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Research Paper :

Quantitative analysis of proximate principles and trypsin inhibitor in mature and processed Indian soybean genotype

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ABSTRACT

The present investigation was undertaken to study and compare the changes in proximate principals and T_1 content in differently processed mature Indian soy genotypes. Proximate principals as moisture, proteins, carbohydrates, fat, ash, fibre and TI content were assessed in two Indian soybean genotypes *viz.,* NRC-37 and JS- 335 in mature and after applying simple processing technique (soaking, boiling, roasting and germination). Results of the study revealed that in NRC-37, forty per cent increase in protein was noted after germination. Lowest increase was noted in boiled soybean. In roasted soybean 13 per cent increase in fat was noted. In JS-335, maximum increase in protein was noted after roasting (37.3%). Twenty per cent increase in fat was noted after germination. Decline in T_1 content in NRC-37 was less (11.06 %) after soaking and maximum was noticed after roasting (93.80 %). Boiling reduced the TI activity to 82.87%. In JS-335 reduction in TI activity was more after boiling (86.69%). Soaking reduced TI content to 69.59%. Roasting of JS-335 reduced 80.36% of TI content. From the study it can be concluded that different soy genotypes have different proximate contents and also vary in their nutrient content after processing. Boiling and roasting reduced TI contents significantly and improved the digestibility of soybean.

Key words : Soybean, Proximate principles, Trypsin inhibitor, Processing technique

Soybean is one of the nature's wonderful nutritional gifts. It is considered as ''gold'' obtained from soil and is thus rightly called today the "Gold nugget of nutrition" owing to its nutritional composition (Singh *et al.*, 2001). India is the fifth largest producer of soybean. Soybean cultivation in India started long ago but its successful cultivation was increased over last two decades (SOPA Report, 2001, 2003). Soybean is one of the few plants providing a high quality protein with minimum saturated fat. In addition to being a rich source of nutrients, soybean has a number of phytochemicals (isoflavones) which offer health benefits along with soy protein .

Soybean contains anti nutritional factors which are heat labile. The content of these factors depend upon the variety of soybean. Trypsin inhibitors are used as indices of adequate processing of edible soy products. Through the use of appropriate processing technology of soy product developed in India can find wide use when popularized as nutrient-dense plant foods.

Soybean is considered to have a beany flavor. Digestibility problem has been noticed because of the presence of trypsin inhibitors. These anti-nutritional factors can be eliminated to a vast extent by application of various processing techniques such as soaking, boiling, roasting and germination etc. and the nutritional content of soybean can be made available to our body.

Thus, the present study will focus on assessing the nutritional quality of popular two varieties of soybean grown in Rajasthan and the effect of various processing methods on them. Keeping this in view, the present study was carried out with the following specific objectives :to chemically analyze and compare the proximate principles in two varieties of soybean, NRC-37 and JS-335, to find out the effect of various processing techniques (soaking, boiling, roasting and germination) on nutritive composition of NRC-37 and JS-335 and to find out the effect of processing on the trypsin inhibitor content of both the soybean genotypes.

METHODOLOGY

Two varieties namely, JS-335 and NRC-37 were selected for the study on the basis of popularity and recent yield. These varieties were purchased from Agriculture Research Station, Kota. Whole unbroken soybean free from infestations was selected for study purpose. The study was conducted in two phases.

Phase I: Analysis of proximate principles and trypsin inhibitor (Table 1):