THE JOURNAL OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

Journal homepage: http://www.journals.wsrpublishing.com/index.php/tjanrs

Online ISSN: 2383-238X Print ISSN: 2423-4397

**Original Article**

# The Role of Conserved Range Forges during Summer Season of Babanousa Area

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**How to Cite this Article**
Salih, E.M., Dosougi, M.A., and Abdelkreim, M. (2015). The Role of Conserved Range Forges during Summer Season of Babanousa Area. *The Journal of Agriculture and Natural Resources Sciences*, 2(3), 543-546.

**Article History**
Received: 8 Jun. 2015
Revised: 16 Aug. 2015
Accepted: 16 Aug. 2015

**ABSTRACT**

The cattle of the Messerya– nomadic tribes surrounding Babanosa (west Kordofan) usually suffer from shortage of grazing during summer time. The abundant forage production after the grazing Season (Autumn) encourages the conservation techniques as silage and hay which were used for ruminant in most parts of the world, so, the remaining range plants in the area especially *Zornia diphylla* can be harvested during the flowering stage and conserved whether as silage or hay to be used as feed for livestock during summer time.

**Keywords**: hay, silage, crude protein, crude fiber, dominant plant species. Relative frequency, density.



## INTRODUCTION

The improvement of the use of available forage to maximize animal production is important objective in livestock sector. The abundant forage production after the grazing seasons especially *Zornia diphylla* which was the dominant plant species at Babanosa area, encourages the conservation techniques as silage and hay which were used for ruminant in most parts of the world (Elnour, 2006). In the USA and Australia silage and hay are made during winter season because the snow usually covers the range vegetation. In Africa forage conservation usually is done during the rainy season to make forage available for livestock during the dry season or summer time (Darag, 1988).

### Silage Making

Silage is forage that result from storing green forage of considerable moisture content under an aerobic condition (Mustafa, 2000).

Storey (1968) reported that to get proper silage fermentation a proper an aerobic condition to inhibit the destructive wasteful activities of aerobic bacteria.

There are different ways for silage making, these are:

### A- The Normal Way

It is most common that fermentation of the forage carbohydrates will give rest to lactic acid that will cause the reduction in the silage PH.

**B- Direct Addition of Preservatives or Acids**

It is uncommon that certain chemical such as Sulphur dioxide and formaldehyde are used, (Mustafa *et al*., 2000).

Silage quality is measure of the effectiveness of the ensiling procedure, Different physical parameters are used to judge silage quality such as amount of less , relative palatability of silage, color texture and amount of foresight matter that are important to determine silage quality (Elnour, 2006).

**C- Major advantages of silage Making**

a- Availability of good quality forage for feeding the animals during lean period to ensure optimum livestock production.

b- Ensiling process is less dependent on weather fluctuation and if stored properly, it would conserve essential nutrients as efficiently as good quality silage.

C- The digestibility of the forage is improved due to partial break down of the structural carbohydrates, (Range management society of India, 1988).

**Hay Making**

Hay is defined as rough forage resulting as on outcome of drying green forage to moisture content of 15% or below.

It is a good source of energy and it is rich in protein, minerals and vitamins and easy to digest, when dried to about 80 – 85% dry matter which preserves most of its nutrients including carotene are called hay.

It is quantitatively and qualitatively important from both economical and nutritional point of view particularly in the tropical countries. Good quality hay provides a considerable proportion of the energy and certain other essential nutrients like carotene (Range management society of India, 1988).

The hay should look green, with good smell, moisture content between 10 – 15 %, high in protein and low in fiber (Mustafa *et al.*, 2000).

**There Are Different Ways of Hay Making, Those Are:**

a- Field drying under the direct sun. The forage is harvested, put in rows and left to dry 2 – 3 days. Later is bailed or directly stored.

b- Drying through free or heated air: fans to blow the free or heated air.

c- Artificial drying for a short period using high temperature: The forage is subjected to temperatures between 800– 1000C (Mustafa *et al.*, 2000).

There are various factors influencing the feeding value of hay. Some of the portent factors that influence the quality of hay are:

a- Forage species.

b- Stage of harvest.

c- Process of drying.

d- Extent of damage during hay making.

e- Leaf content of the hay.

f- Physical form in which it is fed to the animal, (Range management society of India, 1988).

## MATERIALS AND METHODS

For the analysis in order to investigate the crude protein and fiber, 10 quadrate samples were taken randomly.

The plants of the ten quadrates were harvested at a height of I inch and the ten samples were well mixed then randomly divided into two samples, one to be used for silage making and the other for hay making.

**Silage Making**

The harvested green forage (which resulted from the division of the mixed samples) was put immediately in a nylon plastic bag, and then it was well tied to prevent the air from entering to the forage so as to create anaerobic conditions. The tied nylon plastic bag is put upside down in another empty plastic bag so as to drop the solutions which come out of the green forage from the first nylon plastic bag. The period of the fermentation extended to more than six weeks, then forage was opened and dried by sun and air for three days and then milled.

Ten grams were used for the crude protein and crude fiber analysis which was done at the laboratory of College of Animal production (Khartoum University).

**Hay Making**

The other harvested green forage (the other half sample which resulted from the mixing of all samples), was dried by sun and air for more than six weeks, and milled. Ten grams were used for the crude protein and crude fiber analysis which was conducted at the laboratory of College of Animal Production (Khartoum University).

**Crude Protein Content**

The method used for determination of protein was the kjeldahl method for nitrogen.

The sample was digested by mineral acid, the solution rendered alkaline and the ammonia released is removed by distillation and collected in a measured quantity of sulfuric acid, the excess of which was filtered with a hydroxide solution.

**Crude Fiber Content**

The sample was defatted and treated successively with boiling of 0.125 M sulfuric acid and sodium hydroxide is 0.313M. The residue was separated by filtration, washed, dried, weighed and ached.

The loss in weight resulting from aching corresponded to the fiber present in the sample.

## RESULTS AND DISCUSSIONS

**Crude Protein**

The chemical analysis of *Zornia diphylla* for the silage indicated that, the crude protein was 11.403%. While it was 7.823% for the hay (Table1).

The reduction in the crude protein content in hay compared to silage in *Zornia diphylla* from 11.403 to 7.812 % respectively, may be due to the fact that as the crop is cut, change begins to occur in the crop, leading to eventual deterioration and loss. Sigh (1984) investigated loss of crude protein vitro true dry matter digestibility as affected by different hay making techniques, and concluded that the risk of loss varies to some extent with the stage of growth of the crop, the method of conservation and weather condition. Hongi (1980) attributed the loss of higher crude protein to the prolonged respiration process. Stoddart *et al.*, (1975) reported that as plant mature, the decrease is due to change in the stem – leaf ratios and the actual change in the composition within each plant part.

Range management society India (1988) attributed the decrease of crude protein in the forage is due to shattering and shedding of its leaves. They also concluded that drying weather influenced the loss of CP significantly.

**Table 1: the crude protein for the silage and hay**

| Conserved Forage | Crude Protein% |
|---|---|
| Silage | 11.403 |
| Hay | 7.812 |

**Crude Fiber**

The chemical analysis of *Zornia diphylla* for silage indicated that, the crude fiber was 30%, while it was 42% for the hay (Table 2).

The reduction in fiber content in silage compared with hay in *Zornia diphylla* from 42% to 30% respectively, may be due to the ensiling plants for more than two weeks which decreases C.F. content. Elnour (2006) reported that spraying paddy straw ensiling (plastic sheet) for two to three weeks decreases C.F. content to about 25%.

The increase of C.F. in hay may be attributed to the mechanical waste which might have happened to the leaves of *Zornia diphylla* during the process of hay making darag (1988), stated that during the drying process of hay making moisture content of the leaves of the plant reduces quickly in comparison to that of the stems.

**Table 2: the crude Fiber for the silage and hay**

| Conserved Forage | Crude fiber % |
|---|---|
| Silage | 30 |
| Hay | 42 |

## CONCLUSION

The leaves ore then lost more easily than stems. Thus, the hay loses several leaves as a result of the process of transportation and strong treatment and because of the high nutritive value of the leaves the produced hay is low in nutritive value.

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