

## **RELATIONS AMONG FACTORS AFFECTING FARMER'S FLOCK PRODUCTION**

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### **SUMMARY**

Lambing interval (LI) was studied among small holders flocks as a tool to judge the role of different factors affecting production performance.

Twenty eight flocks owned by small holders including 142 Egyptian local ewes were followed up to collect data on lambing date, litter size, weaning age and age of ewes over three year duration. Lambing incidence is extended over the year in all local flocks and rams run with ewes all the year round.

In general LI was averaged 291 days, i.e. 1.25 lambings per ewe per year. The factors recognized to have significant effect on LI were litter size, weaning age and ewe age at lambing.

Ewes which produced twins came to next lambing 43 days later than those produced singles. Lambs weaned early (2 months) allowed dams 29 days earlier in lambing. Ewes less than two years old came to next lambing 74 days later than those aged from 2 to 5 years.

Lambing in winter was followed by the longest interval to next lambing (315 days) compared to other seasons (average 294 days).

Twinning incidence did not cause ewe to delay its next lambing (11 days more) when occurred in spring compared to the other three seasons (53, 88 and 34 days more during winter, summer and autumn, respectively). This mostly referred to abundance of fodder in the spring time.

Early weaning shortened LI by 14 days only when applied during spring and by 22, 46 and 32 days when

performed during winter, summer and autumn, respectively.

Age of ewe had a clear role on response of ewe to both suckling duration and litter size. Accordingly, lambing interval increased by 46 and 160 days, respectively, when ewes lambed at younger age than 2 years. Comparable figures for older ewes (up to 8 years old) were 22 and 24 days, respectively.

These relations highlights the interaction among factors involved in the production process. These factors should be considered during implementation of any intervention to improve production among farmers flocks.

**Keywords:** Sheep, flock production

#### **INTRODUCTION**

Realizing factors involved in monitoring production performance of the ewes is of importance prior interference to modify or improve productivity of the farmers herds.

Lambing interval is one of the important criteria that could express production efficacy of the flocks. This study highlights the role of some biological, environmental and managerial factors which may affect lambing interval.

#### **MATERIALS AND METHODS**

Data was collected from 29 flocks located in Sharkeia Governorate east of the Nile delta. A total of 142 local ewes, of Rahmani and Ossimi breeds mainly, were followed up for three years. Herds owners usually posses less than 5 feddans of cultivated lands and not less than 3 ewes.

Production system characterize with low external inputs, insufficient disease control, prolonged reproductive cycle with free mating.

Crop residues and farm by-products have basic contribution in feeding animals. From December to May, Berseem is dominant, while in summer and autumn feeding depend on berseem hay, stubble, green maize or sordan grass as available.

All followed up ewes were ear tagged and their age was

estimated. Data was collected fortnightly and included lambing date, litter size and weaning age.

Fixed effects on lambing interval were estimated by Analysis of variance using Least Square method (SAS, 1985). Factors included in the fixed model were age of ewe at lambing, season of previous lambing, litter size and weaning age. Interactions were measured for some relevant factors.

#### RESULTS AND DISCUSSION

Least square means and standard errors of the studied factors are presented in Table 1 while analyses of variance of those factors are presented in Table 2.

The general mean of LI is estimated by 291 days (1.25 lambing crop per ewe per year) under the small holders management system.

Table 1. Least square means and standard errors of factors affecting lambing interval

Factors	L.S.M. $\pm$ S.E.
Age of ewes (mo):	
< 24	365 $\pm$ 16
25 - 36	279 $\pm$ 15
37 - 60	304 $\pm$ 12
> 60	249 $\pm$ 10
Season of lambing :	
Dec - Feb	315 $\pm$ 11
Mar - May	291 $\pm$ 13
Jun - Aug	297 $\pm$ 17
Sept- Nov	295 $\pm$ 11
Litter size:	
Single	276 $\pm$ 7
Twins	323 $\pm$ 11
Weaning age:	
normal (4 mo)	314 $\pm$ 6
Early weaned(2 mo)	285 $\pm$ 11

Table 2. Analysis of variance of factors affecting lambing interval

Source	DF	Mean square	Pr>F
Age of ewe (age)	3	71915.3	0.0001
season of lambing(S)	3	4680.1	0.436
Type of lambing (TL)	1	84696.5	0.0001
Type of weaning (TW)	1	28010.8	0.0203
Age x TW	3	1309.8	0.8579
Age x TL	3	47311.4	0.0001
S x TL	3	11387.2	0.086
S x TW	3	1346.5	0.852
Error	234	5134.0	

**Ewe age at lambing**

The lambing interval was significantly ( $P < 0.01$ ) effected by age of ewe at lambing. Ewes aged 5-8 years had the shortest lambing interval (252 days).

Ewes which ranged between 2 and 5 years old were intermediate (290 days), while younger ewes which lambed before 2 years old had the longest lambing interval (366 days). This result agrees with that reported by Wilson & light (1986).

This indicates that early culling of ewes towards better reproductive cyclisity is not always a correct tool where it may be of negative impact. This also implies that reproductive maturity is not fully reached untill older ages.

**Season of previous lambing**

The analysis indicates a non significant effect of lambing season on interval to the next lambing. However, lambing during winter months (Dec. to Feb.) resulted, relatively, into the longest lambing intervals (about 20 days more than other seasons). Shelton (1972), in Texas, reported the same for winter lambing.

Season of the year reflects differences in availability and type of feeds allowed for animals, climatic condition and seasonal difference in estrous activity.

The possible reason behind this delay may be that their time of mating (Feb. to April) fall within the known period for local breeds to be in poor estrous

activity over the year (Aboul-Naga & Aboul-Ela, 1984 and El Nakhla, 1985).

#### Litter size

The analysis showed that litter size have a significant effect on lambing interval ( $P < 0.05$ ). Ewes produced single offspring came to next lambing 44 days earlier than those giving twins (322 days).

Increase of milk production usually accompanies larger litter. Milk secretion and suckling cause delaying of post partum estrous (Conzalez *et al.*, 1980 in sheep and Wyatt *et al.*, 1977 in cows) which in turn will increase lambing interval.

Table 3. Expression of interaction between season and litter size on lambing interval (days)

Season of lambing	Lambing Interval		
	Single	Twins	Difference
Dec - Feb	288	341	53
Mar - May	286	297	11
Jun - Aug	253	341	88
Sept- Nov	278	312	34

In Table 3, the role of seasons with their fluctuation in feed resources available to animals is clear.

The availability of fodder in spring was the reason to remedy the deleterious effect of twining on lambing interval where only four days difference was measured between single and twin Autumn followed the spring in ability to modify stress of big litter (32 days delay in lambing time), then winter (50 days delay) and then summer at last when green fodder is almost unavailable where lambing interval increased by 90 days.

#### Weaning age

The age of weaning lambs significantly ( $p < 0.01$ ) affected lambing interval. When lambs were weaned early (2 months old), their dams re-lambed 29 days earlier than those reared their lambs later at 4 months old.

The effect of extending suckling period on delaying post partum estrous is recognized (Short *et al.*, 1974 & Williams *et al.*, 1982 working on beef cows, Carruthers

& Hafs, 1980 working on dairy cows and Fletcher, 1973 and Aboul Naga *et al.*, 1980 working on sheep).

The role of suckling, not lactation per se, and its stimulus for prolactin secretion is reported to be the reason behind suppression of the ovarian activity (Kann *et al.*, 1977 and Rhind, 1977).

Table 4. Expression of interaction between season of lambing and weaning age on lambing interval (days)

Season of lambing	Lambing Interval(days)		Diff.
	Normaly weaned	Early weaned	
Dec - Feb	326	304	-22
Mar - May	298	284	-14
Jun - Aug	320	274	-46
Sept- Nov	311	279	-32

The interaction between weaning age and season of lambing is presented in Table 4. Though statistical analysis did not prove significance here, there is a noticeable trend.

The positive effect of early weaning on encouraging conception is clear, but season still have its role where the poorer the season (in vegetation or unsuitability of climate), the early weaning was more helpful to ewes to prepare themselves faster to next lambing. Kann and Marinet (1975) obtained similar results.

Accordingly, to increase production through more frequency of lambing ewes should be kept in a good nutritional condition to overcome stress of suckling.

Thus, weight of lambs at weaning is better to be the criteria to choose time of weaning instead of early weaning lambs while not at good weight.

The interaction between age of ewes and time to dry the ewe is presented in Table 5.

Table 5 indicates the relation between age of ewe and its ability to withstand stresses. Period to next lambing for young ewes (< 2 years old) was greatly affected with time of weaning (-46 days) and production of twin (- 160 days). Difference still occurred at older

ages but at moderate level.

Table 5. Expression of interaction between age of ewe and both weaning age and birth type on lambing interval (days)

Ewes age (years)	Lambing interval (days)				
	normal- weaned	Early- weaned	Diff. born	Twin- born	Diff.
<2	388	342	-46	285	445-160
2-3	288	271	-17	291	268 23
3-5	315	293	-22	280	328- 48
5-8	264	235	-29	249	251- 2

These results indicate that early introduction of yearlings to mating could negatively affect the next crop interval. What is more beneficial to the farmer (economically and biologically) still need screening of individuals productivity over their life span.

#### CONCLUSION

This study indicates that sheep raised under small holders condition do not receive the same attention, in respect of feeding allowances, over the year round.

The availability of vegetation at different seasons seems greatly affecting the levels of feeding allowed to animals. Out times of abundant vegetation, farmers do not practice to supplement animals to compensate lack of grazed food.

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## العلاقة بين العوامل المؤثرة على إنتاجية الأغنام لدى المربين

حلمى مطاوع - عصام شحاته

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أختيرت الفتره بين الولادات لتكون أداه للحكم على تأثير العوامل المختلفه على إنتاجيه الأغنام لدى المربين الصغار. تم متابعه ٢٨ مربى لديهم ١٤٢ نعجه بلديه لمدته ثلاثه أعوام كامله. تناولت جميع البيانات موعد الولاده؛ التواميه؛ عمر الفطام؛ عمر النعجه. بصفه عامه فإن القطعان المصريه. كانت الفتره بين ولادتين بصفه عامه ٢٩١ يوماً أى ١,٢٥ ولاده للنعجه فى السنه وكانت العوامل المؤثره معنوياً على هذه الصفه هى معدل التواميه فى البطن وطول موسم الرضاعه وعمر النعجه عند الولاده.

النعاج التى ولدت توأم حققت الولاده التاليه متأخره ٤٣ يوماً مقارنة بالتى ولدت فرادى. كما أن النعاج التى فطمت حملاتها مبكراً، (على عمر ٢ شهر) أنت حملها التالي بزيادة ٢٩ يوماً. وفيما يخص العمر فإن النعاج التى ولدت وهى تقل عن عامين عمراً ولدت فى المره التاليه ٧٤ يوماً متأخره عن التى ولدت وهى عمرها بين ٢-٥ سنوات.

وجد أيضاً أن الولاده شتاء تتبع بأطول مده لتحقيق الولاده التاليه (٣١٥ يوم) مقارنة بباقي المواسم (٢٩٤ يوماً). لوحظ أن ولاده النعاج لتوائم فى موسم الربيع لم يتبع بزيادة ملموسه فى الوقت لتحقيق الولاده التاليه (١١ يوماً فقط) مقارنة بالمواسم الثلاثه الأخرى حيث كانت أطول ب ٥٣، ٨٨ ثم ٣٤ يوماً لمواسم الشتاء والصيف والخريف بالترتيب. يرجع ذلك غالباً إلى وفرة الأعلاف الخضراء فى موسم الربيع.

كان للفطام المبكر للحملات أثراً إيجابياً على تقصير المده لحدوث الولاده التاليه وكان لفصل السنه أثراً متداخلاً مع الفطام المبكر حيث قصرت المده ب ١٤، ٢٢، ٤٦، ٢٣ يوماً لمواسم الربيع والشتاء، والصيف، والخريف بالترتيب.

وجد أن لعمر النعجه ارتباط واضح بدرجة إستجابته النعجه لطول فترة الرضاعه أو معدل التواميه الناتج. فعندما قل عمر النعاج عن عامين طالت المده حتى الحمل التالي بمقدار ٤٦، ١٦٠ يوماً تحت تأثير هاذين العاملين بالتتالى مقارنة بالنعاج التى تزيد عن ذلك فى العمر حتى ثمانى سنوات حيث كان متوسط الزيادة فى المده ٢٢، ٢٤ يوماً فقط.

ومن ذلك يتضح التداخل بين العوامل التى تناولتها الدراسه وتشابك تأثيراتها على الإنتاجيه مما يرجح أهمية أن يؤخذ ذلك فى الاعتبار عند محاولة التدخل لتحسين الصفات الإنتاجيه لدى المزارعين.