CHAPTER – 1

INTRODUCTION

The continuous health consciousness and enthusiastic availability of information on effectiveness of diverse diet with their direct relationship to health are progressively increasing the demand of nutritious foods in their regular diet. The concept of consuming partially processed and functional foods include the beneficial effects on host health and reduce the risk towards onset of chronic diseases beyond providing the basic nutritional functions. Increasing attentiveness of end users health and interest in nutritional foods to achieve a healthy lifestyle has resulted in the need for the development of food products with innovative and versatile health promoting characteristics (Das et al., 2011). Changing patterns in food production, processing, distribution and to present before the end user have paved the path of novel challenges before the food engineers. Cereals, pulses, fruits, vegetables, milk and oil are the basic and accepted ingredient for the vegetarian populations in their staple diets as the important nutraceuticals and phytochemical sources.

Paddy (*Oryza sativa* L.) is a widely cultivated cereal crop has witnessed production in India more than three folds increase in past 50 years and contributing more than one fifth of total paddy production in world (FAO, 2013). The diversities among cultivars existed for kernel size, shape, cooking, color, flavor, milling, nutritive value and their ability to make different rice products. Apart from calorie and protein, rice being staple food also supply to some extent vitamins and minerals in the poor-man’s diet. Brocken rice is a valuable byproduct of rice milling industry. Price as well as the utilization problems has been often faced by the associated
entrepreneurs in disposing off their produce. Broken rice may thus be better source of nutritive starch as the quality of rice protein which surpasses that of wheat, which is hypoallergenic and contains good quantity of lysine and thus considered as suitable ingredient for various food formulations (Prasad et al., 2010a; Prasad et al., 2010b; Burks and Helm, 1994; Gurpreet and Sogi, 2007).

India ranks second in the production of vegetables in the world. The utilization of vegetable proteins continued to attract attention globally due to the increasing demand for cheap and affordable dietary nutrients especially proteins and particularly among the low income group to combat the protein energy malnutrition problems (Singh et al., 2012). Use of dehydrated vegetables is also preferred by the people due to presence of dietary fibre, antioxidant and phyto-chemical of physiological properties (Suvarnakuta et al., 2005; Prasad and Sharma, 2012). Dehydration of vegetables seems to be convenient alternative for long term storage as compared to other storage practices. The quality of dehydrated vegetables is affected by responsible controlling parameters as well as chemical constitutes concentration with the presence of associated enzymes and applied preprocessing treatments. Dehydrated vegetable products have been utilized for the preparation of various food preparations in all over the world (Suman and Kumari, 2002). The pre-treatments and methods of dehydration have been reported to influence the quality of dried products (Kulkarni and Govindene 1994; Waghmore et al., 1999; Krokida and Maroulis, 2001), which may further affect the characteristics of the instant soup mix.

The use of oil blends with recommended degrees of unsaturation as per American Heart Association (AHA) recommendation may further result in a blend that may be more stable with the added leafy vegetable supplemented product having associated with enhanced antioxidant activities. The oil blends also stay clear and
unaltered for a longer period of time (Mahmoud et al., 1996) thus may be beneficial for the use in the desired product. Blended fats or oils are often referred to as a new generation fat that can be considered as nutraceutical foods or part of foods that provide medical or health benefits beyond supplying the basic nutrients, including the potential for prophylactic and/or curative measures in combating certain diseases (Singh et al., 2014; Akoh, 2002).

The traditional prevalence of rice gruel (Marr) before the implementation of steam cooking of rice has been noticed. The rice gruel is provided to the children with tea-spoon full of ghee (butter oil) and pinch of salt and spices for maintaining health, mostly prevalent practice often observed in remote villages even now a days in India. Various types of societal reforms and development led the people to depend on the processed foods. The availability of processed foods in refined form further reduces the availability of some vital nutrients and thus leads to various types of physiological disorders. Present scenario of industrial development, changing food habits and availability of refined processed foods hinder the major challenge of providing the nutritional and complete diet before the masses in order to combat the existing nutritional problems associated mostly with the underdeveloped and developing nation like India. As soup is consumed before almost every meal, so the concept for the development of instant vegetable soup can be considered as the potential nutrient vehicle to meet the aforesaid challenge. Moreover, the vegetable based instant soup may thus be considered as the noble food product for all sections of society especially supportive to the vegetarian based population like India.

The ingredients plays vital role in deciding the quality characteristics of any food products including instant soup. The optimization of ingredients level concerning to the cost and nutritional characteristics thus be considered essential
while developing any recipe. Response surface methodology (RSM) is a statistical procedure frequently used for optimization of complex processes as it simultaneously evaluates the associated interactive effects of independent variables (Montgomery, 2000). This technique has been successfully used in the optimizing food and allied products and processes (Badwaik et al., 2012; Kukreja et al., 2001; Kumar et al., 2008; Kumari et al., 2009; Prasad and Nath, 2011; Prasad and Nath, 2002a; 2002b; Prasad and Sharma, 2001a; 2001b; Prasad, 2009; Sharma et al., 2003; Sridhar et al., 2001). At the same time special reference may also be explored for the prevalence of associated therapeutic aspects.

Only very few published information is readily available regarding the instant vegetable soup; hence there had been an urgent need for the research work in this noble aspect. It is essential that scientific and traditional knowledge should go together to find mutually beneficial results. Keeping all these aforesaid information in view, the attempts were made to formulate the instant vegetable soup mix, which provide the masses not only the variety of soup in their diet but also provide balanced nutritional diet on association with the outcome of the present research investigation undertaken with the following objectives:

1. To study the characteristics of long grain paddy varieties as affected by level of processing.
2. To study the effect of grinding methods on flour characteristics of milling susceptible rice variety.
3. To develop shelf stable quick cooking carrot, peas and drumstick leaf powder to be used in instant soup mix.
4. To optimise the levels of ingredients (Rice flour, vegetable and oil blend) using response surface methodology (RSM) for instant soup mix.
5. To study the engineering characteristics, cost analysis and reconstitution behavior of optimized instant soup mix.