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Development of Protein Rich Flavored Bar

Kaustav Mukherjee[1], Verma Anisha[2], Neeru Bala[3]
[1]*Research Scholar,* [2]*Assistant Professor Dept. of Food Nutrition and Public Health (SHUATS),* [3]*Associate Professor Dept. of Food Nutrition and Public Health (SHUATS)*

Abstract: ***The present study entitled "Development of protein rich flavoured bar" was conducted with the objective to develop protein rich flavoured bar using different ingredients, to assess the sensory accessibility, determine the nutritional composition and cost of developed protein bar. Protein rich flavoured bar were prepared by using three treatments i.e. T_1 (dates 50g, oats 10g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 5g, cocoa powder 10g), T_2 (dates 45g, oats 8g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 12g, guava flavour 10g) and T_3 (dates 40g, oats 13g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 12g, orange flavour 10g). Organoleptic evaluation of the prepared product in relation to sensory attributes was carried out using the nine point hedonic scale score card by Srilaksmi (2015). The nutrient content of the value added food products were calculated with the help of food composition table given by Gopalan et al., (2011). The cost of individual raw ingredients used in the preparation of the food product as the prevailing market price. All treatments were replicated four times and the data obtained during investigation were statistically analyzed by using analysis of variance (ANOVA) and critical difference (C.D.) techniques. On the basis of sensory acceptability it was found that T_1 was scored highest in terms of colour and appearance, body and texture, flavour and taste and overall acceptability. As well as T_1 shows significantly high in the nutritive value among all treatments regarding energy, protein, carbohydrates, fat, fibre, calcium and iron. The cost of the protein rich flavoured bar per 100g of dry ingredients at the prevailing cost of the raw materials was highest in T_1 (Rs. 29.33) followed by T_2 (Rs. 20.69) and T_3 (Rs. 20.34). Dates are very good source of fibre, carbohydrate, protein and act as natural sweetener with no fat. As the bar is rich in protein, iron and other macronutrients, so it is majorly recommended for Protein-energy malnutrition (PEM), athletes and anemic patient. Daily 100g of dates intake helps to get all essential nutrients. Strictly restricted for Type-1 diabetic patients.***
Keywords: Protein, Nutrient content, organoleptic evaluation, nutrition bar, cost.

I. INTRODUCTION

In today's on-the-run society, where sitting down for a meal is sometimes an impossible luxury, the emergence of nutritional bars may seem to be just what the doctor ordered. In the current bar-wars environment, there are literally hundreds of these rewrapped and portable products competing for shelf space at gyms, health-food stores, and supermarkets. There are high-carbohydrate bars, protein bars, energy bars, breakfast bars, brain -boosting bars, meal-replacement bars, diet bars, and women-only bars **(WebMD, 2002)**. From weight loss bars, energy bars, and low carbohydrate bars to protein and granola bars, these cheerful-looking snacks are saturating the market today. Sadly, many people fall victim to the promised health benefits on the «nutritional» bar packaging, without reading through the ingredients or thinking of the processing **(Pauliina Salmehaara, 2017)**. When professionally and ethically prepared, nutritional bars can serve a wide variety of needs and functions, through variations in nutrient and vitamin doses calculated to sustain precise purposes. Protein Bar – A supplement bar for a great source of a protein boost. Some protein bars are so high in calories and added sugar that they might as well be in the candy aisle. If eating protein bars solely for their protein, keep in mind that most people consume more protein than they need, so may be already getting enough of this nutrient. The grams of protein a body needs will depend on a variety of factors, from how person built and how active individual are, to what nutritional goals aiming toward. Myth about Protein bar is Protein bar make lose/gain weight and frankly that's not true. Protein bars may be nutrient-dense, but if individual consuming more calories than burning, person may experience weight gain .Keeping above points in mind the present study was conducted with the objective to develop protein rich flavoured bar using different ingredients, to assess the sensory accessibility, determine the nutritional composition and cost of developed protein bar..

II. MATERIALS AND METHODS

The entire study was conducted in Nutrition Research Laboratory of Department of Food Nutrition and Public Health, Ethelind College of Home Science, Sam Higginbottom University of Agriculture, Technology and Sciences Prayagraj, Uttar Pradesh. Procurement of raw materials such as dates, oats, flaxseeds, sesame seeds, pumpkin seeds, peanut, honey, cocoa powder and guava were purchased from the local market of Prayagraj, Uttar Pradesh. Orange peel were collected from university campus of Sam Higginbottom University of Agriculture, Technology and Sciences Prayagraj, Uttar Pradesh.

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Three treatments were made by using different proportion of dates, oats, flaxseeds, sesame seeds, pumpkin seeds, peanut, honey, cocoa powder and guava. The different treatments in the study **T_1 (**dates 50g, oats 10g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 5g, cocoa powder 10g),**T_2 (**dates 45g, oats 8g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 12g, guava flavour 10g) and **T_3 (**dates 40g, oats 13g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 12g, orange flavour 10g). All treatments were replicated four times. The prepared protein bar were 100g of selected ingredients and was used for sensory analysis.

The sensory evaluation of the prepared product was done by the panel of judges selected from the faculty member of the Ethelind College of Home Science. Product was judge by using the various sensory attributes like colour and appearance, body & texture, flavour and taste and overall acceptability. The evaluation was done by on the 9 point Hedonic scale based score card **(Srilakshmi, 2015)**. Determination of the nutrient content of the value added food products were calculated with the help of food composition table given by **Gopalan *et al.*, (2011).** Cost of the prepared products was calculated by taking into account the cost of individual raw ingredients used in the preparation of the food product as the prevailing market price. The data was statistically analyzed by using analysis of variance (two way classification of ANOVA) and critical difference (C.D.).

III. FINDINGS

The data collected and tabulated under the study are presented with appropriate illustration and discussed in this chapter.

Table 1: Average sensory score for different parameters for Protein rich flavoured bar.

Treatments	Colour and Appearance	Body and Texture	Flavour and Taste	Overall Acceptability
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
T_1	7.63±0.58	6.75±0.67	7.50±0.50	7.50±0.85
T_2	6.38±0.10	6.88±0.46	6.50±0.58	7.00±0.50
T_3	6.88±0.58	6.25±0.76	7.38±0.29	7.13±0.29
Results	S	S	S	S

(i) Colour and Appearance
F value = 11.40(4.76), Significant, P≤0.05, CD = 0.55

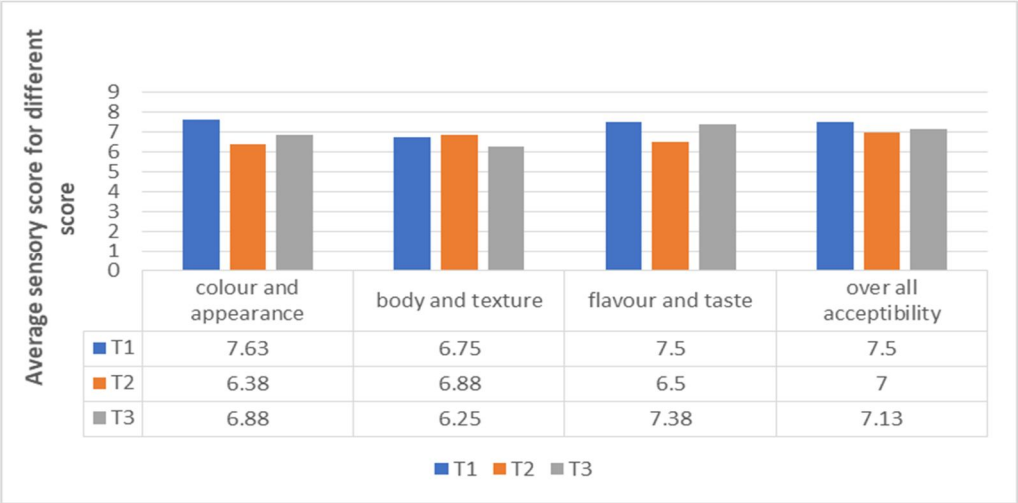
(ii) Body and Texture
F value = 10.10(4.76), Significant, P≤0.05, CD = 0.57

(iii) Flavour and Taste
F value = 12.11(4.76), Significant, P≤0.05, CD = 0.45

(iv) Overall Acceptability
F value = 11.45(4.76), Significant, P≤0.05, CD = 0.49

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Figure 1: Average sensory scores for different attributes of protein rich flavoured bar.



1) *Colour and Appearance:* The above Table 1 and Figure 1 shows the mean scores of protein rich flavoured bar indicates that T1 (7.63) had the highest score followed by T3 (6.88) and T2 (6.38) respectively. Scoring shows that the treatment T1 was liked very much while T3 and T2 were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the colour and appearance of the protein rich flavoured bar. The addition of different proportion of flavours affect the colour and appearance becomes darker as the amount of cocoa powder increases.
2) *Body and Texture:* The above Table 1 and Figure 1 shows the mean scores of protein rich flavoured bar indicates that T2 (6.88) had the highest score followed by T1 (6.75) and T3 (6.25) respectively. Scoring shows that the treatment T2 was liked very much while T1 and T3 were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the body and texture of the protein rich flavoured bar.
3) *Flavour and Taste:* The above Table 1 and Figure 1 shows the mean scores of protein rich flavoured bar indicates that T1 (7.50) had the highest score followed by T3 (7.38) and T2 (6.50) respectively. Scoring shows that the treatment T1 was liked very much while T3 and T2 were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the flavour and taste of the protein rich flavoured bar due to addition of cocoa.
4) *Overall Acceptability:* The above Table 1 and Figure 1 shows the mean scores of protein rich flavoured bar indicates that T1 (7.50) had the highest score followed by T3 (7.13) and T2 (7.00) respectively. Scoring shows that the treatment T1 was liked very much while T3 and T2 were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the overall acceptability of the protein rich flavoured bar.

Cost of the prepared protein rich flavoured bar- Average cost of the protein rich flavoured bar per 100g of dry ingredients at the prevailing cost of the raw materials materials was Rs. 29.33 for T_1, Rs. 20.69 for T_2 and Rs. 20.34 for T_3. This shows that as the incorporation of cocoa powder increased the cost of the treatment T_1 and treatment T_3 has the lowest cost.

IV. CONCLUSION

On the basis of finding it is concluded that dates, oats, flaxseeds, sesame seeds, pumpkin seeds, peanut powder, honey and cocoa powder can be successfully used for the preparation of the protein rich flavoured bar. On the basis of sensory acceptability it was found that T_1 (dates 50g, oats 10g, flaxseeds 5g, sesame seeds 5g, pumpkin seeds 5g, peanut powder 10g, honey 5g, cocoa powder 10g) was scored highest in terms of colour and appearance, body & texture, flavour and taste and overall acceptability. . As well as T_1 shows significantly high in the nutritive value among all treatments regarding energy, protein, carbohydrates, fat, fibre, calcium and iron. Also T_1 shows the highest cost among all the treatments from range 29.33 to 20.34 rupees per 100g.

V. RECOMMENDATIONS

Dates are very good source of fibre, carbohydrate, protein and act as natural sweetener with no fat. As the bar is rich in protein, iron and other macronutrients, so it can be recommended for the children, athletes and the person who are suffering from Protein-energy malnutrition (PEM) and anemia. Developed protein rich bar is also good for consumption during pregnancy.

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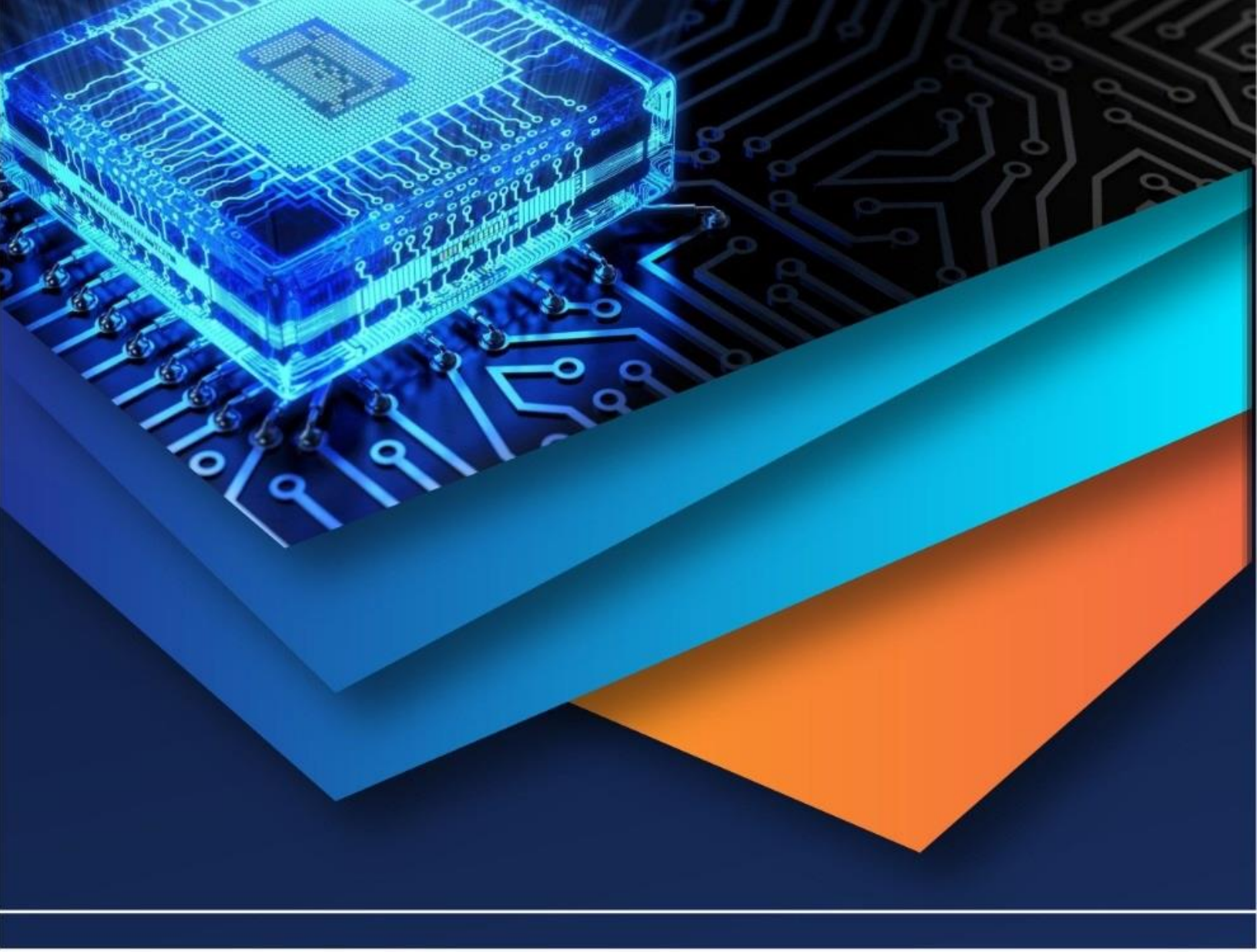
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