



## Original Research Article

### Production and Optimization of Meat Protein Based Health Beverage

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#### ABSTRACT

##### Keywords

Chicken  
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Papain,  
Beverage,  
Nutritional  
Content

Meat contains a large amount of protein, vitamins and minerals and it is more beneficial to the body as the need for nutrients is an important one for the body. The present study aimed to obtain the meat protein based health beverage through the various process. The protein is extracted from chicken breast meat by using the papain enzyme and extracted meat protein powder utilized for proximate analysis of moisture, ash, protein and fat. The result obtained 13.2g, 3.8g, 26.4g and 10.1g respectively. The meat beverage prepared using different concentration of meat protein such as 20g, 30g and 40g in 100 ml. Among these the 30gram of meat protein powder concentration was seen to be very excellent compared to other concentration levels by sensory evaluation.

#### Introduction

Meat is a rich source of nutrients which human nutrition often lacks and important source of essential amino acids, vitamins, minerals and also long chain polyunsaturated fatty acids (Keith *et al.*, 1986). Moderate intake of lean meat enables easier composition of balanced diet. On the other hand, excessive meat intake supersedes from the diet foodstuffs which supply dietary fibers, vitamins, and also non-vitamin antioxidant active substances and minerals (Polly *et al.*, 2005). Not meat itself but imbalanced nutrition with too much fat and saturated fatty acids and deficient intake of  $\omega$ -3 fatty acids, antioxidant vitamins and phytochemicals, minerals and dietary fiber present a risk for the development of cardiovascular disease

and cancer. Because of its distinct and high nutritional value meat preserves its role in a rational human nutrition. A beverage is a kind of liquid which is specifically prepared for human consumption. There are many groups for drinks. It can be divided into various groups such as plain water, alcohol, non-alcoholic drinks, soft drinks (carbonated drinks), fruit or vegetable juices and hot drinks. In addition to fulfilling a basic need, drinks form part of the culture of human society (Blandino *et al.*, 2003). Human requirements for protein have been thoroughly investigated over the years (FAD/WHO 1985) and are currently estimated to be 55 g per day for adult man and 45 g for woman. (There is a higher requirement in various disease states and conditions of stress) so the development of protein based beverage may be simple and

economical way of improving their nutritive value, sensory properties and functional qualities.

## **Materials and Methods**

### **Procurement of sample (chicken breast meat)**

The fresh chicken breast meat (1 Kg) is purchased by retail meat shop in Redhills and then the meat packed with in polyethylene bags and transported in insulated, refrigerated containers to laboratory under hygienic conditions. The whole chicken meat is washed thoroughly with sterile water and then it is deskinning and deboned with hygienic handling of meat. After that the meat is cooked for 10 minutes.

### **Enzymatic preparation of meat protein powder**

The protease enzyme of papain is prepared by dilution about 25g in 100 ml in distilled water. Then the cooked meat is added with papain enzyme at the concentration of 1:30 (enzyme nitrogen to protein nitrogen) and the temperature is maintained at 55°C in the reaction vessel during the hydrolysis and maintained optimal pH 6.5 for 15 min with vigorously stirred.

After that it is placed into the boiling water bath at 90°C in order to inactive the enzyme for stop the reaction of hydrolysis in the vessel. After inactivating the enzyme the liquefied meat protein concentrate is spread on the sterilized tray, filtered, centrifuged and dried in vacuum to get the fine hygroscopic powder. Finally the dried meat protein powder is pulverized and packed and it can be incorporated in food preparations like soups, beverages etc. as a protein supplement (Apinya *et al.*, 2005).

### **Proximate analysis of meat protein powder**

The methods of the Association of Official Analytical Chemist (AOAC, 1990) were used for determination of moisture, ash, protein and fat content of the meat protein powder. All the determinations were done in duplicates. 5g, each in duplicate was used for determination of moisture content by weighing in crucible and drying in oven at 105°C, until a constant weight was obtained. Determination of ash content was done by ashing at 550°C for about 3h. The kjedhal method (AOAC, 1990) was used to determine the protein content by multiplication of the nitrogen value with a conversion factor (6.25). The lipid was done by soxhlet extraction method (AOAC, 1990).

### **Preparation of meat based beverage (soup)**

Take a hygienic and wash chicken bones and cut into small pieces. Then place the chicken protein powder in a deep pan in different concentration likewise 100ml of soup contains 20g, 30g and 40g of meat protein powder respectively. After that add 2liter water, onion, chopped garlic, ginger, and bring it to a boil for half an hour. Strain and keep aside. Heat the oil in a pan and put the spice mixture and mashed tomato, cook for a minute on a slow flame and then add black pepper powder and salt. Bring it to a boil and serve (Crowley *et al.*, 2005).

### **Sensory analysis**

These types of tests supply information about people's likes and dislikes of a product. They are not intended to evaluate specific characteristics, such as crunchiness or smoothness. They are subjective tests and include hedonic, paired comparison and

scoring. 9-point-scale is used for the sensory analysis of Meat protein based beverage (Childs *et al.*, 2007).

**Results and Discussion**

The cooked meat were subjected to preparation of meat protein powder using enzymatic hydrolysis by Apinya *et al.*, 2005 method and totally 100gram of protein obtain from 400gram of fresh chicken meat. The result obtained Meat powder were subjected to proximate analysis for detection of moisture, ash, protein and fat was 13.2g,

3.8g, 26.4g and 10.1g respectively (Table 1). In these results totally 26.4gram of protein was present in 100 gram of meat powder also present in significant amount of minerals and fat.

The meat protein powder based Soup was prepared by different concentration such as 20, 30 and 40gram of meat protein powder in 100ml of soup (Fig 1). Among these the 30gram of meat protein powder concentration was seen to be very excellent compared to other concentration levels by sensory evaluation (Table 2 and Fig 2).

**Table.1** Analytical results of Animal meat protein powder

S. No	Properties	Results
1	Moisture	13.2g/100g
2	Ash	03.8g/100g
3	Protein	26.4g/100g
4	Fat	10.1g/100g

**Table.2** Sensory Analysis

Sample (Meat powder)	Colour and Appearance	Flavours	Taste	Texture	Over all acceptability
20g	9	8	7	8	8
30g	9	9	8	8	9
40g	8	7	6	7	7

Note: 9-Extremely acceptable, 8- Highly acceptable, 7-Moderately acceptable, 6-Slightly acceptable, 5-Dislike moderately, 4-Dislike slightly, 2-Dislike very much, 1-Dislike extremely.

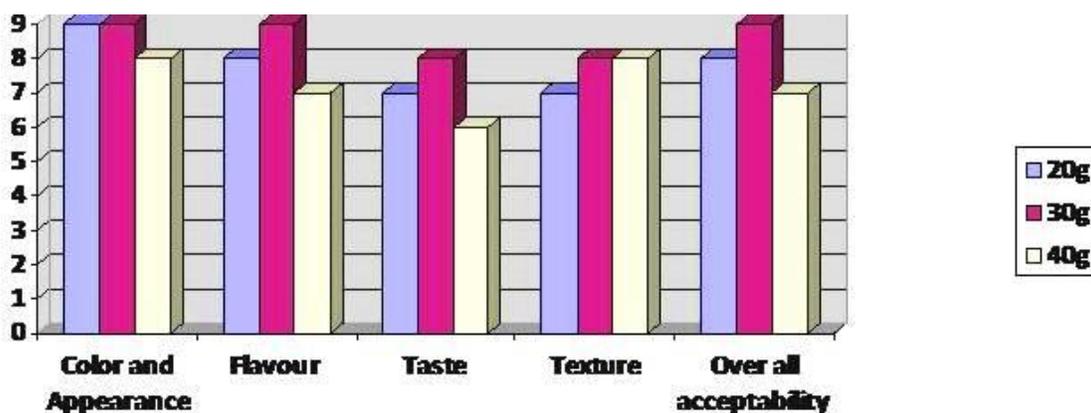
**Fig.1** Meat protein Powder



**Fig.2** Preparation animal protein beverage



**Fig.3** Sensory analysis



The healthy proteins in meat function as building blocks for bones, muscles, cartilage, skin and blood. They are also building blocks for enzymes and hormones. This is the attempt to produce a novel beverage from meat protein which is Nutritive, Healthy and also excellent to taste as Drink. In future the research will be focused on increasing its nutritive value, taste and making it available as ready to mix soup and future value addition of beverage to improve its shelf life by using modern food packaging technologies.

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