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Development of the *Nutrient Optimised Bar* for the *Sport Person*

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Abstract: ***On the basis Studies were accompanied in order to develop a nutrient bar with a low glycemic index from a formulation based on the millet and soybean. The pre-treatment applied to raw materials (germination of millet, pre-cooking or soybeans) has facilitated to recover the functional properties of blends. Flours complete from germinated millet has a low estimated glycemic. Millet has so many reliable and produces a harvest even under adverse growing conditions. Millets could be cast-off for traditional as well as novel foods. The fertility of starch, protein and fibre, niacin, magnesium, phosphorus, manganese, iron, potassium, essential amino acids and vitamin E make millets an important nutritional bio-source. In accumulation, millet has therapeutic benefits such as prevention of heart diseases, diabetes, migraine and premature death. In line with the recent awareness on functional foods and neutraceuticals, millets have a great potential. The useful effects of exercise and a healthy diet are well documented in the general population but poorly understood in athletes previous research in athletes suggests that regular training and an antioxidant t-rich diet enhance antioxidant defences and performance, courage of athletes. Conclusion: Sports nutri bar has been widely used in many countries. In India, not many studies have focused on this aspect. Development of a sports nutri bar which is antioxidant rich, ready to consume, easy to carry snack would be an ideal supplement for athletes- pre event and post event snack as well.***

Keywords: Millet flour, Soya flour, puffed rice, Roasted Bengal gram, Jaggery and Honey, Nutrient value

1. Introduction

Nutrition bars have been becomes the food of choice for so many people on the run. The bars offer a fast, convenient food source that requires no preparation, a long shelf life and no refrigeration. For this reason so many consumers grab them as quick snacks or meal replacements, assuming they have healthy alternatives to other food choices. The Sports/Nutrition/Energy Bar industry started in 1987 with the original Power Bar. The concept was to create an energy source for athletes concerned with energy depletion associated with long duration training.
(Nathalie Piccardi et al 2009)

The low-fat, high-carbohydrate bars was consisted largely of high-fructose corn syrup and grape and pear juice concentrate, with added vitamins and minerals. The bars were more functional than flavorful, aimed at satisfying the blood glucose levels wanted for high performance. However, it didn‟t take long before the energy bars became more taste oriented, as different companies tried to capitalize on a fast emerging market. Early studies suggested that the bars were not really an energy breakthrough, but many of a convenient alternative to other food choices 24

Energy bars could be a good source of calories for people on the run and may be aid in providing nutrients missed from a diet controlled by a busy work schedule, but they should not be used in place of real food sources. Elizabeth Applegate, a nutritionist and exercise expert at the University of California at Davis, cautions people “not to replace wholesome food with energy bars,” particularly when the bar selection is composed of highly processed milk and soy protein, high-fructose corn syrup, and oils. When bars contain the majority of calories in the diet, consumers may miss “the benefits of foods like vegetables, beans, low-fat dairy, and other real foods that can cut the risk of cancer, heart disease, and stroke.**(Welsh, et al., 1999).**

A diet may be rich in the energy bar are often lowly in variety. Without change in their diets, persons may be missing out on important nutrients. A good goal might be to consume at least 20 to 30 different kinds of foods per week 3. So, if energy bars are a necessary part of the diet then complement the engineered foods with a variety of natural foods. Energy bars are still best served for the people they were originally designed for, competitive athletes and those with heavy training volumes sed in place of real food sources. **(Ziegler, et al 1998).**

2. Methodology

Selection of Sample
Whole Millet Flour, Roasted Bengal gram white coloured gingelly seeds, puffed rice, soya flour, jaggery and honey were purchased from local market, Lucknow.

Product Planning

The nutrient composition of the EPIC bar to be prepared from nutrient- dense ingredient was planned and 250g of the bar using analysed values for all the individual ingredient. However the values of nutrient composition of full fat soya flour were used for the same. These calculated values were used as a basis to nutrient- dense bar by recipe standardization.

Recipe Standardization
The recipe was carefully standardized as per the method with slight modification using whole Millet Flour, soya flour, Bengal gram (roasted channa), puffed rice, gingelly

seeds, honey and jaggery. After subjecting then to preparation and further processing.

Sieving and Roasting

Sample was prepared by sieving whole Millet flour 150g and 100g of soya flour separately using a household metal sifter of 40 mesh size separately to remove the coarse particles. The whole Millet flour and soya flour were then roasted on a low flame for the 20 min. till they leave the sides of the pan to give an aroma. 50g of the puffed rice was roasted on a low flame of the gas burner for 6 min.

Deskinning and Grinding

The 400g of roasted Bengal gram purchased were Deskinning by hand and subsequently grounded in the electric mixer for the 10 to 15 minutes. Similarly 50g of white- coloured gingelly seeds were also ground to powder using an electric mixer for about 5 to 10 minutes.

Cooling

All the roasted and ground ingredient was then allowed to cool at room temperature for 5 minutes.

Mixing and blending of Nutrient bar

Nutrient composition of prepared bar was computed per 100g by calculative method using the nutritive value of different ingredient (used in making bar). However for full fat soya flour the value of nutrient composition of the bar.All the ingredient (whole millet flour, soya flour, puffed rice, gingelly seeds and roasted Bengal gram), after receiving preliminary preparation were scooped in a teaspoon individually. Each of the ingredients drawn from the teaspoon was then independently weight on the digital balance to note the actual amount procured. These amount were the recorded against each ingredient measured. Similarly 350 jaggery and 2 teaspoon of honey was taken and measured on the digital weighing balance. It was noted 2 teaspoon each all ingredient yielded 2.60 g puffed rice, 4.75g of roasted Bengal gram 3.80g of soya flour. 5.80 g of whole millet flour, 2.50 g of gingelly seed, 3.50g of jaggery and 2.3 g of hone. All ingredients were quadrupled in amount and mixed together in a mixing bowl and gradually 350g of jaggery and 50g of honey pre-measured was added till it agglutinated all mixture together, leaving the sides of the bowl. The amount of jaggery and honey used to bind was recorded to 60.00 gm. The same method was employed in which the amount of other ingredient was kept constant but the amount of jaggery and honey were used 350g and 50grespectivilly.

Freezing

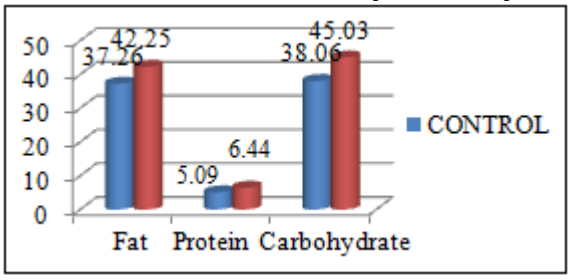
The mixture of Nutrient bar was transferred and allowed to set in the rectangular mould in freezer at temperature of (-15±50C) for 3 to 3.30 hour

3. Result & Discussion

Comparison between the nutritive values of control sample i.e. Nutrient bar (250gm) with that of nutritive value of experimental sample (250gm). This result was shown in form of table below.

Parameters	Control	Experimental
Fat (Gm.)	37.26	42.25
Protein (Gm.)	5.09	6.44
Carbohydrates (Gm.)	38.06	45.03

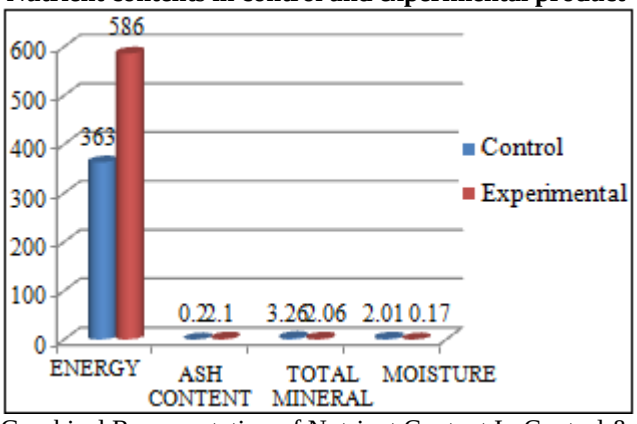
Nutrient contents in control and experimental product



Fat, Protein, Carbohydrate contents in control and experimental product

Parameters	Control	Experimental
Energy(KCAL)	363	586
Ash Content	0.2	2.1
Total Mineral	3.26	2.06
Moisture	2.01	0.17

Nutrient contents in control and experimental product



Graphical Representation of Nutrient Content In Control & Experimental Sample

4. Conclusion

The great tasting nutrient optimized bars pack potent nutrient punch. Nutrient bars are versatile food product embody ingredient from the food group of a well balance diet. These bars alongwith other available energy, protein, carbohydrate, fat, and mineral dense foods are earmarked at people who require a quick source of both macro and micronutrient to supplement their diet. The junk foods are unhealthy snacks foods including chocolate bars and potato chips that cannot furnish the nutrient as that coming from a well-balanced diet. They are disparate from quick energy provided soft drinks that do not supply protein and other micronutrient to the body.

Despite of the fact that agriculture sustains the life of Indians being the major occupation, the food crops yielding high nutritional value are underutilized. There is a need to formulate value added recipes from locally available cheap agriculture crops using befitting processing techniques to diversify the use of food crops in India. In the present scenario, when food habits of the people are changing due to

urbanization and popularization of processed and ready-to-eat unhealthy food product, utilization of nutritive value food to formulating processed, ready-to-eat products, utilization of high nutritive value foods to processed, ready-to-eat product will prove to be advantageous with regard to nutritional and functional value.

Therefore the present study was undertaken with a view to formulation of EPIC nutrient bars using recipe standardization, determination of chemical composition which including proximate composition and minerals (i.e. iron and calcium). Quality of the bar was judged using sensory evaluation techniques. The bar was store for the few days than check the shelf-life of nutrient bar. Effects of store on sensory attributes were undertaken for study. The packaged bar sample were store and maintained at a freezing temperature of (-10±5oC).

The Proximate composition of the designed bar has been summarized as follows:

The Optimized EPIC bar housed 4.50 per cent moisture 3.26 per cent ash, 6.44 per cent protein, 42.25 per cent fat, 45.03 per cent Carbohydrate, 2.06 per cent Mineral and 586 kcal of energy.

Data of sensory quality of the bars while using Nine point Hedonic scale 2 month. Data of Score of score card method revealed that colour decrease with increase day of storage and had no effect of packaging used. Flavour had no effect of days of storage instead had an effect of packaging. Packaged bar significantly higher value in relation to flavour. On the other hand the texture was effected by packaging and days of storage. In case of appearance the bar packing increase with days of storage.in days of storage. There was no significant but it dwindled significant with increase in days of storage. Overall acceptability of the bars packing substantially different and it decrease with increase in days of storage showing an inverse relation.

The EPIC bar can be stored safely and up to an acceptable period of 2 month by packaging and storing it at -10±50C. Thus from the present study it can be concluded that EPIC bar has the potential for serving the needs of the world's rocketing population of all age group and employed in different occupation and belonging to different socio-economic background and improving their nutritional status.

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