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Nutrient Analysis and Effect of Different Cooking Methods on Selected Recipes Incorporated with and without HVP

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ABSTRACT

Hydrolyzed vegetable protein is a natural flavor and taste enhancer used in a wide variety of processed food products. The flavor enhancers and taste enhancers are food additives commonly added to various food preparations to enhance the natural taste of the food products. The main purpose of incorporating hydrolyzed vegetable protein in most of the food products are because of its meaty and roasted flavor which is dark brown in color and appearance. HVP is produced by boiling cereals and legumes such as corn, wheat, rice bran and ragi in an acid medium and then neutralizing the solution with sodium hydroxide. It contains good amount of protein compared to the other taste enhancers and recommended usage level of HVP in products is two grams. Four recipes were prepared to study the effect of different cooking methods such as roasting, steaming, boiling and microwave cooking on recipes like yam roast, dumplings, sambhar, and paneer tikka incorporated with and without hydrolyzed vegetable protein were prepared and standardized to find the acceptability of the recipes among young adults. Fifteen subjects between the age group of 19-22 years were selected as panel members for testing the acceptability of the products using composite scoring cards in terms of color and appearance, texture, flavor and taste. Three trials were conducted to check the acceptability of the products. All the four recipes incorporated with HVP had high acceptance among young adults compared to recipes prepared without HVP. From the present study it can be concluded that the overall acceptability of recipes prepared with HVP was superior to recipes prepared without HVP. So it can be used as a natural taste enhancer alternative to the commercial taste enhancers.

KEYWORDS: HVP- Hydrolyzed vegetable protein.

INTRODUCTION

Food is the basic necessity of life which satisfies physiological and social needs of human being. Foods generally include cereals, pulses, vegetables, fruits, nuts and oilseeds, sugar, fats and oils which are categorized as energy giving foods, body building foods and foods for maintenance and protection (Seithi, 2000). Nutritional status of human being is achieved and regulated by consuming 'food', substances that supply nutrients to the body. Food contains all the essential nutrients. They are classified as macronutrients and micronutrients (Whitney, 2011). Food Proteins are large, complex molecules essential for the human body that plays many critical roles in the human and animal body system. There are two sources of protein being available to the body, protein from animal source and protein from vegetable source. Animal source includes all seafood, red meat, eggs and poultry where as protein from vegetable source includes pulses, beans, legumes, yoghurt, tofu and nuts (Pirie, 2012). Food additives are widely used as a taste and flavor enhancer in almost all the commercially prepared foods as well as in home made preparations using different sources of natural or synthetic additives. These food additives give a particular taste and flavor to the product which increases the acceptability of the food product. Proper selection of food additive from the wide range of naturally and synthetically derived ones, will impart good taste and flavor to the product. Taste is one of the traditional five senses. It refers to the ability to detect the flavor of substances such as food (Jones, 2005). Taste is sensed through the taste cells, which are known as taste buds. The sensation of taste can be categorized into five basic tastes: sweet, bitter, sour, salty, and umami. "Umami" is originally the Japanese word for meaty or savory flavor, it is a characteristic of many oriental dishes. The monosodium glutamate produces a strong umami taste (Lindemann & Berned., 2001). Hydrolyzed vegetable protein is a natural taste and flavor enhancer that is made from a combination of cereals and legumes like soy, wheat, corn, rice bran and ragi, it is used in a wide variety of processed foods and it is produced by the process of hydrolysis. According to the FAO, the recommended usage level of hydrolyzed vegetable protein products ranges from 0.5%-2% (FAO, 2006).

The present study was undertaken to study the standardization and acceptability of recipes incorporated with and without hydrolyzed vegetable protein.

The study was designed with following objectives:-

1. To analyze the nutrient content of hydrolyzed vegetable protein.
2. To study and standardize the effect of different cooking methods on selected recipes incorporated with and without HVP

MATERIALS AND METHODS

In the present study experimental research and sensory research design was used to determine the acceptability of recipes incorporated with and without hydrolyzed vegetable protein among young adults. Sensory research is used to evoke measure, analyze and interpret consumer responses to products, which they perceive using their senses of sight, taste, smell, touch and hearing (Kothari, 2004). The sample size of the present study was four recipes, such as yam roast, dumplings, sambhar and paneer tikka. These were prepared using different cooking methods to find the acceptability of the recipes incorporated with and without hydrolyzed vegetable protein among young adults. Fifteen subjects between the age group of 19-22 years were selected using purposive random sampling technique as the panel members for testing the acceptability of the products.

Nutrient Analysis

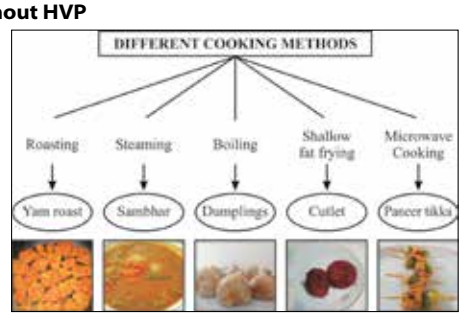
The nutrients present in hydrolyzed vegetable protein such as the carbohydrate content of the HVP is determined by calculating the percent remaining after all the other components have been measured, carbohydrate (100-%moisture-%protein-%fat-% mineral), protein (kjeldal), fat (soxhlet) and calcium (colorimetric) content of hydrolyzed vegetable protein were analyzed to find the nutrient content of the product using the standard procedures in the National Agro Foundation Research and Development Centre, Taramani.

Standardization of recipes

Standardization is the process of developing and implementing recipes using technical standards. A standardized recipe is one that has been tried, adapted and retried several times for use by a given food service operation and has been found to produce the same food to produce good results and yield every time when the exact procedures are used with the same quality and quantity of ingredients (Srilakshmi, 2003).The standardization of all the four recipes incorporated with and without HVP was done using standard measures of ingredients in the Foods Laboratory

of Clinical Nutrition and Dietetics Department, Ethiraj College for Women, Chennai. The standard amount of HVP used for the standardization of all the four recipes was two grams which imparted good taste and flavor. The testing instrument for acceptability is the panel of human judges who have been randomly selected to carry out the sensory evaluation. In order to avoid errors due to physical, psychological, environmental and individual characteristics, a panel of fifteen young adults were selected randomly between the age group of 19-22 years from Ethiraj College for Women, Chennai. The panel members were requested to avoid coffee and tea which will interfere with the correct organoleptic judgement. All the four recipes incorporated with and without hydrolyzed vegetable protein such as yam roast, dumplings, sambhar and paneer tikka prepared using different cooking methods were evaluated in terms of color and appearance, texture, flavor and taste on the basis of a composite score card. The score cards, which are an essential part of the sensory evaluation process, were designed carefully for each of the product so that it permitted the judges to transmit their assessment of the sample accurately on the paper. The score cards can act as a guide for the evaluation process. The score cards were clearly printed. The experimental data obtained were tabulated and analyzed statistically by employing statistical test namely paired't' test, standard deviation and mean.

Figure- 1 Selected recipes for acceptability test with and without HVP



RESULTS AND DISCUSSION:

The results obtained are presented under the following headings:

- Nutrient analysis of HVP
- Effect of Different Cooking Methods on Selected Recipes Incorporated With and Without HVP

Nutrient analysis of HVP

The nutrient content of HVP analyzed using standard procedures in the National Agro Research and Development centre, Taramani is given in table 1.

Table 1
Nutrient Content of HVP/ 100g

PARAMETERS	RESULTS	PROCEDURE
Moisture %	4.84	As per BIS Methods
Ash %	49.46	As per BIS Methods
Fat %	0.15	As per BIS Methods
Protein %(N x 6.25)	29.6	As per BIS Methods
Carbohydrate %	15.95	Calculation by difference
Sodium (mg/ 100g)	394	By AAS
Potassium (mg/ 100g)	362	By AAS
Calcium (mg/100g)	200	By AAS
Iron (mg /100g)	13.4	By AAS
Energy (Kcal)	184	By calculation

Table 1 revealed that the analyzed protein content of HVP was 29.6/100g obtained using the Kjheldhal method where as the fat content of HVP derived using soxhlet method was 0.15%/100g, and it contains no trans fatty acid and cholesterol according to the study done herta zieglar in the year 2007. The carbohydrate and calorie content of HVP was 15.95% and 184kcal/100g respectively. Being a taste enhancer HVP contains high amount of iron of about 13.4mg/100g and the sodium and potassium content of HVP was 394mg and 362mg/100g respectively which can be the reason for limiting the usage level to 2% (Andres., 2005).

Effect of Different Cooking Methods on Selected Recipes Incorporated With and Without HVP

Figure - 2

Comparison on acceptability of yam roast incorporated with and without HVP

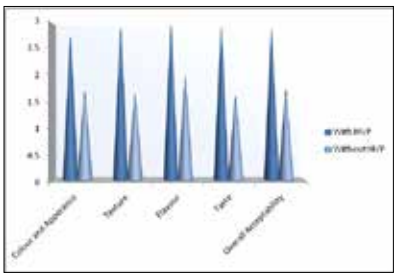


Figure 2 depicts the comparison of the mean values of yam roast incorporated with and without HVP for sensory attributes like color and appearance, texture, flavor and taste indicates that there was a significant difference at 1% level. The mean overall acceptability scores of yam roast incorporated with and without HVP were found to be 2.87 and 1.72, taking into account all the sensory attributes such as color and appearance, texture, flavor, and taste respectively. Based on the criterion for scoring of overall acceptability, it was evident that the acceptability of yam roast incorporated with HVP was found to be good compared to the yam roast without HVP

Figure 3

Comparison of the acceptability of dumplings incorporated with and without HVP

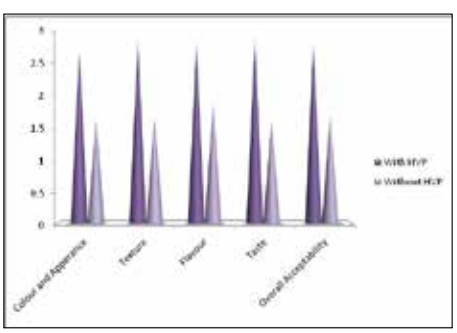


Figure 3 depicts the comparison of the mean values of dumplings incorporated with and without HVP for sensory attributes like color and appearance, texture, flavor and taste indicates that there was significant difference at 1% level. The mean overall acceptability scores of dumplings incorporated with and without HVP were found to be 2.86 and 1.71, taking into account all the sensory attributes such as color and appearance, texture, flavor, and taste respectively. Based on the criterion for scoring of overall acceptability, it was evident that the acceptability of dumplings incorporated with HVP was found to be better compared to the dumplings without HVP.

Figure 4 Comparison of the acceptability of sambhar incorporated with and without HVP

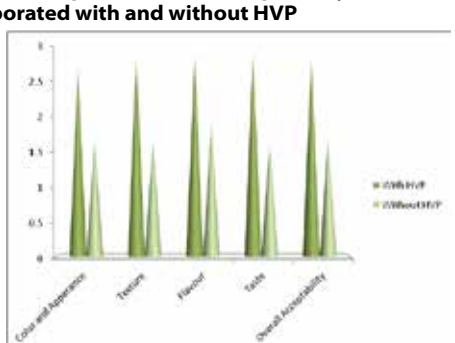


Figure 4 depicts the comparison of the mean values of sambhar incorporated with and without HVP for sensory attributes like color and appearance, texture, flavor and taste indicates that there was a significant difference at 1% level. The mean overall acceptability scores of sambhar incorporated with and without HVP were found to be 2.86 and 1.71, taking into account all the sensory attributes such as color and appearance, texture, flavor, and taste respectively. Based on the criterion for scoring of overall acceptability, it was evident that the acceptability of sambhar incorporated with HVP was found to be good compared to the sambhar without HVP.

Figure 5
Comparison of the acceptability of paneer tikka incorporated with and without HVP

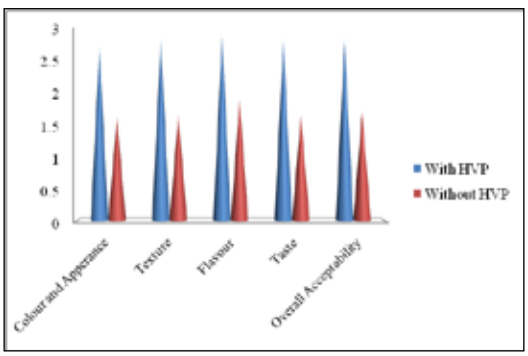


Figure 5 depicts the comparison of the mean values of paneer tikka incorporated with and without HVP for sensory attributes like color and appearance, texture, flavor and taste indicates that there a was significant difference at 1% level. The mean overall acceptability scores of paneer tikka incorporated with and without HVP were found to be 2.86 and 1.72, taking into account all the sensory attributes such as color and appearance, texture, flavor, and taste respectively. Based on the criterion for scoring of overall acceptability, it was evident that the acceptability of paneer tikka incorporated with HVP was found to be good compared to the paneer tikka without HVP.

CONCLUSION

The present and newly derived knowledge on the use of HVP as a food material along with the other ingredients, not only produces products that has good taste or flavor but provides better nutritional quality along with necessary attributes for consumer acceptance. All the four recipes incorporated with HVP had a better acceptability compared to recipes prepared without HVP. From the present study it can be concluded that HVP is a good source of protein and also the overall acceptability of recipes prepared with HVP was better. So it can be used as a natural taste enhancer alternative to the commercial taste enhancers.

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