



Utilization of Sesban Tree and Reed Forage in Lambs Feeding

By

Mohammed El Fateh Abd El-Rahman Abd El-Monaime

B. Sc. of Agric .Sci (Poultry Production), Cairo University, 2007

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Examination Committee:

Prof. Dr. Galal A. Abd El-Hafez

Prof. Dr. Sabbah. M. Allam

Prof. Dr. Soliman M. Mousa

Dr. Mohsen M. Farghaly

Supervision Committee:

Prof. Dr. Soliman M. Mousa (Main Supervisor)

Prof. Dr. Abdelraheem I. Suliman

Prof. Dr. Hatem A. Hamdon

Dr. Mohsen M. Farghaly

CONTENTS

Title	Page
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	4
1. Sesbania sesban and reed forage as untraditional feed for ruminants	4
2. Chemical composition of Sesbania sesban and reed forage	6
3. Effect of feeding Sesbania sesban and reed forage on nutrient digestibility	11
4. Nutritive value of sesban and reed plants rations.....	16
5. Effect of feeding sesban and reed plants on rumen liquid parameters	17
5.1. Rumen pH value.....	17
5.2. Ammonia-N concentrations	17
5.3. Ruminal total volatile fatty acids, TVA's.....	19
5.4. Total protozoa count.....	20
6. Effect of feeding sesbania sesban and reed forage on performance of growing lambs.....	21
6.1. Daily gain	21
6.2. Feed intake.....	23
6.3. Feed conversion ratio.....	24
6.4. Water consumption.....	26
7. Effect of feeding sesbania sesban and reed plants on blood parameters	26
8. Effect of feeding sesbania sesban and reed plants on carcass traits.....	27
9. Economic efficiency of rations based on sesbania sesban and reed plants	28
III. MATERIALS AND METHODS	30
1. Digestibility trials	30
1.1 Animals.....	30
1.2. Experimental rations.....	30
1.3 Chemical analysis and digestion coefficients measurements.....	31
1.4 Rumen liquor parameters	32

Title	Page
2. Feeding trial	33
2.1 Animals, management and feeding	33
2.2 Blood samples.....	34
3. Carcass characteristics	35
4. Economic evaluation	37
5. Statistical analysis	37
IV. RESULTS AND DISCUSSION.....	39
1. Chemical composition of Sesbania sesban and reed plants.....	39
2. Digestibility trails.....	40
2.1 Nutrient digestion coefficient.....	40
2.2 Nutritive value.....	45
2.3 Rumen fermentation activities.....	47
3. Growth performance.....	51
3.1 Daily gain.....	51
3.2 Feed Intake.....	53
3.3 Feed conversion.....	55
3.4 Water Consumption.....	55
3.5 Blood parameters.....	58
4. Carcass characteristics	63
4.1 Gross composition, chemical composition and physicochemical properties of longissimus dorsi muscle of lambs.....	65
4.2 Edible and non-edible parts.....	67
5. Economic efficiency.....	68
V. SUMMARY AND CONCLUSION.....	71
VI. REFERENCES	77
VII. ARABIC SUMMARY.....	

List of Tables

No	Title	Page
1	Chemical composition of sesbania sesban plant as reported in the literature.....	8
2	Chemical composition of reed plant as reported in the literature.....	9
3	Digestion coefficients of Sesbania Sesban by different animal species of ruminants as reported in the literature.....	13
4	Digestion coefficients of reed plant by different species of ruminants as reported in the literature.....	15
5	Ingredients composition of concentrate mixture.....	31
6	Chemical composition (%) of Alfalfa, <i>sesbania sesban</i> , reed plants and CFM (as DM basis).....	40
7	Effect of feeding <i>Sesbania sesban</i> and reed plants to ram's on nutrient digestibility and nutritive values of experimental rations of sheep.....	43
8	Effect of feeding <i>Sesbania sesban</i> and reed plants on rumen fermentation activities.....	49
9	Effect of <i>Sesbania sesban</i> and reed plants on growth performance of growing lambs.....	56
10	Effect of <i>Sesbania sesban</i> and reed plants on blood serum constituents of growing lambs.....	60
11	Effect of <i>Sesbania sesban</i> and reed plants on hot carcass, dressing percentage and carcass traits of growing lambs (Mean \pm SE)	64
12	Effect of <i>Sesbania sesban</i> and reed plants on gross and chemical compositions, and physicochemical properties of longissimus dorsi muscle of lambs (Mean \pm SE).....	66
13	Effect of feeding <i>Sesbania sesban</i> and reed plants on edible and non-edible parts in lambs (Mean \pm SE).....	68
14	Economical efficiency of lambs fed experimental rations...	69

LIST OF FIGURES

No.	Title	Page
1	Carcass cuts	36
2	Effect of feeding Sesbania sesban and reed plants to ram's on DM and OM digestibility, %	44
3	Effect of feeding Sesbania sesban and reed plants to ram's on CP, CF, EE and NFE digestibility, %	44
4	Effect of feeding Sesbania sesban and reed plants to ram's on NDF, ADF, Cellulose, Hemicel and ADL digestibility, %	45
5	Effect of feeding Sesbania sesban and reed plants on TDN and DCP of experimental rations of sheep	46
6	Effect of feeding Sesbania sesban and reed plants on rumen PH degree	50
7	Effect of feeding Sesbania sesban and reed plants on rumen NH ₃ -N	50
8	Effect of feeding Sesbania sesban and reed plants on rumen TVFA.	51
9	Effect of feeding Sesbania sesban and reed plants on total protozoa count	51
10	Effect of sesbania sesban and reed plants on final weight and body weight (BW) gain for growing lambs	57
11	Effect of sesbania sesban and reed plants on average daily gain for growing lambs	57
12	Effect of sesbania sesban and reed plants on DMI of concentrate and roughage for growing lambs	57
13	Effect of sesbania sesban and reed plants on total DM, TDN and DCP intakes for growing lambs	58
14	Effect of sesbania sesban and reed plants on feed conversion ratio for growing lambs	58
15	Effect of Sesbania sesban and reed plants on total protein, albumen and globulin in blood serum of growing lambs	61
16	Effect of Sesbania sesban and reed plants on albumen/globulin ratio in blood serum of growing lambs	61
17	Effect of Sesbania sesban and reed plants on glucose and cholesterol in blood serum of growing lambs	62
18	Effect of Sesbania sesban and reed plants on ALT, AST and urea-n in blood serum of growing lambs	62
19	Effect of Sesbania sesban and reed plants on creatinine in blood serum of growing lambs	63
20	Total feed cost (TFC), total revenue (TR) and net revenue (NR) of lambs fed experimental rations	70
21	Economical efficiency of lambs fed experimental rations	70

V. Summary and conclusion

This study was carried out at the Animal Production Research Farm, Faculty of Agriculture, New Valley University, El Kharga, New Valley Government. The objective of this study was to evaluate the effect of feeding untraditional green feeds, especially fresh *Sesbania* and reed forages, on nutrients digestibility, rumen parameters, growth performance and carcass characteristics of growing lambs. The present work included two parts:

The First Part: Three digestibility trials were carried out using nine local rams with 50 ± 0.25 kg average body weight to investigate the effect of feeding *sesbania sesban* and reed plants on nutrient digestibility, nutritive value and rumen fermentation in sheep. Animals in control group were fed basal diet consisting of 700 g concentrates (which cover 60% of their requirements based on NRC requirements) with fresh Alfalfa *ad libitum*. The second and third groups (T1 and T2) rams were fed 700 g concentrates with fresh Sesban and reed plants respectively *ad libitum*. Each trial lasted for 22-day, the first 15-day was considered as a preliminary period followed by a 7-day collection period. At the end of digestibility trial, samples of rumen contents were collected three times 0, 4 and 8 hours after feeding from each ram using a stomach tube to measure rumen pH, NH₃-N, TVFAs and total protozoa count.

The Second Part: A feeding trial was conducted to study the effect of feeding growing lambs on *sesbania sesban* and reed plants on feed intake, growth rate, feed conversion ratio and serum blood metabolites. Fifteen male Farafra lambs 5-6 month' old with 19.0 ± 1.87 kg bodyweight were divided

into three groups (five males each). Average initial weights were similar in all groups. Lambs were fed on the previous experimental diets that mentioned in the first part for 230 days. The experimental period consisted of two periods; 15-days adaptation period followed by 215 days experimental phase. Lambs were fed individually. Animals were weighed in two successive days every other week before morning feeding. Body weight was averaged to the nearest 0.1 kg. Blood samples were collected monthly from the jugular vein of each lamb. The total water consumption of each animal was measured daily.

At the end of the feeding trial, three lambs from each group were selected randomly and slaughtered. After slaughtering, the hot carcass weight with or without edible parts were recorded. Also, the weights of edible and non-edible parts were recorded. Dressing percentage to fasting body weight was calculated. Carcass was cut to shoulder, leg, loin, rack, brisket, flank and *longissimus dorsi* muscle (the eye muscle) were determined each part was individually weight. The gross composition, chemical composition and physicochemical properties of *longissimus dorsi* muscle were measured.

The results of this study are summarized as follow:

Digestibility trails

1. Chemical composition: DM content of *Sesbania sesban* was about 18.61 % higher than Alfalfa. Also, CP content of *Sesbania sesban* was higher than that of Reed plants by 32.57 %. The CP of reed plants is lower than that of Alfalfa by about 21.83%. The reed forage contains a high percentage of fiber fractions (NDF and ADF) as compared with alfalfa and *sesbania sesban*.

Chemical composition of sesban and reed forage in the present study was close to alfalfa or higher than it in some components.

2. Nutrients digestion coefficients: All nutrients digestibility were not affected by feeding of different sources of forages which were almost similar in all groups except of NDF and ADF digestibility, which improved ($P<0.05$) with feeding reed plants as compared with Sesbania group .

3. Nutritive value: The nutritive value of different experimental rations in terms of TDN and SV was not significantly affected among groups. However, the DCP of the control and Sesbania groups was significantly higher ($P<0.05$) than Reed group.

4. Rumen fermentation activities: The ruminal pH, $\text{NH}_3\text{-N}$, TVFA's and total protozoa count showed no significant differences among groups. However, the ruminal $\text{NH}_3\text{-N}$ and TVFA's concentration were numerically lower in Reed forage group than other groups. Concerning the effect of sampling time on rumen liquor parameters, the mean values of pH were significantly ($P<0.05$) higher before feeding time then decreased at 4 hrs. after feeding. However, all of $\text{NH}_3\text{-N}$ and TVFA's concentration were lower before feeding and increased after feeding to reach the peak at 4 hrs. post feeding. There are no significant interactions between treatments and time effect have been detected for ruminal pH, $\text{NH}_3\text{-N}$ and TVFA's.

Growth performance

1. Daily gain: The body weight gain and average daily gain were not significantly affected by experimental rations. However, weight gain and average daily gain tended to be higher in Sesbania group than reed group.

2. Fed Intake: The forage intake of lambs fed on reed plants was lower by 31.25% than the control group (440 vs. 640 g). However, the forage intake of lambs fed *Sesbania sesban* was similar to those fed alfalfa (690 vs. 640g).

3. Fed conversion: Feed conversion ratio didn't differ significantly among groups. However, some improvement in feed conversion rate of lambs fed reed forage was observed as compared with other groups (7.79 vs. 9.07, respectively)

4. Water Consumption: There is a numerical increase in water consumption of lambs fed *Sesbania* or reed plant when compared with control group (3.12 and 3.21 vs. 2.18 L/d respectively).

5. Blood parameters: Feeding of *Sesbania sesban* increased ($P<0.05$) serum cholesterol level when compared to control group. Urea concentration was higher ($P<0.05$) in *Sesbania* group than reed plant one, but didn't differ than control. Nevertheless, serum AST concentration was significantly ($P<0.05$) increased in reed plants group than *Sesbania* one.

Carcass characteristics

There were no significant differences in hot carcass, dressing percentage and carcass components in lambs fed alfalfa, *Sesbania* or reed plants. However, brisket weight was higher in *Sesbania* group than reed and control groups (0.93 vs. 0.55 and 0.70 kg, respectively). Moreover, weight of hot carcass tended to be higher in lambs fed alfalfa and *Sesbania sesban* than reed forage treatment.

1. Gross composition, physicochemical properties of longissimus dorsi muscle of lambs: Feeding different sources of forages to lambs didn't affect the longissimus muscle composition. Weight of longissimus muscle was lower by about 25 % for lambs fed reed forage compared to control group.

Moreover, meat and bone contents of longissimus muscle in lambs fed *Sesbania sesban* and reed forages were numerically higher than control, but lower in fat content. Feeding of *Sesbania* and reed forages to lambs decreased ($P < 0.05$) the eye muscle area (EMA) when compared to the control group.

2. Edible and non-edible parts: Weights kidney fat was higher in control group than *Sesbania* and reed plants groups (580 vs. 150 and 300g, respectively). Also, liver and heart weight were high with feeding alfalfa ration when compared with reed plants ration. Moreover, feeding lambs alfalfa and *Sesbania* rations increased spleen weight as compared with reed plants ration (90 and 90 vs. 60g, respectively).

Economic efficiency: Feeding lambs *sesbania* and reed plants rations were tendered to decrease cost of feed consumption during the experiment compared with control. Moreover, net revenue was markedly improved with lambs fed on *sesbania* and reed plants as compared with control group.

Conclusion

In conclusion chemical analysis, nutritive value and nutrients digestibility of sesban and reed forage were close to alfalfa or higher than it. Also, the rumen fermentation activates and the total protozoa count was improved by feeding sesban and reed forage to rams. There was no adverse effects on performance of growing lambs those fed on sesban and reed forage until 40% of their requirements. However, some improvement in performance was observed particularly with feeding *Sesbania sesban*. Therefore, we can recommend these forages as an alternative source of alfalfa in the diet of sheep.

Keywords: *Sesbania sesban*, reed plant, lambs, nutrient digestibility, rumen fermentation, growth performance, carcass characteristics