

not been known to attack any other host under field conditions. The longevity records show that the parasites are fairly long lived and the egg laying capacity is not low as in other cases. The cocoons collected from the field as well as those reared at the laboratory give rise to a higher percentage of females than males. Moreover, the life cycle of the parasite is much shorter than that of the pest. All these considerations make the parasite a fairly efficient one in the control of the pest under South Indian conditions.

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STUDIES IN THE QUALITY OF CROPS II

Nutritive values of proteins of different varieties of Red gram (*Cajanus Indicus*).

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It has been shown in a previous communication by the present authors (1) in their work on *ragi* grains that different varieties of the same cereal possess different nutritive values. In this communication the nutritive values of different varieties of red gram obtained locally and from the hills are presented as determined by Mitchell's N-balance method. The technique of the experiments was the same as that used in a previous communication (1), and the diets were compared at 5% and 10% protein levels. Whole grains with the husk on, and *dhalls* prepared out of them by the local method of mixing the grains with red earth and pounding were analysed for their food values, and the results of those analysis, presented in Table IV. Marmite at the rate of 50 mg. per rat per day, and codliver oil at 4-5 drops per animal daily were fed to provide the necessary vitamins. The N content present in marmite was not taken into consideration while calculating the results. As usual it has been assumed that the variation in the values of endogenous N of urine and metabolic N of feces from the first to the final period is linear.

Discussion. The analytical data of the food values (Table 2) shows that the protein content of the local variety is decidedly higher than that of the rest. There are, otherwise, no marked differences in any of the other nutrients analysed for food value.

Considering the digestibility coefficient and biological values, it is found (Table 1) that the local variety has the highest digestibility coefficient and next to it comes the white variety, small, hill type. The black variety (hill type), is easily the worst of the lot both as regards digestive coefficient

and biological value, but it has a slightly higher protein content. The local variety is inferior to some of the hill types as regards biological value and the white variety (big) ranks first at both protein levels. A consideration of the net protein value which is an all important factor in deciding the relative nutritive values of foodstuffs shows that the local variety takes the first place by virtue of its high digestive coefficient and higher protein content.

TABLE 1. Total net protein values of the different red gram samples.

Variety of grain tested.	Protein content of gram on dry basis.	At 5% Protein level.		At 10% Protein level.			
		Digestibility coefficient.	Biological value.	Digestibility coefficient.	Biological value.		
	%	%	% cal value.	%	%	%	%
1. Black (Hill Type)	23.69	85.92	70.09	14.27	79.25	66.65	12.51
2. Brown (do.)	22.54	83.01	78.19	14.64	81.63	73.32	13.49
3. White (small) (do.)	22.53	89.10	80.57	16.17	84.51	75.25	14.33
4. White (big) (do.)	22.79	86.79	82.98	16.42	85.19	81.00	15.72
5. Brown (Local)	25.62	89.89	76.80	17.68	86.69	74.53	16.55

TABLE 2. Chemical analysis of the several red gram samples (Food analysis).

Serial No.	Heads of analysis.	Analysis of whole grains (with husk on).				Analysis of dhalls.					
		Hill Type. Black.	Hill Type. White (small).	Hill Type. White (big).	Hill Type. Brown. Local. (Brown).	Hill Type. Black.	Hill Type. White (small).	Hill Type. White (big).	Hill Type. Brown. Local. (Brown).		
1.	Moisture.	9.57	9.37	10.24	9.58	10.35	9.94	7.83	9.01	8.74	8.66
	Food value.										
2.	Ash.	3.98	4.45	4.11	3.92	4.17	4.09	4.21	4.19	4.03	4.19
3.	Crude Proteins	22.44	21.55	20.77	21.44	23.64	23.69	22.53	22.79	22.54	25.62
4.	Ether Extract	1.60	2.36	1.74	2.26	2.47	1.69	2.00	1.89	1.96	1.54
5.	Fibre	6.17	8.91	7.77	8.00	7.86	1.09	2.74	2.11	2.19	2.46
6.	Carbohydrates (by difference)	65.81	62.73	65.61	64.38	61.86	71.80	69.13	69.03	69.28	66.19
7.	Total.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
8.	Albuminoids	20.32	18.77	18.65	18.85	21.67	21.12	19.49	20.25	20.31	23.11
9.	Acid value (No. of mg. of KOH for 1 gm. of extract).	39.99	62.92	17.26	32.10	26.04	—	—	—	—	—
10.	CaO.	0.30	0.33	0.33	0.37	0.37	0.504	0.268	0.339	0.398	0.364
11.	MgO.	0.28	0.30	0.29	0.25	0.28	0.414	0.359	0.374	0.426	0.408
12.	K ₂ O.	1.98	2.09	1.99	1.96	1.96	2.03	2.15	2.03	2.01	2.01
13.	P ₂ O ₅ .	0.85	0.98	0.91	0.95	0.98	1.06	1.05	1.08	1.16	1.32
14.	N.	3.59	3.45	3.32	3.43	3.78	3.79	3.61	3.65	3.61	4.01

Apart from these differences there seems to be little to choose among the varieties.

The popular belief is that the local variety is more easily digested, and the data presented above would seem to show that the belief is to some

extent justified. Apart from chemical analysis and data collected by biological assay, it may be that the varieties behave differentially on cooking and have different flavour, both qualities that cannot be measured.

The biological values obtained for the local variety agree with those obtained by Niyogi *et. al.* (2) and confirm their observations.

Summary. Different varieties of Red gram obtained locally and from the hills have been compared for their relative nutritive values, and it is found that the local variety has a high protein content, and digestibility value.

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ECONOMICS OF WET AND DRY LAND CULTIVATION IN THE VIZAGAPATAM DISTRICT

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In Bulletin No. 40 of the Madras Agricultural Department on the economic condition of the ryot in the Vizagapatam district, and how to improve it", the net annual cash income from an average holding of about 5 acres supporting a family of 5 adults (2 children being considered equivalent to 1 adult) and consisting of both wet and dry land partly commanding facilities for well-irrigation was estimated at Rs. 137. Adding the value of food grains consumed, the total family income of an owner-cultivator works out to Rs. 237. To enable the productive capacity and the costs of cultivation of each kind of land to be judged, the economics of 5 acre holdings of wet and dry lands with and without a well, under normal cropping suitable for each, are now presented. Crop-var data were worked out in detail, as well as the cropping schemes, the cost of cultivation and the estimated yield from each kind of holding. A summary of the figures therefrom is given in Table I for ready reference and comparative study. The family incomes which a lessee manager (one who takes land on lease and cultivates it entirely with hired labour), a lessee cultivator (one who takes land on lease but cultivates it with as much of his family labour possible supplemented by hired labour), an owner-manager and an owner cultivator respectively, derive from each kind of holding are shown therein. The family income of a lessee manager represents the net business income, all cultivation expenses and the lease amount (interest on the value of the land plus other equipment plus assessment) being deducted from the gross value of the produce. The family income of a lessee cultivator will be the above,