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# Voluntary Feed Intake of Goats Supplemented with Different Dietary Fats

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**Abstract:- Three (3) female (rumen-cannulated goats) weighting 27.33±1.53 kg were housed in individual elevated metabolism stalls provided with 30% concentrate in the morning based on feed requirements (3% of their body weight (BW) dry matter (DM) basis) of the animals. *Ad libitum* feeding of napier grass follows thereafter. Clean drinking water were made available all the times in the respective animal watering troughs.**

**All data were collected sequentially in every cycle of the study. There were 7 days lag period in every cycle for the animals to return to each natural state. On the 8th day of every cycle animals were given different dietary treatment. Voluntary feed intakes were recorded for 3 days. This was done on the 11th to 13th day of feeding trial (3 days after treatment).**

**The following were data collected, daily roughage dry matter intake (g/ kg metabolic body weight), daily concentrate feed intake (g DM/kg MBW) and daily total feed dry matter intake (g DM/ kg MBW).**

**All data collected showed no significant difference (P > 0.05) among treatment means was observed. This implies that supplementing 3 to 5% dietary fats from two different sources (VCO and Lard) in ruminant diet do not influence the roughage, concentrate and total feed intake of mature female goats.**

## I. INTRODUCTION

An obvious reason for supplementing ruminant diets with fat is to increase the energy density of the animal's diet. Fatty acids yield more energy than other organic nutrients when metabolized by the animal (Hess et al, 2008). On their research conducted in order to elucidate the effects of supplemental fat on utilization of other dietary components on ruminants. Negative associative effects are not likely to be observed in ruminants consuming forage-based diets with supplemental fat at ≤2% of DMI. Moreover, inclusion of supplemental fat at ≤3% of DM is recommended to obtain the most benefit from the energy contained within the fat and other dietary components in high-forage diets. For ruminants fed high-concentrate diets, supplementing fat at 6% of diet DM is expected to have minimal impacts on utilization of other dietary components. Although there is greater potential to supply the ruminant animal with unsaturated fatty acids from dietary origin if fat is added to high-concentrate diets, incomplete ruminal biohydrogenation of C18 unsaturated fatty acids results in an increase in duodenal flow of 18:1 *trans* fatty acids regardless of basal diet consumed by the animal.

A variety of fat supplements is available today for ruminant nutritionists to use. These include various commodity fats such as lard and coconut oil. Thus, this study was conducted in order to evaluate the effect of dietary fats on voluntary feed intake of mature female goats.

## II. MATERIALS AND METHODS

Three (3) female (rumen-cannulated goats) weighting 27.33±1.53 kg were housed in individual elevated metabolism stalls provided with 30% concentrate in the morning based on feed requirements (3% of their body weight (BW) dry matter (DM) basis) of the animals. *Ad libitum* feeding of napier grass follows thereafter. Clean drinking water were made available all the times in the respective animal watering troughs.

All data were collected sequentially in every cycle of the study. There were 7 days lag period in every cycle for the animals to return to each natural state.

On the 8th day of every cycle animals were given different dietary treatment. Voluntary feed intakes were recorded for 3 days. This was done on the 11th to 13th day of feeding trial (3 days after treatment).

## III. RESEARCH DESIGN AND LAY-OUT

Three mature goats surgically fitted with rumen cannula were used. The experimental animals were in good body condition prior to and throughout the duration of the study. Complete Randomized Design (CRD) was used to evaluate the effect of different dietary treatments. Five dietary treatments were used in the study with dietary treatment combinations as follows.

➢ *Treatment Combinations*

The rumen-cannulated goats were supplemented with different levels of two dietary fat sources with dietary treatment combinations as follows.

- Treatment 1 - CONTROL
- Treatment 2 - 3% Virgin Coconut Oil (VCO)
- Treatment 3 - 5% Virgin Coconut Oil (VCO)
- Treatment 4 - 3% Lard
- Treatment 5 - 3% Lard

| Treatment | Initial | 1st Cycle | 2nd Cycle | 3rd Cycle | 4th Cycle |
|---|---|---|---|---|---|
| Animal 1 | T3 | T2 | T5 | T4 | T1 |
| Animal 2 | T2 | T3 | T4 | T1 | T5 |
| Animal 3 | T5 | T4 | T3 | T1 | T2 |

Table 1:- Treatment assignment of goats for the entire duration of the study.

➢ *Data Collection*

The data were collected by weighing of feed given to mature female goats based on feed requirements [3% of their body weight (BW) dry matter (DM) basis] of the animals. Feed refused were collected and weighted to determine the voluntary feed intake of the animals. A ratio of 70% napier grass and 30% concentrate feeding combination were used.

## IV. RESULT AND DISCUSSION

➢ *Daily Roughage Dry Matter Intake (g/ kg Metabolic Body Weight)*

Napier grass dry matter (DM) intake of goats fed with napier grass supplemented with different dietary fats (Figure 1) showed that among treatments, goat given with 5% VCO in the concentrate feed got the highest NG feed intake of 465.28g followed by control with 461.96g, 5% lard with 460.56g NG feed intake, 3% lard with 457.76g and the lowest NG feed intake was with 3% VCO having 439.22g.

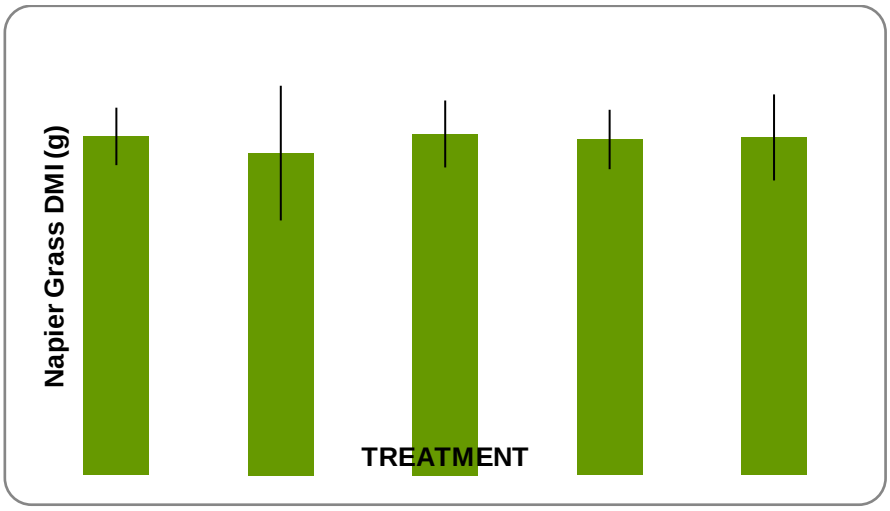


Fig 1:- Daily Roughage Dry Matter Intake (g/ kg Metabolic Body Weight)

Although more than 26g was observed between the lowest to highest rumen napier grass feed intake, no significant difference ($P > 0.05$) among treatment means was observed., This implies that supplementing 3 to 5% dietary fats from two different sources (VCO and Lard) in ruminant diet do not influence the NG feed intake of mature female goats.

➢ *Daily concentrate feed intake (g DM/kg MBW)*

Concentrate dry matter (DM) feed intake of goats fed with napier grass supplemented with different dietary fats (Figure 2) on the concentrate showed that among treatments, goat given with 5% VCO in the concentrate feed got the highest concentrate feed intake of 204.9g followed by goat supplemented with 3% VCO having 200g.

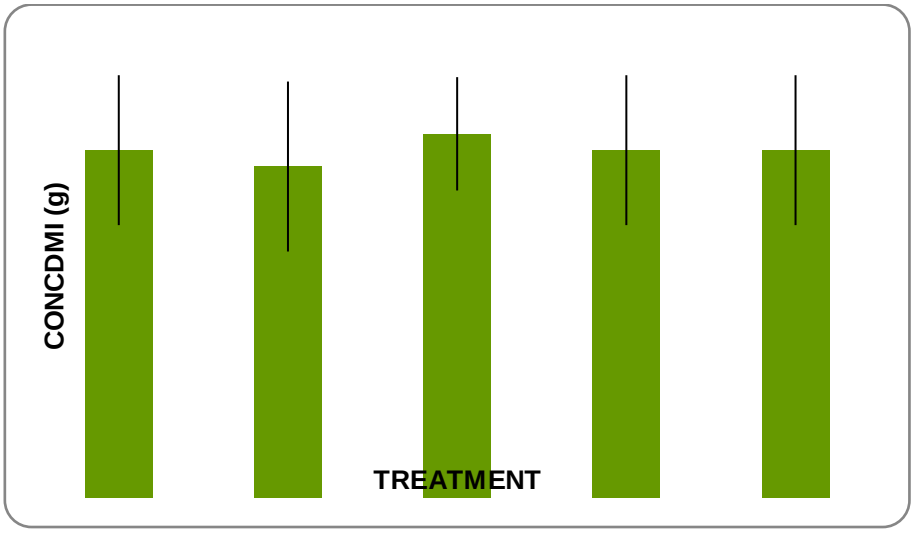


Fig 2:- Daily concentrate dry matter feed intake (g DM/kg MBW)

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No significant difference (P > 0.05) among treatment means was observed. This implies that supplementing 3 to 5% dietary fats from two different sources (VCO and Lard) in ruminant diet do not influence the concentrate feed intake of mature female goats.

➢ *Daily total feed dry matter intake (g DM/ kg MBW)*

Average total dry matter (DM) intake of goats fed with napier grass supplemented with different dietary fats on the concentrate (Figure 3) showed that among treatments, goat given with 5% VCO in the concentrate feed got the highest total feed intake of 670.21g followed by control with 664.42g, 5% lard with 663.02g total feed intake, 3% lard with 660.22g and the lowest total feed intake was with 3% VCO having 639.21g.

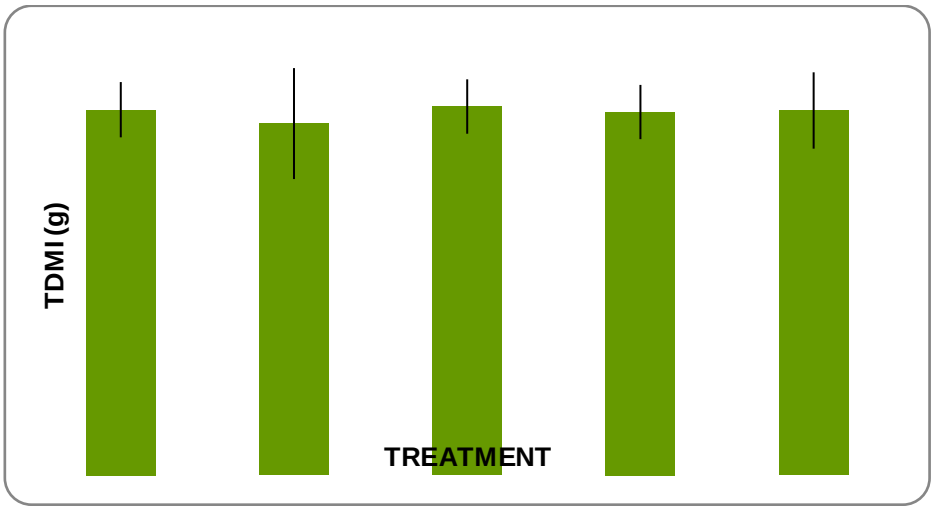


Fig 3:- Daily total feed dry matter intake (g DM/ kg MBW)

The 31g difference between the highest (5% VCO) and the lowest (3% VCO) supplemented on the concentrate, no significant difference (P > 0.05) among treatment means was observed., This implies that supplementing 3 to 5% dietary fats from two different sources (VCO and Lard) in ruminant diet do not influence the total feed intake of mature female goats.

The result of the experiment confirm the study of Booyens *et al*., (2013) that no significant difference on DMI on lambs supplemented with beef tallow and soybean oil. This similar feed intake was expected because the diet nutrient composition (especially NDF content) was the same. Differences in NDF content could affect diet digestibility and rumen fill, two important factors influencing feed intake (McDonald *et al*., 2002).

## V. SUMMARY AND CONCLUSION

### *A. Summary*

Three (3) female (rumen-cannulated goats) weighting 27.33±1.53 kg were housed in individual elevated metabolism stalls provided with 30% concentrate in the morning based on feed requirements (3% of their body weight (BW) dry matter (DM) basis) of the animals. *Ad libitum* feeding of napier grass follows thereafter. Clean drinking water were made available all the times in the respective animal watering troughs. Complete Randomized Design (CRD) was used to evaluate the effect of different dietary treatments on goat voluntary feed intake.

All data were collected sequentially in every cycle of the study. There were 7 days lag period in every cycle for the animals to return to each natural state. On the 8$^{th}$ day of every cycle animals were given different dietary treatment. Voluntary feed intakes were recorded for 3 days. This was done on the 11$^{th}$ to 13$^{th}$ day of feeding trial (3 days after treatment).

The data were collected by weighing of feed given to mature female goats based on feed requirements [3% of their body weight (BW) dry matter (DM) basis] of the animals. Feed refused were collected and weighted to determine the voluntary feed intake of the animals. The following were data collected, daily roughage dry matter intake (g/ kg metabolic body weight), daily concentrate feed intake (g DM/kg MBW) and daily total feed dry matter intake (g DM/ kg MBW).

All data collected showed no significant difference (P > 0.05) among treatment means was observed. This implies that supplementing 3 to 5% dietary fats from two different sources (VCO and Lard) in ruminant diet do not influence the roughage, concentrate and total feed intake of mature female goats.

### *B. Conclusion*

This study showed that dietary fats supplementation of either virgin coconut oil or lard at a maximum of 5% level did not influence the response the roughage, concentrate and total feed intake of mature female goats.

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