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STUDIES ON DEVELOPMENT OF PROCESS TECHNOLOGY FOR PREPARATION OF RAGI NOODLES

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Abstract

Study of preparation of Ragi Noodles was successfully done. The aim preparation and Formulation of ragi noodles was to provides nutritious food product and to provide convenience to the . Preparation of ragi noodles were done by only having ragi/fingermillet as a main ingredient. The ragi noodles were prepared by adding ragi flour to the warm water and mixing it constantly till there are no posibble remaining lumps in the dough. Then the dough was shaped into a log and pressed through the traditional noodle (sev) making machine. Ragi Noodles were stored in LDPE pouches at room temperature.Ragi noodles were prepared with different samples like S1,S2 and S3 and among all of samples, S3 was best as it scored higher in comparison to other samples.The Proximate analysis of Standardized noodles was evaluated and chemical properties of ragi noodles was Moisture 17.70% content, Ash 2.49%, Protein 11.3% and carbohydrate 69.11%. Energy value of prepared ragi noodles was (321.8 Kcal.). It was concluded that Ragi Noodles can be store for 30 days in low density polyethylene pouches at room temperature.

Keywords:- Ragi, Finger millet, ragi noodles, proximate analysis, sensory evaluation, storage

INTRODUCTION

Noodles have been a staple food in many parts of the world and are of ancient origin. Nearly 4000 years old according to the discovery of a pot of thin noodles in China which were found to be similar to the la-Mian which are the traditional Chinese noodles made by hand pulling and stretching of the dough (Lu et al. (2005). Technological advancements, eating habits, growing health consciousness, regional diversity of raw materials and taste preferences have lead to major evolutions in the noodle formulations and made them one of the most popular foods in the world. They can be made from wheat, rice, potato starch, pulses, millets etc. and are available in variety of shapes and formulations. Processing properties, color and appearance of the noodles are the main criteria that are used to judge the quality of raw noodles. Noodle products are mainly made from refined wheat flour, water and salt by the process of sheeting and cutting essentially by machines. Noodles must have appropriate flavor and texture along with good shelf life and bright color. For noodles to withstand the process of sheeting the flour should have adequate gluten strength. The wheat flours with good amount of gluten and high starch swelling property and good pasting properties of starch are ideal for making noodles (Fu (2008) .

Noodles are widely consumed throughout the world and their global consumption is second only to bread. Instant noodles are widely consumed throughout the world and it is a fast growing sector of the noodle industry (Owen, 2001). This is because instant noodles are convenient, easy to cook, low cost and have a relatively long shelf-life. Wheat flour which is usually used to make instant noodles is not only low in fibre and protein contents but also poor in essential amino acid, lysine. Flour of hard wheat (Triticum aestivum L.) is the main primary ingredient (Fu, 2008) and the addition of alkaline salts can help strengthen the structure and hence improve the firmness of the final product (Hou and Kruk, 1998).

The noodles also can be made from, rice, buckwheat, and starches derived from potato, sweet potato, and pulses. The corn starch may be used as binding agent in the noodle (Yalchin and Basmani, 2008; Tan et al., 2009). The addition of GMS in noodles decrease the hardness slightly and the cohesiveness, gumminess, springiness and chewiness to a significant extent (Kaur et al., 2005). Instant noodles are dried or precooked noodles fused with oil and often sold with a sachet of flavoring. Dried noodles are usually eaten after being cooked or soaked in boiling water for 3-5 min while precooked noodles can be reheated, or eaten straight from the packet (Fu, 2008).

Ragi (Eleusine coracana) is an important foodcrop of the poor marginal farmers, especially tribalpeople of the India. It is rich in protein, fibre, minerals viz. iron, calcium, phosphorus, and vitamin content. Traditionally ragi is processed either by malting or fermentation (Rao and Muralikrishna, 2001). Malting of finger millet improves its digestibility, sensory and nutritional quality as well as pronounced effect in the lowering the antinutrients. Malting characteristics of finger millet are superior to other millets and ranks next to barley (Malleshi and Desikachar, 1986; Pawar and Dhanvijay, 2007). There is also overall improvement in the flavour profile of ragi during germination process (Nirmala and Muralikrishna, 2002; Ram et al., 1979; Rao and Belavady, 1978). There are various benefits of malting such as vitamin-C is elaborated, phosphorus availability is increased and lysine and tryptophan are synthesized (Dulby and Tsai, 1976).

Ragi is indigenous minor millet used in the preparation of geriatric, infant food and health foods both in natural and malted forms. It is usually used for preparation of flour, pudding, porridge and roti (Chaturvedi and Srivastava, 2008). With the changes in scenario of utilization of processed products and awareness of the consumers about the health benefits, ragi has gained importance because of its functional components, such as slowly digestible starch and resistant starch (Wadikar et al., 2007). The malted and fermented ragi flour are extensively used in preparation of weaning food, instant mixes, beverages and pharmaceutical products (Rao and Muralikrishna, 2001).

MATERIAL AND METHODS

Procurement of materials for Ragi Noodles

Raw materials required during present investigation were procured from local market of Saralgaon such as ragi flour, salt, oil etc. the raw material were cleaned and made free foreign matters**.**

Physical Properties of Ragi Noodles

The physical properties/parameters of finger millet were calculated accordingly, with result such as colour, bulk density, true Density, porosity etc.

Chemical Properties of Ragi Noodles

The chemical parameters of ragi were found 13.10% moisture, 7.30 g of protein,72.00 carbohydrate, 1.30 g of fat,energy (kcal) 328.00, mineral at 2.2%

Sensory Evaluation

Prepared product was evaluated for sensory characteristics in terms of appearance, color, flavour, aftertaste, 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 of Ragi Noodles

Storage effect on product was good on up to 30 days at ambient temperature was carried out & score recorded was S3 sample. The significant changes were noticed in colour, consistency, appearance and taste during 30 days of storage.The storage was best kept in LPDE packaging.

Statistical analysis

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.

Flowsheet for Ragi Noodles

Finger Millet flour/ragi flour
↓
Sifting
↓
Boiling water in an utensil
↓
Addition of salt and oil and ragi flour to the warm water
↓
Mixing till the lump formation
↓
Kneading the dough
↓
Adding the kneaded dough into noodle/sev making machine
↓
Press the noodles
↓
Sun dry for 24 hrs
↓
Packaging
↓
Storage

RESULT

Physical and Chemical Properties of Raw Materials:-

Physical and chemical Properties of Ragi:-

Parameter	**Units**	**Parameter**	**Units**
Colour	Brown	Mineral	2.2%
Surface Area	6.97mm	Moisture Content	13.10
Volume	1.07mm^{33}	Fat	1.30
Porosity	32.4%	Protein	7.30
True Density	1515.6 kg/m^3	Energy(kcal)	328.00
Bulk Density	993.6kg/m^3	Carbohydrate(g)	72.00
Thickness	1.35mm		

The physical properties/parameters of finger millet were calculated accordingly, with result such as colour, bulk density, true Density, porosity etc.
The chemical parameters of ragi were found 13.10% moisture, 7.30 g of protein,72.00 carbohydrate, 1.30 g of fat,energy (kcal) 328.00, mineral at 2.2%

Physical Properties of Ragi Noodles:-

Physical Properties	**Ladoos**
Colour	Dark brown.
Length	15cm

The physical parameters of ragi noodles from above tabl shows that the colour of ragi noodles were dark brown, and it were calculated at 15 cm of length.

Chemical Properties of Ragi Noodles:-

Chemical Parameter	**Selected sample**
Ash(g)	2.49
Moisture(g)	17.07
Fat (g)	ND<0.1
Protein(g)	11.3
Carbohydrate(g)	69.11
Energy(kcal)	321.8
Dietary Fibre(g)	10.81

The value ash content of ragi noodles was found to be 2.49%, protein content 11.3%, fat content ND<0.1, moisture content at 17.70% and carbohydrate content was found to be 69.11%. Energy values was found to be 321.8 Kcal respectively.

Organoleptic Evaluation of Ragi Noodles

Parameter	T1	T2	**T3**
Colour	08	08	**08**
Flavour	09	09	**09**
Taste	08	07	**09**
Texture	07	07	**09**
Appearance	07	07	**08**
Overall Acceptance	7.8	7.6	**8.6**

The sample T3 has highest score as compare to the other samples. The colour of T3 sample as per graph is 8 point while samples T1 (08), T2 (08). The flavour of sample T3 was acceptable with 09 while samples T1 (09), T2 (09). The texture of sample T3 was selected by 9 points while other samples points

are T1 (7), T2 (7). The appearance of sample T3 was selected by 8 while other samples points are T1 (7), T2 (7). The taste of sample T3 was selected by 9 points while other sample are T1 (08), T2 (07). The overall acceptability of sample T3 was selected by 8.6 points while other samples points are T1 (7.8), T2 (7.6).

CONCLUSION

Conclusively, it emerges that the Studies on Development and Quality Evaluation of ragi noodles was carried out successfully prepared. The health benefit of finger millet/ragi is well known so the product is having nutritional values. Ragi/finger millet is rich in calcium, carbohydrates and minerals. This type of value addition by way of nutrient enrichment does certainly help to provide good source of energy. After consuming the product it can satisfy the nutritional needs of the consumer.

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