JKAU: Met., Env. & Arid Land Agric. Sci., **vol. 12,** pp. 55-67 (1421 A.H. / 2001 A.D.)

Evaluation of Some Factors Influencing the Weight of Lamb and Placenta at Lambing in Local Sheep Under Arid Environment of Saudi Arabia

H.E. El Sobhy*
Dept. of Arid Land Agric., Faculty of Meteorology, Environment and Arid Land Agric., King Abdulaziz University, Saudi Arabia

Abstract. Data of the present study were collected from 105 lambing from 7 breeding groups. The sheep flocks were raised at Hada El-Sham Experimental Station of King Abdulaziz University, KSA. The aim of the study was to evaluate the effect of breed, season of lambing, parity, weight of ewe and sex of lamb on lamb birth-weight and placental weight at lambing. The average lamb birth weights (LBWT) of different breed groups were 3.01, 2.95, 2.77, 3.29, 2.82, 3.34 and 2.97 kg for Naeemi (NAE), Sawakni (SAW), Najdi (NAJ), Harri (HAR), and crosses of (HAR × NAJ), (HAR × SAW) and (HAR × NAE), respectively. Difference between the two averages was significant. The average placental weights (PWT) of the same breeds were 488, 507, 481, 447.94, 457.57, 491.25 and 527.21 g respectively. Difference between the two averages was significant. The average fluids weight (FWT) of the different groups were 2.12, 2.25, 2.31, 1.81, 2.05, 2.22 and 1.91 kg, respectively. Differences between NAJ and HAR were significant (2.31 and 1.81 kg, respectively). No consistent pattern was observed with regard to parity effects on LBWT, PWT. LBWT was heavier for male lambs than for female lambs, however, PWT of female lambs was heavier than males. Sex difference was found to have significant effect on LBWT and PWT. Estimates of linear regression revealed that the increase in ewe weight was associated with an increase in LBWT, PWT and decrease in FWT.

**Permanent address:* Department of Animal Production, Faculty of Agric., Ain-Shams University, P.O. Box 68 Hadayek Shoubra, 11241 Cairo, Egypt.

Introduction

Birth weight is an economically important feature in sheep flock. Lamb birth weight has been shown to be the most important factor affecting lambing difficulty (Sobiraj, 1994 and Cloete *et al.,* 1998). Weight at lambing is positively associated with placenta weight (Galan *et al.,* 1999 and Risam *et al.,* 1999). Accordingly, the factors affecting birth weight of lamb are mostly the same factors influencing placental weight at lambing. Lamb birth weight and/or placental weight in a flock of sheep appears to be affected by maternal factors (Omar, 1990; Abiola & Onwuka, 1998; Chaiwatanasin *et al.,* 1998; Hassan *et al.,* 1998, Mbap & Ikechi, 1998; Malik *et al.,* 1998; Arora *et al.,* 1999; Risam *et al.,* 1999 and Combellas & Combellas, 1999), direct genetic effects (Malik *et al.,* 1998; Eskandary & Kashan, 1998; Chaiwatanasin *et al.,* 1998; Hassan *et al.,* 1998; Singh *et al.,* 1998; Risam *et al.,* 1999 and Yazdi *et al.,* 1999), sex (Omar, 1990; Osinowo *et al.,* 1993, Abba, 1997; Yazdi *et al.,* 1998; Gill *et al.,* 1996 and Al-Merestani *et al.,* 1999), and the physiological state of the dam as associated by age, parity or weight (Omar, 1990; Jenkin *et al.,* 1995; Ozturk, 1996; Abba, 1997; Abiola & Onwuka, 1998; Hassan *et al.,* 1998; Mbap & Ikechi, 1998; Malik *et al.,* 1998; Singh *et al.,* 1998; Yazdi *et al.,* 1998; Risam *et al.,* 1999; Arora *et al.,* 1999; Thieme *et al.,* 1999; and Combellas & Combellas, 1999).

Since the sheep placenta is known to produce sufficient amounts of prostaglandin (PGE_2), it seems that the placenta controls fetal thermogenic responses to some extent. This transforms the fetus into an ectothermic organism, and yet allows the newborn a full exploitation of thermoregulatory responses typical to endothermic animals (Schroeder & Power, 1997).

The objectives of this study were to evaluate the nongenetic maternal and some environmental influences on lamb, placental and fluids weights at lambing and to clarify the relationship between placental weight and the weight of lamb produced at lambing under arid land environment.

Materials and Methods

Data from 105 ewes were collected from 7 different breed groups and their crossbreds namely Naeemi (NAE); Sawakni (SA); Najdi (NA); Harri (HA); ♀Harri)♂MNajdi (HA × NA),♀Harri) × ♂Sawakni (HA × SA) and ♀Harri × ♂ Naeemi (HA × NA), raised at Hada El-Sham Experimental Research Station belonging to the Faculty of Meteorology, Environment and Arid Land Agriculture, King Abdulaziz University.

This experimental station, covering an area of 100 acres, was established in an area located hundred and ten kilometer to the Northeast of Jeddah, in Hada Al-Sham area in Jamoum Governorate, which is rich of underground fresh water. Its climate is characterized by a long, hot and dry summer with increased humidity and a relatively short winter. The maximum temperature could reach 47°C in summer and about 10°C in winter. The average annual rainfall is below 10 cm and occurs mostly during winter.

All sheep were housed in open sheds, grazed on pasture from 7 to 11 in the morning and from 3 to 6 afternoon. Dry ewes and ewes in early pregnancy were offered ½ kg of concentrated feed/head/day (18% CP). This amount was increased to 0.75 kg during the last month of pregnancy. After lambing, the ewes with their lambs were transferred to individual pens, measuring 1.5 × 1.0 m in size, for one week and then transferred again to a larger enclosure with another 15-25 ewes and their lambs. All animals including had free access to fresh water and mineralized salt blocks.

Intensive sheep production system criteria were used (3 lambing/2 years). Ewes were bred in three breeding seasons over the year (January-February), (May-June) and (September-October). Consequently, there were three lambing seasons (June-July), (October-November) and (February-March).

Ewes were normally inseminated by rams. All ewes delivered normally, weight of lamb at birth (LBWT) and ewe weight immediately before (WTEB) and after (WTEA) lambing were recorded after expulsion of placenta (3-5 h) after parturition. Placental weight (PWT) was recorded to the nearest g. Weight of placental fluids was calculated from the following formula

$$FWT = WTEB - (WTEA + LBWT + PWT)$$

whereas

FWT = Fluids weight

WTEB = Weight of EWE just before lambing

WTEA = Weight of EWE after lambing

LBWT = Lamb birth weight

PWT = Placental weight

Data of lamb birth weight, placental and placental fluids weights at lambing were analyzed by the least squares and maximum likelihood program of Harvey (1990). A linear model including the fixed effects of parity, sex and season of lambing weight of ewe just before lambing was considered as a covariant.

Meteorological data for the total duration of the experiment (from May 1998 to June 1999) were obtained from the Department of Meteorology in Hada El-Sham Experimental Research Station.

Results and Discussion

Meteorological data

Figure 1 indicated that environmental temperature and relative humidity percent fluctuated among the different months. The highest ambient temperature was attained during May and September (46.15 and 46.00°C, respectively), while the least was recorded during January (10°C). Daily photoperiod length showed the longest day during May, June and July (11, 11 and 11 h, respectively) while the shortest day was recorded during December (8.5 h).

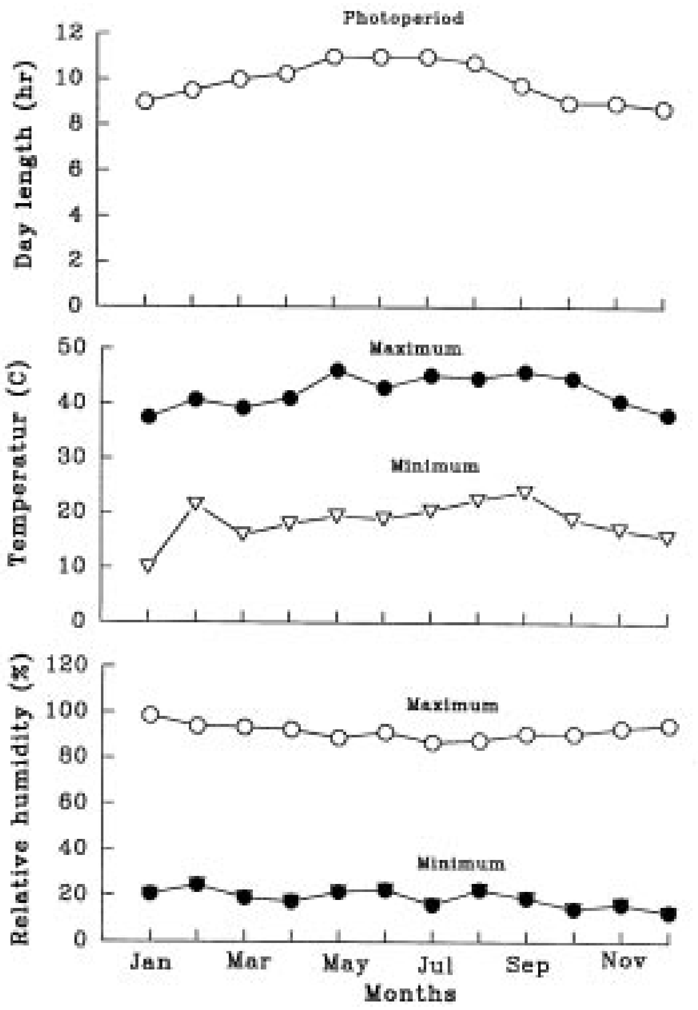

FIG. 1. Average monthly variations in day length, environmental temperature and relative humidity throughout the study.

Means and Variation of Uncorrected Records

The means, standard error and coefficient of variation (CV%) of ewes weight immediately before lambing (WTEB), after lambing (WTEA), lamb birth weight (LBWT), number of lambs (NOL), placental weight (PWT) and fluids weight (FWT) are given in Table 1.

TABLE 1. Means, standard errors (SE) and coefficient of variation (CV%) of unadjusted records.

Variable		Mean ± SE	CV%
Weight of ewe before lambing (WTEB)	(kg)	41.49 ± 0.37	9.18
Weight of ewe after lambing (WTEA)	(kg)	36.26 ± 0.36	9.90
Lamb birth weight (LBWT)	(kg)	2.90 ± 0.05	19.20
Number of lambing (NOL)		1.12 ± 0.03	29.45
Placental weight (PWT)	(g)	461.71 ± 7.43	16.50
Fluids weight (FWT)	(kg)	1.97 ± 0.05	23.66

*Number of observations = 105.

For the traits studied LBWT and PWT, CV relatively are nearly similar in magnitude (19.20 and 16.50), respectively. These higher coefficients of variation are more likely to be due to higher maternal effects on growth of lamb during the prenatal period.

The average LBWT and PWT at lambing in native sheep included in the present study are relatively low (2.90 kg and 461.71 g, respectively) compared to other estimates for the same breed reported in the literature. In this respect, higher average birth weight for the same or different breeds of sheep have been reported by some investigators (Omar, 1990; Mbap & Ikechi, 1998; Arora *et al,.* 1999 and Abba, 1997). While the contrary was observed by others (Abiola & Onwuka, 1998; Mbap & Ikechi, 1998; Singh *et al.,* 1998; Chaiwatanasin *et al.,* 1998 and Combellas & Combellas, 1999). The evidence from the differences between the estimates for the traits studied and those reported by other investigators for the same and/or different breeds of sheep could possibly by attributed to possible differences in genitical criteria, climate, nutritional and/or managerial aspects.

Breed Effect

Least squares means of factors affecting lamb birth weight (LBWT), placental weight (PWT), fluids weight (FWT) and weight of ewe just before lambing are presented in Table 2. The average LBWT was 3.01, 2.95, 2.77, 3.29, 2.82, 3.34 and 2.97 kg. For NAE, SAW, NAJ, HAR, (HAR × NAJ), (HAR × SAW) and (HAR ×NAE) crossbreds respectively. The heaviest LBWT average was observed in HAR × SAW crossbred (3.34 kg), and the lightest LBWT average was observed in NAJ lambs (2.77 kg). Difference between the two averages was significant. The average PWT of the same breeds was 488, 507, 481, 447.94, 457.57, 491.25 and 527.21 g, respectively. The heaviest PWT average was detected in HAR ×NAE crossbred (527.21 g) and the lightest PWT average was observed in HAR (447.57 g). Difference between the two averages was significant. The average FWT of the different groups mentioned above was 2.12, 2.25, 2.31, 1.81, 2.05, 2.22 and 1.91 kg, respectively. Again difference between NAJ and HAR was significant (2.31 vs. 1.81 kg, respectively).

Breed in this study was found to exert a significant influence on LBWT, PWT and FWT. This result is in agreement with those obtained by Omar (1990); Ozturk (1996); Hassan *et al.* (1998); Mbap & Ikechi (1998); and Malik *et al.* (1998).

Parity Effect

Parity failed to exert a significant influence on LBWT and PWT (Table 2). Differences between FWT due to parity effect, however, were significant. Results on LBWT and PWT are in agreement with those obtained by Abba (1997) who concluded that lambs born to multiparous ewes were heavier than those born to primiparous ewes.

TABLE 2. Least squares-means ($\bar{x}$) of factors affecting lamb birth weight (LBWT), placental weight (PWT), fluids weight (FWT) and weight of ewe just before lambing (WTEB).

Independent variable	N	LBWT (kg)		PWT (g)		FWT (kg)		WTEB	
		$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Breed		*		*		*		*	
1. Naeemi (NAE)	20	3.01	0.12	488.60	17.79	2.12	0.10	44.27	0.64
2. Sawakni (SAW)	10	2.95	0.16	507.37	24.79	2.25	0.14	46.01	0.86
3. Najdi (NAJ)	5	2.77	0.21	481.68	32.60	2.31	0.19	38.73	1.26
4. Harri (HAR)	30	3.29	0.10	447.94	15.35	1.81	0.09	38.76	0.54
5. (HAR × NAJ)	20	2.82	0.10	457.57	16.70	2.05	0.10	43.72	0.62
6. (HAR ×SAW)	10	3.34	0.16	491.25	23.60	2.22	0.15	39.59	0.91
7. (HAR ×NAE)	10	2.97	0.15	527.21	23.29	1.91	0.13	39.85	0.91
Parity		ns		ns		*		ns	
1st	31	3.04	0.09	462.63	14.39	1.69	0.08	41.89	0.57
2nd	33	2.94	0.09	489.02	13.88	2.05	0.08	41.60	0.55
3rd	24	3.04	0.10	494.81	15.75	2.24	0.09	41.26	0.63
4th	18	3.06	0.12	497.32	18.445	2.40	0.11	41.50	0.73

TABLE 2. Contd.

Independent variable	N	LBWT (kg)		PWT (g)		FWT (kg)		WTEB	
		$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Season of lambing		ns		*		*		ns	
Feb-March	35	3.09	0.09	458.07	13.31	1.95	0.08	42.05	0.53
Jun-July	30	2.94	0.09	480.82	14.42	2.21	0.08	41.59	0.57
Oct-November	40	3.03	0.09	518.94	13.37	2.13	0.08	41.06	0.53
Sex		*		*		ns		ns	
1. Male (M)	45	2.81	0.08	462.32	11.54	2.06	0.07	41.84	0.46
2. Female (F)	2.6	2.76	0.07	465.28	11.06	2.11	0.06	40.90	0.44
3. Twins	12	3.49	0.04	530.24	20.90	2.11	0.12	41.95	0.83
Linear regress on ewe weight at lambing		0.072^{**}	0.017	1.750^{ns}	2.673	-0.673^{ns}	0.015	–	–

* = P < 0.05
ns = Not significant

From another point of view, the present result indicated that lambs born in the 4th parity or more were heavier than those born at earlier parities, this conclusion agrees with those reported by Yazdi *et al.,* (1998) who revealed that lambs were born at parities 4-6 had heavier birth weight than those born at earlier or later parties. However, the effect of parity could result as a combination of increased nutritional supply to the embryo, increased placental size, physical effects, ... etc. Therefore, findings of the present and reviewed studies can be expected because ewes in their first parity have just reached sexual maturity. Difference between least square means of the first and second parities in LBWT can be neglected biologically (3.04 vs. 2.94 kg), and consequently their efficiency in providing their fetus with nourishment and intrauterine environment during the prenatal mothering ability increase with the advancement of parity until a certain age, then it remained constant for a period and decreased thereafter due to aging (Abba, 1997).

FWT at lambing increased linearly as parity advanced (Tables 2 and 3). During the first pregnancy, the ewes still growing (*i.e.,* there is a competition between the ewe and its fetus concerning the use of nutrition) and consequently their body size (relevant to placental weight) are increased with advancement of parity.

Season of Lambing Effect

Least-squares means given in Table 2 indicated that the effect of season on LBWT was not significant. Seasons, however, were significant on PWT and FWT. There was a general tendency for LBWT and PWT at lambing to be low, when lambing took place in hot month (June). This tendency increased however with lambing during the months of February and October. The results of the analysis of variance in Table 3 showed that a significant relationship existed between PWT, FWT and season of lambing. This conclusion was observed by other investigators (Mbap & Ikechi, 1998; Hassan *et al.,* 1998 and Malik *et al.,* 1998). These results could be attributed to the fact that, during June and July (summer season) and October and November (autumn season), grazing on green fodder for pregnant ewes was not available in sufficient quantity, and was lower in nutritive value as well as the weather was not favorable. But during February (winter season), fodder became more abundant and of high nutritive value as the weather becomes milder. These results were in agreement with those obtained by Malik *et al.* (1998).

TABLE 3. Analysis of variance and coefficient of determination (r^2) of factors affecting lamb birth weight (LBWT), placental weight (PWT) and fluids weight (FWT) at lambing.

Source of variation	DF	LBWT (kg)	PWT (kg)	FWT (g)
		Mean squares	Mean squares	Mean squares
Breed	6	0.49^{*} ($r^2 = 0.091$)	10948^{*} ($r^2 = 1.088$)	0.40^{*} ($r^2 = 0.108$)
Parity	3	0.08^{ns} ($r^2 = 0.007$)	5795^{ns} ($r^2 = 0.288$)	1.90^{**} ($r^2 = 0.253$)
Linear	1	0.03^{ns}	10688^{ns}	4.85^{**}
Quadratic	1	0.09^{ns}	3307^{ns}	0.23^{ns}
Cubic	1	0.09^{ns}	391^{ns}	0.02^{ns}
Season of lambing	2	0.18^{ns} ($r^2 = 0.001$)	30079^{**} ($r^2 = 0.997$)	0.60^{*} ($r^2 = 0.053$)
Sex	2	2.50^{**} ($r^2 = 0.155$)	21910^{*} ($r^2 = 0.726$)	0.03^{ns} ($r^2 = 0.003$)
Linear regression on ewe weight	1	3.65^{*} ($r^2 = 0.113$)	2435^{ns} ($r^2 = 0.040$)	0.14^{ns} ($r^2 = 0.006$)
Residual	90	0.20	4584	0.015

$^{*}P < 0.05$ and $^{**}P < 0.01$.

The present results also indicated that, FWT in June (hot summer season) were significantly higher than that in October and November season of lambing. Findings of the present and reviewed studies, as well, can be expected because the fact that 'engine' of fetal metabolism generates heat (3-4 W kg-1 in fetal sheep), which has to be dissipated to the maternal organism. Because resistance to heat flow is larger than zero, fetal temperature exceeds maternal temperature by about 0.5°C (0.3-1°C). Schroeder and Power (1997) who added that since the sheep placenta is known to produce sufficient amount of prostaglandin E-2 (PG E-2), it seems that the placenta controls fetal thermogenic responses to some extent. This transforms the fetus into an ectothermic organ and yet allows the newborn a full exploitation of thermoregulatory responses typical to endothermic animals.

Since the fetus is considered as ectothermic, the effect of environmental heat on the thermoregulatory responses is expected to be more pronounced. Due to the fact that the present study revealed a non-restricted placental growth during hot seasons, this means that the sheep were thermoregulating well when exposed to hot environment. This conclusion is in agreement with the work of McCrabb and Bortolussi (1996). The sheep included in the present study are native of the arid land environment of Saudi Arabia. This might explain their observed thermoregulatory response.

Sex Effect

Male lambs were heavier in birth weight and PWT than female lambs (Table 2). In this respect, many investigators working in the different breeds of sheep observed that male lambs and their placenta were heavier in weight at lambing than female lambs (Omar, 1990; Osinowo *et al.,* 1993; Abba, 1997; Yazdi *et al.,* 1998; Gill *et al.,* 1996 and Al-Merestani *et al.,* 1999). These results are expected because LPWT was significant and positively correlated with PWT at lambing. The trends in sex differences in LPWT and PWT were statistically significant, respectively, while they were nonsignificant for fluids weight (Table 3).

Weight of Ewe before Lambing (WEBL)

LBWT was increased linearly with the increase of WTEBL (Tables 2 and 3) while PWT increased linearly, but did not reach statistical significance. Meanwhile, the relative size of F-values for the fixed effects included in the model of analysis (Table 3) indicated that weight of ewe effects contribute significantly to the variance of LBWT (Abba, 1997; Singh *et al.,* 1998 and Thieme *et al.,* 1999).

Estimates of linear regression (Table 2) revealed that the increase in ewe weight was associated with an increase in LBWT and PWT, and decrease in FWT. Each kg increase in ewe weight was associated with an increase of 0.072 kg, 1.75 g LBW and PWT respectively, and decreased 0.673 FWT.

References

Abba, D. (1997) Reproductive performance of Massa sheep in the extreme north Cameron, *Tropicultura,* **15**(4): 177-179.

Abiola, S.S. and **Onwuka, C.F.I.** (1998) Reproductive performance of West African dwarf sheep and goats at village level in Ogun State, Nigeria, *Nigerian Journal of Animal Production,* **25**(1-2): 79-82.

Al-Merestani, M.R., Zarkawi, M. and **Wardeh, M. (**1999) Early breeding and pregnancy diagnosis in Syrian Awassi sheep yearlings, *Reproduction in Domestic Animals*, **34**(5): 413-416.

Arora, A.L., Sharma, R.C., Narula, H.K., Ravindra-Kumar and **Kumar, R.** (1999) Comparative performance of Avikalin and Malpura sheep, *Indian Journal of Small-Ruminants,* **5** (1): 4-8.

Chaiwatanasin, W., Chantsavang, S., Thanintarathratharn, B., Wanee, C., Somchai, C. and **Bundit, T.** (1998) Production of crossbred sheep in Thailand, *Kasetsart Journal, Natural Science,* **32**(2): 158-162.

Cloete, S., Scholtz, Anna, J., Ten, Hoope, J., Lombard, P.I. and **Franken, M.C.** (1998) Ease of birth relation to pelvic dimensions, litter weight and conformation of sheep, *Small Ruminant Research,* Dec, 1998; **31**(1): 51-60.

Combellas, J. de and **Combellas, J.** (1999) Productive characteristics of West African sheep grazing star grass (*Cynodon nlemfuensis*) and Leucaena (*Leuca na Leucocephala*). *Revista de Facultad de Agronomica, Universidad del Zulia,* **16(**2): 204-210.

Eskandary, M.P. and **Kashan, N.E.J.** (1998) Estimation of genetic parameters in black Karakul sheep, *Agricultural Science, Tabriz,* **7**(3-4): 79-89.

Galan, H.L., Hussey, M.J., Barbera, A., Ferrazi, E., Chung, M., Hobbins, J.C. and **Battaglia, F.C.** (1999) Relationship of fetal growth to duration of heat stress in an oven model of placental insufficiency, *American Journal of Obstetrics and Gynecology,* May, 1999; **180**(5): 1278-1282.

Gill, J.W., Egan, A.R. and **Hosking, B.J.** (1996) Modulation of sexual dimorphism in growth in twin sheep, Animal Production in Australia, *Proceedings of the Australian Society of Animal Production,* **21:** 207-210.

Harvey, W.R. (1990) *Mixed Model Least-Squares and Maximum Likelihood Computer Program LSMLMW and MIXMDL,* PC-2 Version (Mimeographic: Columbus, Ohio, USA).

Hassan, H.A., Fahmy, S.T.M., Mousa, M.T., Suliman, A.I.A. and **Metwally, M.K.** (1998) Improvement of Ossimi productive traits through crossing with Chios sheep. Body weight and daily gain, *First International Conference of Animal Production and Health in Semi-Arid Areas, El-Arish, Egypt, 1-3 September,* 1998, 361-370.

Jenkin, G., McFarlane, J. and **De-Kretser, D.M.** (1995) Inhibin and activin in embryonic and fetal development in ruminants, *Journal of Reproduction and Fertility* (Suppl.) **49:** 177-186.

Malik, R.C., Razzaque, M.A., Aali, M.A.T., Al-Khozam, N.M., Al-Mutawa, T.A. and **Abbas, S.** (1998) Factors affecting preweaning lamb survival in continuously housed sheep, *Australian Journal of Experimental Agriculture,* **38(**8): 795-799.

Mbap, S.T. and **Ikechi, U.D.** (1998) Production performance of sheep at two locations in Bauchi State of Nigeria, *Nigerian Journal of Animal Production,* **25**(1-2): 198-203.

McCrabb, G.J. and **Bortolussi, G.** (1996) Placental growth and the ability of sheep to thermoregulate in hot environment, *Small Ruminant Research,* **20**(2): 121-127.

Omar, M.E.M. (1990) Growth of Lambs and Carcaus traits of Najdi and Harry sheep, *MSc. Thesis,* Faculty of Meteorology, Environment and Arid Land Agriculture, King Abdulaziz University, Saudi Arabia. (*in Arabic*).

Osinowo, O.A., Abubakar, B.Y. and **Trimnell, A.R.** (1993) Genetic and phenotypic relationship between gestation length, litter size and litter birth weight in Yankasa sheep, *Animal Reproduction Science.* **34(**2): 111-118.

Ozturk, A. (1996) Breed of sire and parity effects on litter size of Konya Merino sheep, *Indian Veterinary Journal*, **73**(4): 421.

Risam, K.S., Mir, M.Y. and **Kirmani, M.A.** (1999) Genetic parameter of birth and weaning weights in a closed flock of Corriadale sheep, *Indian Journal of Small Ruminants*, **5**(1): 1-3.

Schroeder, H.J. and **Power, G.G.** (1997) *Physiological Society Symposium, Fetal-placental interactions, Engine and radiati,* Fetal and Placental interactions for heat dissipation, *Experimental Physiology*, **82**(2): 403-414.

Singh, V.K., Gopal, D., Mehta, S.C. and **Sharma, R.R.** (1998) Selection in Marwari sheep: 1. Performance of selection line, *Indian Journal of Small Ruminants,* **4**(1): 1-4.

Sobiraj, A. (1994) Dystocia in sheep and goats: A survey of seven lambing periods at clinic for obstetrics, *DTW (Deutsche Tieraerztliche Wochenschrift),* **101**(12): 471-476.

Thieme, O., Karazeybek, M., Azman, M.A. and **Ugurlu, A.** (1999) Performance of village sheep flocks in Central Anatolia, 1. Growth of Lambs, *Turk Veterinerlik ve Hayvancilik Dergisi,* **23**(5): 467-474.

Yazdi, M.H., Eftekhari-Shahroudi, F., Hejazi, M. and **Liljedahl, L.E.** (1998) Environmental effects on growth traits and fleece weights in Baluchi sheep, *Journal of Animal Breeding and Genetics,* **115**(6): 455-465.

Yazdi, M.H., Johansson, K., Gates, P., Nasholm, A., Jorjani, H. and **Liljedah, L.E.** (1999) Bayesian analysis of birth weight and litter size in Baluchi sheep using Gibbs sampling, *Journal of Animal Science*, **77**(3): 533-540.

تقييم لبعض العوامل التي تؤثر على وزن الحملان ووزن المشيمة عند الولادة في الأغنام المحلية تحت ظروف البيئة الجافـة بالمملكة العربية السعودية

حنفي إمبابي الصبحي*

قسم زراعة المناطق الجافـة ، كلية الأرصاد والبيئة وزراعة المناطق الجافـة

جامعة الملك عبد العزيز ، جـــدة - المملكة العربية السعودية

المستخلص . البيانات الموجودة في هذه الدراسة تم جمعها من عدد ١٠٥ ولادة شملت ٧ أنواع من قطعان الأغنام الموجودة بمحطة الأبحاث بهدى الشام التابعة لجامعة الملك عبد العزيز بالمملكة العربية السعودية . وكان الغرض من الدراسة تقييم تأثير النوع وموسم الولادة ، وعدد مرات الولادة ووزن الأم قبل الولادة وجنس الحمل على وزن الحملان ووزن المشيمة عند الولادة . ووجد أن متوسط أوزان الحملان عند الولادة في الأنواع المختلفة هو ٣,٠١، و٢,٩٥، و٢,٧٧، و٣,٢٩، و٢,٨٢، و٣,٣٤، و٢,٩٧ كجم لكل من النعيمي ، والسواكني ، والنجدي ، والحري ، وخلطان (الحري والنجدي) ، و (الحري و السواكني) ، و(الحري والنعيمي) على الترتيب . ووجد أن متوسط أوزان المشيمة في نفس الأنواع السابقة ٤٨٨، و٥٠٧، و٤٨١، و٤٤٧,٩٤، و٤٥٧,٥٧، و٤٩١,٢٥، و٥٢٧,٢١ جم بالترتيب . ووجد أن أثقل متوسط لوزن المشمية في خليط (الحري والنعيمي = ٥٢٧,٢١ جم) ومتوسط أخفها وزنًا في خليط أغنام (الحري = ٤٤٧,٥٧ جم) وكان الاختلاف بين المتوسطين معنوي . ولقد لوحظ أن متوسط أوزان السوائل الجنينية لمختلف الأنواع المدروسة ٢,١٢، و٢,٢٥، و٢,٣١، و١,٨١، و٢,٠٥،

* العنوان الدائم : قسم الإنتاج الحيواني ، كلية الزراعة ، جامعة عين شمس ، ص. ب ٦٨ حدائق شبرا ، ١١٢٤١ القاهرة - مصر.

و٢٢, ٢، و٩١, ١ كجم بالترتيب . ووجد أن الاختلاف بين أثقلها وزنا وأخفها وزنًا معنويا . ولم تظهر النتائج تأثيراً معنويًا لعدد مرات الولادة على الصفات المدروسة ، ولكنها أظهرت زن متوسط وزن الميلاد للحملان الذكور أثقل من متوسط وزن الحملان الإناث ، بينما كانت متوسطات أوزان المشيمة للحملان الإناث أثقل من الذكور . ووجد أن جنس المولود له تأثير معنوي على الصفات المدروسة .

وبتقدير الانحدار الخطي أوضحت النتائج أن هناك علاقة طردية بين وزن الأم مع كل من وزن الحملان ووزن المشيمة عند الولادة ، وعلاقة عكسية مع وزن السوائل الجنينية .