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Full Length Research Paper

Influence of Nutritional Supplementation "Flushing" on Reproduction Performances of Barbarine Sheep

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The objective of this work is to study the effect of feed supplement (Flushing) on the reproductive performances of the barbarine ewes. It was carried in 2011 in our laboratoty of animal ressources, fisheries and food technology in Tunis (Tunisia) The study was conducted on 199 records and each of them contains: the ewe's identification, the initial weight, the final weight, the weight difference, the number of corpus luteum and the lambs' number. The 199 ewes are divided into 3 groups: the control group (0) that does not have a feed supplementation, group 200 which receives 200g/ewe/day, of the concentrate feed and the group 400 g gets 400g/ewe/day, of the concentrate feed as well. The initial weight is very important for the reproductive performances. It's included between 39 kg and 53 kg. The reproductive performances are calculated for all ewes to study the influence of the Flushing on the performances' change. In fact, the prolificacy's average of the group 200 is (143%), the low average is in the group 0 (124%); however, the group 400 has the average (127%). The fertility average is 95.61%. The group 200 has the maximum rate (100%). For the group 0, the rate is 95.31%, however, the group 400 has the minimal rate (91%). For the ovulation rate, we find the group 200 with the most important average (1.51); the group 0 has the lowest average (1.29). And the group 400 has the average (1.37). Hence, the average of embryonic mortality is almost the same for the 3 groups which is around of (0.1). Moreover, the average of the weight difference and the quantity of the concentrate feed are proportional, and in fact the averages are as follows: group 0: 0.1kg; group 200:1.9kg; group 400: 2.34kg.

Keywords: barbarine ewes, Flushing, prolificacy, fertility, ovulation rate**.**

INTRODUCTION

The food complementation for ewes during the fight can improve reproductive performance in different levels. This food complementation, Flushing, allows a increased levels of prolificacy (Khaldi, 1984), and the fertility rate of females sheep. The reliability of Flushing is dependent of the initial body condition of ewes, Dudouet (2003) mentioned that Flushing is effective if the body condition score is between 2.5 and 3. This study aims to determine and interpret the relationship between Flushing and reproductive performance of ewes barbarines in the research station INRAT Bou Rebia (Ben Arous).

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MATERIAL AND METHODS

Location of experimentation

The study is carried to the governorate of Ben Arous, M'Hamdia delegation in 2011. Which is an agricultural area which is characterized by a diversity of agricultural activities.

Geographical location of the station Bourébia of INRAT

The Governorate Ben Arous is 10 km from Tunis, the experiment station, source base file, is the station of Bou Rebiaa INRAT (Institut National des Recherches Agronomiques de Tunisie). This station is located between points 23 and 24 km from Tunis to Zaghouan in the national road number 3.

Climatic conditions of the Governorate Ben Arous :

Substantially the entire Ben Arous Governorate belongs to the semi-arid superior bioclimatic stage.The average temperature is 6.8 ° C and 17.9 ° C with a pluviometry annual 275 and 515 mm

Animals

The study covers 199 ewes, herd Barbarine, in the Research Station Bou Rebiaa of INRAT . The herd is submitted to the fight of spring. These females were divided into three groups homogeneous as to their mean age (4.5 + 1.8 years) and their mean body weight (45.1 + 2.6 kg) on April 10th .

Feeding

The herd's Feeding is based on rangeland with annual plants. Every group receive one of the following levels of complementation from April 10th :

-Group 0: ewes receiving no complementation.
- Group 200: ewes receiving 200 g of concentrate / day.
- Group 400: ewes receiving 400 g of concentrate / day.

The food focus is composed of 82% barley, faba bean and 15% 3% of CMV (Condiment vitamin mineral). The fight that began on May 1, supplementation (flushing) began three weeks ago and continued throughout the fight which is the duration of two months.

Controls

Control of œstrus

Of the first day of fighting, four rams were introduced into each batch of a permanent and a heat control has been made daily morning and evening until the end of this struggle.Any female in estrus is then a projection 2 times 12 hours apart.

Control of ovarian activity

The ovulatory activity of ewes come into heat was controlled by the laparoscopic ovaries 7 to 11 days after estrus. This allows control of ovarian determine the rate ovulating females.

The base file

The base file comported 199 recordings. Each record corresponds to a sheep and it contains the following data:

-The number of sheep.
-Group.
-The initial live-weight.
-The final live weight.
-The difference in weight (final weight-initial weight).
- The mating day.
-Number of corpora lutea.
-Number of lambs
Mortality-embryonic.

Parameters analyzed

The description and analysis of reproductive parameters are based on two sheep
are important indicators that the rate of prolificacy and fertility rates.
Prolificacy rate = (number of lambs nes / number of females giving birth) * 100
Apparent fertility rate = (number of lambing M / M put a number of control) * 100
= Actual fertility rate (number of females giving birth / number of females protrusions) * 100
Ovulation rate = number of eggs released by the ovaries of sheep.
The weight difference = final weight - initial weight.
* Initial weight = weight of the sheep in the beginning of the period of the struggle.
* Final weight = weight of the ewes at the end of the period of the fight.

Statistical Analysis

Analysis of variables is performed by statistical software SAS (statistical analysis system). All analyzes are realized by the procedure "general linear model."

The statistical model adopted is as follows:
Yi = R + Li + e
Y: The rate of the parameter (fertility or prolificacy ...)
A: The general average.
L: Effect of the Group.
e: residual error

RESULTS AND DISCUSSION

The prolificacy rate

The average prolificacy of the entire herd is 131%. While rates means Groups of prolificacy 0, 200 and 400 are successively, 124%, 134% and 127% (Figure 22) which confirms the ideas advanced by Khaldi (1984) explain that although complementation of food increases the rate of prolificacy.

But for Group 400 rate of prolificacy is smaller than that of Group 200 which leads us to hypothesize if a significant amount of focus and not well studied can have a negative feedback on the rate of prolificacy. Flushing has no effect on fat females (Theriez,1984).

Figure 1 shows that the prolificacy rate follows the amount of concentrates for its increase only 0 to 200 g / ewe / day which is not the case for complementation of 400 g / ewe / day. Indeed there is a dramatic decrease in the rate prolificacy.

In the same orientation,table1 shows that the average rates of prolificacy of 0 and a Group of Group 200 the two letters are different from each other (U = 0.05). While the figure for Group 400 carries the two letters together, so this rate is not significantly different (U = 0.05) and the rate of the batch and the rate of 0 200 Group.

Group average prolificacy
Group has 1.24 0
Group 200 b 1.43
Group 400 1.27 ab

-Percentage distribution of sheep by number of lambs The Group contains 0 the highest percentage of ewes with a lamb (71.9%), this percentage decrease (56.1%) in favor of the sheep with two lambs which increases 23.4% for the batch 0 (Figure 23) was 33.9% for Group 200 (FIG. 24), which is consistent with the above results for prolificacy. Nevertheless, Group 400 possesses the highest percentage greater of sheep that have no lambs (Figure 25). This justifies although overeating can deteriorate badly studied reproductive performance.

The fertility rate

The average rate of fertility (Figure 26) is 95.61%, Group 400 possesses the highest rate lower (91%) and the batch has a rate of 0 (95.31%). Nevertheless Group 200 has the highest high (100%). This justifies the idea of well Theriez (1984), Flushing does not increase the rate of fertility in females whose physical condition is average.

The ovulation rate

The mean ovulation rate of the herd is 1.39 and the average of three Groups are as follows:

- Set 0: 1.29
-Group 200: 1.51
-Group 400: 1.37, which is consistent with the ideas advanced by Lassoued and Khaldi (1995), for race Barbarine mean ovulation rate was 1.32 with a maximum of 1.6 and a minimum of 1.1. For Groups 0 and 200 the results well justify the idea that the Flushing increases the ovulation rate in sheep (Dudouet, 2003). But for Group 400 ovulation rate changes direction towards the reduction of variation (Figure 27), which leads us to think complementation that excessive food decreases the ovulation rate which automatically decreases the rate of prolificacy, which confirms the idea cited by Theriez 1984: (the Fuhsing does not increase the rate of fertility in females whose state body is medium, because in females the Fuhsing lean and fat has no effect on fertility).

The mean ovulation rates of 0 and a Group of Group 400 are the two letters
So these two different rates are significantly different from each other (U = 0.05). Nevertheless the figure for the rate of Group 400 carries the same two letters together, so this rate is not significantly different (U = 0.05) nor the rate of Group 0 and the rate of Group 200. (Table 2).

Group average ovulation
Group has 1.29 0
Group 200 b 1.51
Group 400 1.37 ab

The results with the same letters are not significantly different at 5%.

The difference in weight

The mean difference in weight for the entire herd is 1.46 kg. And the difference Groups of weight 0, 200, 400 are respectively 0.1 kg, 1.9 kg and 2.3 kg (Figure 28). The variation of the weight difference is proportional to the quantity of concentrates distributed.

The weight difference, JP = final weight - initial weight, significantly increased ($P < 0.05$) when we increase the amount of food distributed focus. There is likely that the

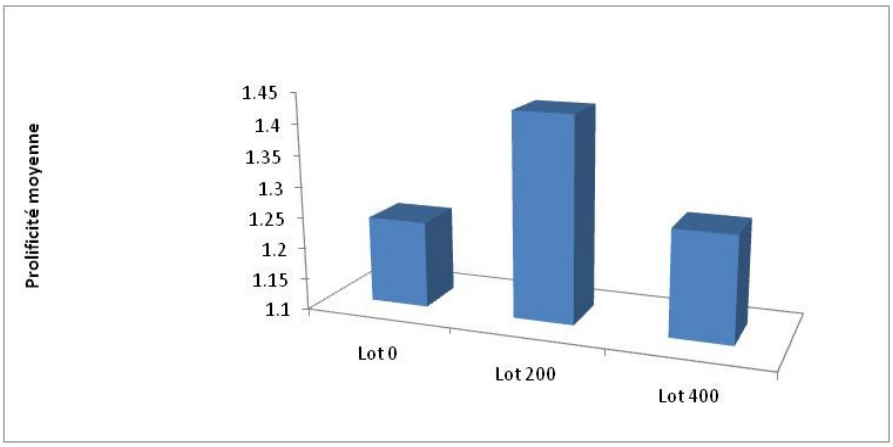

Figure 1. Average prolificacy according: Groups (0, 200, 400).

Table 1. Average prolificacy of ewes per batch (0, 200, 400)

Group	Prolificité moyenne
Group 0	1,24[a]
Group 200	1,43[b]
Group 400	1,27[ab]

The results with the same letters are not significantly different at 5%

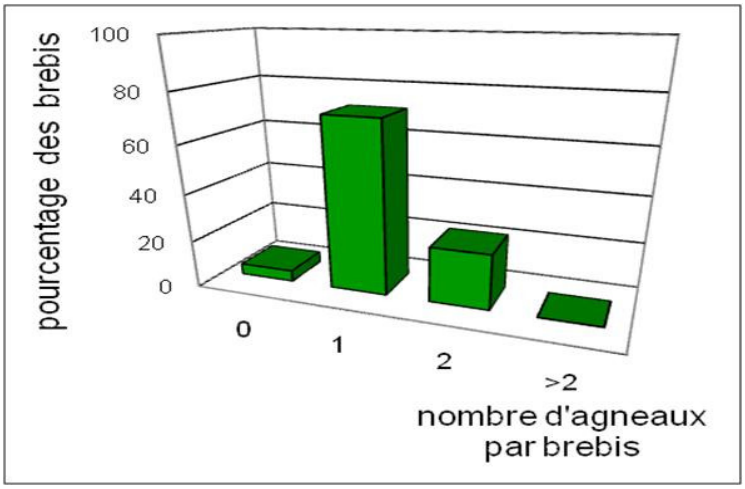

Figure 2. Distribution of percentage of ewes by number of lambs (group 0).

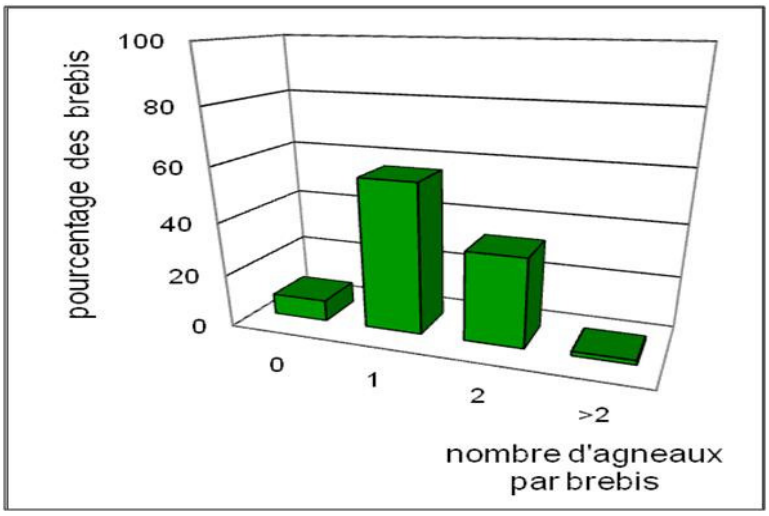

Figure 3. Distribution of percentage of ewes by number of lambs (Group 200).

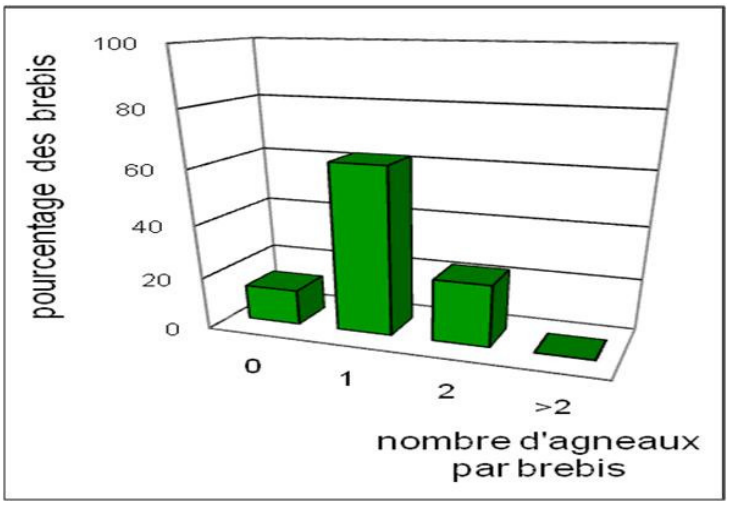

Figure 4. Distribution of percentage of ewes by number of lambs (Group 400).

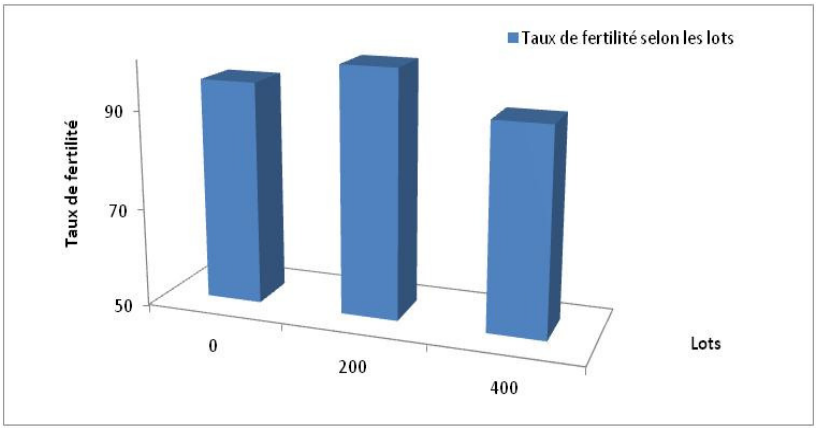

Figure 5. Average fecundity per batch (0, 200, 400)

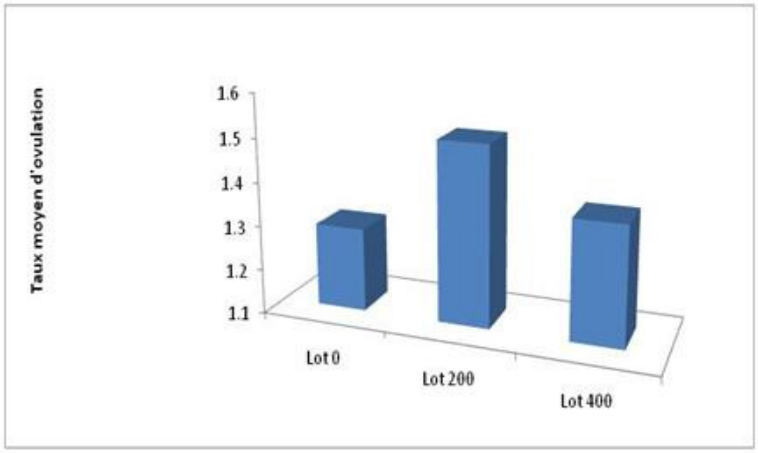

Figure 6. Average rate of ovulation per batch (0, 200, 400).

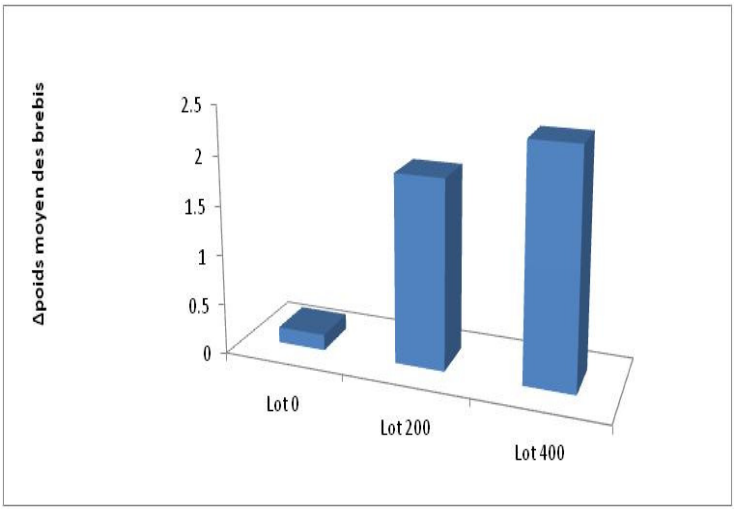

Figure 7. Difference in average weight per batch (0, 200, 400)

Table 2. Average of ovulating ewes per batch (0, 200, 400).

Group	Average of ovulating
Group 0	1,29[a]
Group 200	1,51[b]
Group 400	1,37[ab]

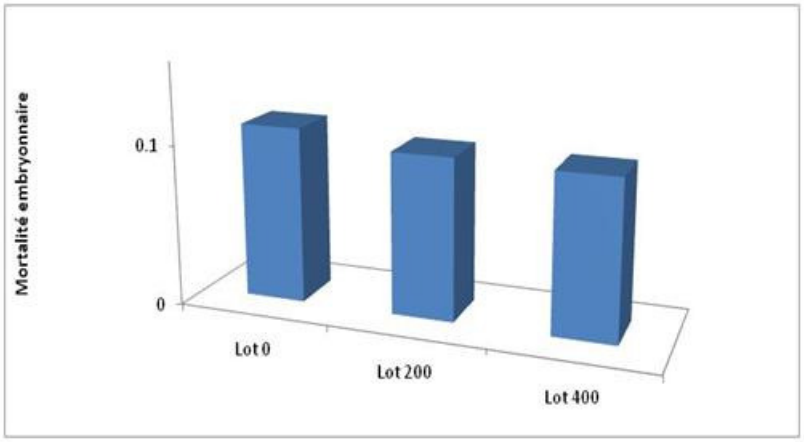

Figure 8. Mortality embryonic average sheep per batch (0, 200, 400).

Table 3. Difference in average weight of sheep per batch (0, 200, 400)

Group	Difference in average weight(kg)
Group 0	0,16[a]
Group 200	1,90[b]
Group 400	2,34[c]

Table 4. Embryonic mortality average sheep per batch (0, 200, 400)

Group	**Embryonic Mortality average**
Group 0	0,109[a]
Group 200	0,10[a]
Group 400	0,098[a]

sheep that receive more focused complementation increase more weight. And yet the weight increase is explained by a 44% the increase in the amount of the concentrate distributes.

Initial weight = weight of the sheep in the beginning of the period of the struggle.

Final weight = weight of the ewes at the end of the period of the fight.

The results of three batches of letters are different so these results are

significantly different (U = 0.05) (Table 3).

Group Difference of average weight (kg)

Group has 0.16 0

Group 200 1.90 b

Group 400 2.34 c

The results with the same letters are not significantly different at 5%.

The embryonic mortality

The rate of embryonic mortality of the entire herd is 0102, and the average each Group shall be deferred as follows: 0 batch: 0109, Group 200: 0100, Group 400: 0098 (Figure 8).

The results of embryonic mortality for all three bear the same letter which means that the difference between these results is not significant. (Table 4).

Mortality embryonic average Group

Group has 0 .109

Group 200 was 0.10

Group 400 is 0.098

The results with the same letters are not significantly different at 5% So we can conclude that Flushing has no significant effect on mortalityembryo. As Fernandez (2003) mentioned that the Flushing improves the rate ovulation and reduces embryonic loss.

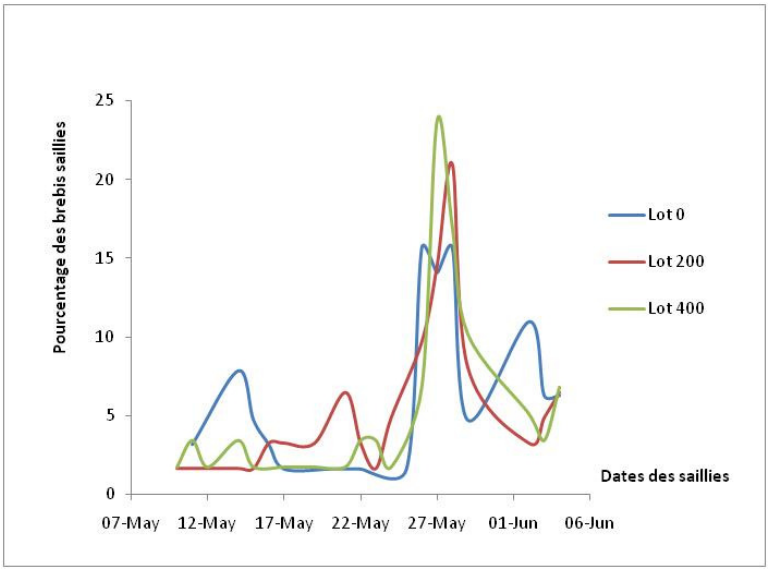

Figure 9. Distribution of projections

Distribution of projections in time

Figure 30 shows the distribution of the projections sheep in time (May 10 until June 4). The percentage of females projections undergoes an evolution in the different sense but the maximum projections of the sheep is in the interval 22 May - early June and depending on the speed of each curve we can see that the projections of Group 400 are the most grouped and then come the projections of Group 200 and finally there are the projections of Group 0, which leads us to infer that the amount of concentrates distributed to an influence on the coming ewes in estrus or it is considered that the complementation allows a food slight grouping of oestrus sheep which is consistent with the ideas advanced by (Dudouet, 2003): "The needs in times of struggle are not different from those of maintenance but ovular laying and consolidation of birthing are influenced by the Flushing. " The coming into heat and in relation to the body condition of each sheep so 0 for the Group there is a fluctuation of the date of the projections that more remarkable that the two other Groups which can be explained by the heterogeneity of the initial weight of the sheep. By cons for Group 400 the percentage of ewes projections in the range 22 May - early June is larger than in the other two Groups.

The sheep breed has several characteristics Barbarine morphological and physiological that distinguish it from many other breeds. These characteristics make her a hardy breed, good producer, including the characteristic of reserved fat (fat tail) which allows ewes Barbarine adapt well to the condition of livestock. Food for a flock may reach 55% of operational costs, She has a great influence on the economic profitability of the herd. Performance reproduction are in close relationship with the diet of animals. Nevertheless, the parameters of reproduction are improving condition has mastered the techniques supply. Based on the analysis of the results of this study, we can deduce that RATIONAL overfeeding of ewes during the period of the struggle improves spawning ovular, in fact witness for the batch mean ovulation rate was 1.29 and for Group 200 is 1.51. For Group 400 it is 1.37 which shows that excessive complementation in turn decreases the ovulation rate. Flushing and increase the average prolificacy of 124% in the control group, up 143% in the batch that receives 200g. The number by lambs percent increase is 15.32% which is consistent with the idea advanced by Dudouet (2003), Flushing improves the number of Lambs born from 10 to 20%.Nevertheless the average prolificacy has suffered a decrease to 127% for Group 400. The average rate of fertility is 95.61%. Group 200 has a maximum rate of fertility 100% and the batch has a rate of 0 95.31%. While Group 400 is the lowest 91%. Thus the feeding of sheep, including Flushing seems a major factor breeding sheep to master.

Finally we can say that it is essential to master feeding techniques and breeding for successful rearing sheep. Particularly Barbarine race that is well has adapted several agro-systems in Tunisia. An economic role that race and social e important. The Barbary sheep herd may be improving in acting primarily on technical factors and the short and medium term (Food and reproduction).

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