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Utilization of ragi and oats for studies on formulation, preparation and sensory evaluation of nutri crunchy bits

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Abstract
The aim is to prepare Nutri Crunchy bits as nutrition point of view and to provide convenience to the consumer. The main ingredients which were used for preparation of Nutri Crunchy bits Ragi and Oats. Ragi is a nutritious whole grain rich in fibre, calcium and iron. Its gluten-free nature and low glycaemic index make it suitable for regular consumption, promoting digestive health and overall well-being. Oats are rich in essential nutrients likes' fibre, essential fatty acids, vitamin E and protein and minerals like thiamine, zinc, iron, phosphorus. Nutri Crunchy bits are a good typically made from Ragi and Oats, bits are usually small, Round in shape and crunchy. For preparation all flours were mixed together then adding other ingredients in Appropriate Proportion mix and place it for conditioning after 15 min make a sheet of dough after that frying and cool the final products. Three trials had done T1, T2 and T3 and from these trials T2 has selected. Accourding to sensory panel member sample T2 selected for the further study. Chemical composition of Nutri Crunchy were carbohydrates 66.22%, moisture 0.47%, crude fiber4.83%, fat content 22.15%, protein content 8.75% and total minerals 2.40%. Energy values was found to be 499.25 Kcal respectively all the chemical parameter analyzed in chemistry laboratory. Among all the levels of Nutri crunchy bites prepared recorded highest score in all the quality attributes and good storage ability. It was concluded that the Crunchy bits can be store two month in aluminum foil and polyethylene bag at room temperature. So, Crunchy bits can be satisfying the consumer in accepts and quality.

Keywords: Ragi, oats, preparation, sensory evaluation, proximate analysis, storage etc

Introduction

Snack crackers are popular as healthy snacks and there is a high potential to enhance the nutritional value by incorporating natural ingredients. In the present study, the dietary fiber content of the snack crackers was improved by incorporating Amaranth Leaves powder. Snack food consumption has increased as a result of urbanization and modernization. However, most of the snacks are contained high amount of fats, sugar, and salts and least amount of dietary fiber which can be caused health problem. Due to that, the consumer demand of healthy snacks is increasing. Therefore, snack crackers can be considered as one of the most desirable snacks due to their good eating quality and superior nutritional properties (Jayasundara *et.al*, 2017).

Cracker is a good typically made from grain and flour, dough. Crackers are usually flat, crisp, and small in size. Flavouring and seasonings 'such as salt, Ajwain and cumin powder, ginger-garlic paste etc. Various flours are used such a's whole wheat flour, refined wheat flour, corn flour, to get unique taste and essential nutrients". The product which we designed is completely new in market (Karad *et.al*, 2014)**.**

The oat (Avena sativa), sometimes called the common oat, is a species of cereals grain grown for its seed, which is known by the same name (usually in the plural, unlike other cereals and pseudo cereals). While oats are suitable for human consumption as oatmeal and rolled oats, one of the most common uses is as livestock feed. Oats have numerous uses in foods; most commonly, they are rolled or crushed into oatmeal, or ground into fine oat flour. Oatmeal is chiefly eaten as porridge, but may also be used in a variety of baked goods, such as oatcakes, oatmeal cookies and oat bread. Oats are also an ingredient in many cold cereals, in particular muesli and granola, Oat extract can also be used to soothe skin conditions. Oat grass has been used traditionally for medicinal purposes, including to help balance the menstrual cycle, treat dysmenorrhoea and for osteoporosis and infections. Oats are generally considered healthy due to their rich content of several essential nutrients. In a 100 gram serving, oats provide 389 calories and are an excellent source (20% or more of the Daily Value, DV) of protein (34% DV), dietary fiber (44% DV), several B vitamins and numerous dietary minerals, especially manganese (233% DV). Oats are 66% carbohydrates, including 11% dietary fiber and 4% beta-glucans, 7% fat and 17% protein. The established property of their cholesterol-lowering effects has led to acceptance of oats as a health food. Oats are excellent source of soluble fiber, pertained in the B vitamins, thiamin, riboflavin and B6. They also provide iron, calcium, magnesium, selenium and phosphorus (Richa Tiwari et, al, 2017) [2].

Finger millet is well recognized for its high nutritional profile, including protein (6–13%), calcium (0.34%), dietary fiber (18%), phenolic compounds (0.3–3%), and minerals (2.5–3.5%). In addition, it is a good source of a vitamin B complex (thiamine and riboflavin), as well as essential amino acids (methionine, isoleucine, leucine, phenylalanine, etc.). Finger millet contains 30 times as much calcium as rice, namely 344 mg/100 g, which plays a positive role in bone development and maintenance, as well as in the functioning of nerves and muscles. According to studies, finger millet possesses various medicinal and nutritional proties. It is well known for its biological properties

(antitumorigenic, anti-atherosclerogenic, anti-diabetic, antioxidant, and antimicrobial) mainly due to polyphenols and dietary fiber. Also, finger millet prevents oxidation of low-density lipoproteins, hypertension, hypercholesterolemia, and diabetes mellitus, as well as improves gastrointestinal tract functioning and vascular fragility (Gaikwad V, Kaur J, *et al*, 2024) [3].

Materials and Methods

Procurement of materials for Nutri Crunchy Bites

Raw materials required during present investigation were procured from local market of Saralgaon such as oats, Ragi, Maida, oil, salt, sugar and Ajwain etc. the raw material were cleaned and made free foreign matters.

Physical Properties of Nutri Crunchy Bites

The colour of Crunchy bits was determined by visual observations. The shape of Crunchy bits was determined by visual observation. The weight of Crunchy bits was measured on weighing balance and thickness and diameter measured by vernier calliper.

Chemical Properties of Nutri Crunchy Bites

Different chemical properties of samples were analysed for moisture content, ash, fat, protein and total carbohydrate. All the determinations were done in triplicate and the results were expressed as the average value. For moisture determination samples were dried in oven at 130ºC for 60 minutes. For ash determination samples were placed in muffled furnace at 550ºC to burn out all carbon compounds leaving in organic part (ash). Fat was determined by fat extraction unit by using n. Hexane.

Sensory Evaluation Nutri Crunchy Bites

Prepared product were evaluated for sensory characteristics in terms of appearance, color, flavour, after taste, texture and overall acceptability by 10 semi-trained panel members comprised of academic staff members using 9- point Hedonic scale. Judgments were made through rating the product on a 9 point Hedonic scale with corresponding descriptive terms ranging from 9 ‘like extremely’ to 1 ‘dislike extremely’. The obtained results were recorded in sensory score card.

Storage Study of Nutri Crunchy Bites

Storage of Nutri Crunchy Bits at room temperature bits stored under different conditions. The experiment involved an impact assessment of two packing type (aluminium foil and Polyethylene).

Statistical analysis Nutri Crunchy Bites

The analysis of variance of the data obtained was done by using Completely Randomized Design (CRD) for different treatments as per the method given by Panse and Sukhatme (1967). The analysis of variance revealed at significance of $P<0.05$ level S.E. and C.D. at 5 per cent level is mentioned wherever required.

Formulation of Nutri Crunchy Bites

Nutri Crunchy Bites prepared with incorporation varying levels of Ragi and Oats were investigated. The formulation *viz.*, 00:00,30:50,40:40 and 50:30 percent T0, T1, T2 and T3 respectively. Sample T3 of Nutri Crunchy bites was organoleptically acceptable and used for further study and 20% other ingredients used in formulation of preparation of Nutri Crunchy Bites.

Preparation process flow chart for Nutri Crunchy Bites

Selection of material → cleaning → weighting→ mixing → dough making conditioning → sheet making →frying → cooling → packaging → storage

Results and Discussion

Table 1: Physical Properties of Nutri Crunchy Bites

Physical Properties	Doughnut
Colour	Dark brown
Shape	Round
Weight	3gm

Physical properties observed Visual analysis done that brown colour of Crunchy bits having round shape and weight was 3gm. The product was very crunchy as its name, looking very tempting and taste was super. And it was accepted by many consumers very easily.

Table 2: Chemical Properties of Nutri Crunchy Bites

Chemical Parameter	Selected sample
Minerals	2.40%
Moisture	O.47%
Fat	22.17%
Protein	8.75%
Carbohydrate	66.22%
Energy	499.25kcal
Fiber	4.83%

Chemical constitutes analysed that I was Carbohydrates 66.22%, Moisture 0.47%, Crude Fiber4.83%, Fat Content 22.15%, Protein content 8.75% and Total minerals 2.40%. Energy Values was found to be 499.25 Kcal respectively. This analysis done in Food Chemistry and Nutrition laboratories. It’s found that protein in that product is in high amount and it makes this product very nutritious.

Table 3: Sensory Evaluation of Nutri Crunchy Bites

Parameter	T0	T1	T2	T3
Colour	07	06	08	08
Flavour	06	07	06	08
Texture	06	06	07	08
Taste	05	06	07	08
Overall acceptance	6	6.2	7	08

The Sensory evaluation of Nutri Crunchy bits shows that sample T3 has highest scores as compared to other samples. The colour of T3 sample as per tabulated is 8 point while samples T0 (07), T1 (06), T2 (8). The flavour of sample T3 was acceptable with 8 while samples T0 (06), T1 (07), T2 (06). The texture of sample T3 was selected by 8 points while other samples are T0 (06), T1 (06), T2 (07). The Taste of sample T3 was selected by 8 while other samples points are T0 (05), T1 (06), T2 (07). The overall acceptability of sample T3 was selected by 8 points while other samples points are T0 (6), T1 (6.2), T2 (7) respectively. In all the quality parameters sample T3 was good in all the attributes.

Conclusion

Finally, It Conclude that utilization of Ragi and Oats for studies on formulation, preparation and Sensory Evaluation

of Nutri Crunchy Bits was carried out successfully prepared by using Oats, Ragi and other ingredients. The health benefit of Oats and Ragi are well known so the product is having nutritional values. it can satisfy the nutritional needs of the consumer. Consumer can prefer this product than others and hence they get benefited by more nutrition.

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