Trials of Pistia stratiotes L. as animal feed

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INTRODUCTION

The scarcity of forage in West Africa during the dry season, and the availability of grasses of poor quality during the rainy season, are some of the greatest problems limiting ruminant production. Oladosu and Case (1) observed that the shortage of forage in the dry season encourages animals to eat toxic plants, thus further increasing mortality among the animal population. A search for an alternate feed or feed supplement would therefore be quite useful. A variety of low cost materials including *Eichhornia* (4), Tapioca spent pulp and dried activated sludge (2) are currently being used as feed supplement in animal production. Recently, Sharma and Sridhar (3) reported that the productivity of the aquatic weed *Pistia stratiotes* L. is very high in polluted waters and contains about 14 percent protein. Initial experiments using the plant as a feed for grasshoppers encouraged further studies with higher animals.

MATERIALS AND METHODS

Fresh plants of water lettuce (*Pistia stratiotes* L.) were collected from Oba Lake on the University of Ibadan Campus. The lake is about 700 m long and 135 m wide and receives a variety of organic pollutants. The floating *Pistia* plants were picked mechanically, and washed carefully and fed to animals. The various animals used were (a) adult cattle (white Fulani, Holstein, German Brown and N'dama and Holstein crossed with German Brown), (b) Sheep and goats (West African dwarfs and Red Sokoto goats), (c) horses, (d) pigs (Weaners and adults), and (e) albino rats.

The plant was presented as feed in various forms as follows: (a) whole fresh plant, (b) fresh plant mixed with grain ration at 5, 10 and 100 percent, (c) whole dried plant, and (d) dried plant mixed with grain ration at 5, 10 and 100 percent. The plant was dried in the sun for 2 to 3 days depending on the availability of sunlight. The plant whether fresh or dried was provided in chopped form only. The feeding trials were carried out over a period of about 3 months.

RESULTS AND DISCUSSION

The proximate composition of water lettuce as compared with some of the low cost feeds normally used in animal rations is compared in Table 1. It is fairly rich in organic matter, mineral content, crude fibre and crude protein. Feeding trials revealed that only pigs accepted the

TABLE 1. PROXIMATE COMPOSITION OF *Pistia stratiotes* L. AS COMPARED TO SOME LOW COST FEEDS SUPPLEMENTED IN THE REGULAR RATIONS.

Composition	*Pistia stratiotes* L.	*Eichhornia crassipes* (Mart) Solms	Dried activated sludge	Tapioca spent pulp	Ground nut cake	Yellow Maize
Organic matter, %	69.9	82.3	67.8	95.9	94.2	98.1
Ash, %	30.1	17.8	32.2	4.1	5.8	1.9
Crude protein, %	13.9	22.9	37.5	2.2	50.3	10.5
Crude fibre, %	21.9	18.3	9.8	14.4	5.0	2.3
Ether extract, %	3.2	2.1	6.0	0.3	5.8	3.8
Nitrogen free extract, %	27.8	a	a	79.0	33.2	81.5
Calorific value, K cal/g	3.8	a	a	a	a	a

a = Data not available.

plant. The weaners and the adults accepted the fresh plant as such and consumed both the shoots and roots. The pigs appeared clinically normal for several weeks. Cattle tried to separate the mixed grain ration from the dried plants. They were very selective even when only 5 percent of the plant was mixed in the ration. Herdsmen also revealed that cattle normally leave the plant ungrazed when feeding in swampy areas. Even rats refused to accept the plant, even though they were starved for 48 hours. They were noted biting the leaves at margins but discarded them. They were also selective like cattle, and used only maize and left the plant mixed in ration at 5 percent level. The likely reason for the animals to leave the plant as feed might be the odour which becomes more pronounced on drying.

Since pigs readily accept the plant, this aquatic weed which can be grown and harvested in polluted waters and sewage effluents, is likely to be a useful feed or a feed supplement. *Pistia* indeed is being used as an ingredient in traditional medicine in Nigeria and China, and it was also recorded that it was eaten by people during famine in certain areas (3). Further work on the removal of odour from the plant and the physiological effects on pigs when fed for longer periods is in progress.

LITERATURE CITED

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