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Development of Oyster Mushroom (Pleurotus spp.) Based Cookies: Nutritional Enhancement and Sensory Evaluation

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ABSTRACT

Mushroom cultivation is increasing day by day in Chhattisgarh as well as India and important dietary food for rural people. The protein nature of the cereal-based diet can be improved by fortification. Edible mushrooms are rich in protein, carbohydrate, minerals, other nutritive compounds. Value additions of mushrooms in the form of powdered, biscuits cake etc are one of sources that have incredible potential to fulfill nutrition demand. The present aim of the investigation was to develop oyster mushroom cookies mushrooms from locally accessible crude materials. Raw mushroom were cleaned in normal water and whitened with steam for 10 min and sliced it for uniform size and kept dry in solar dryer at 35°C for 8 hours. Prepared a composition of flour, rava, sugar, mushroom powder, milk powder, ghee, baking powder, baking soda, salt for making biscuits. Mixed all the ingredients and make dough, rolled it with the help of a rolling pin and keep it in the microwave at 170°C for 40 minutes. After this, It was cooled and kept at room temperature and kept it in an air tight container. The Biscuits was ready and sliced in uniform size in the form round and square shape for packaging. After analysis it was found that mushroom fortified cookies have high protein content, low fat content, high fibre, minerals and vitamin content which will be useful to overcome malnutrition problems.

Keywords :- Oyster mushroom (*pleurotusostreatus*), Cookies, Nutritional value, Sensory evaluation.

INTRODUCTION

Cookies form an important baked food widely consumed in western countries. Baked foods form the base for enrichment with various nutrients improving nutrition and quality. development of mushroom powder with its utilization for cookies formulation.

According to national family survey-4 37.7% children below 5 years of age in the state were suffering from malnutrition so made mushroom cookies so that malnutrition rate can b reduced in chhattishgarh if you see in oyster mushroom

In Chhattisgarh cookies are eaten a lot like refined flour cookies, wheat flour cookies, multigrain cookies and all kind of cookies. To make it more nutritious oyster mushroom are added so that children feel good in eating and they also get good nutrition. Cookies A sweet biscuit having a fairly soft, chewy texture and typically containing pieces of corn, coconut, chocolate, fruits. In many English-speaking countries outside North America, including the United Kingdom, the most common word for a crisp cookie is biscuit (Nelson Libby 2015).

Oyster Mushroom the fruiting bodies of *basidomycetous*fungi generally called *basidomata (basidiocarps)* have fascinated man since time immemorial and *"mycophagy"* (*i.e.* mushroom eating) has always been alternating since then(dr. R.P. Singh 2018). This has been because of their innate flavor and richness in high protein. There are richness in high quality protein, vitamin d and carbohydrate. They also contain an appropriate amount of minerals, lipids and folic acid.

Oyster Mushroom Cookies Baked foods form the base for enrichment with various nutrients improving nutrition and quality. Considering the short life of mushroom and its browning behavior on drying (Aishah M., et.al 2013). Development of mushroom powder with its utilization for cookies formulation. Cookies are a food for all sections of the people across the broad varieties and shape. Cookies are typically sold in bakeries and consumed at any time of the day (Hassan 2018). Mushroom flour is a gluten-free flour, which may benefit people with celiac disease, a condition in which the consumption of gluten can trigger the immune system in the small intestine and damage the intestinal lining, leading to malabsorption (prevention of nutrient absorption). Mushrooms can be dried and converted into powdered form, which can be used for fortification in baked products like bread, biscuits, etc (Singh et al., 2014).

OBJECTIVES

I. To identify the malnutrition people and cure through mushroom.
II. To value addition on mushroom and explore to their nutritive value.
III. To maintain formulation mushroom product for food security.

MATERIAL AND METHOD

Sample area - This study was conducted at Department of Food Processing and Technology UTD Atal Bihari Vajpayee Vishwavidyalaya Bilaspur Chhattisgarh 2021-22.

Sample size - We were selected 3 types of samples in which the first was taken refined flour cookies second wheat flour cookies and third multigrain cookies. They were fortified with oyster mushroom powder cookies.

Required material - oyster mushroom powder (p. ostreatus), Wheat flour, refined flour, multigrain flour, sugar, butter, milk powder, semolina (suji, rawa), baking soda, baking powder, salt, vanilla essence, microwave, weighing machine, measurement cup, spoon, bowl, etc.

Method - At first measure all ingredients according to recipe. Then crushing sugar to fine powder with a crusher. Then 5g amul butter, until it turned into cream. Then add 200g refined flour, wheat flour and multigrain 100g rawa, 20g, 25g, 25 mushroom powder, 200g sugar, 5g baking powder, 5g baking soda2-3 drops vanilla essence, 1 pinch salt thoroughly until a dough is produced. Mix the dough by hand thoroughly and keep the dough for 20 minutes. Then shape the cookies with a mold and put them in a tray. Put the tray into microwave (IFB M.NO.- 255C4) for 40 minutes at 170 degree Celsius. Check after 20 minutes. After 40 minutes take out the tray and cool.

RESULT AND DISCUSSION

Cookies prepared from flour of refined flour, wheat flour and multigrain flour. It was observed the

nutritional value of mushroom cookies. The properties like protein, carbohydrate, fat, vitamin were calculated through nutritive value of Indian food c. gopalan 2010 NIN Hyderabad. We selected 3 different types of parameter:

1. Nutritional Value :- The raw materials, i.e., refined flour, wheat flour, and multigrain flour and mushroom powder were analyzed for proximate composition and the data are presented in refined flour, wheat flour, and multigrain flour contained 12g, 6.1g, 15g protein, 1g, 23g, 3.4g fat, 74g, 67g, 11.8g carbohydrate. Owing to the extraction refined flour, wheat flour, and multigrain flour it contains lesser amount of protein, fiber, fat and ash. The composition of mushrooms powder was found more or less similar to those reported by Gupta and Sarma (2015). But analysis of mushroom powder cookies, there was a great modification in nutrient content was found C.,gopalan 2010 Nin hyderabad . Average protein, fat, carbohydrate, vitamin content in the oyster mushroom cookies was 31.04g, 25.14g, 34.06g protein, 3.86g, 26.76g, 6.26g fat, 107.07g, 100g, 44.87g carbohydrate and 109mg vitamin D.

2. Sensory Evaluation :- Sensory evaluation was conducted after cooling the cookies for 1 hr at room temperature. Cookies were placed on a plastic dish coded by a three-digit random number and offered to 9 trained panelists in an individual booth with lighting. Appearance, flavor, texture and overall acceptability were evaluated using the 9-point hedonic scale with 9 indication strong attribute.

Point hedonic scale and score pie chart of sensory evaluation of the product :-

Fig.1 Refined Flour Cookies

Refined Flour Mushroom Cookies
- Appearance
- Flavor
- Test
- Texture
- Color
- Overall Acceptability

Fig.2 Wheat Flour Cookies

Wheat Flour Mushroom Cookies
- Appearance
- Flavor
- Test
- Texture
- Color
- Overall Acceptability

Fig.3 Multigrain Cookies

Multigrain Flour Mushroom Cookies
- Appearance
- Flavor
- Test
- Texture
- Color
- Overall Acceptability

Comparison of Nutritional Value of Oyster Mushroom Cookies with Market Cookies :-

(A) Difference between Refined Flour Market Cookies & Refined Flour Mushroom Cookies

(B) Difference between Refined Flour Market Cookies & Refined Flour Mushroom Cookies

(C) Difference between Multigrain Flour Market Cookies & Multigrain Flour Mushroom Cookies

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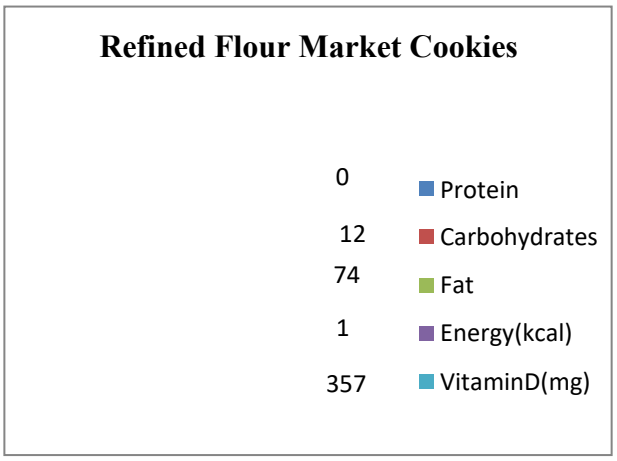
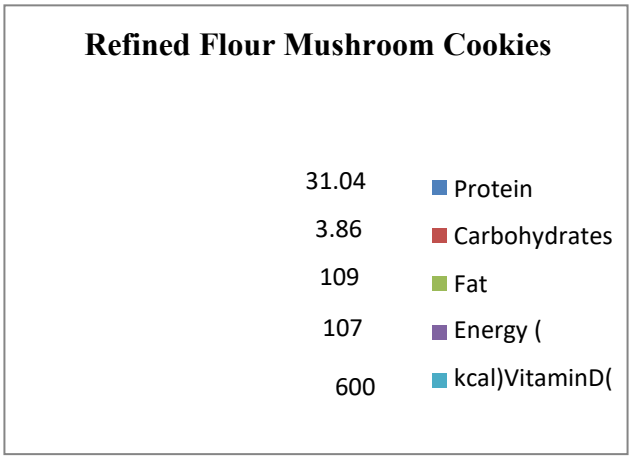
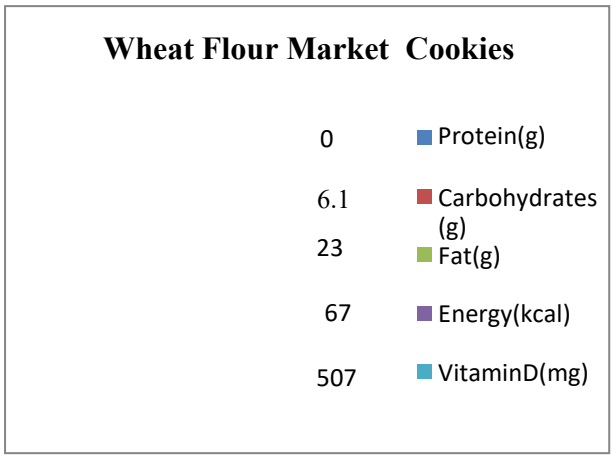
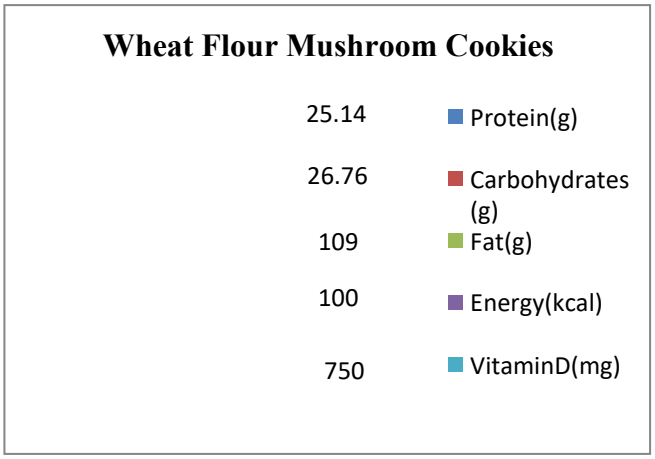
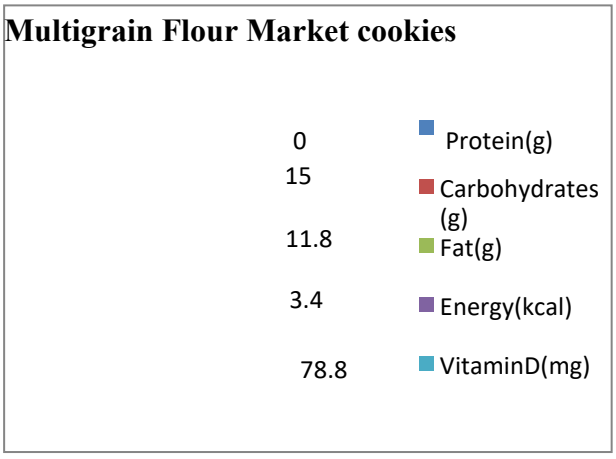
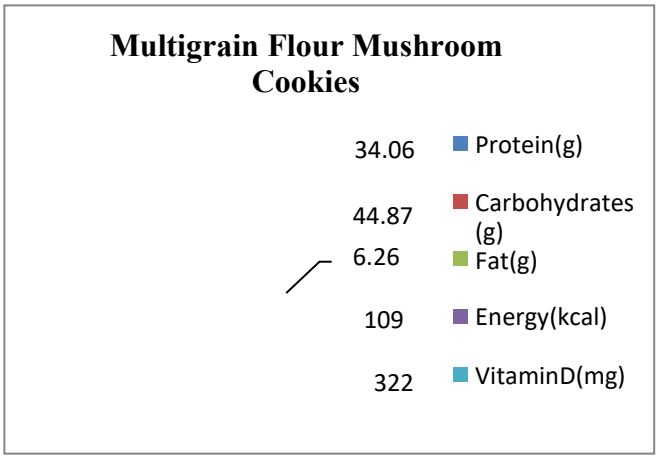












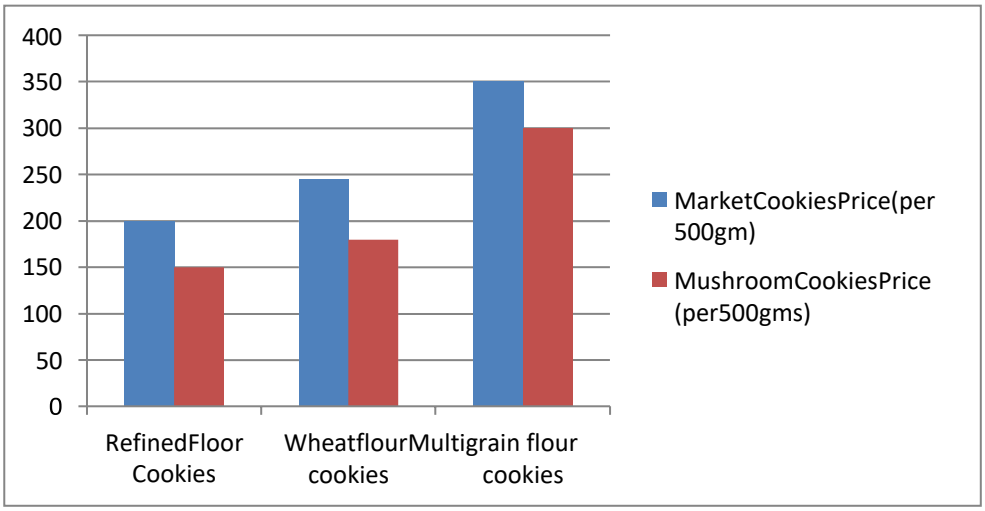
3. Cost analysis per unit compared between Market cookies & Mushroom Cookies.

Discussion:-

We can promote this research to the government that these cookies are good for the malnutrition purpose because it has a lot of protein, vitamin, carbohydrate. Mushroom cookies are good source of vitamin D (109mg). Comparing found that the nutritional value in mushroom cookies is higher than in the market cookies. Mushroom cookies also contain B vitamins as well as powerful antioxidant which helps & support the immune system and prevent damage to cells.

The data on sensory indicated that there were no considerable differences for colour, flavour, appearance and overall acceptability between the control cookies and those prepared with 5% and 10% replacement levels of mushroom powder, respectively. The cookies prepared with 20% replacement scored minimum lower in almost all the quality parameters with respect to the control and rest of the cookies. This showed that replacement of refined flour, wheat and multigrain with mushroom powder at 10% did not affect the sensory parameters of the cookies. However, further replacement adversely affected the acceptability of the cookies.

We found that in refined flour cookies 575 grams of raw material, we got 500 grams of cookies which cost Rs. 150 and knowing the price of cookies in the market of Bilaspur is approxRs. 200. Wheat flour cookies 570 grams of raw material, we got 500 grams of cookies which cost Rs. 180 and knowing the price of cookies in the market of Bilaspur is approx Rs. 245. Multigrain flour cookies 570 grams of raw material, we got 500 grams of cookies which cost Rs. 300 and knowing the price of cookies in the market of Bilaspur is approxRs. 350.



5. Conclusion

The reason for the examination was to locally get ready neighbourhood crude materials, to improve their quality by including mushrooms. Build up a standard system for the creation of mushroom cookies. They are solar drying. So the mushrooms were made into powder. To build the dietary benefit, these mushrooms as powder are utilized for the formula of customary scope. The expansion of mushroom powder adds to the higher the substance of nutrients, protein, mineral, unrefined fiber and phenol content in the items. The purpose of the study was to prepare Cookies from locally available raw materials, to improve its quality by

adding mushroom. To develop a standard methodology for the production of mushroom cookies. To increase nutritional value, these powder form mushroom was used to traditional cookies recipe. Higher incomes and more active lifestyles in recent years around the globe have resulted in consumers in seeking high-quality convenience foods in the market. The cookies made from Mushroom Powder may help to fulfill the needs of consumers for this very popular fast-growing food item in the country.

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