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SOME INDIGENOUS FEEDINGSTUFFS OF CEYLON

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THE shortage of feedingstuffs in Ceylon has drawn the attention of livestock owners to the feasibility of utilizing waste materials from human foods and other materials not normally fed to cattle.

The existing supplies of feedingstuffs in the Island, as reported by Wright (1), for the $1\frac{3}{4}$ million cattle population is less than 10 per cent. of their requirements. These are comprised of rice straw and coconut cake in the main with very small amounts of gingelly cake, rice bran and rice sweepings. At present the whole of the balance requirements have to be met from grazing and cultivated fodder crops. There are no established pastures as such to any appreciable extent and the grazing available is limited. The acreage under fodder crops in Ceylon is so small as to be almost negligible. This necessitates the introduction of new feeds to replace or supplement the existing ones. In the search for new materials the quantities available, their distribution, and the economics of their utilization must be borne in mind.

A number of agricultural wastes and other materials have therefore been analysed for their proximate constituents as a preliminary step in ascertaining the possiblity of utilizing some of them as feedingstuffs. It should, however, be clearly understood that these analytical data are no indication of the actual nutritive value of these materials. It has been found that materials of a very similar chemical composition may have widely different nutritive values due to differences in the digestibility of their constituents. Before recommending a feedingstuff, its palatability and nutritive value should be ascertained. It is also necessary to see whether there are any harmful effects caused on prolonged feeding. To determine the nutritive value the material has to be fed to animals under strictly controlled conditions and the digestibility of the several constituents determined. Thus only will an estimation of the digestible crude protein and the total digestible nutrients

or the starch equivalent of these materials be made possible. As, however, the chemical analysis of any feedingstuff is an essential preliminary to the securing of the data referred to, this data is published.

TABLE I

Cassava tubers.—It is not advisable to feed cassava tubers in the fresh state as there is the possibility of prussic acid (hydrocyanic acid) poisoning. In the dried form as meal—the fleshy portion sliced, ground down and dried it is used for fattening pigs. Halnan (2) states that it can replace up to 25 per cent. of the total concentrate ratio fed. Yields of 40 tons of tubers per acre (equal to 13½ tons of meal) have been obtained in Ceylon. In times of glut the excess may be converted into meal for feeding livestock.

Jak and Breadfruit.—These are carbohydrate foods but are poorer in protein than the cereal grains. The dry materials from these are similar to the corresponding fresh material when compared on a moisture free basis. Boiling in the preparation of the flakes has had no marked beneficial effect. Jak meal was fed to dairy cows at the Experiment station, Peradeniya, on a very small scale in 1934. It was found that when soaked in water prior to feeding, cattle ate it readily mixed with other feeds and also alone. The economic production of jak and breadfruit meal is not impossible when times are more normal. At present they are greatly in demand as human foods.

Plantain Cabbage and Red Pumpkin Leaves.—The very high moisture percentage with consequent low food nutrient contents, make these ill-balanced feedingstuffs. The availability of these materials is limited.

Saccharum arunidnacum and Saccharum Spontoneum.—These are coarse grasses not normally eaten by cattle. When compared with good pasture and fodder grasses the protein is low and the material is very coarse. Trials with saccharum spontaneum at the Indian Veterinary Research Institute, Izatnagar, showed that this could be fed without ill effects to cattle. The investigation was made in connection with " Famine Fodders " for India. It was recommended that this grass be utilized only in times of great scarcity.

Sugar cane tops.—The protein in this material is low as compared with pasture and fodder grasses. Sugar cane tops are fed to cattle in India when the cane crop is harvested. The nutritive value of sugar cane leaves in the dry condition has been worked out by Indian workers, *e.g.*, Sen (3) who has found that the digestible crude protein is nil and the starch equivalent is low. Experiments conducted at the Imperial College of Tropical Agriculture, Trinidad, showed that cane tops had a digestible crude protein content of 0·6 per cent. and starch equivalent of 11 to 14. The quantity of sugar cane tops available in Ceylon at present is small.

Mango seed kernel.—The kernels are rich mainly in carbohydrates and may be compared with acorns. It was found that over 75 per cent. of the kernels received were attacked by weevils. The better varieties seem to be more susceptible. With regard to the availability of this material, unless and until a mango canning industry is established the collection and transport of the seed will not be economic.

Ingasaman pods.—This material has a fair amount of protein but the collection and distribution may not prove economic.

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3. Sen, K. C.—The Nutritive Values of Indian Cattle Foods and the Feeding of Animals. I. C. A. R. Misc. Bull. No. 25.
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TABLE I

Analysis of Indigenous Livestock Feeding Stuff.

		Moisture. %	Protein. %	Carbo-hydrate. %	Ether Extract. %	Fibre. %	Mineral Matter. %	Calorific Value Per 100 gm.
1.	Cassava (Manioc) fresh	67·83	0·81	29·63	0·58	0·71	0·44	127· 0
	Cassava sundried or desiccated	12·90	2·18	80·24	1·58	1·91	1·19	343· 9
2.	Jak ripe (Waraka)	68· 8	1·81	27·54	0·29	0·65	0·91	120· 0
	Jak half ripe (Kos)	67·83	2·33	27·76	0·12	0·91	1·06	121· 4
	Jak half ripe (sundried) (Calculated)	12·58	5·77	76·50	0·30	2·23	2·62	331· 8
	Jak half ripe flaked (pulp and seed boiled and sundried)	12·96	6·48	74·96	0·40	3·16	2·04	329· 4
	Jak tender (polos)	86·45	1·78	8·89	0·47	1·65	0·76	46· 9
	Jak waste matter (without pulp and seed) fresh	89·12	0·62	7·83	0·12	2·12	0·19	34· 9
	Jak waste matter (without pulp and seed) dried	5·29	5·42	68·20	1·00	18·40	1·69	303· 5
3.	Breadfruit ripe mature edible	73·70	1·94	21·95	0·51	1·11	0·79	100· 0
	Breadfruit ripe mature boiled and dried (whole fruit)	7·68	4·22	71·87	0·89	12·45	2·89	312· 4
	Breadfruit ripe mature boiled and dried (edible portion)	8·46	4·20	78·27	0·20	6·73	2·13	331· 7
	Breadfruit ripe immature fallen	61·00	2·20	33·13	0·15	1·89	1·63	142· 7
4.	Plantain cabbage (undifferentiated core of stem)	95·00	0·21	3·93	0·03	0·74	0·09	16·18
5.	Red Pumpkin (tender leaves)	88·90	2·29	5·21	0·13	1·60	1·87	8· 7
6.	Fodder grass. Saccharum arnudinaceum young shoots 6-8 months	83·00	1·90	9·50	—	5·03	0·57	45·60
	Fodder grass. Saccharum old shoots 2 years	65· 7	1·16	22·48	—	10·33	0·39	94·56
	Fodder grass. Saccharum spontaneum 6 months	63·17	1·80	17·82	—	15·07	2·14	78·48
	Fodder grass. Saccharum spontaneum 1½ years	58·25	0·89	22·22	—	17·21	1·43	92·44
7.	Sugar cane tops (local)	77·20	1·49	13·12	—	6·23	1·96	58·44
8.	Mango seed kernel parrot variety	58·79	2·98	37·20	0·55	—	1·03	160· 7
	Mango seed kernel Jaffna variety	42·88	3·98	51·93	—	—	1·21	223· 6
9.	Ingasaman (Rain tree) Pods without seed	39· 0	6·82	38·92	0·92	12·72	1·62	191·24