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Varietal Differences in Protein, oil and Methionine Contents of Soybean

Soybean plays a Significant role in food systems as a source of supplementary and complementary protein. Whole soybeans are processed into a number of snack foods, beverages and fermented foods. Soy protein is an ideal supplement for cereal proteins since it corrects lysine and other amino acid deficiencies. Blends of soy flour or grits with cereals such as corn, wheat or sorghum are widely used in world feeding programmes. The inherent variability in the protein, oil and methionine content of fifteen soybean varieties has been studied and reported here.

All the varieties taken up for analysis were grown under identical conditions during Rabi 1979 in the Pulses Breeding Station of the Tamil Nadu Agricultural University,Coimbatore. The oil content was estimated by ether extraction, crude protein by Kjeldahl method and methionine by the method of Horn *et al* (1946). The crude protein and methionine were estimated in defatted samples and all the results have been expressed on moisture free basis.

The fifteen cultivars had a mean 100 seed weight of 10.76g. The seeds of the variety KM1 were very small and had the lowest 100 seed weight. The crude protein content of soybean seeds varied from 36.19 to 42.85 per cent, the average being 39.86 per cent. The coefficient of variation was very low (4.65%) for crude protein. The varieties UGM21 and UGM28 were found to have more than 42% protein.

The oil content of 15 soybean varieties ranged from 13.4 per cent in UGM26 to 22.0 per cent in UGM25. Four varieties (UGM22, UGM23, UGM 25 and Nimsoy 7) were found to have an oil content of more than 20 per cent. Various workers (Nishiyama, 1977; Rahman *et al*, 1977 and Rahman and Chowdhury, 1978) have reported that the oil content of soybean cultivars ranged from 17 to 23 per cent and crude protein from 24 to 45 per cent. In the present study of 15 soybean varieties a larger variation for oil and a narrower range for crude protein were observed. Hartwig (1979) has reported that there was a high negative correlation between oil and protein.

Methionine is the limiting amino acid in all logumes including soybean. Though the variety UGM23 had the highest methionine content of 1.56 mg/100mg protein it is much lower when compared with the methionine content of cereal grains and animal proteins.The methionine content showed the greatest variation (CV=36.32%) among the four parameters studied. Japanese workers Taira *et al* (1976) have observed a coefficient of variation of 97% for the methionine content of 110 soybean samples. According to them the methionine content was

negatively correlated with crude protein and 100 seed weight and crudep rotein was positively correlated with 100 seed weight. In the present study no significant correlation between any two parameters was observed.

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REFERENCES

HARTWIG, E. E. 1979. In Seed protein improvement in cereals and grain legumes Vol II. IAEA, Vienna pp. 59-66.

HORN, M. J., T. B. JONES and A. E. BLUM. 1946. Colorimetric determination of methionine in proteins and foods. *J. Biol. Chem.* 16. 313-26.

NISHIYAMA, K. 1977. Aspects of soybean cultivation in Brazil. *J. Trop Agric.* 20: 263-73.

RAHMAN, Q. N. and A. M. CHOWDHURY. 1978. Oilseed crops in Bangladesh: Proximate composition of several soybean varieties. *J. Sci. Ind. Res.* 13: 231-33.

RAHMAN, Q. N., A. M. GHOWDHURY. F. Z. MAJID and M, M. RAHMAN. 1977. Oilseed crops in Bangladesh 8. Botanical aud chemical studies of some foreign winter varieties of soybean. *J. Sci. Ind. Res.* 12: 125-28.

TAIRA, H., H. TAIRA. N. KAIZUMA, J. FUKUI and S.MATSUMOTO. 1976. Varietal differences of seed weight, protein and sulphur containing amino acid content of soybean seeds. *Proc. crop. Sci. Soc. Japan.* 45:381-93

100 seed weight, oil, protein and methionine contents of some soyabean varieties.

Variety	100 seed weight	Protein %	Methionine mg/100mg protein	Oil %
Co1	7 88	38.60	1.34	19.20
UGM21	11.57	42.85	1.10	14.24
UGM22	13.99	39.52	0.54	21.60
UGM23	16 82	36.30	1.56	21.20
UGM24	13 33	39 75	1.18	20.00
UGM25	8.08	41.47	0.79	22.00
UCM26	9.93	39.41	9.95	13.40
UGM27	8.74	40 21	1.17	18.80
UGM28	13.25	42.05	0.22	14.40
Punjab 1	12.17	40.21	1.29	19.60
KM1	5 54	36.19	0.91	17.80
Nimsoy 7	10.00	41.59	1.02	21.60
HILL	10.23	39.98	0.53	19.60
Hardee	9.99	40.44	1.22	18.40
PK257	9.94	39.41	1.43	19.80
Mean	10.76	39.86	1.02	18.78
SD	2.83	1.85	0.37	2.75
CV(%)	26.30	4.65	36.32	14.66