# A NOTE ON THE POTENTIAL USE OF MORINGA OLEIFERA TREE AS ANIMAL FEED

**Mabruk, A. A; Talib, H. N; Mohamed, M. A; Alawad, A. H.**
Animal Production Research Centre, Hillat Kuku, P.O. Box 1388

**المستخلص**

تم تحليل عينات من الاجزاء المختلفة للمورينجاا (بذور، ازهاره، ثمار ، اوراق، سيقان غضه والنبات الكامل) لمعرفة مكوناتها الكيميائية وقيم قابلية الهضم . كشفت النتائج بان محتويات البروتين الخام لتلك الاجزاء تتفاوت بين ٩٧,١ – ٣٤٨,٥ جم/كجم مادة جافه ممثلة مصدرا جيدا من البروتين لاطعام الحيوان . اضافة الي وجود المحتويات العالية من الدهون في البذور(٣٨٨,٠ جم/كجم) عليه يمكن مثل هذه البذور تستعمل كمصدر للزيوت القابلة للاكل .

## Abstract:

Samples of different morphological parts of *Moringa oleifera* (seeds, flowers, pods, leaves, stems and whole plant) were analyzed for their chemical components and *in situ* digestibility values. The results revealed that the crude protein contents of those parts varied between 97.1-348.0 g/kg DM suggesting them as a good source of protein for feeding animals. Furthermore the high contents of fat in seeds (388.0 g/kg DM) suggesting that such seeds could be used as a source of edible oils.

## Introduction:

Moringa oleifera belongs to family moringaceae. Among the 13 species of Moringa, oleifera is the most common one. Moringa oleifera is native to India and introduced into the tropics (Hutchinson and Dalziel, 1966). It is a multipurpose tree that grown in semi-arid and tropical areas. It is commonly cultivated in the hedges and backyards because of its usefulness as a fodder tree and its remarkable capacity to stand maltreatment. It is mainly used for human nutrition and for correction of malnutrition of kids in India and Southern America. In Sudan, Moringa oleifera spread all over the country and used mainly as fences and for traditional water purification (Rawag tree). Another species Moringa pregrina is native to Sudan and mostly found in rocky valleys of arid and semi desert areas of the Red Sea Hills, Blue Nile, Kordufan, Darfur, Northern state and Equatoria (Mohammed, 2009). The description of Moringa tree as a miracle tree coincide with its high nutritive value as human food beside its different medicinal uses.

The use of Moringa tree as an animal feed is not very common but the results of its chemical composition beside the absence of harmful objects, nominates it as a successful animal feed ingredient.

The objective of this note was to evaluate the nutritional value of different morphological parts of Moringa oleifera tree as animal feed.

## Materials and Methods:

**Samples collection and preparation**:

All samples were obtained from local private farm located in Khartoum State cultivating *Moringa oleifera* tree. The forage *Moringa oleifera* second cut was air dried under shade and ground for analysis. Leaves and stems were obtained from dried forage. Seeds, pods and flowers were obtained from full grown trees, air dried under shade and ground for analysis.

**Chemical analysis:**
The ground samples of leaves, stems, forage, seeds, pods and flower were analyzed for dry matter, ash, crude protein, ether extract and crude fiber according to AOAC (1980). Neutral detergent fiber (NDF) and acid detergent fiber (ADF) were determined according to VanSoest (1994).

**Degradability Study:**
Digestibility of the tested samples was done by weighing ground samples in triplicates on nylon bags and incubated in fistulated bull for 48 hours , after that the bags were get out, washed by running tap water, dried, weighed and digestibility was calculated as the dry matter degradation after 48 hours as follows:
Digestibility of dry matter (g/kg DM) =

$$\frac{\text{Dried wt. of incubated sample(g) - wt.of residue (g)}}{\text{Dry wt. of incubated sample (g)}}$$

## Results and Discussion:

The chemical composition of dry matter (DM), ash, crude protein (CP), ether extract (EE) and crude fiber (CF) and digestibility of different morphological parts of *Moringa oleifera* were presented in Table 1. As shown in Table (1) the crude protein contents varied between 97.1-348.0 g/kg DM. This wide range of protein content of different morphological parts nominates this plant to be a valuable source of feed for different kinds of animals such as poultry and ruminants.
The seeds had the highest contents of CP (348.0 g/kg DM) suggesting that such seeds could be used as a valuable source of protein. According to Van Nostrand, (1992), the fat content of the seeds, exceeded 1/3 of the total dry matter (388.0 g/kg DM) made resemblance to groundnut seed (35.54), lower in content compared to sesame seed ( 43-51 EE %) and sunflower seed ( 42-51 EE %) and higher than cotton seed ( 18-24 EE%) making it suitable for oil extracts.

Other morphological parts of *Moringa oleifera* like leaves, stem, whole plants and pods according to their moderate to high protein contents (71.2-267.9 g/kg DM) and high CF content ( 210.0 - 490.0 g/kg DM) elected them as a good source of roughage for feeding domestic ruminants for maintenance and production. Generally, in term of nutritional value of the above mentioned *Moringa oleifera* morphological parts made resemblance to barseem hay , Abu-70 , Philipsara and Clitoria (Suleiman and Mabrouk, 1999).

## Conclusion:

From the above mentioned results, the different morphological parts of Moringa oleifera can form a valuable source of animal feed putting in mind the adaptability of the plant to grow in different tropical areas and high growth rate beside low labor requirement.

**Table (1): Nutrient composition and digestibility (g/kg) of different morphological parts of Moringa oleifera.**

| M. oleifera | DM | Ash | CP | EE | CF | Digestibility |
|---|---|---|---|---|---|---|
| Seeds | 950.0 | 34.8 | 391.7 | 388.0 | 48.0 | - |
| Flowers | 892.5 | 112.1 | 314.8 | 68.0 | 170.0 | - |
| Pods | 940.0 | 97.1 | 71.2 | 20.0 | 490.0 | 430.7 |
| Leaves | 930.0 | 139.8 | 267.9 | 64.0 | 210.0 | 790.5 |
| Stems | 940.0 | 101.1 | 112.3 | 32.0 | 430.0 | 521.7 |
| Whole plant (forage) | 914.0 | 123.7 | 200.0 | 24.0 | 270.0 | 760.9 |

## Acknowledgement

The authors deeply acknowledged engineer Mr. Salah Abdoon for provision of *Moringa oleifera* tree. Thanks extend for the technical staff of the Department of Animal Nutrition Research for conducting the chemical analysis and finally all thanks are due to the financial support of Animal Production Research Centre (APRC)

## References:

Aney, J. S.; rashmi, T.; Maushumi K. and Kiran B. (2009). Pharmacological and pharmaceutical potential of Morina oleifera: A Review. Journal of Pharmacy Research 2:1424-1426.

AOAC (1980). Official Methods of Analysis. 9th edn. AOAC, Washington, DC, USA.

Hutchinson, J. and Daziel, M. J. (1966). Flora of Tropical Africa, Vol. 1, part 1. White Friars Press Ltd., London.

Mohammed, H. Y. (2009). The moringa tree and its role in desertification retardation and enviroment protection-Sudan. Case study of *Moringa pergrina*, Northern state. M. Sc. Thesis, University of International Africa.

Van Nostrand, R. (1992). The World Oilseeds Chemistry, Technology and Utilization. Anavibook, New York.

VanSoest P., 1994. Nutritional Ecology of the Ruminants. O & B Books, Corallis, Oregon, 374 pp.