

THE EFFECT OF CROSSING CHIOS RAMS WITH OSSIMI AND SAIDI EWES ON GROWTH PERFORMANCE AND VIABILITY OF LAMBS

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SUMMARY

The present investigation was conducted to evaluate the body weight, daily gain and viability in lambs of two purebred groups (Ossimi, O; Saidi, S) and two F1 crosses (1/2 Chios 1/2 Ossimi; 1/2 Chios 1/2 Saidi). The study was carried out on 304 lambs reared during the period 1989 to 1991 in the Experimental Animal Farm, Faculty of Agriculture, El-Minia University.

Breed group had a significant effect ($P<0.05$) on birth and 6-month weights. The F1 crossbred lambs were generally heavier than purebred lambs. Male and single lambs were significantly ($P<0.01$ or $P<0.05$) heavier than female and twin lambs, respectively for all weights studied. Season of lambing had significant effects ($P<0.01$ or $P<0.05$) on all weights studied except for birth weight, which was not significantly differed. Winter-born lambs were heavier than summer-born ones at weaning, 6 months and yearling weights. The effects of age of dam on birth and weaning were significant, while they were not significant for 6 months and yearling weights.

The effect of breed group on daily gain was not significant during the period from birth up to one year of age. Daily gain of F1 crosses was generally superior to purebred groups in all periods studied. Daily gain of lambs from birth up to one year of age was decreased as a lamb get older. Growth rate of weaned lambs (4 months age) was 50-55% lower than the preweaning stage.

Differences in daily gain due to sex and type of birth were significant ($P<0.01$) at all periods studied. Male and single lambs grew faster than females and twin ones. Daily gain of winter-born lambs was higher than that of summer-born lambs at all periods studied. Daily gain of lambs increased with the advance of its dam's

age, particular from birth to weaning, but without significant.

Differences in viability of lambs due to breed group and age of dam were not significant. The viability of purebred Ossimi lambs was in the range of 87.3 to 71.1%, while Saidi lambs viability values were ranged between 88.9 to 70.2 at 30 and 180 days of age, respectively. The F1 cross of 1/2 C 1/2 O had the highest viability value (95.0%) followed by 1/2 C 1/2 S (81.5%) up to 180 days of age. Single born lambs exceeded ($P < 0.01$) twins in viability at all ages studied. Viability of lambs up to either 120 or 180 days of age was significantly affected ($P < 0.05$) by season of lambing. Winter-born lambs had higher viability than those of summer-born lambs (90.3 vs 68.5% at 180 days of age).

Keywords: Crossing, Chios, Ossimi, Saidi, Performance, Viability, Lambs

INTRODUCTION

Body weight and viability of lambs are two of the most important characteristics in lamb production. Crossbreeding is one of the methods commonly used for improving the efficiency of productive traits. Positive effect of crossbreeding on weights, daily gain and viability of lambs have been reported by several investigators (Aboul-Naga et al, 1972; Oltenacu and Boylan, 1981; Rastogi et al, 1982; Hassan and Sallam, 1988).

Chios sheep are recognized as one of the prolific subtropical breeds. They are used as dual purpose animals for the production of milk and meat. This breed is characterized by high milk production (267 kg in 220 days), high prolificacy (1.8 lambs born per ewe lambing), early sexual maturity (first mated at the age of 8 to 9 months) and had satisfactory growth rate (0.20 to 0.25 kg/day) (Mason, 1967; Louca, 1972; Lawlor et al, 1974).

Crossbreeding with prolific breeds of sheep has the potential to increase production through improvement of litter size of crossbred ewes, but it may have a negative effect on body weight of crossbred lambs (Dickerson, 1977 and Boujenane et al, 1991). Lamb viability has generally been reported to be higher for crossbreds than for purebreds (Galal et al, 1974; Dickerson et al, 1975; Aboul-Naga, 1977 and Hassan et al, 1985).

The objective of this study was to evaluate the results of crossbreeding system when using the foreign Chios rams with local Ossimi and Saidi ewes. Also, the effects of sex, type of birth, season of lambing and age of dam on body weight at birth, weaning, 6 months and yearling and daily gain from birth up to one year of age and viability of lambs at 30, 120 and 180 days of age were studied.

MATERIAL AND METHODS

The data for this study were obtained from the Experimental Farm, Department of Animal Production, Faculty of Agriculture, El-Minia University from 304 lambs of four breed groups (Ossimi, O; Saidi, S; 1/2 Chios (C) 1/2 O; 1/2 C 1/2 S). The lambs were reared in this farm since May 1989 to November 1991. The first cross (F₁) resulted from crossing Chois rams with each of Ossimi ewes (1/2 C1/2 O) or Saidi ewes (1/2 C 1/2 S). Chios rams were used in this study were purchased from Malawy Farm, Research Institute of Animal production, Ministry of Agriculture, Egypt.

Management Procedures:

Mating started at the age of one year for the ewe lambs and two years for the rams. The system of three lambing seasons per two years was adopted. Mating per breeding season lasted for two months. Lambs born from September to February were considered as winter lambs and those born from March to August as summer lambs. Weaning took place when lambs were 120 days of age. Viability of all lambs born alive was evaluated in terms of survival (0= dead and 1= live) at 30, 120 and 180 days of age.

From November to May, the animals grazed Berseem *Trifolium alexandrinum* and were given 0.5 kg of concentrate mixture per head/day. In summer, they grazed the field grasses and crop residues and were offered, on the average, one kg of concentrate mixture per head/day. Bean straw was given ad-libitum to the animals during the period from May to November. Sheep were allowed to drink freely twice a day.

Data were analysed using the least squares procedure described by SAS (1989) The model used to analyse the body weight, Daily gain and viability was as follows:

$$Y_{ijklmn} = U + B_i + S_j + T_k + X_l + A_m + (BT)_{ik} + (BX)_{il} + (BA)_{im} + e_{ijklmn}$$

where Y_{ijklmn} = the observation on $ijklmn$ th lambs, U = general mean, common elements to all observation; B_i = the effect due the i th breeding group, $i = 1, 2, 3, 4$; S_j = the effect due to the j th sex, $j = 1$ (male), 2 (female); T_k the effect due to the k th type of birth, $k = 1$ (single) 2(twin); X_l = the effect due to the l th season of lambing, $l =$ (summer), 2 (winter); A_m = the effect due to m th age of dam, $m = 1$ (2 yr or less), 2(2 yr), 3 (4 yr), 4 (5 yr or more); $(BT)_{ik}$, $(BX)_{il}$ and $(BA)_{im}$ = one way interaction and e_{ijklmn} = random error particular to the $ijklmn$ th observation and assumed to be independently and randomly distributed $(0, \sigma^2 e)$.

Tests of significance for differences between means of different levels within each factor or classification were according to Duncan (1955).

RESULTS AND DISCUSSION

Least squares means and tests of significance of factors affecting body weight at birth, weaning, 6 months and yearling are presented in Table 1. Breed type of lambs significantly ($P < 0.05$) affected body weight at birth and at 6 months of age, while this effect was not significant for weaning and yearling weights. Crossbred lambs 1/2 C 1/2 O and 1/2 C 1/2 S were heavier than purebred lambs (Ossimi and Saidi, respectively). The F_1 crossbred (1/2 C 1/2 O) had the heaviest body weight, while Saidi lambs had the lightest value at all studied age (Table 1).

Table 1. Least squares means \pm S.E and tests of significance of factors affecting body weight of lambs.

Classification	wt. at birth		wt. at weaning		wt. at 6 months		wt. at yearling	
	No.	L.S.M \pm S.E	No.	L.S.M \pm S.E	No.	L.S.M \pm S.E	No.	L.S.M \pm S.E
Overall mean (Kg)	304	3.12 \pm 0.04	244	19.56 \pm 0.23	230	23.34 \pm 0.28	228	35.97 \pm 0.40
<u>Breed group:</u>		*		NS		*		NS
Ossimi (O)	78	3.12 \pm 0.09a	60	19.27 \pm 0.55a	53	23.73 \pm 0.72a	53	36.51 \pm 1.03a
Saidi (S)	107	2.91 \pm 0.08b	78	18.86 \pm 0.48c	75	22.08 \pm 0.56b	74	34.05 \pm 0.81b
1/2 Chios C1/2 O	52	3.40 \pm 0.15a	50	20.82 \pm 0.83b	47	24.66 \pm 0.97a	47	37.40 \pm 1.49a
1/2 C 1/2 S	67	3.05 \pm 0.13b	56	19.29 \pm 0.79a	55	22.89 \pm 0.93bc	54	36.43 \pm 1.34a
<u>Sex:</u>		*		**		**		**
Male	157	3.20 \pm 0.07	126	20.37 \pm 0.42	120	24.51 \pm 0.51	119	40.00 \pm 0.74
Female	147	3.04 \pm 0.07	118	18.75 \pm 0.41	110	22.17 \pm 0.49	109	31.95 \pm 0.71
<u>Type of birth:</u>		**		**		**		**
Single	124	3.54 \pm 0.07	110	21.74 \pm 0.40	106	25.73 \pm 0.48	105	37.86 \pm 0.69
Twin	180	2.71 \pm 0.07	134	17.38 \pm 0.44	124	20.95 \pm 0.54	123	34.09 \pm 0.78
<u>Season of birth:</u>		NS		*		**		*
Summer (Mar-Aug)	119	3.17 \pm 0.11	84	18.66 \pm 0.63	75	22.13 \pm 0.76	75	34.51 \pm 0.09
Winter (Sep-Feb)	185	3.07 \pm 0.07	160	20.46 \pm 0.38	155	24.55 \pm 0.46	153	37.44 \pm 0.64
<u>Age of dam:</u>		**		*		NS		NS
2 yr - old or less	45	2.86 \pm 0.11a	33	18.09 \pm 0.72a	33	21.63 \pm 0.84a	33	35.30 \pm 1.21a
3 yr - old	43	3.06 \pm 0.11ab	39	19.69 \pm 0.64a	37	23.06 \pm 0.77a	36	35.65 \pm 1.12a
4 yr - old	106	3.31 \pm 0.09b	85	20.05 \pm 0.53a	81	24.44 \pm 0.64a	80	36.71 \pm 0.91a
5 yr - old or over	110	3.25 \pm 0.10b	87	20.51 \pm 0.57a	79	24.23 \pm 0.67a	79	36.15 \pm 0.96a

* = $P < 0.05$ ** = $P < 0.01$ NS = not significant
Means within a column and within the same classification that do not have a common letter differ ($P < 0.05$).

Percentages of superiority (S %) of 1/2 C1/2 O lambs over local Ossimi lambs were 8.9, 8.0 3.9 and 2.5% for live body weight at birth, weaning, 6 and 12 months of age, respectively. The superiority corresponding figures were 4.8, 2.3, 3.7 and 7.0% for 1/2 C 1/2 S over Saidi lambs. The superiority in live body weight of the

crossbred lambs, suggests the presence of the heterosis effect resulting from the infusion of Chios genes in to local Ossimi and/or Saidi genotypes.

These results agree with reported by Aboul-Naga et al(1972), Galal et al (1972), Oltenacu and Boylan (1981), Bata (1982) and Boujenane et al (1991). They found that breed group is one of the most important factors affecting live body weight of lambs at different ages. Differences due to breed group were significant in most cases. The first cross (F_1) lambs were generally heavier in body weight than their contemporaries of the parental breeds.

Male lambs were 0.16, 1.62, 2.34 and 8.05 kg heavier than females at birth, weaning, 6 and 12 months of age, respectively. Difference between males and females was significant($P<0.01$ or $P<0.05$) (Table 1). Sex differences in weight of lambs increased as lambs advanced in age. This phenomenon may be attributed to the action of sex hormones which play a major role in accelerating growth. It is a fact that the gonades and its secretion are not fully developed before puberty. Variation in body weight depending on the sex of lambs have been reported by El-Kouni et al, (1974), Kornal et al, (1977), El-Kimary et al (1979), Cho et al, (1989) and Boujenane (1991).

Type of birth was the most important source of variation ($P<0.01$) in body weight. Singles-born lambs were consistently the heaviest at all ages (Table 1). Body weight for twin lambs at birth, weaning, 6 and 12 months of age was 76, 79, 80 and 89%, respectively of the body weight of singles. The differences between the extreme groups decreased with the advanced of age. Highly significant effect on birth, weaning and yearling weights was due to type of birth (Aboul-Naga et al, 1972, El-Kimary et al, 1979, Shrestha and Vesely, 1986 and boujenane et al, 1991).

Lambs born in winter were significantly heavier by 1.8, 2.42 and 2.93 kg at weaning, 6 and 12 months of age than those born in summer. However, summer-born lambs were heavier (0.10 kg) at birth, but the difference was not significant (Table 1). This result may be due to the moderate weather conditions and the availability of the green during pregnancy. Similar results were reported by El-Hommosi and Abd-El-Hafiz (1976) on Ossimi and Saidi Lambs, Bata (1982) on some local breeds and their crosses with Finnish and ILe-de-France sheep, and Hassan and El-Feel (1988) on Ossimi, Barki and Saidi breeds.

The effect of dam's age on birth and weaning weights was significant at $P<0.01$ and $P<0.05$, respectively. This effect was not significant for body weight at 6 and 12 months of age. Lambs born by ewes of 2 year old or less were lighter at birth and at different ages than those born by ewes of 4 years old or more (Table 1). The increase in the average weaning weight of lambs as age of dam was increased may be attributed to the improvement in their mothering

ability brought out by age together with larger amount of ewes milk being available to the lambs and to positive correlation between birth and weaning weight. These results are consistent with those from other studies (El-Kimary et al, 1979, Shrestha and vesely, 1986 and Boujenane, 1991).

Least squares means, standard error and tests of significance for factors affecting daily gain are shown in Table 2. Differences in daily gain due to breed group were not significant from birth to weaning, from weaning to 6 months of age and from 6 months up to one year of age (Table 2). Among purebred lambs, Ossimi lambs were greater in daily gain than those of Saidi lambs during the three periods studied. The difference between the two breeds was significant ($P < 0.05$, Duncan's test) during the periods from birth to weaning and from weaning to 6 months of age, while it was not significant for daily gain from 6 months to one year of age.

Table 2. Least squares means \pm S.E and tests of significance for factors affecting daily gain up to different ages studied.

Classification	DG 1		DG 2		DG 3	
	No.	L.S.M \pm S.E	No.	L.S.M \pm S.E	No.	L.S.M \pm S.E
Overall mean (g)	244	137 \pm 1.9	230	61 \pm 1.7	228	70 \pm 1.5
<u>Breed group:</u>		NS		NS		NS
Ossimi (O)	60	135 \pm 3.4 a	53	61 \pm 4.4 a	53	71 \pm 4.0 a
Saidi (S)	78	132 \pm 3.9 b	75	53 \pm 3.5 b	74	67 \pm 3.2 a
1/2 Chios C 1/2 O	50	146 \pm 6.7 a	47	63 \pm 5.9 c	47	68 \pm 5.4 a
1/2 C 1/2 S	56	135 \pm 6.5 a	55	59 \pm 5.7 bc	54	75 \pm 5.2 a
<u>Sex:</u>		**		**		**
Male	126	143 \pm 3.4	120	68 \pm 3.2	119	86 \pm 2.9
Female	118	131 \pm 3.4	110	55 \pm 3.0	109	54 \pm 2.4
<u>Type of birth:</u>		**		**		**
Single	110	152 \pm 3.3	106	66 \pm 2.9	105	67 \pm 2.7
Twin	134	122 \pm 3.6	124	56 \pm 3.3	123	73 \pm 3.0
<u>Season of birth:</u>		**		*		**
Summer (Mar -Aug)	84	129 \pm 5.2	75	56 \pm 4.7	75	69 \pm 4.3
Winter (Sep -Feb)	160	145 \pm 3.1	155	67 \pm 2.7	153	71 \pm 4.5
<u>Age of dam:</u>		NS		NS		NS
2 yr - old or less	33	124 \pm 5.8	33	59 \pm 5.2	33	77 \pm 4.7
3 yr - old	39	140 \pm 5.2	37	57 \pm 4.8	36	70 \pm 4.3
4 yr - old	85	139 \pm 4.2	81	68 \pm 3.9	80	68 \pm 3.6
5 yr - old or over	87	144 \pm 4.6	79	62 \pm 4.2	79	66 \pm 3.8

* = $P < 0.05$ ** = $P < 0.01$ NS = not significant

+ Means within a column and within the same classification that do not have a common litter differ ($P < 0.05$).

DG₁ = daily gain from birth to weaning.

DG₂ = daily gain from weaning to 6 months.

DG₃ = daily gain from 6-months to yearling.

Daily gain of F_1 crosses (1/2 C 1/2 S) was superior to Saidi lambs in the three periods studied, while that of the F_1 cross (1/2 C 1/2 O) was lower in daily gain than those of Ossimi lambs during period from 6 months to one year of age. The cross (1/2 C1/2 O) had the highest value for daily gain from birth to weaning (146 g/day). These results agree with those reported by Fahmy et al (1989) and Hassan and El-Feel (1988). They reported that F_1 crossbred lambs generally had a rapid growth rate than purebreds.

Daily gain was increased at a diminishing rate with the increase of age, lambs in general, had a more rapid growth rate in the first period from birth to weaning. Jatap et al (1989) observed that average daily gain the highest from birth to 3 months of age. Growth rate after 3 months of age was 50-75% lower than that from birth to 3 months. Also, Killedar et al (1987), stated that least squares mean of daily gain was 0.11 - 0.13 kg from birth to 3 months of age and 0.08 - 0.12 kg from birth to 6 months of age .

Male lambs recorded faster growth rate per day at all periods studied, particularly after six months of age up to one year (86.0 vs 54.0 g). The difference in daily gain due to sex of lambs was significant ($P<0.01$) for all periods studied (Table 2). Movrogeis and louca (1979) with Cyprus fat-tailed, Chois, Awassi and their crosses, Killedar et al (1987) on Deccani, Merino, Dorest and their crosses and Jagtap et al (1989) with Deccani and crossbred lambs. They found that male lambs grew faster than female ones and the sex effect was significant on daily gain through the first year of age.

Lambs born and reared as singles gained faster than twin lambs. Particularly from birth to weaning (152.0 vs 122.0 g/day). The superiority of single lambs than twin lambs in daily gain during the first period may be attributed to heavier birth weight and milk intake for single lambs than twin ones. Difference in daily gain due to type of birth was significant ($P<0.01$) at all periods studied (Table 2). These results are consistent with those from other studies (Ragab et al, 1978, Mousa; 1991).

Daily gain of winter-born lambs was higher than that of summer-born ones, during the period from birth up to six months of age and the differences were significant (Table 2). It was not significant during the period from six months up to one year of age. Differences in growth rate due to season of lambing may be mainly due to seasonal variation in nutritional conditions that lambs were subjected during pre- and post-weaning periods. Similar results were reported by Hassan and El-Feel (1988).

The effect of age of dam on lamb daily gain was not significant for all periods studied (Table 2). Daily gain of lambs was increased with the advance of dam's age during the period from birth to weaning. Yet this trend was not shown during the period from weaning to one year

of age (Table 2). These results agree with those reported by Hassan and El-Feel (1988) who found that the difference in daily gain due to age of dam was not significant. However, Jagtap et al (1989) reported that lambs born in the 3rd and 4th parities gained 57-67 g per day more than those born in 1st or 2nd parity from birth up to 9 months of age.

Significant ($P < 0.01$) interactions were found between breed group of lambs and season of lambing during the two periods, from weaning to 6 months and from 6 months to one year of age, as shown in the following Table:

Breed	Daily gain (Weaning to 6 - months) (g)		Daily gain (6 to 12- months) (g)	
	Summer	Winter	Summer	
Winter				
Ossimi	42	79	79	62
Saidi	55	53	66	67
1/2 C 1/2 O	55	71	56	77
1/2 C 1/2 S	62	56	72	78

There is contention that Ossimi lambs would do relatively better in good feeding seasons, while they are worse in poor feeding seasons. This might be expected based on the fact that the Ossimi is normally kept under more favourable feed conditions. Environments sufficiently different to produce such an interaction can of course be envisioned.

Least squares means and tests of significance of factors affecting viability of lambs are presented in Table 3. The highest survival rate was recorded in F_1 crossbred lambs (1/2 C 1/2 O and 1/2 C 1/2 S), while the lowest value was found for lambs of Saidi (70.2% at 180 days of age). The lowest viability value obtained for the purebred or crossbred of Saidi lambs could be due to the small amount of milk produced (60.9 kg during the suckling period) and high percentage twinning in Saidi ewes (34.6%) (Hassan et al, 1984). Viability percentage differences due to breed group were not significant (Table 3).

Both crossbred lambs of 1/2 C 1/2 O and 1/2 C 1/2 S survive better than purebreds Ossimi and Saidi lambs. Superiority of the 1/2 C 1/2 O over Ossimi lambs in this economic trait was 32% and the 1/2 C 1/2 S crosses over Saidi lambs was 17% up to 180 days of age. These differences were attributed to the effect of hybrid vigour in birth weight and viability of lambs. Also, the present estimate for F_1 crossbred lambs was better due to the fact that Chios sheep as a subtropical is more adapted to Egyptian weather conditions than the

European sheep. These results agree with those reported by Mousa (1991) on Ossimi, Awassi, Chios and their crosses found that mortality rate up to weaning age (8 weeks) of Chios (C), Awassi (A), Ossimi (O), CA and CO were 7, 13, 13, 7 and 9, respectively. Goot (1976) on German Mutton Mernio (Gmm), found that lamb mortality rate up to 120 days of age was higher in GMM (24%) than F₁ crossbred (14%). Also, Hassan and Sallam (1988) found that the F₁ crossbred lambs had high livability values (80.6%), while Saidi lambs had low value (72.7%) at 180 days of age.

Table 3. Least squares means \pm S.E and test of significance of factors affecting viability of lambs (lambs alive per 100 lambs born) up to different ages studied.

Classification	No.	Viability of lambs from birth to		
		30 days L.S.M \pm S.E	120 days L.S.M \pm S.E	180 days L.S.M \pm S.E
Overall mean	304	92.3 \pm 2.1	82.3 \pm 3.2	79.4 \pm 3.4
<u>Breed group:</u>		NS	NS	NS
Ossimi (O)	78	87.3 \pm 4.5 a	76.2 \pm 6.1 a	71.1 \pm 6.6 a
Saidi (S)	107	88.9 \pm 3.9 a	73.2 \pm 5.3 a	70.2 \pm 5.7 a
1/2 Chios C 1/2 O	52	99.4 \pm 7.8 a	96.2 \pm 10.7 b	95.0 \pm 11.5 b
1/2 C 1/2 S	67	93.8 \pm 6.8 a	83.8 \pm 9.4 ab	81.5 \pm 10.0ab
<u>Sex:</u>		NS	NS	NS
Male	157	93.2 \pm 3.6	82.9 \pm 5.1	80.4 \pm 5.4
Female	147	91.5 \pm 3.6	81.7 \pm 4.9	78.4 \pm 5.3
<u>Type of birth:</u>		**	**	**
Single	124	98.5 \pm 3.6	89.5 \pm 5.0	87.6 \pm 5.4
Twin	180	86.2 \pm 3.7	75.2 \pm 5.2	71.2 \pm 5.6
<u>Season of birth:</u>		NS	*	*
Summer (Mar -Aug)	119	90.6 \pm 5.7	73.7 \pm 7.8	68.5 \pm 8.4
Winter (Sep -Feb)	185	94.1 \pm 3.5	91.0 \pm 4.8	90.3 \pm 5.1
<u>Age of dam:</u>		NS	NS	NS
2 yr - old or less	45	89.8 \pm 6.1	77.3 \pm 8.9	75.1 \pm 8.9
3 yr - old	43	95.3 \pm 5.8	92.2 \pm 8.0	89.5 \pm 8.6
4 yr - old	106	92.0 \pm 4.6	81.2 \pm 7.0	78.4 \pm 7.5
5 yr - old or over	110	92.4 \pm 5.1	79.0 \pm 6.3	74.7 \pm 6.8

* = P<0.05 ** = P<0.01 NS = not significant
Means within a column and within the same classification that do not have a common letter differ (P<0.05).

Male and female lambs did not differ in survival (P>0.05). These results agree with those reported by Labban et al (1972) on Rahmani, Malik and Charya (1972), Hassan and Sallam (1988) and Boujenane et al (1991) who found that the effect of sex of lambs on lamb viability was insignificant. However, male lambs had slightly higher survival rate up to 6 months of age than those of female lambs (Table 3). Ragab et al (1954) found that mortality rate of the Rahmani breed were 8.8 and 10.3% for male and female lambs, respectively.

Lamb survival rate was significantly ($P < 0.01$) influenced by litter size. Single born lambs had higher viability value than twins up to all ages studied (87.6 vs. 71.2 to 180 days of age). Mortality was increased with increasing litter size. This is in part due to small birth weight found in twin ; litters and suckle less amount of milk in comparison with single born lambs. Therefore survivability of twin lambs till weaning and thereafter would possess less physical potentially than singles, accordingly their viability would be expected to be lower than those of lambs born and raised as singles. These results are agreement with those of Galal et al (1974) , Afifi et al (1984), Hassan and Sallam (1988) and Boujenance et al (1991). However, Aboul-Naga et al (1972) found that type of birth did not significantly affect mortality rate till weaning.

Winter-born lambs had higher viability than summer-born lambs up to all ages studied. The differences were not significant at 30 days of age, but it was significant ($P < 0.05$) at 120 and 180 days of age (Table 3). This result may be due to the moderate weather conditions and the availability of the green forage during winter season, while in summer the animals are suffering from heat stress and shortage of green forage supply. These conditions are playing a major role in viability of lambs. These results agree with those reported by Aboul-Naga et al (1972) and Hassan and Sallam (1988).

The effect of age of dam on viability of lambs was not significant for all periods studied (Table 3). This agrees well with the findings of Galal et al (1974) who found that age of dam had no significant effects on lamb livability at 6, 60 and 120 days of age . However, Afifi et al (1984) reported that age of dam was a source of variation and had a significant effect on livability of lambs up to 120 and 180 days of age. Means showed that lambs born by ewes of 3 years age had the highest viability value (89.5%), while lambs born by ewes aging 5 years or more had the lowest value (74.7%) at 180 days of age. These results are consistent with those reported by Aboul-Naga (1972), Afifi et al (1984) and Hassan and Sallam (1988). They found that livability of lambs tended to be low for lambs out of young or old ewes than those by middle ages ones. This result may be attributed to low milking abilities of the youngest ewes and reducing milk production of the oldest ones (Majid et al, 1981 and Brandford and Boylan, 1981).

Out of this research it could be concluded that crossing local Ossimi and Saidi ewes with chios rams had positive effects on live body weight, growth rate and viability of lambs.

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تأثير الخلط بين الكباش الكيوس و النعاج الأوسيمي و الصعيدي على صفات النمو و الحيوية للحملان

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اجرى هذا البحث بفرض دراسة تأثير عملية الخلط بين الكباش الكيوس مع النعاج الأوسيمي و الصعيدي على صفات الوزن عند الميلاد و الفطام و ٦ شهور و عمر سنة و معدل الزيادة اليومية للحملان من الميلاد و حتى عمر سنة بالإضافة إلى صفة حيوية الحملان عند الأعمار ٣٠ ، ١٢٠ ، ١٨٠ ، يوماً - و قد شملت الدراسة عدد ٣٠٤ راسا من الحملان الأوسيمي و الصعيدي و الجيل الأول الناتج من خلط كباش الكيوس مع النعاج الأوسيمي (١/٢ كيوس ١/٢ اوسيمي) و النعاج الصعيدي (١/٢ كيوس ١/٢ صعيدي) و كانت العوامل التى درس تأثيرها هى عملية الخلط (السلالة) و جنس المولود و نوع الولادة (مفرد أو تولم) و موسم الولادة و عمر الأم - و قد جمعت بيانات هذه الدراسة من الحملان المولودة خلال الفترة من عام ١٩٨٩ - و حتى عام ١٩٩١ بمزرعة الإنتاج الحيوانى - كلية الزراعة - جامعة المنيا .

وقد اظهرت نتائج البحث ما يلى :

١- كان تأثير السلالة جوهريا على وزن الميلاد والوزن والوزن عند عمر ٦ شهور فى حين كان غير جوهريا على وزن الفطام والوزن عند عمر سنة - كانت حملان الجيل الاول الخليطة اقل وزنا من الحملان النقية للاغنام المحلية وقد اظهر الخليط (١/٢ كيوس ١/٢ اوسيمي) تفوق مقدراة ٨,٩ ، ٨,٦ ، ٤,٣٢ ، ٢,٧٢٪ عن السلالة الأوسيمي فى حين كان تفوق الخليط (١/٢ كيوس ١/٢ صعيدي) مقدراة ٤,٨ ، ٢,٤ ، ٤,١ ، ٧,٩٪ عن السلالة الصعيدي عند الميلاد و الفطام و ٦ شهور و عمر سنة على التوالى.

٢- كانت الحملان الذكور اقل وزنا من الاناث - والحملان الفردية اقل وزنا من الحملان التوامية فى كل الاعمار تحت الدراسة - وكانت الفوارق بينها جوهرية جدا فيما عدا تأثير الجنس فقد كان جوهري فقط عند الميلاد .

٣- كان تأثير موسم الولادة غير جوهريا على وزن الميلاد و كانت الحملان المولودة صيفا اقل وزنا من الحملان المولودة شتاء - بينما كانت الحملان المولودة شتاء اقل وزنا عند الأعمار التالية و كانت الفوارق بينهما جوهرية او جوهرية جدا .

٤ - كان تأثير عمر الأم جوهريا جدا على وزن الميلاد و جوهري فقط على وزن الفطام بينما كان غير جوهري على الوزن عند عمر ٦ ، ١٢ شهرا و كانت الحملان الناتجة من الأمهات عمر سنتين اقل أخفها وزنا و الناتجة من الأمهات عمر ٤ سنين فأكثر هى اقلها وزنا .

٥ - كان تأثير السلالة غير جوهري على معدل الزيادة اليومية عند كل الفترات تحت الدراسة من الميلاد و حتى عمر سنة - و كانت الحملان الخليطة (١/٢ كيوس ١/٢ اوسيمي) اعلاها من الفترة من الميلاد و حتى الفطام بينما كانت الحملان الخليطة (١/٢ كيوس ١/٢ صعيدي) هى اعلاها فى معدل الزيادة اليومية خلال الفترة من ٦ شهور و حتى عمر سنة .

٦- كان تأثير الجنس جوهريا جدا على معدل الزيادة اليومية عند كل الفترات تحت الدراسة و كان أثره واضحا خلال الفترة من ٦ شهور و حتى عمر سنة - بينما كان تأثير نوع الولادة جوهري جدا خلال الفترة من الميلاد وحتى عمر ٦ شهور و غير جوهري خلال الفترة من ٦ شهور و حتى عمر سنة - و كانت الحملان الفردية أعلى في معدل الزيادة اليومية من الميلاد و حتى عمر ٦ شهور بينما حدث العكس خلال الفترة من ٦ شهور و حتى عمر سنة .

٧ - كان تأثير موسم الولادة جوهريا جدا على معدل الزيادة اليومية خلال الفترة من الميلاد و حتى الفطام وجوهري خلال الفترة من الفطام و حتى ٦ شهور بينما كان غير جوهري خلال الفترة من ٦ شهور و حتى عمر سنة - وقد تفوقت الحملان المولودة شتاء في معدل الزيادة اليومية على الحملان المولودة صيفا - وقد كان تأثير عمر الام غير جوهري على معدل الزيادة اليومية خلال كل الفترات تحت الدراسة .

٨- كان تأثير كل من السلالة والجنس غير جوهري على صفة حيوية الحملان عند كل الاعمار تحت الدراسة - وقد تفوقت حملان الجيل الاول الخليطة على الحملان النقية في صفة الحيوية عند كل الاعمار - وقد كان تفوق الحملان (١/٢ كيبوس ١/٢ اوسيمي) على الحملان الاوسيمي بمعدل ٣٢٪ في حين كان تفوق الخليط (١/٢ كيبوس ١/٢ صعيدى) على الحملان الصعيدى بمعدل ١٧٪ عند عمر ١٨٠ يوم .

٩- كان تأثير نوع الولادة (مفرد - توام) جوهريا جدا على صفة حيوية الحملان عند كل الاعمار تحت الدراسة - وكانت الحملان المولودة فرادى اعلى في هذه الصفة (٨٧٪ الفرادى مقابل ٧١٪ للتوائم عند عمر ١٨٠ يوما).

١٠- كان تأثير موسم الولادة غير جوهري عند عمر ٣٠ يوم ثم اصبح جوهري عند الاعمار ١٢٠ ، ١٨٠ يوما وكانت حيوية الحملان المولودة شتاء اعلى من الحملان المولودة صيفا عند كل الاعمار تحت الدراسة .

١١- كان تأثير عمر الام غير جوهري على صفة حيوية الحملان عند كل الاعمار الدراسة - وكانت الحملان الناتجة من امهات ٣ سنوات هي اعلاها ولكن الحملان الناجمة من امهات عمر سنتين قائل او ٥ سنوات فاكثر هي اقلها .