1. INTRODUCTION

It is well recognized that there are many countries all over the world suffer bitterly from plant protein and / or animal protein deficiencies to an extent that it leads to a dangerous nutritional problems. Food scientists as well as the food security concerned authorities either at the national or international levels always seek for specific solutions to narrow the animal protein deficiency gap. One of the principal solutions is to compensate the deficiency in animal proteins with high nutritional quality vegetable proteins. Legumes were found to be one of the most attractive and practical solutions to replace animal protein in food preparation and to narrow such protein deficiency gap **(El-Reffael, 1998).**

Legumes serve as the main source of protein and calories in many tropical and subtropical areas of the world. Dry legumes and their products are the richest of food protein from plant **(Deshapande *et al.,* 1983 and Sathe *et al.,* 1984). Thus,** legume flours have been used to fortify many products to improve their nutritional values **(Mc Watters, 1990).**

The main antinutritional substances are various alkaloids of the quinolizidine group. Nevertheless, it is known that quinolizidine alkaloids effect the nervous system, and in humans can cause disturbances (Schmidlin — Meszaros, 1973). But German plant breeders in 1920 produced the first selections of alkaloid -free of sweet lupin, which can be directly consumed by human **(Hudson, 1979).** The pharmacological effects of all quinolizidine alkaloids have not been completely elucidated **(Keeler and Gross, 1980). The major alkaloids are lupanine,**

isolupanine, hydroxylupanine and sparteine (Blaicher *et* **1981).** Many lupins have high levels of alkaloids (bitter tasting compound) that make the seed unpalatable and some times toxic. Historically, lupin alkaloids have been removed from the seed by boiling for half hour, then steeped in running water for 3 days **(Rahma and Narasinga Rao, 1984).**

Supplementation of spaghetti with lupin flour improves colour, appearance and cooking qualities, while enhancing protein efficiency ratio and biological value. Lupin flour can successfully replace 5-10% of the wheat flour in noodles and can be used in the production of imitation milk. Alkaloid-free lupin meal can also be included in the preparation of products such as soups, purees and creams for human consumption **(Oliva and Ballester, 1984).**

Sweet lupin could be used as a source of protein especially is lower in antinutritional factors and would not need to be heat treated since trypsin inhibitors, haemaglutinnins are practically absent **(Schoeneberger** *et al.,* **1983 and Matthews, 1989).**

Functional properties of any protein material are very important and helpful in orienting such protein to the right application. Functional properties of several different species of Lupinus have been reported in literature. Sosulski *et al.* **(1978)** and **Sathe** *et al.* **(1982)** studied the emulsifying and solubility properties of protein isolate prepared from lupin seed flour.

The process conditions of protein isolate from lupin seed are properly handled its possible, with different functional properties depending on the use of isolate would be given i.e., incorporated into milk substitute formulation for nutritional purposes where high solubility is required or as additive in different food systems where water absorption binding and gelation are important (King ***et al.,*** 1985). Lupin could be used as a source of protein or fiber and for supplementation in existing or new products. Lupin can also be used in bread making, biscuits, pasta products and a variety of other food products **(Hill, 1986 and Mohamed and Rayas,** 1995). The interest in utilization of lupin has increased worldwide, with Australia emerging as a major advocate. New markets in Australia for lupins being considered for human foods as well as animal feed **(Hough and Jacobs, 1994).** Also, the products containing full - fat toasted lupin flour are now on Sale in Belgium, Holland and Germany **(Feldheim, 1998).**

Chickpea is consumed as whole seeds or dehulled. Chickpea flour, also known as besan in India, has been added to wheat flour (up to 20% replacement) to produce acceptable quality bread **(Naikare and Kadam, 1985). Cooking,** germination, composite flours and preparation of a variety of snack products are some of the ways of processing this bean for human consumption. High protein foods using low fat groundnut flour, chickpea flour and fish flour have been developed **(Salunkhe and Kadam, 1989).** Fermented foods prepared from chickpea flour include dhokla, khaman and dosa and these products are popular in the Indian subcontinent. Typically, dhokla is prepared by soaking the chickpea flour in water containing 25% buttermilk (12 h at 32°C).

Chickpea flour can be used to enrich cereal flours without impairing flavour, baking quality and the like in preparation of bread, cookies and tortillas **(Hernandez and Sotelg, 1984 & 1987). Ulloa** *et al.* **(1988)** have prepared a chickpea - based concentrate for infant feeding formulas. The nutritional value of this was enhanced by supplementation with methionine and its digestibility was significantly higher than raw chickpea.

In countries of North, Central and South America, *P. vulgaris* is by far the most commonly consumed grain legume. In Africa and Asia the most commonly consumed legumes are species of the genera Dolkhos, Vigna and Cajanus whereas in the Middle East, it is species of the genera Pisum and Vicia. In these countries dry beans provide a major fraction of the daily protein intake of millions of low and moderate income families according to **(Sgarbieri, 1989).**