Egypt. J. Anim. Prod. 20, No. 2, pp. 147-152 (1980)

Effect of Length of Suckling Period on the Performance of the Local Ewes Bred Three Times per two Years

A.M. Aboul-Naga, A.S. El-Shobokshy and E.A. Afifi

Animal Production Research Institute, Faculty of Agriculture, and Faculty of Agricultural Sciences, Zugazig Univ., Egypt.

Two hundred and twenty five ewes from the local Rahmani, Ossimi and Barki sheep, bred 3 times/2 years, were studied over two mating seasons (winter and autumn). The winter mated ewes, had suckled their lambs for 6, 8 or 10 weeks in their previous season, while the autumn mated ewes had suckled their lambs for other 8 or 10 weeks in their last crop.

Body weight of the ewes at the rejoining time differed significantly with the length of the suckling period. Ewes suckled their lambs for shorter periods (6 or 8 weeks) were heavier in weight than those suckled their lambs for longer periods. However, differences in body weight of the ewes at weaning time and 2 months after mating were slight and statistically non-significant.

Reproductive performance of the ewes did not differ significantly with the length of the suckling period in either season. In the winter mating season, however, the ewes weaned their lambs earlier were, generally, of better reproductive performance than those weaned their lambs at 10 weeks of age. In the autumn mating season no consistent trend was noticed between the ewes that suckled their lambs for either 8 or 10 weeks. It was concluded that the nursing ewes can conceive and reproduce successfully 6-8 weeks after lambing as long as suckling has been terminated.

In the system of 3 crops per 2 years, the time lapse from lambing rebreeding is a maximum of 3 months. The post-partum aneostrus period was reported to last for 60 to 80 days in the nursing ewes, while it is limited to only 30 to 40 days in the milking or dried-off ewes (Mauleon and Dauzier, 1965; and Kann *et al.*, 1977). This means that the nursing ewes under the system of 3 crops per 2 years rejoin the rams in the very beginning of the ovarian reactivity. Therefore the length of the suckling period with its close relationship to the post-partum ovarian activity is a critical aspect to be investigated under such system. Furthermore, the suckling period could affect the condition of the ewes which in turn might influence the reproductivity of the ewes in the next season. The performance of the local Rahmani, Ossimi and Barki ewes bred 3 times per years as affected by the length of suckling period.

Material and Methods

The experimental work was carried out at Mehallet Moussa Experimental Farm, Animal Production Research Institute. Three flocks of Rahmani,Ossimi and Barki ewes, bred 3 times per 2 years, were involved in the study over 2 consecutive seasons. Numbers of ewes available were 120, 60 and 45 from the 3 breeds, respectively. Ewes lambing in October, 1972 were left to suckle their lambs for 6, 8 or 10 weeks. They rejoined fertile rams by the *1st* of January;1973 (winter mating season) and lambed in June, 1973. Six weeks were considered as a critical age for weaning such summer born lambs, therefore, the length of the suckling period was either 8 or 10 weeks only. The nursing ewes rejoined fertile rams by the *1st* of September, 1973 (autumn mating season).

Ewes were mated in random mating groups of 30-35 ewes each. The mating seasons lasted for a period of 35 days (2 oestrus cycles). Any ram showing disability for mating was replaced by another fertile one.

In winter, the ewes grazed on Egyptian clover (*T. Alexandrinum*) with additional concentrate supplement during the suckling period and 2 weeks before joining the rams, as flushing treatment. In summer, the ewes were fed concentrate mixture pellets and straw or hay if available, with similar additional supplementation during the suckling period and 2 weeks before joining the rams.

The ewes were weighed, at the weaning time of their lambs and monthly thereafter till lambing in the following season. The reproductive criteria considered were : number of days needed per conception, conception rate, percent of multiple births, litter weight at birth (kg born) and percent of lambs weaned per ewe joined.

The unweighed means procedure as followed for analysis of variance of the continuous traits; while Chi square was used for testing the differences between different experimental groups in the discrete reproductive traits (Snedecor and Cochran, 1971).

Results and Discussion

Body weights of the ewes

Within each breed and in the 2 seasons, body weight of ewes at the weaning time of their lambs differed with the length of suckling period (Table 1). Ewes suckling their lambs for longer period (10 weeks,were generally lighter in weight than those suckled their lambs for shorter period (6 or 8 weeks in the last season and 8 weeks in the *2nd* season). However, the differences were statistically non-significant (Table 2). In the *1st* season, body weights of ewes at the weaning time of their lambs were almost similar in the suckling groups of 6 and 8 weeks.

TABLE 1. Ewe performance for different suckling groups of the 3 local breeds in the two mating seasons.

Experimental groups	No.	Weight at weaning (kg) $\bar{X}\pm$ S.E.	Weight at rejoining (kg) $\bar{X}\pm$ S.E.	Weight at 2 months after rejoining (kg) $\bar{X}\pm$ S.E.	Days needed conception $\bar{X}\pm$ S.E.	Conception rate (%)	Multiple births (%)	Litter Weight at birth (kg)	Lambs weaned/ ewe joined (%)
a) Winter mating season									
Rahmani									
6 weeks	37	38.40±0.73a	40.22±0.38a	42.94±0.41a	21.06±3.51a	58.1	3.2	4.0±0.40a	61.3
8 weeks	39	38.12±0.58v	38.27±0.45b	43.24±0.41a	21.26±2.50a	68.4	19.2	4.5±0.28a	81.6
10 weeks	39	37.97±0.74a	37.45±0.67b	42.60±0.67a	16.62±2.42a	56.8	4.8	3.9±0.73a	56.8
Ossimi									
6 weeks . . .	20	36.06±1.41v	37.27±0.69a	41.47±0.87a	18.12±5.34a	53.3	0.0	3.9±0.06a	50.0
8 weeks . . .	17	36.41±1.18a	37.29±0.84a	38.50±0.51a	25.50±4.84a	60.0	0.0	4.1±0.11a	53.3
10 weeks . . .	18	34.60±1.14a	37.06±0.76a	42.00±0.48a	16.22±3.55a	56.3	0.0	3.6±0.16a	56.3
Barki									
6 weeks . .*d*.	14	31.50±2.49a	36.17±1.49a	39.83±1.76a	17.20±2.89a	83.3	0.0	3.8±0.20a	83.3
8 weeks . . .	16	31.57±1.72a	33.50±0.92b	38.50±0.85a	25.50±1.61a	75.0	0.0	4.0±0.10a	75.0
10 weeks . . .	12	31.80±1.39a	33.80±0.31b	39.40±0.87a	28.25±4.31a	80.0	0.0	4.1±0.99a	70.0
b) Autumn mating season									
Rahmani									
8 weeks . . .	50	42.25±0.81a	45.35±0.76a	46.25±1.24a	14.67±1.56a	85.7	66.7	5.3±0.24a	122.4
10 weeks . . .	54	41.22±0.89a	43.63±0.81b	45.67±0.77a	13.55±1.43a	92.6	42.6	5.2±0.69a	119.6
Ossimi									
8 weeks . . .	21	41.88±1.33a	42.65±1.38a	43.76±1.40a	13.33±1.91a	75.0	33.3	5.0±0.69a	110.0
10 weeks . . .	23	41.00±1.32a	42.00±1.37a	42.82±1.38a	15.38±2.20a	91.3	14.3	4.7±0.54a	100.0
Barki									
8 weeks . . .	16	39.62±.76 a	40.56±0.88a	41.75±0.92a	11.21±1.69a	81.3	23.1	4.1±0.64a	93.8
10 weeks . . .	14	37.92±1.13a	38.46±1.14b	39.92±1.18a	12.50±3.31a	76.9	50.0	5.2±0.42a	107.7

By the rejoining time, differences in body weight of ewes from different suckling groups were more detectable and proved to be statistically significant ($P<0.01$ in winter mating season, and <0.05 in the autumn mating season). The ewes suckled their lambs for shorter period had better opportunity to recover in weight than those continued nursing their lambs nearly up to the time of rejoining the rams. Differences between the suckling groups of ewes were more recognizable in some breeds than in others. Rahmani and Barki ewes suckling their lambs for shorter periods (6 weeks in the winter and 8 weeks in the autumn season respectively) were significantly ($P<0.05$) heavier at rejoining than those suckling their lambs for longer periods. On the other hand, differences between Ossimi groups of ewes were slight and non-significant in both seasons. This trend resulted in significant ($P>0.05$) breed by suckling period interaction in the winter mating season (Table 2).

TABLE 2. Analyses of variance for the ewe performance continuous traits in the 2 mating seasons

Source of variation	d.f.	Mean squares			d.f.	Mean squares days needed per conception
		Wt. at weaning time	Wt. at rejoining	Wt. 2 months after rejoining		
a) Winter mating season						
Breed	2	319.88**	111.85**	75.43**	2	81.72
Suckling period	2	1.93	31.77**	2.03	2	184.12
Breed x suckling period	4	11.77	27.09*	8.26	4	250.25
Residual	203	17.76	9.39	8.68	109	152.43
b) Autumn mating season						
Breed	2	280.27**	159.87**	397.32**	2	63.41
Suckling period	1	79.31	123.65*	72.61	1	1.58
Breed x suckling period	2	15.57	20.33	11.81	2	36.12
Residual	172	30.25	31.18	29.47	143	90.18

The wider variation in body weight of Rahmani ewes could be attributed to the high frequency of multiple births they produced (25% vs 12 and 0% in Ossimi and Barki ewes, respectively.). Ewes rearing twin lambs are likely to be more affected by the length of suckling period and needed more time to recover back. Further Barki ewes, as a light breed, are more liable to change in live body weight with differences in length of the suckling period.

Two months after rejoining ,differences in body weight of the ewes from different suckling groups were diminished and failed to attain statistical significance. By that time the ewes seemed to recover in weight from lactation.

Reproductive activity

Differences in reproductive activity of the ewes suckling their lambs for different periods were generally mild and statistically non-significant for all traits studied on both seasons (Tables 1 and 2). In the winter mating season, the 3 breeds showed varying trends of reproductive activity between the different suckling groups with some adventage from the short suckling periods. As was the case in body weight group, differences were more detectable in Rahmani ewes than in the Ossimi or Barki ewes. In the autumn mating season, no consistent trend was observed between the 8 and 10 weeks suckling groups of the 3 breeds.

The absence of cyclical activity and the anovulation in the suckling ewes has been reported widely in the literature (Meithes, 1966; Lamming *et al.*, 1974; Kann *et al.*, 1977 and others). They attributed it to the antigonadal action of the prolactin hormone. Kann and Martinet (1975), Kann *et al.* (1977) and Rhind (1977) had demonstrated that it is the surges of prolactin secretion specifically induced by suckling and not by lactation itself, that are responsible for the suppression of the ovarian activity during suckling. The prolactin influence seems to diminish shortly after weaning. Rhind (1977) had established results of interest in this respect. He weaned lambs at 30, 50, 70 and 100 days of age, which corresponded to -35, - 15, +7 and + 35 days from the remating time of their dams. High conception rates were obtained from ewes dried before mating with slight differences between those dried 35 or 15 days before mating. In contrast to that , the conception rate of the post -mating weaning groups of ewes were greatly low in those suckled their lambs for 7 or 35 days during mating. They reported that the principal causes of barrenness in the suckling ewes were fertilization failure and / or failure to maintain pregnancy. In the present work, the ewes with the longest suckling period (of 10 weeks) had been mated 1-15 days after the suckling was terminated and their reproductive activity did not differ significantly from those dried 30-45 days before mating. These consistent results of both studies indicate that the length of the suckling period did not affect the reproductive activity of the ewes, as long as suckling had been terminated before mating. The limiting factor for attaining normal reproductive activity from the ewes will be, only the time for uterine involution which had been reported by Foote (1971) , Moseley (1971) and Wyck *et al.*(1972) to be about 4-6 weeks post-partum and to be lengthened by lamb (s) suckling. Therefore, the local ewes bred 3 times per 2 years, and nursing their lambs are likely to conceive and reproduce successfully, if mated 6-8 weeks post-partum as long as suckling has been terminated.

It is worthy of note from the present results, that the performance of the ewes from the 3 local breeds was better in the autumn mating season than in the winter mating season, more so in the reproductive activity than that in body weight. Higher conception rate, more multiple births and less number of days per conception were obtained from September (autumn) mating. These observations are consistent with the results of Aboul-Naga (unpublished data) from 9 different flocks of local sheep bred 3 times 2 years over 9 successive crops.

References

Foote, W.C. (1971) *J. Anim. Sci.* 32, Suppl. 1, 48.

Kann, G. and Marinet, J. (1975) Prolactin levels and duration of post-partum anaestrus in lactating ewes. *Nature*, 257, 63.

Kann, C. Marinet, J· and Schirar (1977) Modifications of gonadotrophin sceretion during natural and artificial hyperprolactinaeima in the ewe. "*Prolactin and Human Reproduction*". Academic Press, New York.

Lamming, G.E., Moseley, S.R. and NcNeilly, J. R. (1974) Prolactin release in sheep. *J. Reprod. Fert.* 40, 151.

Mauleon, P. and Dauzier, L. (1965) *Ann. Biol.* An. Bioch. *Biophys* 5, 131.

Meites, J. (1966) Control of mammary growth and lactation. In "*Neuroendocrinology*" Vol. 1, p. 669. Eds. L. Martini and W.F. Ganog. Academic Press, New York.

Moseley, S.R. (1971) The effect of lactation on reproduction in the ewe. *Ph. D. Thesis* Nottingham University.

Rhind, S.M. (1977) The effect of season, nutrition and lactation on the breeding activity and hormone status of ewes. *Ph. D. Thesis*, Aberdeen University.

Snedecor, G.W and Cochran, W.G. (1971) "*Statistical Methods*" (6*th* Edition). Iowa State University Press, Ames, Iowa, U.S.A.

Wyck, L.C. Van, Niekerk, C.H. Van, and Belonje, P.C. (1972)Fur ther observations on the involution of the post-partum uterus of the ewe. *J. South African Veterinary Association.* 43, 29.

دراسة تأثير طول فترة الرضاعة على أداء النعاج المحلية التى تربى للحصول على ثلاث ولادات كل سنتين

عادل أبو النجا ، احمد الشبكشى وعزت عطا عفيفى

معهد بحوث الانتاج الحيوانى ، كلية الزراعة بالزقازيق ، كلية العلوم الزراعية بمشتهر

استخدم فى هذا البحث بيانات ٢٢٥ نعجة محلية من أغنام الرحمانى والأوسيمى والبرقى – تربى تحت نظام ثلاث ولادات كل سنتين وذلك خلال موسمى تلقيح متتاليين ·

النعاج التى لقحت فى الموسم الشتوى (يناير ٧٣) كانت ترضع حملانها فى الموسم السابق لفترة ٦ ، ٨ ، ١٠ أسابيع – بينما تلك التى لقحت فى الموسم الخريفى (سبتمبر ١٩٧٣) كانت ترضع حملانها لفترة ٨ ، ١٠ أسابيع فى الموسم السابق ·

اختلفت أوزان النعاج عند التلقيح معنويا تبعا لطول فترة الرضاعة فى موسم الولادة السابق وكانت النعاج التى ترضع حملانها لفترة أقصر (٦ أو ٨ أسابيع) أثقل وزنا من تلك التى ترضع حملانها لفترة أطول (١٠ أسابيع) بينما لم تختلف معنويا أوزان النعاج عند الفطام أو بعد شهرين من بدء التلقيح ·

لم يتأثر الأداء التناسلى للنعاج معنويا لطول فترة الرضاعة فى الموسم السابق الا أن الأمهات التى فطمت حملانها مبكرا فى موسم التلقيح الشتوى (بعد ٦ ، ٨ أسابيع من ولادتها) كان مستوى أدائها التناسلى أفضل من الأمهات التى فطمت حملانها بعد عشرة أسابيع من ولادتها – أما فى موسم التلقيح الخريفى فان طول فترة الرضاعة لم يكن له تأثير محدد على الأداء التناسلى وقد استنتج من الدراسة أن النعاج المحلية تحت نظام ٣ ولادات كل سنتين يمكن أن تتناسل بنجاح بعد ٦ – ٨ أسابيع من ولادتها على شرط أن تكون فترة الرضاعة قد انتهت قبل التلقيح ·