Some observations on performance of first kidding Sudanese Nubian goats .

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SUMMARY

Thirty-six Sudanese Nubian female kids were selected' in this experiment which extended from weaning to end of first lactation. The experimental animals were divided into two eqUal groups based on body weight and were assigned at random to either sorghum or molasses based diet. Each group was further divided into three subgroups (six animal each) according to date of birth.

The sorghum fed group maintained a higher DMI than molasses fed group. Daily milk yield in both groups were similar (0.79±0.31 and 0.76±0.23) for sorghum and molasses fed group respectively.

The age at successful service in the niolaiseS fed group was lower than that of sorghum group (9.1±0.26 versus 11.1±0.85 months respectively) despite similarity of body weight (16.5±0.02 kg). The standing heat duration for both groups were (12-28 hrs). Estrous cycle length for short and normal period (4-12 and 18-24 days) and gestation length (146±0.78 days). The molasses fed group kidded at younger age (14.56±0.8 month) compared to sorghum group (16.5±0.79 months) and at heavier body weight (25.1±0.77 kg versus 23.33±0.07 kg) for sorghum fed group. The 'kidding interval and service period of molasses fed group were significantly ($P<0.05$) lower than those of the sorghum fed group. Kids born to sorghum fed group maintained heavier birth weight, higher pre-weaning gain and weaning weight compared' with the other group. Male kids were heavier than female kids while twins were heavier than single at all stages of growth. The mortality percentage was 35% in the molasses fed group and 24% in the sorghum group:

INTRODUCTION

Goats are important species of livestock in most traditional agricultural production system in Africa. The recognition of the importance of goats is developed as results of the capacity that goats can survive under marginal conditions unfavorable for cattle and sheep. Goat in the Sudan has received little emphasis in research programmes. The basic information on Nubian goats for milk and meat production is scarce. Large quantities of agroindustrial by-products are available in Sudan for local consumption as animal feeds and export namely, oil seed cake, wheat bran, sorghum gluten meal and Molasses. Huge tonnage of molasses is produced. High molasses feeding system has been developed as mean of intensifying animal production in the tropics. In spite of the success, which has been reached in application of high molasses feeding system for fattening cattle, there are few parallel efforts to establish such system for milk production. The objectives of this study was designed to compare the effect of molasses based diet and conventional concentrate diet (sorghum) on reproductive potentials of first kidding Sudanese Nubian goats.

For the purpose of the experiment 36 newly born female kids at the Animal Production Research Center Kuku, Khartoum North were used. The kids were allowed to suckle twice daily till weaning at three months of age.

MATERIAL AND METHODS

The weaned kids were randomly divided into two groups (A and B) of equal weight. Each group comprised eighteen kids divided into three subgroup of six kids of an equal average weight.

The composition of experimental diets is the same as reported by Gubartalla *et al* (2002). Group A *was* offered molasses-based diet while group B was offered sorghum-based diet.

The concentrate diet were offered *ad lib* which insured (10% weigh back, while green fodder Berseem *(Medicago sativa)* was given twice a week at the rate of half kg per head as the source of carotene.

The initial live-weight was recorded on the first day (weaning weight) of the experiment. Bi-weekly weighing of all kids was done. During the first seven months, the buck was kept away from the growing does, and the estrous cycle was detected by close observation. There after the buck was allowed to run with female flock for 24 days. All females were observed closely for any changes of behavior and appearance of estrous signs. The age and weight at the first estrous, the time, duration, date of estrous, the number of services and the end of the estrous signs were all recorded. The daily feed intake with average daily, monthly and total milk yield (kg) were calculated for each doe.

Data were subjected to least-square analysis of variance using the general liner GLM procedure of the statistical analysis system SAS (1990).

Some of the data were analyzed using the unpaired student t test (Snedecor and Cochran 1980). The least-square technique (Harvey 1975) was used to study the factors on birth weight, pre-weaning gain, average daily pre-weaning gain (ADPG) and weaning weight. The following mathematical model was used to explain the variation in the above traits.

Ykim = U+Mj+Tk+Si+(TS) ki+C kim ejkim where

Ykim is the value of trait under study on kids of the ith sex kth type of birth.

U is the overall mean.

Mj is the effect of jth treatment (j = 1,2).

Tk is the effect of kth type of birth (k = 1,2).

Si is the effect of ith type of sex (t = 1,2).

(TS) ki is the effect of interaction between kth type of birth and ith sex of kids.

Ejkim is the random error associated with ejkim kids trait under study and is normally and independently distributed with mean and variance.

To compare the subclass mean for each factor, Duncan's Multiple range test as modified by Kramer (1957) was used.

RESULTS AND DISCUSSION

The results of least-square means with standing error are given in Table 2. in all the studied traits, there is no statistical significance. The overall least-square means for birth weight (2.36 kg) pre-weaning weight (5.05 kg), average daily pre-weaning gain (ADPG) (56.17 gm) and weaning weight (7.35 kg) in the present study were

higher than those reported by the El Naim (1979) and **Kudouda (1985)** for the same breed of goat, and similar in pre-weaning **and** ADPG reported by CIRG (1986) and Sexena *et al.* (1990) in Jamunapari goat in India..

The mean birth weight (Table 2) in this study was closely similar to the birth weight reported by Wilson (1976) in Southern Darfur **goat,** (2.25 kg) and Mittal (1979) in Jamunapari goat in India (2.40 kg). Males were always heavier than female at birth, (Table 3). Similar finding were reported by Milak *et al.* (1986). Growth rate in pre-weaning period was slightly higher in twins and males than single and female, but the differences were not significant. Mukundan *et al.* (1982), Malik *et aL* (1986) and Sexena *et al.* (1990) reported similar results. The daily pre-weaning gain (56.19 gm) was comparable to those reported by Jahri and Talapetra (1971) (54.7 gm) and El Hag (1990) who reported daily gain in local Sudanese goat on Berseem and Gassab only (55.0 gm) and **higher** than that reported by El Naim (1979) and Kudouda (1985) in Sudanese Nubian goats.

Table 2. Least square means with standard errors of pre-weaning period of kids fed molasses and sorghum-based diet.

The mean weaning weight in the present study is matching with those reported by Shalash *et al.* (1970), (7.70 kg). Hassan and El Derain (7.58 kg). The effect of interaction (type* sex) was not significant on all the traits studied. This complies with the finding of Mavrogenis *et al.* (1984) and Sexena *et al.* _(1990). The total dry matter daily intake from three months to 12 month of age for the two groups was between 0.3 to 0.9 kg (60% of which was from concentrate mixture), this intake compares favorably with Devendra and Mcleory (1982) who reported that concentrate may have to be fed at rate of 0.2 to 0.7 kg/day to obtain the desired growth rate. The results observed here regarding the length of estrous cycles (Table 5) were in line with the 'results reported by Salama (1972), Ali *et al.* (1983) and Smith (1978). Regarding the abnormal short cycles observed in this study the results are in line with that reported by Smith (1978) and El Hag (1990) who reported that young does have shorter cycles ranging between 5-7 days. The estrous duration reported was closely similar to the result obtained by Abdel Aziz *et al.* (1982) Kudouda (1985) and El Hag (1990) in Sudanese Nubian_ goats.

Table 5. Estrous cycle length and duration

Diet	Type	No.	Length	Duration	%
Molasses	Short	9	4-12 days	12-48 hrs	50
	Normal	9	18-24 days	12-48 hrs	50
Sorghum	Short	8	4-12 days	12-48 hrs	44
	Normal	10	19-24 days	12-48 hrs	56

The overall means of age and weight at first service (Table 6) was 10.1 months and 16.26 kg respectively and age and weight at first kidding were 15.53 months and 24.2 kg respectively.

Table 6. Least squares means of age and weight at first service and first kidding and gestation length of the groups fed on molasses and sorghum based.

Comparable results of age at first kidding were found by many authors (Devendra (1962) for Anglo-Nubian* katjang (14-17 months) and Katjang (15-16 months) and Ali *et al.* (1983) for Black Bengal (15 months)). However Majed *et al.* (1993) reported that age at first kidding for Alpine, La Muncha. Nubian, Saanen and Toggenburg was (12 months) in Southern United States. The higher age at first kidding reported earlier may reflect the effect of tropical climate, health, stresses and forage quality.

The gestation period in this study (149±0.98 days) was in agreement with the results obtained by El Nairn (1979) and Kudouda (1985).

The kidding rate (Table 7) was (1.0) comparable to the rate reported by Shalash *et al.* (1970) (1.01 kid/year) and Kudouda (1985) and El Hag (1990) (1.0 kid/year). The kidding rate reported here is lower than reported by Mukundan and Rajageplan (1971) (1.64), Gill & Dev. (1972) (1.56) and Hofmeyer (1972) (1.63). The lower kidding rate in this experiment may be attributed to fact that the experimental animals were first kidder.

Table 7. The kidding rate in the two groups of Nubian goats fed on molasses and sorghum based diets.

Particular	Molasses group	Sorghum group	Total	%
Singles	15	13	28	90.3
Twins	2	1	3	9.7
Kidding	1.0	1.0		

In this study it was noticed that the overall kid mortalities encountered in the two groups accounted for 27-35%. These results. match with the finding of Kudouda (1985) which was (36%) and lower than that reported El Naim (1985) which was (50%) in Sudanese Nubian goats.

The service period and kidding interval reported in this study (Table 8) were in the line with those reported by El Nairn (1979) (74±19 and 228±1.7 days for service and kidding interval respectively in Sudanese Nubian goats). Prasad and Pandey (1982) reported a shorter service period and kidding interval in Barbari goat in India which were 54.25 and 179.86 days respectively. The overall results reflect the importance of genetical and nutritional factors in shortening the service period and hence the kidding interval.

The mean birth weight of the female kids was 2.0±0.6 kg for the two groups which is lower than that reported by Mittal (1979) in Jamunapari female kids in India (2.49 kg) and El Hag (1990) in local breed (2.55 kg). The mean birth weight of male kid_s was 2.30±0.6 and 2.45±0.55 kg for molasses and sorghum group respectively, which approximately similar to weight of male kids reported by Wilson (1976) in Southern Darfur goats (2.30±0.5 kg), El Naim (1979) in Nubian goats kids (2.25±0.2 kg) and El Hag (1990) in local breed (2.33±0.25 kg). These finding agree with results of Mittal (1979), Moulik and Syrstad (1970) and El Hag (1990) who reported that the males have heavier birth weight than females. The low birth weight in present study may be attributed to the low mature body weight of the does (27 kg).

The average daily milk yield reported here for the two groups was 0.76±0.23 and 0.79±0.31 kg and similar to that reported by El Naim (1979) (0.5-0.7 kg) Kudouda (1985) (0.625-0.720 kg) and El Hag (1990) (0.75 kg). However the daily milk yield reported here is lower than that reported by many authors for tropical breed Mason and Moule (1960) (1.0 to 1.25 kg), Prakesh and Khanna (1972) (1.0 kg). The difference in the yield may be attributed to the younger age (first kidder) of the goats.

REFERENCES

Abdel Aziz, A. Musa, B. and Ali, B.H. (1982). Study on reproductive feature of male Nubian goat. Sudan **J.** Vet. Sci. Anim. Husb. **23** (1) 13-15.

Ali, A.D. Mohammed, W.A. Grossman, M. and Shanks, RD. (1986). Relationship among lactation and reproduction traits of dairying. J. Dairy Sci. **66** (9) 1926-1936.

CIRG (1986). Central Intitute for Research in Goat, Annual Report. Makhdoom Mathura.

Devendra, C. (1962). Goat Husbandry. An introduction to Animal Husbandry in the tropics. Williamson G. and Payne WJ. A third edition 1978 EIBS Essex England.

Devendra, C. and Mcleroy, G. 13. (1982). Goat and sheep in tropics. Long man Singapore Publisher.

El Hag, K. O.M. (1990). A comparative studies on productive and reproductive performance of cross-breed and local breed of goat. M.V. SAC. Thesis U.K. Sudan.

El Naim, Y.A. (1979). Some productive traits of Sudan Nubian goats_. M. V. Sc. Thesis U.K. Sudan. **3 (4)** 173-178.

Ellis, N. (1981). Nutrient composition of Sudan Animal feed., Bulletin 1. Northern and Central Sudan. Central Animal Nutrition Res. Lab. Kuku — Khartoum North.

Gill, G. and Dev D.S. (1972). Performance of two exotic breeds of

goats under Indian Condition. Anim. Prod. **3** (4) 173-178. **Hassan, N.I. and El Derani. O.H. (1990).** Goats resource in the

"Arab World 2, Republic of Sudan" ACSAD.

Harvey, W.R. (1975). Least-squares analysis of data with unequal sub-clues number. U.S. Department of Agriculture ARS H-4.

Hofmeyer, H.S. (1972). The goat of South Africa. Proc. S. African Soc. Anim. Prod. 3 17-122.

Johni, C.B. and Talapatra, S.K. (1971). Jamunupari kids under Browsing and stall feeding condition Indian Vet. 48 495-502.

Kramer, C.Y. (1957). Extension of Multiple range tests to group correlated adjusted means 13 13-18.

Kudouda, M.E.M. (1985). Reproductive and productive traits of Sudan Nubian goats. M. V. Sc. Thesis U.K. Sudan.

Malik, C.P. Kanaujia, A.S. and Pandey, B.I. (1986). A note on the factors affecting pre-weaning growth on Beetal and Black Bengal Kids and their crosses. Anim. Prod. (43) 178-182.

Majed, A.M. Cartwright, T.C. Yazman, J. and Fitzhugh, H.A. (1993). Performance of five breeds of dairy goats in Southern United States 1 reproductive traits and maturing pattern Wold. Rev. Anim. Prod. 28 (2) 15-23.

Mason, I.L. and Maule, I.P. (1960). The indigenous livestock of eastern and southern Africa Agriculture Bureaux. Farmhum Royal Buck U.K.

Mittal, J.P. (1979). A study on birth of Barbari and Jamanapari kids. Indian J. Anim. Sci. 49 (1) 47-54.

Moulick, S.K. and Systrad, 0. (1971). Genetic and environmental causes of variation in birth weight of Black goats. J. Agric. Sci. Camb. 47 409-414.

Mukundan, G. Bhat, P.N. and Khan, B.U. (1982). Variation in body weight gain in Mulapari goat and their Saanen half-breeds in humie tropic. Indian J. Anim. Sci. 5s (12) 1193.1197.

Prakesh, C. and Khanna, R.S. (1972). Effect of order of lactation and length on milk production in a closed herd of Beetal goat. Indian J. Anim. Prod. 2 (4) 10-13.

Prassad, S.P. and Pandey, M.D. (1982). Reproductive performance associated with re-breeding estrous duration, number of insemination and season in Barbari goats. Indian Vet. J. 59 (10) 794-798.

Salama, A. (1972). Ovarian changes in goats during estrous. Indian J. Anim. Sci. 50 (10) 613-6

SAS/STAT User Guide Version 6 4ed-copy right. (1990). By SAS-Institute Inc. Carry N.C. U.S.A.

Saxena, V.K. Taneja, V.K. and Bhat, P.N. (1990). Genetic and non genetic factors affecting pre-weaning growth in Jamunapari goats. Indian J. Anim. Sci. **60** 974-978.

Shalash, M. Musa, A.A. Nawito, M. Farrac, H. Selim, O.F. and Towfik, M.A. (1970). Economic evaluation of some goat breeds in Egypt Vet. Med JU. A.R. **18** 295-312.

Smith, M.C. (1978). Some clinical aspects of caprice reproduction. Cormell Vet. 68 Supp **1 7** 200-211.

Snedecor, G.W. and Cochran, W.H. (1980). Statistical Methods 7th ed Lower State University Press Ames Lowa . U.S.A.

Wilson, R.T. (1976). Studies on livestock of Southern Darfur Sudan' 11 Production traits in goats. Trop. Anim. Hlth th Prod **8** 221232.

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بعض الملاحظات علي أداء الولادة الأولي في الماعز النوبية السودانية

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:ملخص البحث

تم اختيار 36 سخله نوبية لدراسة أدائها من الفطام حتى الموسم الإنتاجي الأول . تم تقسيمها إلى مجموعتين حسبا وزن الميلاد (مجموعة المولأمي ومجموعة الدريش) ثم تم تقسيم كل من المجموعتين إلى ثلاث مجموعات تبعا لتاريخ الميلاد (6 سخله في المجموعة الكمية المتناولة من العلف كانت أعلي في الدربش من المولاس إلا أن كمية اللبن متساوية في كلا المجموعتين أول عشار ناجح ظهر كان أقل في مجموعة لمولاس من مجموعة العريش (0.2691 فدا 11 + 0.85 شهر علي التوالي) بالرغم من تقارب الأوزان (65 + 2 ( ) . (ك) كانت حالة الشبق متقاربة في المجموعتين 12-28 ساعة طول فترة الشباع القصيرة والطويلة (4-12 و 18-24 ساعة) أما فترة الحمل فمتشابه للمجموعتين (146 0.78 شهر) . العمر عند أول ولادة كان أقل في مجموعة المولاس مقارنة بمجموعة الدريش (14.56 * 0.8 ، 16.5 +79 , ( ) علي التوالي او اكثر وزنا 251 077 ، 23.33 = 07. لكن علي التوالي و المواليد الجدد في مجموعة الدريش كانت نقل وزنا في الزبدة اليومية ووزن الفطام . وزن الذكور كان أعلي من الإناث في الحل النمو المجمر عنين بينما التوام كانت النقل في الوزن من الأوزان الفردية في نسبة % التعرق كانت أعلي في مجموعة المولاس 35 % من مجموعة الدريش 24