

**Effect of Age of Ewe and Level of Nutrition on Fertility and Productivity in Barki Ewes**

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SEVENTY SIX Barki ewes averaging 14 or 20 months of age at the start of the experiment were assigned to two groups. The first group (I) included 37 shearling ewes averaging 20 months of age, while the second group (II) was comprised of 39 yearling ewes averaging 14 months of age.

Both groups were fed a maintenance ration for 99 days pretreatment. Thereafter, each age group was randomly assigned to two nutritional treatments. The first was fed a sub-maintenance (SM) ration (90% of NRC) while the second was offered a maintenance (M) diet for 67 days. Before commencement of the breeding season the SM group within each age was flushed for 28 days. While, the M groups continued on the maintenance ration. After each ewe was mated, both the treated and control groups were maintained for another 15 weeks on the same diet (an early pregnancy ration). At the beginning of the last six weeks of gestation, control groups were fed while the treated groups received a level of nutrition 15% higher than the controls. At lambing, all ewes regardless of age and level of nutrition were offered a nursing diet (9.3% CP and 55% SE). Fifty-eight lambs born to these ewes were randomly assigned according to age and sex to two rearing groups. Natural rearing groups were left to suckle their dams till the 12th week of age and the other groups were weaned earlier at 8 weeks of age. Age of ewe appeared to be the major factor affecting percentage of ewes mated of those exposed, number of services per conception and conception rate, while it did not appear to affect gestation length and twinning rate. On the other hand, flushing ewes prior to and during breeding for 28 days had no positive effect on the same traits. Productivity of the ewes, based on kgs of lambs weaned per ewe lambing, showed that the treated groups (SM) were superior to the control groups (M). Irrespective of age, the net profit shown for the control groups (M) was higher than that of the treated groups (SM) (16.67 and 24.46 LE/ewe vs. 11.34 and 22.29 LE/ewe, respectively). Irrespective of level of nutrition, the net profit from yearling ewes was higher than that from shearling ewes (23.40 LE/ewe vs. 13.44 LE/ewe, respectively).

**Key words :** Sheep, Barki ewes, Nut. level, Fertility, Productivity.

It is an accepted practice by many sheep producers to flush ewes

prior to and during breeding season for the purpose of increasing lamb production.

Wallace (1954); Williams (1954); Campbell *et al.* (1959) and many others found a positive effect of flushing on the number of lambs born. However, flushing has not been found always effective.

Darlow (1942) stated that some ewes have a low genetic potential for twinning and will show no response to flushing. The effect of level of nutrition on fertilization, conception rate and embryo survival has been the scope of many reports.

Hafez (1952), found that conception rate was affected by severe undernutrition in yearling and adult Suffolk ewes, fed a submaintenance diet either before or after the onset of the breeding season, so as to make ewes lose 45% of their initial live body weight. Such ewes required more than one service for conception.

On the other hand, Lamond *et al.* (1973), reported that both low and high energy diets gave poorer fertility due to low ovulation rates in the former and low fertilization rates in the latter. They also reported that protein content of the diet had no significant influence on fertility. Mokhtar (1982) noticed that neither a low level of nutrition nor a high one affected fertility of Barki ewes.

One of the major objectives of this study was to investigate the effect of age of ewe and plane of nutrition on the productive and reproductive capacity of Barki ewes, live body weight changes of pregnant ewes, services needed for conception and length of gestation.

#### Material and Methods

Data of the present study were collected on 76 Barki ewes belonging to the experimental station of the Faculty of Agriculture, Al-Azhar University, Nasr City, Cairo Egypt.

At the start of the study, they were assigned to two age groups. The average age of the first group (group I) of 37 ewes was 20 months, while the second group (II) of 39 ewes averaged 14 months.

*Ewe management*

The lotting and feeding regimen for the ewes in this study is outlined in Table (2). Animals in the two groups were fed as barren ewes for a period of 99 days pretreatment according to NRC (1975) recommendations. Ewes within each age group, were randomly assigned to two nutritional treatments : submaintenance (SM) and maintenance (M) for 67 days. The SM ration fed to group A (considered the treated group) was 90% of the suggested maintenance requirements, while group B fed to meet maintenance requirements served as the control.

Two weeks prior to the beginning of breeding season, the SM group (A) within each age group (I and II) was switched to a high level of nutrition (flushing) for a period of 28 days (Table 2).

The composition of the flushing diet shown in Table (1-a) was recommended by Foote *et al.* (1959).

Submaintenance animals within each age group received 1.5% of their live body weight of this flushing mixture plus 500 gm berseem hay/head/day. The corresponding (M) groups were offered their requirements (48 g. DP and 0.55 units TDN) from the same mixture as control groups. Checking heat was carried out twice daily, at approximately 12 hr intervals using vasectomized rams. Breeding season commenced on 20 December 1985 and lasted until 31 January 1986. Ewes in estrous were hand mated approximately 12 hr after being detected and removed directly to the early gestation ration.

It was noticed that the majority of ewes (87.5%) were served by the seventh of January (one estrous cycle). At the end of the breeding season, both flushed and control groups were maintained for 15 weeks on a diet suggested for pregnant ewes (55% TDN and 4.9% DP) NRC (1975).

As each ewe reached the beginning of the last six weeks of gestation, those ewes that were pregnant were reallocated to their previous nutritional treatments *i.e.* flushing and control. Control groups within each age were offered the NRC (1975) recommended ration corresponding to their average live body weights, while the treated groups received a level of nutrition 15% higher than the control (Table 2).

TABLE 1-a. Flushing diet composition according to Foote et al. (1959).

Ingredient	%
Ground yellow corn	50%
Ground barley	30%
Linseed meal	10%
Wheat bran	10%
Total	100%
Starch equivalent	76%
Digestible protein	8.7%

TABLE 1-b. Composition of creep feeding ration.

Ingredients	%
Soybean meal	15
Decorticated cotton-seed meal	10
Ground yellow-corn	25
Ground barley	20
Wheat bran	7.5
Rice bran	20
additives :	
Sodium chloride	1
Calcium carbonate	1
Mineral mixture	0.5
Vit. A supplement	555 IU/kg.
Vit. D supplement	55 IU/kg.
Oxytetracycline	25 mg/kg.
SE %	72.86
DP %	13.50
Cost/kg in pt.	10.82

At lambing, all ewes, regardless of age and nutritional treatment, were offered a nursing diet (65% TDN and 6.2% DP).

TABLE 2. Feeding regimen for experimental animals.

Phase of production	Age of ewes treatment Item	Shearling 20 months (I)		Total	Yearling 14 months (II)		Total
		A	B		A	B	
		treated	control		treated	control	
Barren ewes	No of animals	21	16	37	24	15	39
	length of feeding regimen	99 days maintenance requirements (M)					
Breeding (45 days)	Length of feeding regimen	SM <sup>(1)</sup>	M	67 days		SM	M
	Feeding regimen length of feeding	Flushing <sup>(2)</sup> M <sup>(3)</sup> 28 days		Flushing 28 days		M	
First 15 weeks of gestation	Feeding regimen	Requirements of early pregnancy for 15 weeks according to NRC requirements (1975).					
Last 6 weeks of gestation	Feeding regimen (NRC requirements) (1975)	Flushing + 15% excess feeding	Flushing	Flushing + 15% excess feeding	Flushing	Flushing	
Lactation	Feeding regimen	Lactation requirements according to NRC (1975).					

- (1) SM : 90% maintenance requirements according to NRC recommendation 1975.
- (2) Flushing : 28 days feedings according to Foote et al. (1959) two weeks prior to and two weeks into the breeding season.
- (3) M = Fed to meet suggested maintenance requirements (NRC, 1975).

### *Lambs management*

58 Barki lambs born in May 1986 (36 males and 22 females) were randomly assigned according by lambing date and sex of lamb to two rearing groups. Natural rearing group (group A) was left to suckle their dams till the 12<sup>th</sup> week of age, while the second group (early weaned) was weaned at 8 weeks of age. From the 3<sup>rd</sup> week of age, lambs of the early weaned group were creep-fed *ad libitum* besides dams milk till weaning at 8 weeks of age. Lambs were then shifted to a starter (13.5% DP & 73% SE) (Table 1-b) fed *ad libitum* till the end of the 20<sup>th</sup> week of age.

The natural weaned group was raised on the same starter as the early weaned group from weaning at twelve weeks of age to the 20<sup>th</sup> week of age.

### *Ewe and lamb measurements*

The main objective of this study was to evaluate the effect of age of ewe and plane of nutrition on the productive and reproductive capacity of Barki ewes. Productivity of the ewe was expressed as cost of feeding a pregnant ewe in relation to average live body weight of lambs weaned per ewe lambing.

Therefore, the following data were collected :

- a) Cost of feeding pregnant ewes irrespective of labor and medications as related to age, nutrition treatment, and type of weaning of offsprings.
- b) Live body weight of weaned lambs.
- c) Feed costs for lambs.
- d) Return from lambs.
- e) Body weight changes in pregnant ewes calculated as the difference between initial live weight at mating and weight at 24 hr after lambing.
- f) Conception rate, gestation length, number of services per conception and lambing rate by treatment group.

### *Statistical analysis*

Data was analyzed statistically according to Snedecor and Cochran (1968) using the (t) test.

## Results and Discussion

### *Effect of age and level of nutrition on the fertility of Barki ewes*

#### *Number of ewes exposed to vasectomized rams and percentage mated*

The number of shearling ewes exposed and mated was 21 and 16 in the treated and control groups, respectively. The percentage of ewes mated from those exposed was 100% for both groups (Table 3).

The number of yearlings exposed was 24 and 15 in the treated and control groups, while the number mated was 18 and 12, representing 75% and 80% for treated and control groups, respectively. Comparing treated and control groups, irrespective of age would indicate that flushing had no positive effect on percentage of ewes mated.

On the other hand, comparing the two age groups, irrespective of feeding level, it appears from these data that age of ewe may be the major factor, affecting percentage of ewes mated. This result is in agreement with Williams (1954); Goldlee (1968) and Dyrmondsson (1973), who stated that, in the ewe, the greater the weight and the higher the age at first mating, the better is the lambing performance. This statement may partly explain the lower percentage of yearling ewes mated compared with the shearlings.

Results obtained from British experimental husbandry farms showed that between two-thirds and three quarters of all ewes exposed to rams for the first time were successfully bred (Mair, 1963).

#### *Number of services per-conception and conception rate*

The average number of services per conception (Table 3) was 1.0 and 1.13 in the treated and control shearling ewes, respectively, while the corresponding values in yearling ewes were 1.17 and 1.08. Thus, it appears that number of services per conception was relatively lower in treated shearling ewes than the control ones, while the opposite was the case for yearlings. The overall mean average number of services per conception was 1.05 and 1.13 for

TABLE 3. Effect of age of ewe and level of nutrition on Barki ewes fertility.

Age of ewe Nutritional treatment Item	Shearling		Total or mean	Yearling		Total or mean
	Treated	Control		Treated	Control	
No. of ewes exposed	21	16	37	24	15	39
No. of ewes mated	21	16	37	18	12	30
% of mated ewes	100	100	100	75	80	76.92
Average number of services/conception	1.00	1.13	1.05	1.17	1.08	1.13
No. of ewes lambing	21	15	36	15	10	25
Conception rate %	100	93.75	97.30	83.33	83.33	83.33
No. of live lambs born :	19*	14*	33*	15	10	25
a. male	12	8	20	11	5	16
b. female	7	6	13	4	5	9
Lambing rate	1.0	1.0	1.0	1.0	1.0	1.0
Gestation length	151.67± 1.84	150.2± 2.7	151.0± 0.57	151.6± 2.99	152.3± 2.6	151.0± 8.80
	a	a	a	a	a	a

\* Lambs died are still births.

a. Identical letters means nonsignificant differences.



the shearling and yearling groups, respectively. The effect of age of ewe was only slightly more pronounced on the number of services needed per conception than on the nutritional regimens. This result was in agreement with Monnib *et al.* (1956); Hafez and Scott (1962) and Anderson (1969). On the other hand, data obtained by El-Wishy *et al.* (1974), showed that, average number of services per conception in local breeds ranged between 1.20 and 1.33 from the first to sixth mating season and that number of services required for conception declined with age at maturity. In this study, conception rates were 100% and 93.75% for the treated and control shearling ewes, respectively, while it was 83.33% for both groups yearling ewes. This indicates that increased nutrition may have had a positive effect on conception rate in shearling ewes but no effect in the yearling group. The overall conception rate for the two age groups was 97.30% and 83.33% in the shearling and yearling ewe groups, respectively. It is therefore, reasonable to suggest from these data that age had a greater effect than nutrition on both percentage of ewes mated and conception rate.

Results obtained in this concern by Williams (1954); Southam *et al.* (1971) and Dyrmondsson (1973) showed that, as a rule, the younger the age and the lighter the weight at first mating, the lower the conception rates and lambing rates. Similarly, reports by Bowman (1966) and Goldlee (1968), showed that, in general, the greater the weight and the higher the age at mating, the better is the lambing performance in terms of number of ewes lambing and number of lambs born.

#### *Length of gestation period*

As shown in (Table 3), the average length of gestation period was 151.67 and 150.2 days for treated and control shearling ewes respectively, while the corresponding values for yearling ewes were 151.6 and 152.3 days.

Statistical analysis for the effect of age and level of nutrition on gestation length (Table 4), showed that differences among groups were not significant. However, gestation period length tended to be longer in yearling than shearling ewes. This is in agreement with Southam *et al.* (1971); Simraks (1979) and Mokhtar (1980), who reported that, plane of nutrition had no significant

effect on gestation period length. Likewise, reports by Southam *et al.* (1971) and Dyrmondsson (1973), showed that gestation period length in ewe lambs was similar to, or, in some cases, somewhat shorter than that observed in yearlings and adult ewes.

TABLE 4. T-test for the effect of age and level of nutrition on the gestation length of Barki ewes.

Item	Treatment	Control	Shearling	Yearling
	Shearling	Yearling	Control	Treatment
T-test value	2.011	-0.600	-1.877	+0.201
df	(33)	(23)	(22)	(84)
Mean diff. ( $\bar{X}_1 - \bar{X}_2$ )	1.56	-0.7	-2.1	+0.16

#### *Lambing rate*

Lambing rate estimated as number of lambs born per ewe lambing was 1.0 in all groups (Table 3). This result indicates that age as well as flushing had no effect on number of lambs born per ewe lambing. The lack of twinning in Barki ewes may be explained by Darlow (1942), who stated that some ewes have a low genetic potential for twinning and will show no response to flushing. Labban *et al.* (1969) reported a lambing rate of 105% in Barki ewes compared with 122% for Rahmani and suggested that ewes become more fertile as they advance in age. Data obtained by Wallace (1961) and Coope (1966) suggested that flushing would be more effective in adult ewes, and to a lesser extent in yearlings. Similar data was reported by El-Sheikh *et al.* (1955) and Foote *et al.* (1959). However, it does not appear to have any clear effect on ewe lambs (Williams, 1954 and Allen and Lamming, 1961). Thus, the lack of twinning in this flock (Table 3) may be attributed to the low genetic potential of this breed and the younger age of the females (parity of lambing). However, it might be expected to be better after the 1st lambing. It is important to point out that flushing in this flock had an advantage in estrous synchronization, since

it was noticed that 87.5% of the ewe flock were served by the 7th of January (one estrous cycle length) as compared to % in the controls.

*Effect of age of ewe and level of nutrition on ewes productivity (Table 5)*

Average weight of lambs weaned per ewe lambled in kg was 15.90; 15.03; 18.53 and 17.04 kg for treated and control shearling and yearling ewes respectively. These results indicate that the weight of lambs weaned from yearlings was slightly higher than that of shearling ewes. Irrespective of nutrition treatment, shearling ewes weaned 15.53 kg, while yearlings weaned 17.93 kg live weight.

These results were in agreement with the findings of Southam *et al.* (1971); Cumming (1973) and Ivanova and Parshikova (1975), who reported that, ewes bred as ewe lambs produced more lambs or more kilograms of lamb than those bred at later ages. However, difference in average weight of lambs weaned/ewe lambing shown in Table 5 may be attributed to lamb losses in the shearling ewe groups, rather than prolificacy of the yearling ewes, since flushing practice did not increase twinning rate in the two age groups. Results shown in Tables 3 and 5 lead to the suggestion that flushing breeds genetically low in twinning may be a wasteful process.

Average live body weight of lambs weaned per ewe bred were 15.90; 14.09; 15.44 and 14.20 kg for both treated and control shearling and yearling ewes, respectively (Table 5). These results indicate that average live weight of lambs weaned per ewe mated was slightly lower for yearlings compared with shearling ewes. This method of measuring productivity of the ewe is more realistic than the previous one, since fertility of the ewes was taken into consideration. Results in Table (3) showed a conception rate of 100% for shearling ewes versus 88.33% for the yearling ones, a result which reflects the effect of age of ewe on conception rate. These results are in agreement with those of Wright *et al.* (1976) and Christenson *et al.* (1976), who found that mature ewes, in general, were more productive compared with younger ewes, while nutritional treatments did not affect lambing rate.

TABLE 5. Effect of age of ewe and level of nutrition on Barhi ewes productivity.

Age of ewe Nutritional treatment item	Shearing 20 months (I)		Total or general mean	Yearling 14 months (II)		Total or general mean
	Treated	Control		Treated	Control	
1. No. of ewes mated.	21	16	37	18	12	30
2. No. of ewes lambing	21	15	36	15	10	25
3. No. of live lambs born	19*	14*	33*	15	10	25
4. No. of lambs weaned	17	11	28	14	8	22
5. Total kgs. of lambs weaned	333.8	225.4	559.2	277.95	170.4	448.35
6. Avg. kg of live lambs weaned/ewe lambing	15.9	15.03	15.53	18.53	17.04	17.93
7. Avg. kg of live lambs weaned/ewe bred.	15.9	14.09	15.14	15.44	14.20	14.95
8. Total maternal live body wt gain (kg)**	83.77	75.27	159.04	126.80	98.89	225.69
9. Avg. maternal live wt change/ ewe lambing (kg)**	3.90	5.02	4.42	8.45	9.90	9.63
10. Summation of maternal and live lambs weaned (kg.)	417.57	300.67	718.24	404.75	269.29	674.04
11. Avg. live body wt. change ewe bred (kg.)	19.88	18.79	19.41	22.49	22.44	22.47
12. Avg. live body wt. change/ ewe lambing (kg.)	19.88	20.05	19.95	26.98	26.93	26.96
						1007.55
						16.52
						15.04
						384.72
						9.63
						1392.27
						20.78
						22.82

TABLE 5. (Cont.).

Ewe productivity							
13. Costs of feeding during pregnancy and lactation stage in LE/head :							
a) Ewes nursing lambs early weaned	18.20	17.18	17.79	16.92	16.23	16.65	17.33
b) Ewes nursing lambs natural weaned	21.14	20.12	20.67	19.79	19.10	19.57	20.18
14. No. of ewes nursing	17.00	11.00	28.00	14.00	8.00	22.00	50.00
15. Avg. costs of feeding lambing & nursing (LE)	18.48	13.38	16.48	17.69	15.94	17.05	16.73
16. Avg. income/head/in pounds	29.83	30.06	29.92	40.48	40.39	40.45	34.55
17. Net profit/head (in LE)	11.34	16.67	13.44	22.79	24.46	23.40	17.82

\* Lambs losses are still births.

\*\* Change in body weight from mating to 24 hrs after lambing.

Results in Table (5), also show that changes in body weight of ewes from mating to 24 hr after lambing fluctuated in opposite direction with age of ewe lambing, the younger the age of dam lambing the heavier the weight gain after lambing, and the older the age of ewe lambing the lighter the increase in body weight after lambing. This agrees with work reported by El-Sely (1969); Robinson *et al.* (1971) and Khalaf *et al.* (1979).

As shown in (Table 5), average gain in live weight was 4.42 and 9.03 kg for shearling and yearling ewes, respectively. This result may be explained by assuming that shearling ewes approached their mature body weight, while younger yearling ewes were gaining during pregnancy. Averages of live body weight gain per ewe bred (on the basis of both maternal growth and live lambs weights were 19.88; 18.79; 22.49 and 22.44 kg for treated and control shearling and yearling ewes, respectively. This indicates that yearling ewes produced more kilograms live weight as gain in both maternal and lambs weight compared with shearling ewes. These results appear to be due mainly to the higher body gain of yearling dams rather than the live body weight of lambs weaned. The same trend was also true for average body weight gain per ewe lambed (Table 5). Costs of feeding ewes during pregnancy and eight weeks nursing were 18.20; 17.18; 16.92 and 16.23 LE. for treated and control shearling and yearling ewes respectively. The corresponding figures for natural rearing were 21.14; 20.12; 19.79 and 19.10 LE for treated and control shearling and yearling groups, respectively.

Data of feed costs, irrespective of lamb production, reflects a higher feed cost for both shearling ewes and the natural rearing groups due to the higher requirements of older ewes which were heavier and the longer feeding period compared with the younger ewes and the early weaning practice.

As shown in (Table 5), net profit per head calculated as the difference between feeding costs, irrespective of medical and labor costs and average income per head as live body weight was 11.34; 16.67; 22.79 and 24.46 LE for both treated and control shearling and yearling ewes, respectively.

Irrespective of level of nutrition, data obtained indicate that the net profit gained by shearling ewes was 13.44 LE as compared to 23.40 LE for yearling ewes. The net profit from control ewes

of both ages was also higher than that obtained from treated ewes of similar ages (16.67 and 24.46 LE versus 11.34 and 22.79 LE for both control and treated groups, respectively). Results of net profit (Table 5) may be attributed to increased level of nutrition for both treated age groups which did not result in higher conception rate nor increased twinning rate.

Hence, in this study, increasing level of nutrition resulted in higher costs of feeding, while net profit per head declined. Similar results were obtained by Darlow (1942); Hulet *et al.* (1963) and Glimp (1971), as they stated that ewes responded differently to flushing and that conception and lambing rate were lower for yearling and two-year-old ewes than for ewes aged 3-6 years of age.

These results lead to the conclusion that flushing at breeding and increasing nutrition above NRC recommendations during late pregnancy is a wasteful process with lowly prolific breeds *i.e.* Barki but it was also noticed that the cost of feeding for early weaning is lower than for natural rearing. In addition, early weaning practice permits condition recovery of dams.

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### تأثير العمر والمستوى الغذائي على خصوبة وانتاجية النعاج البرقى

ايهاب الهلالى ، نبيل فهمى عبد الحكيم ، محمود صفوت ورضا سلامة

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أجريت هذه الدراسة على ٧٦ نعجة برقى يتراوح متوسط اعمارها بين ١٤ - ٢٠ شهرا عند بداية التجربة .  
 ضمت للمجموعة الاولى ٣٧ نعجة متوسط اعمارها ٢٠ شهرا بينما ضمت المجموعة الثانية ٣٩ نعجة متوسط اعمارها ١٤ شهرا غذيت كلا المجموعتين لمدة ٩٩ يوما على عليقة حافظة طبقا لمقررات ال NRC لسنة ١٩٧٥ قبل معالمتها .

ثم بعد ذلك قسمت كلا من المجموعتين عشوائيا الى مجموعتين غذائيتين غذيت المجموعة الاولى المعاملة على عليقة اقل من الحافظة ( ٩٠ ٪ من الحافظة ) بينما استمرت المجموعة القابلة على نفس العليقة الحافظة لمدة ٦٧ يوما أخرى كمقارنة .

قبل بداية موسم التلقيح - دفعت المجموعة المعاملة غذائيا لمدة ٢٨ يوما طبقا لمقررات FOOT et al لسنة ١٩٥٩ بينما استمرت مجموعة المقارنة على نفس السابقة خلال نفس الفترة .

غذيت الجاميع المعاملة والمقارنة داخل كل مرحلة عمرية على عليقة اول الحمل لمدة ١٥ اسبوع طبقا لمقررات ال NRC لسنة ١٩٧٥ م .

يوصل النعاج العشار الى بداية الاسبوع السادس من الحمل - غذيت مجاميع المقارنة على مقررات طبقا لمقررات ال NRC لسنة ١٩٧٥ م . بينما نالت الجاميع المعاملة ١٥ ٪ زيادة على مقررات المقارنة .

بعد الولادة - بصرف النظر عن العمر والمعاملات الغذائية السابقة غذيت الحيوانات على عليقة رضاعة ( ٦٢.٢ بروتين مهضوم ، ٥٥ ٪ معادل نشا ) بلغت عدد المواليد ٥٨ حملا قسمت عشوائيا تبعا للعمر والجنس الى معالمتين رضاعة .

مجموعة الرضاعة الطبيعية وتركت ترصع أمهاتها لمدة ١٢ اسبوعاً - بينما  
 نظمت المجموعة الثانية مبكراً عند عمر ٨ أسابيع .

يمكن تلخيص النتائج المتحصل عليها فيما يلي :

١ - أظهرت الدراسة أن عمر النعاج كان هو العامل المؤثر على نسبة  
 النعاج الملقحة من المعروضة للتلقيح ، عدد التلقيحات اللازمة للاخصاب .  
 معدل الاخصاب بينما لم يكن للعمر تأثير على مدة الحمل - أو نسبة  
 إنتاج التوأم .

٢ - إنتاجية النعاج محسوبة على أساس كمية كيلو جرامات اللحوم  
 المغطومة منسوية لعدد النعاج الوالدة ، أظهر أن النعاج المقارنة كانت  
 أفضل إنتاجية من النعاج العاملة .

٣ - بصرف النظر عن تأثير العمر - فإن صافي الربح المتحصل عليه من  
 نعاج المقارنة كان أكثر من ذلك المتحصل عليه من النعاج العاملة وقد بلغ  
 صافي الربح ١٦٦٧٠ جنيهاً للنعجة العاملة في مقابل ٢٤٤٦٠ جنيهاً /  
 نعجة مقارنة في المجموعة الأولى ، ١١٤٢٠ جنيهاً / نعجة معاملة ،  
 ٢٢٢٩٠ جنيهاً / نعجة مقارنة في المجموعة الثانية .

٤ - بصرف النظر عن مستوى التغذية - فإن صافي الربح في النعاج  
 الأصغر سناً كان أعلى من ذلك المتحصل عليه من النعاج الأكبر سناً  
 حيث بلغت ٢٢٤٠٠ جنيهاً / نعجة حولية مقابل ١٣٤٤٠ جنيهاً / نعجة  
 بدرية على الترتيب .