

## RUMEN DIGESTION OF HAY (MEASURED WITH DACRON BAGS) BY CATTLE GIVEN SUGAR CANE OR PANGOLA HAY

E R Orskov<sup>1</sup> & F D DeB Hovel<sup>2</sup>

*Centro Dominicano de Investigación Pecuaria con Caña de Azúcar  
CEAGANA, Santo Domingo, R D*

Dacron bags containing chopped hay were incubated in the rumen of cattle given chopped whole cane or pangola hay. Dry matter disappearance was lower for the bags incubated in the rumen of the animals given chopped cane (60% vs 78% after 40 hr). These results demonstrate that the rate of fibre digestion can be one of the 1 limiting factors with cane diets.

**Key words:** Cattle, nylon bags, sugar cane, dry matter disappearance

One of the limitations of sugar cane diets may be the rate at which the fibre of the cane is broken down in the rumen. If this rate is slow, it would act as a constraint on the rumen turnover rate of cane fibre, and hence voluntary intake of sugar cane. It has long been known that sucrose can depress fibre digestion (Hamilton 1942) and the objective of the experiment described here was to compare the rate of digestion of a fibre source (hay), in the rumens of cattle given sugar cane or pangola hay,

### Materials and Methods

*Animals and diets:* Four Zebu bulls of about 2.5 years of age fitted with permanent rumen cannulas were used. Two were given chopped whole sugar cane (13°Brix by refractometer; 29% DM) supplemented with 9 g urea and 2.5 g ammonium sulphate per kg fresh cane (as a solution in water mixed into the cane at feeding). The other two bulls were given Pangola hay, This was about one week old, and had been made from young grass. In addition, all animals received 100 g/d of a salt-mineral supplement (50% rock salt and 50% dicalcium phosphate).

*Procedure:* The rumen digestion of chopped hay (poor quality hay from Scotland) was measured using dacron bags (Rodríguez 1968; Mehrez and Orskov 1977). About 10 g of the hay was weighed into a dacron (parachute material) bag measuring about 8 x 10 cm. The bag was closed and secured by a nylon drawstring. Four bags were introduced into each animal and anchored to the cannula by the nylon draw-string. One bag was withdrawn after 6, 15, 27 or 40 hr and thoroughly rinsed with water. The excess water was then squeezed out, and the bag dried at 65°. Dry matter loss during the incubation period was taken to be digestion.

---

<sup>1</sup> Rowett Research Institute, Bucksburn, Aberdeen AB2 9SB, Scotland

<sup>2</sup> Technical Cooperation Officer, Ministry of Overseas Development, London, UK

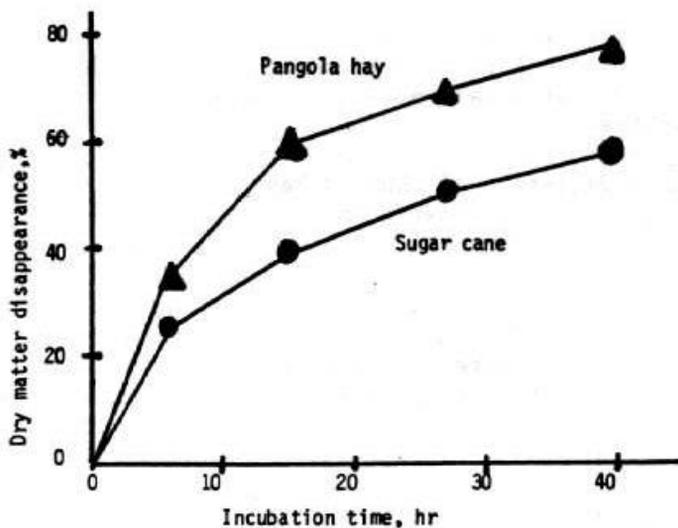
## Results and Discussion

The dry matter disappearance of the hay from the dacron bags is shown in table 1 and figure 1. Agreement between animals was good, and although no formal design was used, the results clearly demonstrate that the rate of digestion was lower in animals given sugar cane than in the rumen of animals given pangola hay.

Table 1:  
The disappearance of chopped hay from dacron bags in the rumens of cattle given chopped sugar cane or pangola hay

Diet	Rate of dry-matter disappearance, %			
	Chopped cane		Pangola hay	
Animal No.	1	2	3	4
Incubation, hr				
6	27	23	37	35
15	39	38	59	60
27	50	52	72	65
40	57	61	79	77

Figure 1:  
The rumen digestion (from dacron bags) of hay by cattle given chopped sugar cane (•) or pangolas hay (▲)



After 40 hr, 36% more material had disappeared from the bags in the rumen of the animals given hay than from those given chopped cane. Interpolation from figure 1 shows that whereas about 11 hr were required for 50% of the DM in the bags to disappear in the rumen of animals given pangola hay, about 27 hr were required in the rumen of the animals given chopped cane- 2.5 times as long.

It is concluded that one of the limitations with cane diets is the rate of fibre digestion.

#### References

- Hamilton T 5 1942 (Cited by Hungate R E 1966: *The rumen and its Microbes*. Academic Press; New York and London)
- Mehrez A Z & Orskov E R 1977 A study of the artificial fibre bag technique for determining the digestibility of feeds in the rumen *J Agric Sci Camb* 88:645-650
- Rodriguez H 1968 The in vivo bag technique in digestibility studies *Rev Cubana Cienc Agric (Eng ed)* 2:78-81

*Received 10 May 1978*