THE MART/AZR PROJECT

HIGH ELEVATION RESEARCH IN PAKISTAN

Pakistan Agricultural Research Council

ARID ZONE RESEARCH INSTITUTE

Brewery Road, Quetta, Pakistan.

No. 16

FOURWING SALTBUSH FORAGE COMPARED WITH CONVENTIONAL FEEDS FOR YEARLING SHEEP

by

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1988

MART / AZR PROJECT RESEARCH REPORTS

This research report series is issued by the Management of Research and Technology Project/Arid Zone Research Component (MART/AZR). This project is financially sponsored by the Mission to Pakistan of the United States Agency for International Development (USAID).

The project contract is implemented by the International Center for Agricultural Research in the Dry Areas (ICARDA) and Colorado State University (CSU) at the Pakistan Agricultural Research Council's Arid Zone Research Institute (AZRI).

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ABSTRACT

Twenty-four yearling Harnai sheep were used to compare the palatability and nutritive value of the following rations : Fourwing saltbush, lucerne hay, and wheat straw plus barley grain. A palatability index showed that there was a continuous rise in uptake of all rations after the second day of feeding. By the ninth day, the fourwing saltbush palatability index was 98%. Weight gain data suggested that after the rumen microflora had adjusted to the fourwing saltbush, the animals maintained their body weight on this forage. During the last week there was a slight increase in body weight of sheep fed fourwing saltbush. This suggests that fourwing saltbush could be a useful plant for rangelands in Baluchistan, and could serve as forage reserve species to supplement natural vegetation.

INTRODUCTION

Rangelands are the major source of feed for the livestock of Baluchistan province (Nagy, et al., 1987). Range management seeks to ensure that the rangelands will continue to provide forage for livestock on a sustainable basis. However, the rangelands of Pakistan have an inherently low productivity due to environmental constraints and chronic overgrazing which has depleted the natural vegetation (Khan, et al., 1988).

Atriplex species, commonly known as saltbush, are strong candidates for introduction into degraded rangelands for increasing productivity in arid or semiarid regions of the world because of their high productivity and ability to establish under arid conditions (Kleinkopf, et al., 1975). These plants have been grown as forage shrubs on marginal agricultural lands in various regions (Goodin and McKell, 1970). Very promising establishment of Atriplex canescens has been demonstrated in upland Baluchistan (ICARDA, 1988). The present study was designed to determine the acceptability and nutritive value of fourwing saltbush when compared with other more conventional feed for sheep (lucerne hay and barley grain plus wheat straw).

MATERIALS AND METHODS

1. ANIMALS

Twenty-four yearling Harnai sheep of approximately the same age and weight were randomly divided into three groups of eight animals each, with four males and four females in each group. The study was conducted at the Animal Nutrition Unit, Arid Zone Research Institute (AZRI), Quetta.

2. FEEDING REGIMES

Each of the three groups of sheep was randomly assigned to be fed one of the following rations:

Ration A	:	Fourwing saltbush (600 g/day/animal)
Ration B	:	Lucerne hay (600 g/day/animal)
Ration C	:	Wheat straw (500 g/day/animal) + barley grain (100 g/day/animal)

Fourwing saltbush was collected daily from a saltbush stand growing at AZRI. Each animal was fed individually and the weights of daily feed consumed and refused were recorded. The feeds were available to the animals from 8 a.m to 4 p.m. The total feed intake was calculated on a dry matter basis. Animals were offered drinking water for 30 minutes after every two hours during the feeding period, and after that they had free access to water. The duration of the study was four weeks, during Feb. and March, 1988. The statistical design of the study was a 2x3 factorial with four replications.

3. OBSERVATIONS

The following data were recorded during the study.

a) Initial body weight of each animal.

b) Weekly body weight gain/loss of each animal.

c) Daily feed offered/refused by each animal.

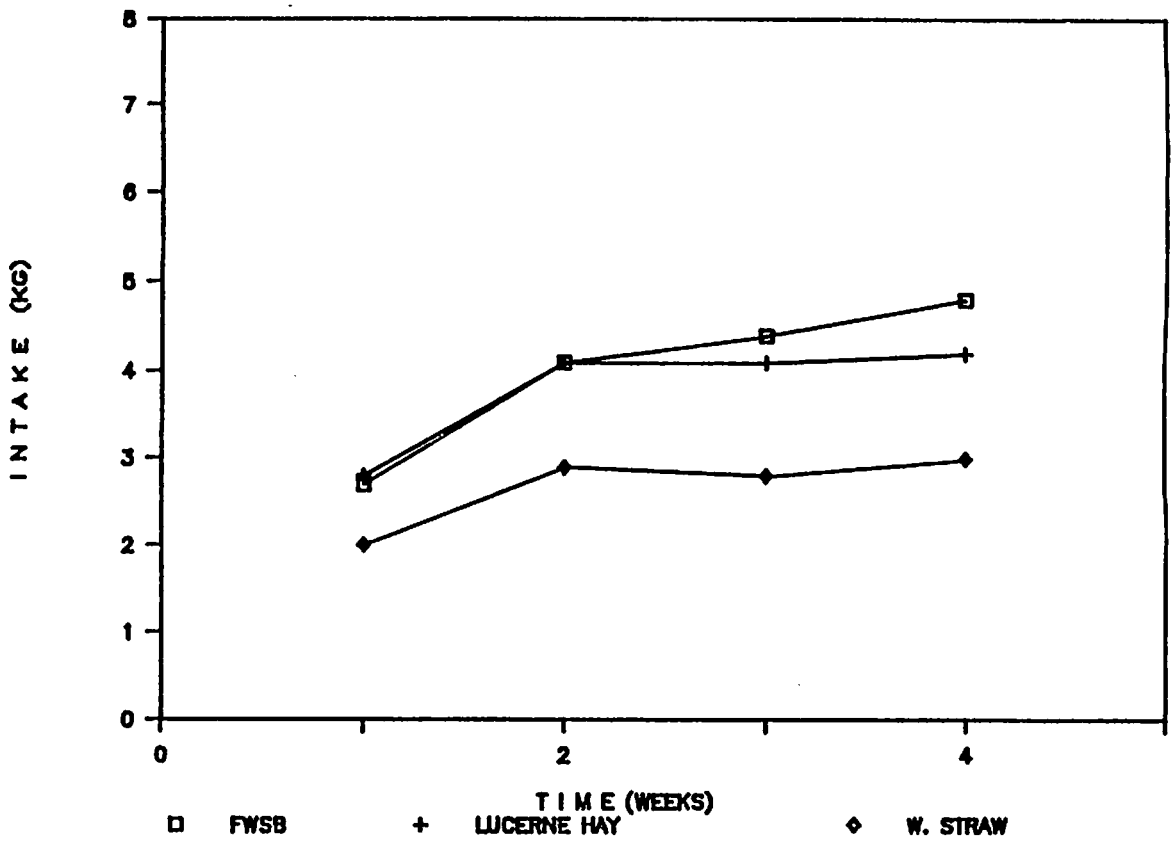
d) Palatability index. Calculated by the following formula:

$$\text{Palatability Index} = \frac{\text{FEED INTAKE}}{\text{FEED OFFERED}} \times 100$$

RESULTS AND DISCUSSIONS

Data summarised in Table 1 indicate the change in palatability index over time for the different rations. There was a continuous rise in uptake of all rations after the second day of feeding. By the ninth day the palatability index became almost stable at 99%, 98% and 69% for lucerne hay, fourwing saltbush and wheat straw + barley respectively. Figure 1 shows the trends of the animals' acceptance of the different rations, expressed as weekly uptake. Data in Table 1 show that the sheep were consuming about 90% of the fourwing saltbush and lucerne by the sixth day, but less than 60% the wheat straw + barley ration. No difference in uptake was observed between the sexes. There was a drop in live weight under all feeding treatments at the end of first week (Table 2). At the end of two weeks

FIG. 1 WEEKLY INTAKE IN YEARLING SHEEP



the lucerne hay and wheat straw-barley grain groups had apparently started to regain some of their weight lost during the initial feed adjustment. The fourwing saltbush group showed a steady weight level from the initial drop to the end of the third week, then in the last week of the study started to gain in weight. The difference in weights for the three groups were significant at the end of three weeks ($P > 0.05$) and four weeks ($P>0.01$). Differences in performance of males and females were not statistically significant.

The drop in live weight in all groups at the beginning of the experiment was probably due to the adjustment of rumen microflora to the new feeds (Preston, 1986). There was an increase in weight after the second week when presumably the flora of the gut had adjusted. The uptake of every feed was very low in the first six days and this is likely to partially or completely account for the loss in body weight recorded during the first week. Data from Hyder et al., (1987) on the chemical analysis of Atriplex canescens grown under non-irrigated conditions indicated a crude protein content of 12.0% ± 1.5. Joseph et al,. (1987) also concluded that ruminants can be kept at a good level of nutrition for body maintenance on a diet of saltbush alone. total non-structural carbohydrates of 10.7% ± 1.5. The results of this study showed that fourwing saltbush could meet the maintenance requirements of sheep and goats. These

results are also in agreement with those reported by the National Research Council 1981, 1984, 1985 that concentration of crude protein (C.P) and digestible organic matter (D.O.M) in fourwing saltbush leaves exceeded the minimum requirements of cattle, sheep and goats in all seasons. Phosphorus was adequate in the spring but marginal to slightly deficient in other seasons. The stems were moderately higher in C.P., D.O.M. and phosphorus during April, but contained deficient levels of all three nutrients in summer, autumn and winter. In the present study no animal displayed any clinical or symptoms of ill health.

The results of this experiment show that fourwing saltbush forage was more palatable than the wheat straw plus barley grain ration. These results tend to agree with those of Fick, et al., (1973), and Benahmed and Dulphy, (1985) who reported that supplementing straw with barley grain only increases straw intake and improves the energy balance of sheep, but in contrast nitrogen intake is very small. Otherwise, the performance and productivity of the animals decline significantly when straw is the only source of forage because of its poor digestibility and low voluntary intake.

ACKNOWLEDGMENTS

The authors would like to thank Dr. R.S. Aro for his guidance in conducting this study and Dr. D.J. Rees and Dr. J.D.H. Keatinge for their assistance in analyses of the results and in the prepration of the manuscript.

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