EFFECT OF FEEDING FORAGES FORTIFIED WITH CONCENTRATE AND MILKING TIME ON SOME NUTRITIONAL COMPOSITION OF WEST AFRICAN DWARF EWES' COLOSTRUM

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ABSTRACT
The effects of feeding forages fortified with concentrate diet and milking time on some nutritional composition of West African Dwarf (WAD) ewes colostrum was investigated. 19 WAD ewes of weight between 18 and 20kg were procured and pregnancies synchronized with prostaglandin were used for this study. The pregnant ewes were randomly allotted to 5 feeding regimes'. thus: T0 = Pregnant ewes on permanent grazing of Panicum maximum + Gliricidia sepium; T1 = Pregnant ewes on zero grazing of Panicum maximum Gliricidia sepium + concentrate at first trimester; T2 = Pregnant ewes on zero grazing Panicum maximum Gliricidia Sepium + concentrate at first trimester; T3 = Pregnant ewes on zero grazing of Panicum maximum + Gliricidia sepium + concentrate at third trimester T4 = Pregnant ewes on zero grazing of Panicum maximum + Gliricidia Sepium + Concentrate at third trimester. The animals on T1 – T4 were fed forages at 8am and concentrate at 4pm and the left over recorded. Data were collected on colostrums milked per animal at interval of 2, 12, 12, 24, 48 and 72 hours and refrigerated at 10^0c and analysed in the laboratory with analysis of variance (ANOVA) and statistical analysis was carried out for a completely randomized design at $P < 0.05$. The results showed that lactose, fat and minerals (Ash) in the pregnant ewes increased in those fed fortified forages and were higher ($P < 0.05$) in ewes at third trimester than in first hand second trimester pregnancy. It was also observed that lactose, fat and ash reduced as the time of milking increased from 2 hours to 72 hours with colostrum milked at 2 hrs having higher ($P< 0.05$) values of the nutrients evaluated. It was recommended that forages should be fortified for pregnant ewes especially at third trimester and that lambs should be introduced to colostrums immediately after lambing for higher nutrients.

INTRODUCTION
An adequate supply of feed in the final stages of pregnant animal is one of the very important factors to ensure the supply of colostrum and subsequently milk after parturition. It had been reported that well fed ewes accumulate a large volume of colostrum in the final few days before birth and secrete milk copiously soon after lambing and there is large increase in the ewes net protein requirement for udder development and colostrum production in the last week of gestation (Adewumi, 2005). Also the survival of small ruminants' offsprings in the first hours following birth is influenced by many factors including the dam's nutrition during pregnancy (Dwyer *et al,* 2003). The proper development of fetuses and the new born requires and adequate transport of nutrient across the plancenta and mammary glands, therefore balance diet during late gestation in very crucial to foetal development and survival (Mellor and Stafford, 2004) Forage fortification with concentrate is very important in late pregnant ewes as Ogunwale (2004) identified inadequate and poor quality feed especially during the dry season as one of the major constraints to small scale dam production. The application of better management practices such as improved feeding level on natural and supplemented feeds using concentrate for ewes during and before parturition would go a long way in improving colostrum yield and quality. Therefore, this study was carried out to investigate the effect of feeding forages, fortified with concentrate and milking time on some nutritional composition of WAD ewes' colostrum to fill the scanty gap in the literature on this subject matter.

MATERIALS AND METHODS
This study was carried out at the sheep and goat unit of the Teaching and Research Farm, College of Agricultural Sciences, Olabisi Onabanjo

University, Ayetoro Campus, Ogun State. 19 West African Dwarf sheep of weight between 18 and 20kg were purchased and used for this study. The animals were given proper medication and their Oestrus was Synchronized using Prostaglandin given at the rate of 1ml per animal. The pregnant animals were randomly allotted to 5 feeding regimes thus TO = Pregnant ewes on permanent grazing of Panicum maximum and Gliricidia sepicum; T1 = Pregnant ewes on zero grazing of Panicum maximum and Gliricidia sepium; T2 = Pregnant ewes on zero grazing of Panicum maximum, Gliricidia sepicum and concentrate at first trimester; T3 = Pregnant ewes on zero grazing of Panicum maximum Gliricidia sepium and concentrate at second trimester T4 = Pregnancy ewes on zero grazing of Panicum maximum + Gliricidia Sepium + Concentrate at third trimester. The animals on T1 – T4 were fed forages at 8am and concentrate at 4pm and the left overs were recorded. Data were collected on colostrum from each animal after parturition at the interval of 2, 12, 24, 48 and 72 hours and refrigerated of 10^0c before laboratory analysis using the method of AOAC (2006) and the data were analysed with analysis of variance (ANOVA) for a completely randomized design experiment at P = 0.05 using (SAS, 2002).

RESULTS AND DISCUSSION

Table 2 shows the proximate composition of forages and concentrate diet used in this study. The nutrition composition of the forages was adequate for the supply of needed nutrients for the animals. Table 3 presents the results of some nutritional composition of colostrum of pregnant ewes at different planes of nutrition. The lactose contents of colostrum from pregnant ewes on permanent forage grazing T0 and those on forage zero-grazing T1 were lower (P <0.05) and increased in Pregnant ewes zero grazed and fortified with concentrate in the 1st trimester T2 with 6.42% and increased further to 9.66% in third trimesters of pregnancy T4. These indicated that the animals might have consumed more of the forage and concentrate diet which eventually increased the lactose composition of their colostrum. Similar results were observed for fat and minerals contents (ash) of the ewes colostrum (Abdelatif and Elnageeb 2010; Addass *et. al.*, 2013).

Table 4 shows the effect of milking time on lactose, fat and ash contents of ewes colostrum. The results indicated that as the milking time increased, lactose, fat and minerals contents of colostrum decreased. Similar results were observed for fat and ash (mineral contents) of milk which indicated that as colostrum changed to normal milk gradually over time the major nutritional contents of it reduced (Ogunwole, 2004; Mohammed *et, al.*, 2007; Meyer *et. al.*, 2011).

CONCLUSION

It can be concluded from the results obtained in this study that major nutritional contents lactose, fat and ash of colostrum of WAD ewes fed forages fortified with concentrate were higher than those on unfortified forages. Also, the study revealed that time had effect on milk composition as milk obtained from the lactating ewes at 2 hours after parturition was higher in the nutrients than milk obtain after 72 hours. It is therefore, recommended that forages should be fortified for pregnant ewes starting from first trimester for higher nutrients and that lambs (offsprings) should be allowed access to colostrum immediately after parturition and up to 24 hours.

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Table 1: Ingredients Composition of Concentrate diet

Ingredient	Percentage (%)
Whole Cassava root meal (WCRM)	47.27
Soybean	1.56
BDG	42.15
Bonemeal	2.00
Ricebran	5.00
Salt	0.51
Oyster shell	1.51
Total	***100.00***

BDG= Brewers Dried Grain

TABLE 2: Proximate composition of forages and concentrate diet

Forage and Concentrate Diet Composition (%)	PM	GS	CD
Dry matter	95.00	85.00	90.00
Crude protein	9.00	12.00	18.00
Crude fibre	10.00	10.00	8.00
Ether extract	5.28	7.30	5.10
Ash	7.50	10.00	15.50
NFE	68.22	60.70	53.40

PM = Panicum Maximum, GS = Glivicidia Sepium, Cd= Concentrate diet NFE= Nitrogen Free Extract.

TABLE 3: Effect of fortified forages on some nutritional composition of ewes colostrum

Treatment diet Variation	TO	T1	T2	T3	T4	SEM
LACTOSE	5.19^{d}	5.23^{d}	6.42^{c}	7.53^{b}	9.65^{a}	0.02
FAT	3.61^{d}	4.75^{c}	5.79^{b}	6.81^{a}	6.89^{a}	0.03
ASH	0.97^{d}	1.12^{d}	2.27^{c}	3.32^{b}	4.39^{a}	0.03

Means on the Same Row with Different Superscripts are statistically significant (P<0.5)

Table 4: Effect of milking time on some nutritional composition of ewes colostrum

Time of milking Variable	2hrs	12hrs	24 hrs	48 horus	72 hours	Sem
Lactose (%)	8.59^{a}	7.40^{b}	6.23c	5.36d	5.20d	0.02
Fat	5.76^{a}	4.65^{b}	4.45^{b}	3.30d	3.17^{c}	0.03
Ash	2.23^{a}	2.17^{a}	1.12^{b}	1.10^{b}	1.00^{b}	0/03

Means on the same row with different superscripts are statistically significant (P < 0.05).

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Table 1: Reproductive performance of mice administered varied concentrations of monosodium glutamate (Mean ± SEM)

Parameters	Group A (Control)	Group B (1mg/g BW)	Group C (1mg/g BW)	Group D (1mg/g BW)
Conception rate (%)	66.67[a]	70.50[a]	20.00[b]	-
Gestation length (days)	20.25±0.25[b]	20.75±0.25[b]	22.00±0.41[a]	-
Average No of pups	7.33±0.04[b]	8.00±0.05[a]	6±0.15[c]	-
Weight of pups (g)	1.50±0.03[a]	1.34±0.04[a]	1.11±0.07[b]	-
No of dead pups	0	0	6	-

[ab]: Means on same row with different superscripts differ significantly (P<0.05).