

## CARCASS MERIT OF HORNED- VS POLLED-SIRED AWASSI LAMBS

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## INTRODUCTION

The Awassi is the main indigenous breed of sheep in Iraq and comprise almost two thirds of the existing population of the 9.7 million (Central Statistical Organization, 1978). Most of the Awassi rams are characterized by long spiral horns and the females in most cases are polled.

It is generally accepted by flock owners that horned rams are superior in many productive and reproductive traits. A question rises whether or not there are sufficient differences between the progeny of horned and polled rams in productive and reproductive performances.

In many societies the consumer prefers joints with a maximum percentage of lean, a minimum percentage of bone and an optimum amount of fat. Therefore the ratio of the different physical components in the carcass is of great significance. Dressing percentage is also a factor of obvious importance since it limits to a great extent the output of meat from a specific animal (Seoudy, 1970). For this reason carcass traits and composition has been examined by many workers (Watson and Broadbent, 1968; Dickerson *et al.*, 1972; Hohenboken *et al.*, 1976 and Latif and Owen, 1979).

The experiment described in this paper was designed to compare carcass traits of progeny of horned and polled rams.

## MATERIALS AND METHODS

In Spring 1980 a group of Awassi ewes were grouped into 4 age groups and mated to a total of five horned and five polled Awassi rams in a single sire pen. The rams were chosen at random from Alsoueira's flock, Directorate General of Animal Resources, Ministry of Agriculture whereas, the ewes were obtained from the College of Agriculture flock. The ewes were allowed to graze alfalfa pastures and flushed 2 weeks prior to mating. The lambs were born between January and March 1981. Feeding and management of the lambs were described in detail by Mousa (1981).

The 66 lambs obtained were slaughtered at 14 months of age and their hot carcass weights and dressing percentages were recorded. Carcasses were chilled thereafter for 24 hours (4°C). After the chilling period, the carcasses were cut into main commercial joints. The *L.dorsi* muscle area (12-13th rib) was measured as described by Naumann (1952). For physical analysis the left chilled cut comprising of the 9-10-11th ribs from each carcass was used and separated into its components (bone, fat and lean).

Table I. Least-square means and standard errors for studied traits

	No.	Slaughter wt.	Carcass wt.	Dressing %	Lean %	Fat %	Bone %	Rib eye area
Overall mean	66	29.06 ±0.76	12.03 ±0.37	41.07 ±0.66	63.52 ±0.87	5.45 ±0.09	30.67 ±0.84	7.40 ±0.24
Rams:								
horned (HR)	41	30.47 ±0.85	12.49 ±0.42	40.66 ±0.75	62.46 ±0.98	5.59 ±0.19	31.68 ±0.95	7.45 ±0.27
polled (PR)	25	27.65 ±1.18	11.58 ±0.58	41.48 ±1.04	64.58 ±1.37	5.31 ±1.55	29.67 ±1.33	7.35 ±0.37
Age of ewe:								
2 year	9	28.70 ±1.78	12.21 ±0.87	41.81 ±1.56	63.28 ±2.05	5.96 ±2.33	29.74 ±1.99	7.84 ±0.56
3 year	20	31.77 ±1.13	13.14 ±0.55	41.52 ±0.99	64.31 ±1.30	7.27 ±1.48	28.70 ±1.26	7.60 ±0.36
4 year	28	28.49 ±0.97	11.53 ±0.47	40.65 ±0.85	61.58 ±1.12	5.51 ±1.27	32.31 ±1.09	6.98 ±0.31
5 year	9	27.28 ±1.63	11.24 ±0.79	40.29 ±1.43	64.91 ±1.87	3.07 ±2.13	31.95 ±1.83	7.17 ±0.51
Sex:								
male	35	33.76 ±0.93	13.74 ±0.46	40.24 ±0.81	65.92 ±1.07	5.78 ±1.21	28.90 ±1.05	7.84 ±0.29
female	31	24.36 ±1.08	10.32 ±0.53	41.88 ±0.95	61.12 ±1.24	5.12 ±1.41	32.46 ±1.21	6.96 ±0.34
Progeny:								
horned (HP)	46	28.86 ±0.88	11.91 ±0.43	41.09 ±0.77	63.61 ±1.01	6.84 ±1.15	30.23 ±0.98	7.15 ±0.27
polled (PP)	20	29.27 ±1.22	12.15 ±0.59	41.09 ±1.07	63.44 ±1.41	4.06 ±1.59	31.12 ±1.86	7.65 ±0.38
Interactions:								
HR X HP	30	28.71 ±0.91	11.44 ±0.44	39.77 ±0.79	62.45 ±1.04	6.37 ±1.18	32.22 ±1.02	6.83 ±0.29
HR X PP	11	32.23 ±1.49	13.53 ±0.73	41.55 ±1.30	62.47 ±1.72	4.82 ±1.95	31.15 ±1.67	8.08 ±0.47
PR X HP	16	29.00 ±1.45	12.37 ±0.71	42.40 ±1.27	64.76 ±1.67	7.32 ±1.89	28.25 ±1.63	7.47 ±0.46
PR X PP	9	26.29 ±1.79	10.78 ±0.87	40.54 ±1.56	64.40 ±2.05	3.30 ±2.33	31.09 ±2.00	7.22 ±0.56

Table 2. Least-square analysis of variance for the effects on the studied traits

Source of variation	D.F.	Mean squares						
		slaughter wt.	carcass wt.	dressing %	lean %	fat %	bone %	rib eye area
Ram (R)	1	8990.76*	931.67	749.90	5076.79	93.26	4601.05	13.05
Age of ewe	3	5810.15	1169.22	543.28	3544.07	3533.74	5123.91	199.10
Sex	1	110701.34**	14616.28**	3319.43	28885.21**	543.17	15857.88*	989.20*
Progeny (P)	1	166.76	58.33	1.89	28.03	7744.67	777.27	250.78
R X P	1	11664.40**	4085.24**	3965.00	45.10	1840.34	4604.35	679.34
Remainder	58	2222.67	532.63	1706.31	2958.89	3803.92	2794.37	220.48

Table 3. Correlation coefficients among dependent variables

	Fat %	Bone %	Rib eye area	Slaughter wt.	Carcass wt.	Dressing %
Lean %	-0.413**	-0.572**	0.336**	0.315*	0.262*	-0.114 <sup>N.S.</sup>
Fat %		-0.297*	0.129 <sup>N.S.</sup>	0.130 <sup>N.S.</sup>	0.161 <sup>N.S.</sup>	0.081 <sup>N.S.</sup>
Bone %			-0.537**	-0.438**	-0.422**	0.016 <sup>N.S.</sup>
Rib eye area				0.518**	0.579**	0.225 <sup>N.S.</sup>
Slaughter wt.					0.906**	-0.132 <sup>N.S.</sup>
Carcass wt.						0.273*

N.S. Non significant

\* p &lt; 0.05

\*\* p &lt; 0.01

The data were analyzed by the least-squares procedure (Harvey, 1960) in which constants were fitted for rams (horned or polled), progeny (horned or polled), interaction of rams X progeny, sex and age of dam.

## RESULTS AND DISCUSSION

The overall means and standard errors of slaughter weight, carcass weight, dressing percentage, lean, fat and bone percentages and rib eye area were  $29.06 \pm 0.76$  kg,  $12.03 \pm 0.37$  kg,  $41.07 \pm 0.66$  %,  $63.52 \pm 0.87$  %,  $5.45 \pm 0.09$  %,  $30.67 \pm 0.84$  % and  $7.40 \pm 0.24$  cm<sup>2</sup>, respectively (Table 1).

### Effect of horns:

Ram groups (horned vs polled) affected slaughter weight significantly (Table 2). Horned sires produced heavier lambs at slaughter ( $30.47 \pm 0.85$  kg) than polled sires ( $27.65 \pm 1.18$  kg). This may suggest that horned rams are superior to polled rams in their breeding values. This finding also supports the claims of flock owners that horned sires are more suitable than polled sires for breeding.

The presence or absence of horns from the progeny did not influence any of the traits studied. This may be due to the significant interaction between ram and progeny groups for slaughter weight and carcass weight. Hence, the significant interaction between ram and progeny groups (Table 2) for slaughter and carcass weights indicates that highest growth measure of the lamb was obtained when the sires were horned and the progeny were polled. Whereas, polled progeny of polled sires had the lowest growth measures. The superiority of the polled progeny of the horned sires may be due to overdominance and/or epistasis of a polled gene in the heterozygous lambs (i.e. P<sub>p</sub> since horns are recessive to the polled trait), which may have advantageous effects on slaughter and carcass weights. Therefore, it is expected that neither homozygous nor heterozygous polled rams are suitable for breeding.

### Effect of sex:

Slaughter and carcass weights of ram lambs were significantly ( $p < 0.01$ ) heavier than those of ewe lambs being  $33.76 \pm 0.93$  vs  $24.36 \pm 1.08$  and  $13.74 \pm 0.46$  vs  $10.32 \pm 0.53$  kg respectively (Table 1). Ram lambs had higher carcass lean ( $p < 0.01$ ) and lower bone percentages ( $p < 0.05$ ) than ewe lambs (Table 1). These findings are consistent with that reported by Makarechian *et al.*, (1978). Fat and dressing percentages showed no significant sex differences. Similar results were reported by Latif and Owen (1979) for dressing percentage. Since significant differences in fat percentage due to sex is attained when animals reach a certain live body weight (Morgan and Owen, 1973), results obtained here are obvious.

### Effect of age of dam:

Age of the ewe had no significant effect on any of the traits studied. Also Kazzal (1973) concluded that age of dam had no significant effect on yearling weight of Awassi sheep.

### Correlations:

Correlation coefficients between the traits studied are given in Table (3). Carcass and slaughter weights were positively associated with lean percentage and rib eye area. Such results are in general agreement with those reported by Cassard *et al.*, (1969) and Shelton and Carpenter (1972). The associations between dressing percentage and other carcass traits were generally low and lacking significance except with carcass weight. Shelton and Carpenter (1972) observed that dressing percentage was highly correlated with carcass weight. Lean percentage was negatively associated with bone percentage.

### SUMMARY

An experiment was conducted to compare some carcass traits of 66 progeny of horned and polled Awassi rams. Ram groups significantly influenced slaughter weight. Progeny of horned-sires were heavier at slaughter than those of polled sires. It has been hypothesized that poll gene exhibited overdominance and/or epistasis for slaughter and carcass weights in the heterozygous lambs. Therefore, neither homozygous nor heterozygous polled rams are recommended for breeding.

### R E S U M E N

Se realizó un experimento para comparar algunos caracteres de la canal de 66 descendientes de carneros Awassi con cuernos y sin ellos. Los grupos de carneros ~~fuertes y débiles~~ ~~si y no~~ influenciaron significativamente el peso al sacrificio. La descendencia de los carneros con cuernos tuvo más peso al sacrificio que la de los padres sin cuernos. Se ha lanzado la hipótesis de que el gene poll (sin cuernos) exhibe una sobredominancia y/o epistasis para los pesos al sacrificio y en canal en los corderos heterocigotes. Por ello no se recomiendan para la reproducción los carneros sin cuernos sean homocigotes o heterocigotes.

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