

EFFECT OF GERMINATION AND HEAT PROCESSING ON PROTEIN, RIBOFLAVIN, VIT-C AND NIACIN CONTENT IN PEAS, COWPEA, REDGRAM AND WHEAT

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ABSTRACT

One obvious way to alleviate today's tragic problem of malnutrition and avoid possible catastrophic tomorrow is to stretch food supplies by improving the nutritive value of our food stuffs, cereals and pulses. By a large the people of Gujarat are vegetarian and solely depend upon these food grains for their nutrition and no systematic data are available on their pre and post germination nutritional status. Therefore it was proposed to undertake the detailed study on the pre and post germination nutritional status evaluation of some important food grains of Gujarat. The consumes seed of cereals like wheat (*Triticum aestivum*), and of pulses like peas (*Pisum sativum*), cowp (*Vigna catjang*) and redgram (*Cajanus cajan*) were selected for the study. Protein, riboflavin, vitamin C and niacin contents of selected pulses were estimated after four different treatments among first was raw sample, second was soaked for 8 hours in water and germinated for 28 hours, third was germinated and oven dried at 60°C and fourth was germinated and pressure cooked for 15 minutes. It was found that germination increased the protein, riboflavin, vitamin C and niacin contents in pulses while heat treatment decreased the protein and water soluble vitamin contents of germinated pulses.

Key words : Wheat, Pea, Cowpea, Redgram, Water soluble vitamins, Heat processing.

The pea (*Pisum sativum*) is a legume with great nutritional potential due to its high protein content and it has been suggested as an alternative protein source to soyabean in countries where the former legume is not a native crop or in situation where soyabean cannot be used due to allergic reactions or intolerances (Davidson *et al.*, 2001). However, the potential benefits might be limited by the presence of antinutritional factors, including trypsin inhibitors activity (TIA) (Urbano *et al.*, 2003; Vidal *et al.*, 2003). Phytic acid and α -galactoside oligosaccharides (Urbano *et al.*, 2003; Vidal *et al.*, 2002) with the aim of improving the nutritive value of legumes, preparation techniques have been developed to significantly raise the bioavailability of their nutrients. Such techniques include germination, a complex metabolic process during which the lipids, carbohydrates, and storage proteins within the seed are broken down in order to obtain the energy and amino acids necessary for the plant development. (Ferreira *et al.*, 1995, Jachmanin *et al.*, 1995; Podesta and plaxton, 1994; Ziegler, 1995), germination also affects the antinutritional factors of the legume, although there is some disagreement as to the ultimate consequences because

the effect depends on the type of legume and on the conditions and duration of the germinating process. Ekpenyoung and Borchers (1980) suggested that cooking improves flavor, increase tenderness and weight of winged beans. Ghorpade *et al.* (1986) worked on cooking of horsegram. They reported that heat at 80°C has no effect on trypsin inhibitor in horsegram meal. However, autoclaving of such meal at 120° C at 15 lbs pressure destroyed the trypsin inhibitor completely. Many scientists (Abdel- Rahman, 1983) have contributed on the changes in the vitamin content during germination process as vitamins play significant role in growth and development. Keeping in a view, the consumed seeds of cereals like wheat (*Triticum aestivaml*), and of pulses like peas (*Pisum sativum*), cowpea (*Vigna catjang*) and redgram (*Cajanus cajan*) of Gujarat were selected for the study. The nutritional status was studied by chemical analysis. The parameters studied were protein, riboflavin niacin and ascorbic acid.

METHODOLOGY

For the present study the selected grains wheat, peas, cowpea and redgram were purchased from the open market. Analysis were carried out to evaluate nutritive status of germinated pulses followed by heat processing