

# Effect of Fenugreek Seeds Supplementation on Nutritional Performance and Milk Production of Sudanese Nubian Goats

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## Introduction

➤ Livestock play a significant role in providing food security as well as income resource for less poor people in Sudan. Therefore, it is necessary to adopt new and different strategies in animal production to increase productive performance.

➤ In high yielding dairy animals, the onset of lactation increases the total energy requirements by approximately four folds, reflecting mostly the oxidative and milk precursor needs of the mammary gland.

➤ In animal feeding after banning the use of antibiotics as growth promoter, the use of alternative natural material become a very important issue in animal feed such as enzymes, organic acids and herbs.

➤ Fenugreek (*Trigonella foenum graecum*) seeds (Figure 1) were internationally believed to have restorative properties and the seed had high protein content (30%) and a good amount of lipid content (6.5%).

➤ Recently, fenugreek seed extracts have been described to increase food consumption and milk yield.

## Results

➤ The Inclusion of fenugreek seed produced an almost immediate increase ( $p < 0.05$ ) in feed intake among treated groups.

➤ goats supplemented with FS5%, FS10% and FS15% consumed more dry matter (1083.3, 1231.8 and 1318.3) g/day respectively than un-supplemented group 546.3 gm/head/day Table 2).

➤ The digestibility of Dry Matter (DMD), Crude Protein (CPD) and Organic Matter (OMD) significantly higher ( $P < 0.05$ ) for animal fed on 10 % and 15 % fenugreek seeds than those fed on 5% and control diet (Figure 3).

➤ The total milk yield during the experimental period responded positively ( $P < 0.05$ ) to fenugreek seed supplementation, furthermore, among the treated groups, goats fed diet having highest percent of fenugreek seeds (FS10% and FS15%) had a greatest milk yield 1138.4 and 1334.0 ml/day than those fed the lowest percent of fenugreek seeds (FS5%) 1016.7 ml/day (Table 2).

➤ The transition from 0% to 15% of fenugreek seed is associated with a reduction in fat content from 3.56 to 2.72%, while the other milk components (protein, lactose and SNF) showed an inconsistent pattern (Table 2).

➤ The Profitability increased in supplemented groups being 199.05 %, 212.38 % and 253.33 %, when fed lactating does on 5 %, 10 % and 15 % fenugreek seeds compared with control group (Table 3).

## Objectives

The aims of this study were to investigate the effect of supplementing different levels of Fenugreek (*Trigonella foenum graecum* L.) seeds on

1. feed intake and digestibility
2. milk yield and composition
3. economic appraisal.



Figure 1: Fenugreek seeds



Figure 2: Sudanese Nubian goat

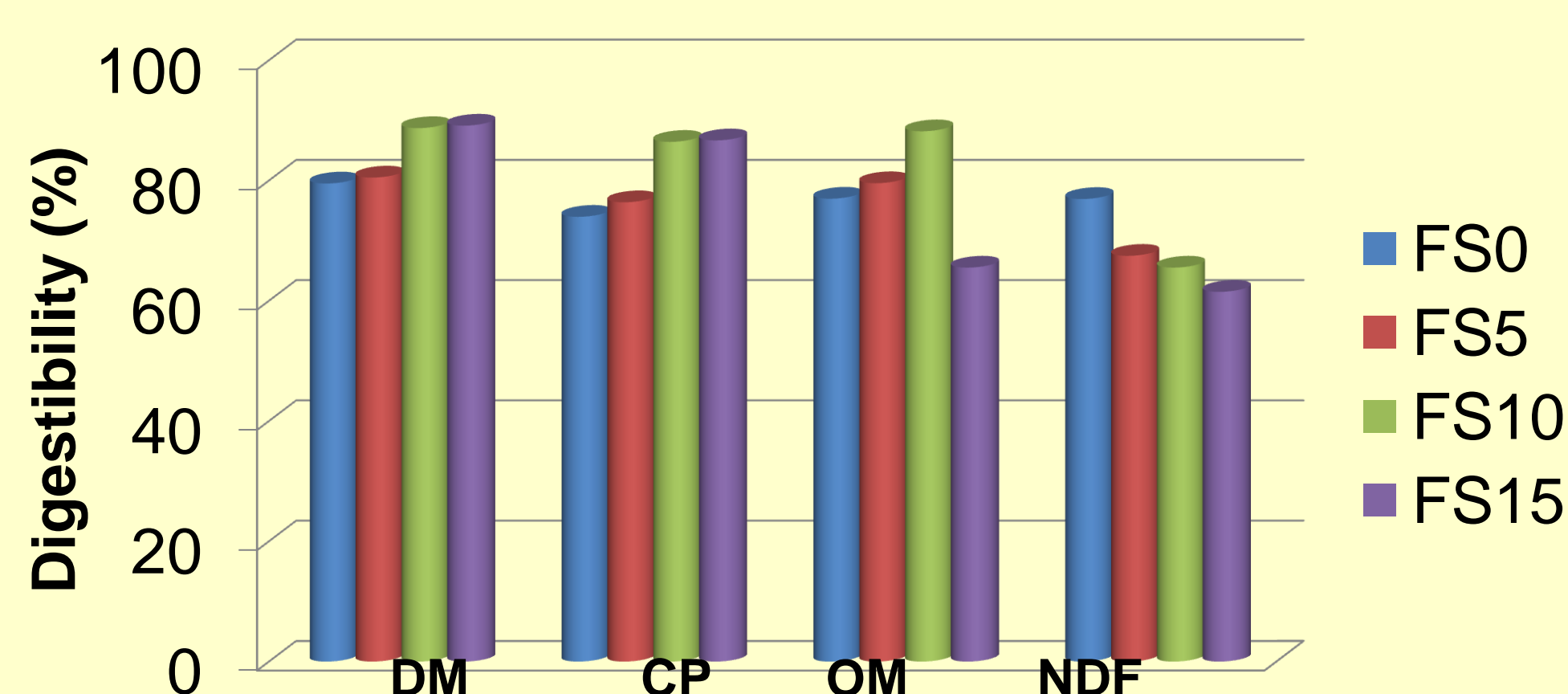


Figure 3: Effect of supplementation fenugreek seeds on nutrient digestibility

Table (1): Calculated chemical analysis of supplementation fenugreek seeds

Item	Level of fenugreek seeds			
	FS0	FS5	FS10	FS15
CP%	14.6	15.3	15.9	15.5
ME(Mj/kg)	11.2	11.1	10.9	10.9

FS0 (0% Fenugreek seed), FS5 (5% Fenugreek seed), FS10 (10% Fenugreek seed), FS15 (15% Fenugreek seed)

Table (2): Effect of supplementation fenugreek seeds on feed intake, Milk Yield and Composition

Item	FS0	FS5	FS10	FS15	SEM
Feed intake (g/day) DM	621.7 <sup>b</sup>	955.0 <sup>a</sup>	1089.3 <sup>a</sup>	1178.0 <sup>a</sup>	88.6
CP	96.8 <sup>b</sup>	139.3 <sup>a</sup>	158.9 <sup>a</sup>	171.9 <sup>a</sup>	12.7
Milk yield (ML)	381.8 <sup>c</sup>	1016.7 <sup>b</sup>	1138.4 <sup>a</sup>	1334.0 <sup>a</sup>	188.4
Fat (%)	3.5 <sup>a</sup>	3.4 <sup>a</sup>	2.9 <sup>b</sup>	2.7 <sup>b</sup>	0.14
Protein (%)	3.7 <sup>a</sup>	3.5 <sup>b</sup>	3.5 <sup>b</sup>	3.6 <sup>ab</sup>	0.06
Lactose (%)	5.2	4.9	5.4	5.1	0.30
SNF (%)	9.6 <sup>a</sup>	9.0 <sup>b</sup>	9.2 <sup>ab</sup>	9.3 <sup>ab</sup>	0.17

SNF (Solid Non Fat) SME: stander error of the means. a-c: values with in row with no common superscript differ significantly  $p < 0.05$

## Materials and Methods

➤ Twelve mature Sudanese Nubian goats were used in this study (Figure 2).

➤ They were matching in age, breed, body weight and stage of pregnancy.

➤ On arrival to the experimental site, each doe was treated against internal and external parasites, identified, and divided into four groups.

➤ The animals were housed in individual pens (1mx2m) partially shaded and offered basal diet daily and green roughages 3 times /week for ad-libitum intake until parturition. Drinking water was freely available to the animals.

➤ Animal were assigned randomly to one of four different treatments diet which are formulated to be iso-nitrogenous and iso-caloric (Table1) with three animals per treatment, following the completely randomized design.

➤ Feed samples and feces were analyzed for dry matter (DM), Crude proteins (CP), crude fiber (CF), ether extract (EE) and ash by method of AOAC (1990). NDF was determined according to Van Soest and Robertson (1980).

➤ After colostrums days were ended, the does were milked daily and milk yield was recorded.

➤ The data obtained from feed intake, milk yield and composition were subjected to Statistical analysis of variance (ANOVA) using statistix<sup>8</sup>.

Table (3): Economic evaluation of supplementation fenugreek seeds fed to Nubian goats

Item	FS0	FS5	FS10	FS15
Price of one Lb milk (SDG)	2.0	2.0	2.0	2.0
Cost of feed Kg/head/day(SDG)	0.5	0.9	1.3	1.6
Milk sales/head/day (SDG)	1.5	4.1	4.6	5.3
Profitability (SDG)	1.1	3.1	3.3	3.7
Profitability %	-	199.1	212.4	253.3

## Conclusion

From the results obtained, it could be concluded that supplementing lactating goat's diets with medicinal plant is highly recommended as a new step in the field of animal production in the Sudan for improving productive performance of lactating goat, regarding feed intake, nutrient digestibility, milk yield and composition and profitability.