the genotypes studied. However, breed effect on daily gain, length of fatening period and feed consumption was not signifcant (Table 1). The first cross (1/2C 1/2O) had the highest daily gain (199 g) followed by 3/4 C 1/4O (175 g), while the O lambs had the lowest value (160 g). The same terend was detected with total gain and final weight (Table 1).

The contrast between crosses (F1 & P1) and purebred lambs (O & C) in daily gain and total gain were significant ($p<0.01$) (F1 & P1 vs O & C), while it was not significant considering the final weight and lof fattening period (Table 2). The average daily gain result obtained in this study (174.2 g) was greater than that reported by Gala *et al.* (1975) on Barki (B), Merino (M), Awassi (A) and their crosses. They obtained the figures of 128, 148, 144, 138,133 ,138, 134, 126 and 160 g/day for B,M,A, 1/4M 3/4B, 3/8M 5/8B, 1/2M 1/2B, 5/8M 3/8B, 3/4M 1/4B and 1/2A 1/2B, respectively in 9 weeks fattening experimenof six-month-old lambs.

Table 2. Orthogonal comparison for means of growth performance, feed consumption and feed conversion (kg TDN/ Kg gain).

	Initial Wt. kg	Final Wt. kg	Total gain Kg	Period day	Daily gains	T.D.N intake kg,	Feed conver-sion
O VS C	NS	NS	NS	NS	NS	NS	NS
FI VS PI	NS	NS	NS	NS	NS	NS	NS
O&CVS FI&PI	NS	NS	**	NS	**	NS	**

** = (P<0.01) * = (P<0.05) NS = Not Significant.

No significant variation in the amount of TDN (kg) consumed (69.0-78.3 kg) by different genotypes studied was observed. However, O lambs consumed greater amount of TDN (kg), 13.4% than the backcross lambs (3/4C 1/4O) being (78.3 vs 69.0 kg TDN). The overall mean of kg TDN consumed along the experimental period (120.4 days) was 73.7 kg.

The values of feed conversion efficiency were in the range of 3.1-4.1 kg TDN/kg gain. The cross lambs (1/2C 1/2O and 3/4C 1/4O) were more efficient in feed utilization than those of O and C lambs (Table 1). This may be a result of the higher daily gain of crosses,. The regression coefficient of the above mentioned traits on initial weight of lambs were not significant, except for final weight was significant ($p<0.01$) and being 0.9 ± 0.12 kg/kg (Table 1).

These results are comparable to those reporetd by Jensen (1989) who mentioned a feed conversion ratio of 4.07 kg feed units/kg gain for Danish fine wool ram lambs. Moreover, Guney (1990) on Ile-de France, Rambuillet, Chios and Awassi recorded a range of feed conversion values 3.8, 4.2, 3.7 and 5.4 kg/TDN/kg gain, respectively, also, Hassan and El-Feel (1991) on Ossimi and their crosses with Saidi and Baraki breeds reported that the effect of breed on feed conversion value was significant ($p<0.01$).

Least squares means and tests of significance of factors affecting carcass traits are presented in Table 3. All slaughtered lambs had nearly similar fasting weight ranged from 43.5 to 44.9 kg. Nevertheless, carcass weight was the heaviest for O lambs (21.4 kg), while the C lambs had the lightest carcass weight (18.2 kg). Carcass weights of the crossbred lambs (1/2O 1/2C and 3/4C 1/4 O) was intermedrate (20.9

and 19.7 kg, respectively). Carcass weight was significantly influenced by breed group. Difference between the two purebreds (O vs C) in carcass weight was significant ($p<0.01$), also the difference between the two crossbred lambs (1/2C 1/2O vs 3/4C 3/4O) was signifcant ($p<0.05$), but between the purebred and crossbred lambs (O & C vs F1 &p1) the difference was not significant (Table 4).

Fasting dressing percentage (FDP) was calculated as carcass weight including tail fat, kidney with fat and tests, divided by the fasting weight. It was the highest in O lambs (49.2%), while it was the lowest C lambs (42.7%). The orthogonal contrast between the two breeds was significant ($p<0.01$). Ossimi lambs also had the highest empty dressing percentage (EDP), while C lambs had the lowest value (60.8 vs 52.7%) (Table 3). The differences in EDP due to breed group effect were significant ($p<0.01$). The orthogonal contarst between purebred and crossbred lambs (O &C vs F1 & P1) was not significant in FDP., but it was significant in EDP ($p<0.01$) (Table 4).

Differences in bonless meat percentage (BLMP) due to breed group were not significant. However, the crosses tended to have higher BLMP than that of the purebreds (Table 3). No significant contarst was found among the tested breed groups in this trait (Table 4).

The effct of breed group on fore and hind quarters percentage of the carcass was significant ($p<0.01$). Chios ram lambs had the highest fore quarter % (54%), while 1/2C 1/2O had the highest hind quarter % (48.8%), followed by O lambs (48.4%). Differences in both fore and hind quarters % among purebred and crossbred lambs (O & C vs F1 & P1) were significant (Table, 4). Findings of Galal *et al.* (1975) and Hassan and El-Feel (1988), support the results obtained. They found that Ossimi is charcaterized with greater% of hind quarter of the carcass.

Regression coefficients of carcass traits studied on age of lambs at slaughter was positive. This regression was not significant for carcass traits studied except fore and hind quarters% which was signifcant ($p<0.05$) (Table, 3). Ossimi carcasses possess more fat (2.4 kg) than any other breed groups. On the contrary, Chios had the lowest amount of total dissected fat (1.0 kg), while the crosses (1/2C 1/2O and 3/4C 1/4O) had intermediate amounts of the total dissected fat (1.8 and 1.6 kg respectively). Orthogonal comparisons indicated a significant difference ($p<0.01$) between purebreds (O vs C) and aslo between 1/2C 1/2O and 3/4C 3/4O (F1 vs P1) (Table,4).

Tail fat weight was heavier in Ossimi than in Chios breed (2.0 vs 0.7 kg). Carcasses of crossbred lambs (1/2 C 1/2O and 3/4C 1/4O) had 1.4 and 0.8kg fat in their tails, respectievly. The present results indicated that crossbreeding between Chios rams (light tail fat) and Ossimi ewes (heavy tail fat) produced lambs, with low fat in thier tails. This trend is quite acceptable. From an economic point of view, fat is a highly expensive tissue to be synthesized from dietary energy. Moreover, lean carcasses are more attractive than those of excessive fat by consumers.

The effect of breed group on kidney and bowel fats was not significant. Nevertheles Chios carcasses possess the lowest weight of kidney fat (188 g), while 1/2C 1/2 O had the heaviest value (300 g). For bowel fat, Ossimi breed had the highest value (268.1 g), while 3/4 C 1/4 O had the lowest value (121.4 g) (Table 3).

Regression coffisient of total dissected fat, tail fat, kidney fat and bowel fat weights on lambs age at slaughter were not significant. Tail and bowel fat weight were positively regressed on age of lambs at slaughter (Table 3). Orthogonal contarsts among different genotypes in kidney and bowel fats were not significant (Table 4).

Table 3. Least squares means ± standard errors (L.S.M±S.E) and regression coefficients for factors affecting carcass traits.

Classification	Fasting Wt. kg	Carcass Wt. kg	Fast dressing%	Empty dressing%	Boneless meat%	Fore quarter%	Hind quarter%	Total fat Wt. kg	Tail fat Wt. kg	Kidney's fat Wt. kg	Bowel's fat Wt. kg
Overall mean	44.1±1.05	20.0±0.68	45.3±0.70	54.8±0.98	76.8±1.15	52.6±0.57	47.4±0.60	1.5±0.18	1.2±0.13	275.5±26.2	202.1±27.2
Breed	NS	*	**	**	NS	**	**	**	**	NS	NS
Ossimi	44.1±1.00	21.4±0.62	49.2±0.77	60.8±1.09	76.5±1.05	51.6±0.52	48.4±0.54	2.4±0.16	2.0±0.14	246.0±23.9	268.1±24.8
Chios	43.5±1.13	18.2±0.74	42.7±0.65	52.7±0.92	73.5±1.24	54.0±0.62	46.0±0.53	1.0±0.18	0.7±0.1	188.0±28.4	234.6±29.3
1/2 C 1/2 O	44.9±0.92	20.9±0.60	46.2±0.66	54.2±0.93	78.6±1.02	51.2±0.50	48.8±0.64	1.8±0.17	1.4±0.15	300.0±23.2	184.4±24.0
3/4 C 1/4 O	44.0±1.18	19.7±0.77	43.2±0.70	51.4±0.99	78.7±1.30	53.7±0.65	46.3±0.67	1.6±0.19	0.8±0.12	297.0±29.3	121.4±30.7
Regression coefficients of carcass traits on: age at slaughter											
	NS	NS	NS	*	*	NS	NS	NS			
	0.50±0.79	0.62±0.52	3.15±6.43	0.41±1.38	1.34±0.87	1.27±0.43	1.22±0.45	0.05±0.13	0.04±0.12	43.14±19.9	23.42±20.6
Intercept	47.6±6.7	24.1±4.2	68.7±52.6	54.2±11.3	88.6±7.1	62.7±3.5	37.7±3.7	1.55±1.05	1.45±1.00	602.9±162.	44.7±168.2

Table 4. Orthogonal comparisons for means of carcass traits.

Classification	Fasting Wt. kg	Carcass Wt. kg	Fast dressing%	Empty dressing%	Boneless meat %	Fore quarter%	Hind quarter%	Total fat Wt. kg	Tail fat Wt. kg	Kidney's fat Wt. kg	Bowel's fat Wt. kg
0 VS C	NS	**	**	**	NS	**	**	**	**	NS	NS
F1 VS P1	NS	*	*	*	NS	NS	NS	**	**	NS	NS
0&CVS F1&P1	NS	NS	NS	**	NS	**	**	NS	NS	NS	NS

These results agree with those reported by Galal *et al.* (1975), Hassan and El-Feel (1988) and Farid (1991) . They considered breed group as one of the most important factors affecting body fats. These differences in carcass fat between genotypes could be attributed to genetical variation.

Least squares means and tests of significance of the studied factors on chemical composition of the 9,10 and 11 rib cut are presented in Table 5. Significant breed type differences in the chemical copmosition of the ribs 9,10 and 11 of the carcass were noted for percentages of ether extract and ash, but it was not significant for moisture and protein percentages. The crossbred lambs (1/2C 1/2O and 3/4C 1/4O) contained higher protein in their 9, 10 an 11 ribs cut than their parents purebred O and C. The values of protein% were 15.1, 15.9, 16.6 and 16.6% for O, C, 1/2C 1/2O and 3/4C 1/4), respectively. Similar finidings by Rattray *et al.* (1973), Marzouk, (1986) and Hassan and El-Feel (1991) were reported.

Fat percentage in this cut of the carcass was 23.1, 23.4, 22.4 and 23.3% for O, C, 1/2C 1/2O and 3/4C 1/4O, respectively.

Table 5. Least squares means ± standard errors (L.S.M ± S.E) and regression coefficients of factors affecting chemical composition of 9, 10 and 11th ribs cut and longissimus dorsi area and average of the fat thikness covering it of different group carcasses.

Classification	Moisture%	Protein%	Fat%	Ash%	Fat thick-ness	Area of long. dorsi (cm)
Overal mean	57.4±0.78	16.1±0.45	23.0±0.20	4.0±0.19	0.4±0.1	15.4±2.2
Breed	NS	NS	*	**	*	NS
Ossimi O	56.8±0.75	15.1±0.43	23.1±0.19	4.3±0.18	0.5±0.1	14.5±2.2
Chios C	57.2±0.82	15.9±0.47	23.4±0.21	4.7±0.2	0.5±0.1	13.7±2.6
1/2 C 1/2O	58.0±0.77	16.6±0.44	22.4±0.20	3.6±0.18	0.4±0.1	16.2±2.2
3/4 C 1/4 O	57.7±0.79	16.6±0.45	23.3±0.20	3.4±0.19	0.3±0.1	17.1±2.8
Regression of Chemical composition on age at slaughter						
	**	NS	NS	NS	NS	NS
	0.1±0.01	0.0±0.01	0.0±0.00	0.0±0.03	0.1±0.3	0.1±01.9
Intercept	30.2±4.3	15.2±2.48	25.4±1.10	4.40±1.03	0.1±0.0	17.8±15.2

Orthogonal comparsion test cleared taht the difference was significant between crossbred 12/C 1/2O and 3/4C 1/O (22.4 vs 23.3%), while between pureberd O and C and between pureberds and crossbreds, the difference was not significant (Table 6)

Table 6. Orthogonal comparison for means of chemical composition of carcass (9, 10 and 11th ribs cut).

Classification	Moisture%	Protein%	Fat%	Ash%	Fat thickness	Area of long dorsi (cm)
OVSC	NS	NS	NS	NS	NS	NS
F1VSF1	NS	NS	**	NS	NS	NS
O&CVSF1&F1	NS	*	NS	**	**	NS

** = (P<0.01)* = (P <0.05)NS = Not Significant.

Differences in ash% due to breed group were signifcant ($p<0.01$) (Tables 5 and 6). The pureberd O and C carcasses contained higher ash (4.3 and 4.7) than crossbred 1/2C 1/2O and 3/4C 1/4O ones (3.6 and 3.4%), respectively (Table 5). Orthogonal contarsts showed that the significant variation ($p<0.01$) between purebreds (O vs C) or between F1 vs P1 were not significant (Table 6). Similar trend was observed by Hassan (1984) and El-Shahat *et al.*(1986).

Thickness of fatty layer above the *Longissimus dorsi* muscle (L.D) was 0.5 cm in purbred O and C lambs. The F1 cross (1/2 C 1/2OO had a0.4 cm fatty layer thickness compared with 0.3 cm for backcross 3/4C 1/4 O (Table 5). No significant difference was found among the breed groups (O vs C or F1 vs P1) in this regard, but orthogonal contrast test indicated a significant ($p<0.01$) difference between O & C vs. F1 & P1 (Table 6).

No significant difference was found among breed groups in L.D. muscle area. The area of L.D muscle ranged from 13.7 to 17.1 cm^2 for C and 3/4C 1/4O, respectievly. Regression coefficient of L.D muscle area and its fatty layer thickness on lamb age at slaughter were not significant (Table 6).

Out of this research it could be concluded that crossing exotic Chios rams with local Ossimi ewes had positive effects on growth rate, feed efficieand some carcass tarits. The produeced lambs were characterised with lighter fat in their tails.

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تأثير الخلط بين أغنام الكيوس والأوسيمى على صفات النمو والذبيحة للحملان

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أجرى هذا البحث بمحطة بحوث الإنتاج الحيوانى بملوى والتابعة لمعهد بحوث الإنتاج الحيوانى على عدد ٣٠ رأس من الحملان الذكور والتى تتبع سلالتى هما سلالة أغنام الكيوس المستوردة والأوسيمى المحلية وإثنين من الخلطان الناتجة من خلطهما معا وهما (٢/١ كيوس ٢/١ أوسيمى، ٤/٣ كيوس و ٤/١ أوسيمى وذلك بهدف دراسة تأثير الخلط على معدل النمو والكفاءة الغذائية خلال فترة التسمين والتى بدأت عند عمر ٦ شهور واستمرت مدة ١٢٠ يوم - وقد تم ذبح عدد ١٢ رأس من المجاميع الوراثية المختلفة (٣ من كل تركيب وراثى) حتى يمكن دراسة صفات الذبيحة وتأثير الخلط والعمر عند الذبح على الصفات المختلفة.

وقد أظهرت النتائج ما يلى:-

١- كان تأثير السلالة معنوى على صفات الوزن النهائى للحملان عند نهاية التجربة والكفاءة التحويلية للغذاء خلال فترة التسمين فى حين كان تأثيرها غير معنوى على معدل الزيادة اليومية ومعدل استهلاك الغذاء خلال فترة التجربة وقد أظهرت الحملان الخليطة تفوقا فى الصفات المذكورة على السلالات النقية وكان أعلاها حملان الجيل الأول الخليطة (٢/١ كيوس و ٢/١ أوسيمى) وكانت الإختلافات بين سلالتى الكيوس والأوسيمى غير معنوية فى كل الصفات المذكورة.

٢- كان تأثير السلالة غير معنوى لصفات الوزن الصائم عند الذبح ونسبة التشافى فى حين كانت معنوية لصفات وزن الذبيحة ونسبة التصافى للوزن الصائم والتصافى للوزن الفارغ وكانت معنوية جدا فى وزن اللية ووزن الدهن الكلى تحت الدراسة (دهن اللية + دهن الكلية + دهن الأمعاء) - وقد أظهرت الأغنام الأوسيمى تفوقا فى معظم الصفات المذكورة فى حين كانت الأغنام الكيوس أقلهم.

٣- كانت نسبة التصافى للوزن الصائم تتراوح ما بين ٤٢،٧ إلى ٤٩،٢٪ وللوزن الفارغ تتراوح ما بين ٥١،٤ إلى ٦٠،٨٪ ونسبة التشافى تتراوح ما بين ٧٣،٥ إلى ٧٨،٧٪ .

٤- كان تأثير السلالة معنوى على سمك الدهن المغطى للعضلة العينية فى حين غير معنوى على مساحتها وكان سمك الدهن أعلى فى السلالات النقية عن الخليطة .

٥- وجد من التحليل الكيماوى للأضلاع ٩، ١٠، ١١ أن تأثير السلالة كان معنويا إلى نسبة الدهن والرماد فى حين كان تأثيرها غير معنوى على نسبة الرطوبة والبروتين وقد أظهرت الحملان الخليطة تفوقا معنويا فى نسبة البروتين عند المقارنة مع السلالات النقية وكانت الإختلافات بين سلالتى الأوسيمى والكيوس غير معنوية فى كل صفات التحليل الكيماوى.