Tropical Animal Production 1984 9:122-128

EFFECTS OF MILK FEEDING ON THE LIVE-WEIGHT PERFORMANCE OF WEST AFRICAN DWARF (FOUTA DJALLON) KIDS

A A Awah, A U Mba and I O A Adeleye

Department of Animal Science, University of Ibadan, Ibadan, Nigeria

Sixteen West African dwarf (Fouta Djallon) kids were maintained on four dietary treatments from 4 days to 12 weeks of age in order to study their liveweight performances. The diet comprised fresh cow's milk and fresh goat's milk supplemented with chopped giant star grass (*Cynodon nelemfuensis* var robustus) plus creep feed.

Mean liveweight gain over all dietary treatments was 37.3 ± 5.71 g/d. There were significant ($P < 0.05$) differences in the liveweight gain of the kids up to 8 weeks of age. At 8, 10 and 12 weeks of age kids consuming milk ad libitum were significantly ($P < 0.05$) heavier than kids on restricted amounts of milk.

Both male and female kids within same dietary treatment grew at similar rates up to 8 weeks of age. However, male kids on cow's milk at half appetite were significantly ($P < 0.05$) heavier than the female kids at 10 and 12 weeks of age.

Except for male kids on natural suckling, which had significantly ($P < 0.05$) lower mean liveweight at 10 weeks of age, the mean liveweight of male kids on all dietary treatments were about the same. Male kids on natural suckling did not survive at 12 weeks of age.

An attemp to wean kids on natural suckling off milk feeding at about 6 weeks of age was not successful.

Key Words: Goats, milk, feeding, liveweight

The West African Dwarf (Fouta Djallon) goat has been described as achondroplastic dwarf by Chang and Landauer (1950), Epstein (1953) and French (1970). This type of dwarfism results from a normal sized trunk on disproportionately short legs. Mature live-weight ranges from 14 to 22 kg with a lenght of 40 to 50 cm measured at withers (Devendra and Burns 1970). The coat colour varies from plain to particolours of black, brown and white. Black appears to be the commonest colour. Growth rate and milk yield are very low, but twin and triplet births are common. They breed at all times of the year, kidding 5 times in three years (Mba 1979).

The dwarf goat is kept mainly for meat in Nigeria, chiefly by peasant farmers. The skin has little commercial value and therefore is usually consumed with the meat. Goat meat is the preferred meat for many ceremonial occassions in Nigeria and there is rising demand for goat meat which therefore calls for considerable research effort to establish their nutritional requirements.

This experiment was designed to study the effect of varying levels of milk feeding, supplemented with grass plus creep feed on the live-weight performance of the West African dwarf (Fouta Djallon) kids from birth to 3 months of age.

Materials and Methods

Sixteen West African dwarf (Fouta Djallon) kids ranging in liveweight from 1.6 to 1.8 kg at birth were subjected to four dietary treatments from 4 days to 12 weeks of age to study changes in live-weight.

The experimental diets comprised fresh cow's milk and fresh goat's milk, each of which was supplemented with chopped giant star grass (*Cynodon nlemfuensis* var robustus) plus creep feed. The creep feed comprised 31.5% cassava flour, 40% soya bean meal, 20% milled brewers grain, 2.5% sucrose, 5% glucose, 0.5% dicalcium phosphate and 0.5% mineral-vitamin mixture. Each kid had free access to salt lick and daily fresh water supply.

Four kids (two males and 2 females) were randomly assigned to each of four dietary treatments viz.

I.	Ad libitum cow-milk feeding	(CA)
II.	Cow-milk feeding at half-appetite	(CH)
III.	Ad libitum goat-milk feeding	(GA)
IV.	Natural suckling	(NS)

Replacement of dead kids on treatment NS which occured after 6 weeks of age done but led to two further repetition of this dietary treatment. A total of 8 kids (including those that died) were used in treatment NS. However, the data presented refer to only one replicate of this treatment.

The mean of the daily milk consumption by kids on cow-milk ad libitum (CA) was used to determine the equivalence of half appetite for kids on treatment CH. The difference between the weights of kids on treatment NS before and after suckling was used to estimate the amount of milk consumed by these kids. Kids on treatment NS were weaned off milk feed at about 6 weeks of age on to grass plus creep feed. Milk feeding was continued throughout the experiment on treatment CA, CH and GA. The kids maintained on treatments CA, CH and CA were bottle-fed with warm fresh milk at about 37°C. All kids were fed three times a day at 8.00, 13.00 and 18.00. Chopped grass and creep feed were introduced on the 10th day of life and were offered ad libitum to all treatment groups once a day during the norning feed.

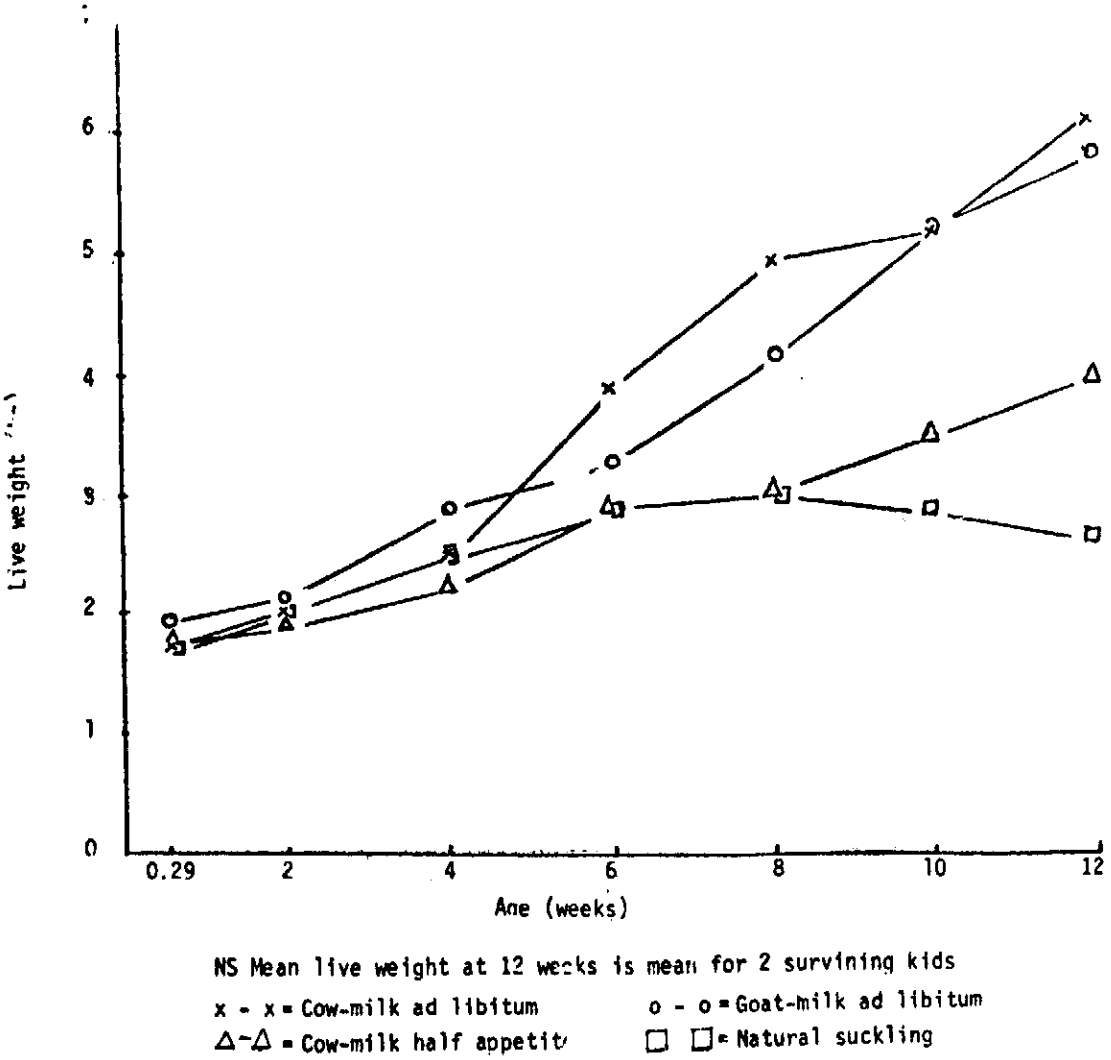
Results

The mean 2 weekly live-weight of the West African dwarf kids are shown in Figure 1. Details of the dry matter consumption from milk, grass and creep feeds have been reported by Awah et al (1982). A summary of the dry matter intake of the components of each diet with standard deviation is shown in Table 1. The total dry matter consumption were 67.4 $\pm$ 7.05, 31.0 $\pm$ 4.43, 49.9 $\pm$ 3.49 and 40.7 $\pm$ 3.91 g/d at weeks of age for kids maintained on treatments CA, CH, GA and NS respectively. The intake figures at 8 weeks of ages were 99.9 $\pm$ 17.84, 75.4 $\pm$ 6.51, 114.3 $\pm$ 8.60 and 98.8 $\pm$ 13.98 g/d for kids on treatments CA, CH, GA and NS respectively. At 12 weeks of age the intake figures were 169.6 $\pm$ 14.52, 115.7 $\pm$ 19.57 and 146.8 $\pm$ 4.51 g/d for kids on treatments CA, CH and GA respectively.

The dietary treatments had no significant ($P > 0.05$) effect on the mean live-weight of the kids up to 6 weeks of age. At 8 weeks of age, kids main-

Figure 1:

Growth of young West African Dwarf kids from 4 days to 12 weeks of age maintained on four dietary treatments



tained on cow-milk ad libitum (CA) and goat-milk ad libitum (GA) had significantly ($P < 0.05$) heavier liveweights than kids maintained on cow-milk at half appetite (CH) and natural suckling (NS). At 10 and 12 weeks of age, kids maintained on treatments CA and GA were significantly ($P < 0.05$) heavier than kids on treatment CH which were also significantly ($P < 0.05$) heavier than those on treatment NS.

Table 1:

Mean dry matter (DM) intake and live-weight for West African dwarf kids maintained on four dietary treatments

Age (weeks)	Treatment	Dry matter (DM intake g/d				Live-weight (kg)
		From milk	From grass	From creep	Total	
2	CA	67.4 ± 7.05^{a}	0.0	0.0	67.4 ± 7.05^{a}	2.2 ± 0.08
	CH	31.0 ± 4.43^{c}	0.0	0.0	31.0 ± 4.43^{c}	2.0 ± 0.09
	GA	48.3 ± 3.36^{b}	1.2 ± 0.66	0.5 ± 0.33	49.9 ± 3.49^{b}	2.3 ± 0.04
	NS	34.8 ± 3.38^{bc}	4.4 ± 0.35	1.9 ± 0.36	40.7 ± 3.91^{bc}	2.2 ± 0.22
8	CA	88.1 ± 18.32^{a}	11.5 ± 1.02^{a}	0.3 ± 0.10^{b}	99.9 ± 17.84	5.0 ± 0.41^{a}
	CH	53.2 ± 3.48^{b}	9.8 ± 1.06^{a}	12.5 ± 4.81^{b}	75.4 ± 6.51	3.2 ± 0.10^{b}
	GA	107.5 ± 7.92^{a}	5.6 ± 1.35^{b}	1.3 ± 0.31	114.3 ± 8.60	4.3 ± 0.33^{a}
	NS	-	12.4 ± 1.96^{a}	86.3 ± 13.23^{a}	98.8 ± 13.98	3.0 ± 0.45^{b}
12*	CA	134.4 ± 9.04^{a}	9.2 ± 0.75	26.0 ± 22.90^{b}	169.6 ± 14.52^{a}	6.2 ± 0.26^{a}
	CH	63.7 ± 0.00^{b}	15.7 ± 3.22	36.3 ± 16.47^{a}	115.7 ± 19.57^{b}	4.7 ± 0.42^{b}
	GA	130.9 ± 2.37^{a}	10.4 ± 0.54	5.5 ± 1.89^{c}	146.8 ± 4.51^{a}	6.0 ± 0.03^{a}

- : No milk feed was offered

± : Standard deviation

* : Kids on treatment NS did not survive at the age indicated

Mean values with same superscript in a colum and within the same age group are not significant ($P > 0.05$).

CA = Cow-milk ad libitum

CH = Cow-milk half appetite

GA = Goat-milk ad libitum

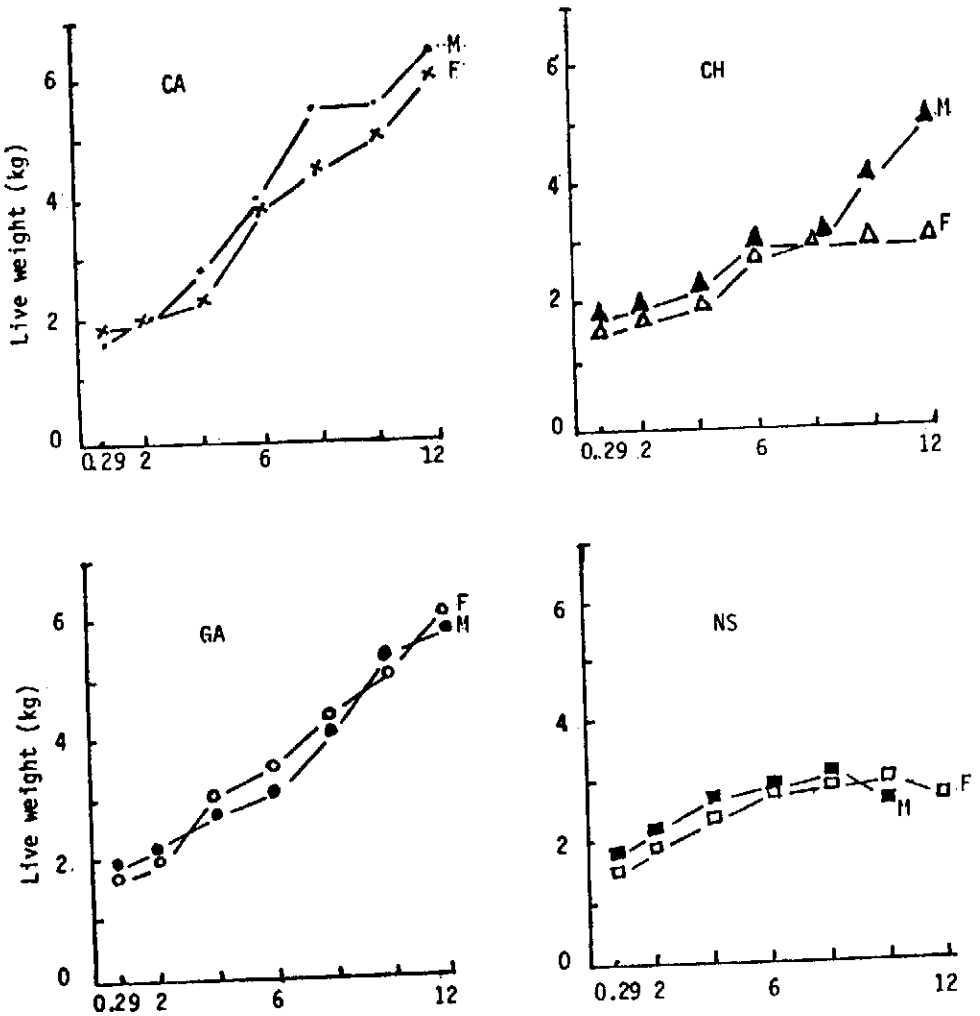
NS = Natural suckling

The separate growth curves for male and female kids within each dietary treatment are shown in Figure 2. The only significant ($P < 0.05$) difference between the sexes was from 10 weeks of age when male kids on treatment CH were heavier than female kids.

Up to 8 weeks of age there were no significant ($P > 0.05$) differences in live-weight between female kids on different dietary treatment (Figure 3). At 10 and 12 weeks of age, the mean live-weight of female kids on treatments CA and GA was similar but significantly ($P < 0.05$) greater than the female kids on treatments CH and NS.

Figure 2:

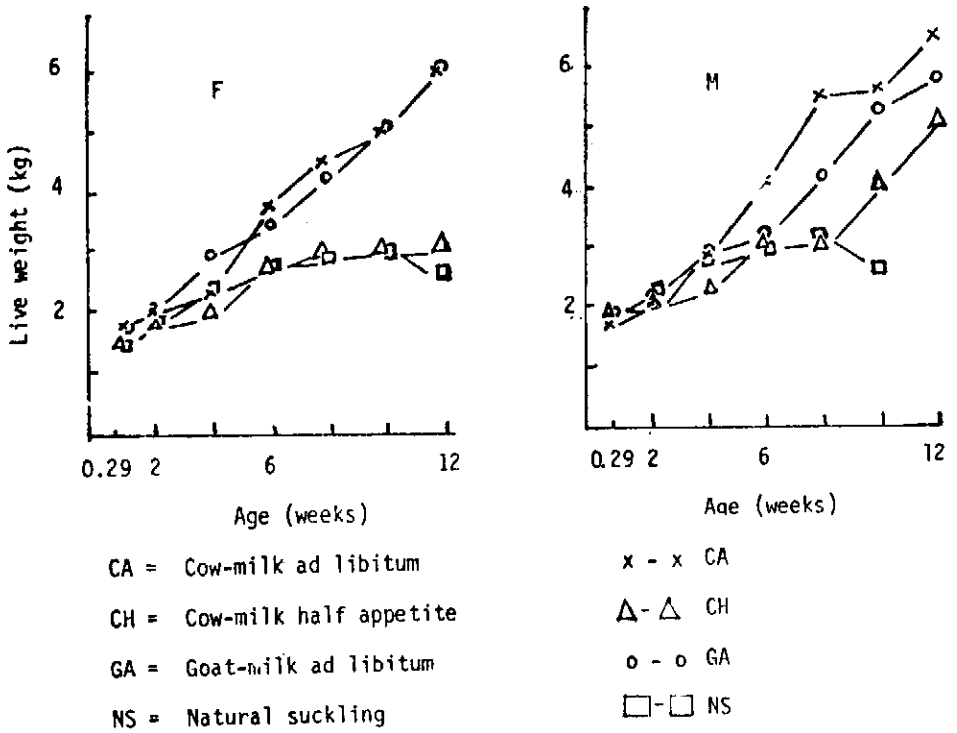
Growth curve for West African dwarf kids showing males (M) and females (F) within each of four dietary treatments



CA = Cow-milk ad libitum
CH = Cow-milk half appetite
GA = Goat-milk ad libitum
NS = Natural suckling

Figure 3:

Growth curve for West African dwarf kids to compare the females (F), the males (M), maintained on four dietary treatments.



The two male kids on treat NS lost weight after 8 weeks of age and were dead before 12 weeks of age, but apart from this treatment, there were no significant ($P > 0.05$) differences between male kids on different diets.

From Figure 1 it would appear that the fastest growth of the kids occurred after 4 weeks of age.

Discussion

The kids were nervous to being handled. Some kids adapted to being bottle-fed within 3 days while others took much longer. Bottle -fed kids scoured occassionally, this phenomenon being more pronounced in treatment CA and GA where milk was offered ad libitum. Treatment with soluble terramycin stopped the scouring. Kids on treatment NS did not scour while suckling,but they scoured soon after complete weaning resulting in high mortality.

The growth of the kids was generally very slow. The mean live-weight increase over all dietary treatments was 37.3 ± 5.71 g/d. Dietary treatment did not significantly ($P > 0.05$) affect the mean live-weight of the kids from 4 days to 6 weeks of age despite the varying levels of milk intake.

This observation tends to suggest that treatment groups receiving smaller amounts of milk feed utilized the amount offered more efficiently than the groups offered milk feed ad libitum. However, from 8 weeks of age, treatment groups receiving milk feed ad libitum had significantly ($P < 0.05$) heavier mean live-weights than kids receiving restricted amounts of milk.

The kids on treatment NS readily consumed the creep feed in amounts comparable with total dry matter intake of other treatment groups after they were weaned. Also kids on treatment NS grew up to 8 weeks at about the same rate as kids offered cow-milk at half appetite. This implies that West African dwarf kids under natural suckling system of husbandry in this country may not be receiving enough milk for maximum performance. The fact that no mortality occured in kids on treatment NS while they were suckling whereas weaning was followed by a high rate of mortality seems to suggest that the kids were physiologically inmature and unable to consume sufficient quantities of solid feed when weaned at 6 weeks. Large (1958,59) reported no setback in live-weight when milk feeding was withdrawn between 5 and 6 weeks of age from lambs. Spedding et al (1961) successfully reared, on grass only, lambs which had been removed from their dams at 2 to 3 weeks of age. The results of the present study suggest the possibility of species or breed differences in response to early weaning, as well as the effect of management since the present studies were confined indoors.

In conclusion, the effect of supplementary milk feeding in improving the live-weight gain of the West African dwarf kids is amply demonstrated in this study. Kids that suckled their dams and offered creep feed grew at about the same rate with kids offered cow-milk at half appetite. Weaning at about 6 weeks of age was detrimental to optimum performance of the kids in this study.

References

Awah A A, Mba A U & Adeleye I O A 1982 Studies on the nutrition of West African dwarf (Fouta Djallon) kids. I. Effects of milk feeding on dry matter intake. International Goat and Sheep Research (In Press).

Chang T K & Landauer W 1950 Observations on the skeleton of African dwarf goats. Journal of Morphology. 86:367-379

Devendra C & Burns M 1970 Goat production in the tropics. Commonwealth Agricultral Bureaux, Farnham Royal, Buckingham, England.

Epstein H 1953 The dwarf goats of Africa. East African Agricultural Journal. 18:123-132

French M H 1970 Observations on the goat. Food and Agricultural Organisation, No. 80 Rome, Italy.

Large R V 1958-59 The Artificial Rearing of lambs. Experiments in Progress (Grassland Research Institute).

Mba A U 1979 Meat Production in Nigeria: Prospects and Problems. Paper presented at the "Think Tank University of Ibadan, National Conference on Food and Nutrition Policy for Nigeria in the 1980" University of Ibadan.

Spedding C R V, Large R V & Brown T H 1961 The Early Weaning of lambs. Veterinary Research, 73:1428.

Received April 18, 1983