International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS | Volume 9 | Special Issue 2| ICAM-2019 | 82-86
Proceedings of International Seminar on "Agricultural Microbiome"
Held at Hindustan College of Arts and Science, behind Nava India, Coimbatore, Tamil Nadu 641028, India, 22nd February 2019
| Research Article | Biological Sciences |Open Access |MCI Approved|
|UGC Approved Journal|

Formulation, Standardization and Shelf Life Evaluation of Selected Seed Powders Incorporated Indian Snack

Angeline Esther Preethi S*[1] and Guna M[2]

[1]Associate Professor & Head, Department of Foods and Nutrition, Rathnavel Subramaniam College of Arts and Science, Sulur, Coimbatore.

[2]PG Student, Department of Foods and Nutrition, Rathnavel Subramaniam College of Arts and Science, Sulur, Coimbatore.

Received: 17 Feb 2019 / Accepted: 19 Mar 2019 / Published online: 01 Apr 2019
*Corresponding Author Email: angeline@rvsgroup.com

Abstract

Food processing and technology includes a set of physical, chemical or microbiological methods and techniques used to transmute raw ingredients into food and its transformation into other forms in food processing industry. Snacks are small portion for a quick meal which can be consumed to enable them to satisfy their hunger between lunch and dinner. In the present study three underutilized seeds namely Niger, Sesame, Turkey berry powders were incorporated into somas, a traditional snack to enhance its nutrient content. Niger seed and Turkey berry seed was incorporated at 4%, 6%, 8% and 10% instead of the main ingredient Maida and Rava. The sesame powder was incorporated at 5%, 10%, 15% and 20% levels. All the 12 variations and the standard somas were analyzed for the sensory attributes using a five-point hedonic scale. The selected products were kept in two packages and zip lock cover and stored at room temperature for a period of 20 days to evaluate the shelf life stability of the products. Niger seed with 4% has the highest mean score in all the criteria compared to the other products. Sesame seed with 10% and Turkey berry with 6% scored the highest among the variations in each category. The nutrient content of the seed powder incorporated somas were higher than the standard product. The results of the microbial analysis showed that the standard and the selected variations had a shelf life of 20 days in both the package materials.

Keywords

Niger, Sesame, Turkey berry, Somas.

*****

INTRODUCTION

In a country like India, with increasing progress and commercialization people are focused more on snack rather than regular meals, as they can be easily prepared without taking much time [1]. Eating healthy snacks energies, the body, improves the brain power, regulates weight management, boosts up mood and makes the day pleasant [2]. There is to a great extent of

diversity in traditional healthy snacks in India because of the evolution of healthy foods in each region suitable to the climate, traditions, and cultivation practices of that particular area [3]. There is a need to formulate nutrient rich shelf-stable food products that are suitable and available to all using under-utilized crops. Consumption of locally available food crops as a source of energy, protein, vitamin, and minerals will help to fight the problem of under-nutrition and high postharvest losses. Sesame seeds have been grown in tropical regions throughout the world since ancient times. Sesame seed is a rich source of protein and one of the first crops processed that was for oil production. Sesame seeds contain two unique substances namely sesamin and sesamolin which has cholesterol lowering effect and prevents high blood pressure [4]. Turkey berry as a vegetable has diverse beneficial components which has nutritional, phytochemical, and pharmacological properties. Chemical entities of the plant have been used as antihypertensive, antioxidants, anti-platelet aggregation activities, anti-microbial activity, seductive, digestive agent due to its therapeutic properties [5]. Sweet potato, Turkey berry is one of the potentially rich under-utilized food crops of high nutritious value. Formulating and fortifying Sweet potato powder with Avocado pear and Turkey berry could provide a nutrient dense food product capable of solving malnourishment and hidden hunger among rural folks [6]. Niger seed has economic and nutritional benefits. So we must formulate products supplemented with them so as to enhance the nutritional status of an individual. Only limited research has focused on their use in food products used for human consumption in daily diet. The nutritional role in the human diet has not been explored much [7]. The present topic is chosen keeping in mind the enhancement of nutritional value of these snacks.

METHODOLOGY

Somas a delicious crispy traditional sweet of south India was selected for the study. Three seeds namely Niger seed, Sesame seed and Turkey berry powder were the selected ingredients. The selected seeds were obtained from the local market. The seeds were cleaned, powdered and packed in air tight plastic container and stored at room temperature. The three seed powders were added separately in the Somas at different proportions instead of the main ingredient Maida flour and rava. Table I gives the variations formulated in the study.

TABLE I
LEVELS OF INCORPORATION OF SELECTED SEED POWDERS IN SOMAS

Ingredient	Standard	Niger Seed				Sesame Seed				Turkey Berry Seed Powder			
		A	B	C	D	A	B	C	D	A	B	C	D
Maida (g)	100	100	100	100	100	100	100	100	100	100	100	100	100
Niger Seed (g)	0	4	6	8	10	-	-	-	-	-	-	-	-
Sesame Seed (g)	0	-	-	-	-	5	10	15	20	-	-	-	-
Turkey Berry Seed Powder (g)	0	-	-	-	-	-	-	-	-	4	6	8	10

Thirty semi trained panelists, comprising of the staff members and students of food science and nutrition were selected for evaluation of the product. A score card was prepared to evaluate the different organoleptic parameters namely appearance, color, texture, flavor and taste. The product that obtained the highest sensory score in each seed powder incorporated product and the standard was taken for further study. The protein, calcium and iron content of the selected variations were analyzed. The products were stored in Zip Lock Cover and Aluminum Foil for shelf life evaluation study for a period of 20 days in room temperature. The sensory analysis and microbial analysis was carried at regular intervals to check the shelf life stability of the selected products.

RESULTS AND DISCUSSION

It is clear from the table II that among the prepared products, Niger seed with 4% has the highest mean score in all the criteria compared to the other

products. Sesame seed with 10% and Turkey berry with 6% scored slightly lower than the standard and the Niger seed.

In a previous study by Virginia P and coworkers [1] concluded that amaranth seeds, watermelon seeds and their flour can be successfully incorporated in "Biscuits", "Mathri" and "Laddoo". Amaranth seed flour and watermelon seed flour in the ratio of 20:10 was found proportion in Biscuits, Mathri and Laddoo in all sensory parameters like colour and appearance, body and texture, taste and flavor and overall acceptability.

TABLE II

MEAN SENSORY SCORE OF STANDARD AND SEED POWDER INCORPORATED SOMAS

CRITERIA	STANDARD	NIGER SEED				SESAME SEED				TURKEY BERRY			
		A	B	C	D	A	B	C	D	A	B	C	D
Appearance	4.8 ±0.48	4.8± 0.48	4.26± 0.49	3.66± 0.43	2.96± 1.06	4.13± 0.77	4.66± 0.54	3.9±0 .84	3.56± 0.97	4.1±0 .71	4.56± 0.56	3.43± 0.85	2.80± 1.03
Colour	4.7± 0.53	4.6± 0.49	4.3 ± 0.61	3.83± 0.83	3± 1.11	4.06± 0.69	4.5± 0.57	3.73± 0.73	3.36± 0.99	4.13± 0.68	4.43± 0.56	3.33± 0.89	2.80± 1.20
Texture	4.8± 0.37	4.6± 0.47	4.46± 0.62	3.83± 0.79	2.63± 1.03	4.3± 0.70	4.5± 0.50	3.83± 0.74	3.23± 1.00	4.06± 0.73	4.46 ±0.50	3.36± 0.92	2.73± 1.04
Flavour	4.8± 0.34	4.7± 0.44	4.4 ± 0.67	3.93± 0.86	2.83± 0.94	4.26± 0.69	4.3± 0.79	3.76± 0.77	3.23± 0.97	3.93± 0.82	4.53± 0.53	3.33± 0.95	2.7 ± 0.95
Taste	4.5± 0.82	4.6± 0.49	4.66± 0.62	4.03± 0.80	2.8± 1.09	4.2± 0.71	4.46± 0.68	3.86± 0.77	3.2±1 .06	3.96± 0.80	4.53± 0.50	3.36± 0.80	2.62± 1.06
Overall acceptability	4.72± 0.50	4.5± 0.82	4.40± 0.76	3.85± 0.59	2.84± 1.05	4.19± 0.71	4.48± 0.62	3.82± 0.65	3.32± 0.99	4.03± 0.89	4.5± 0.53	3.36± 0.88	2.73± 0.78

TABLE III

NUTRIENT CONTENT OF STANDARD AND SEED POWDER INCORPORATED SOMAS (PER 100G)

PRODUCT	PROTEIN (g)	CALCIUM(mg)	IRON(mg)
Standard	16.4	36.1	16.6
Niger seed incorporated Somas	24.2	42.6	19.7
Sesame seed incorporated Somas	17	60.2	17.6
Turkey Berry Powder incorporated Somas	25	59	17.4

Addition of the selected seed powders increased the protein, calcium and iron content of the snack food. Such attempts will help to increase the nutrient content of snacks at affordable cost.

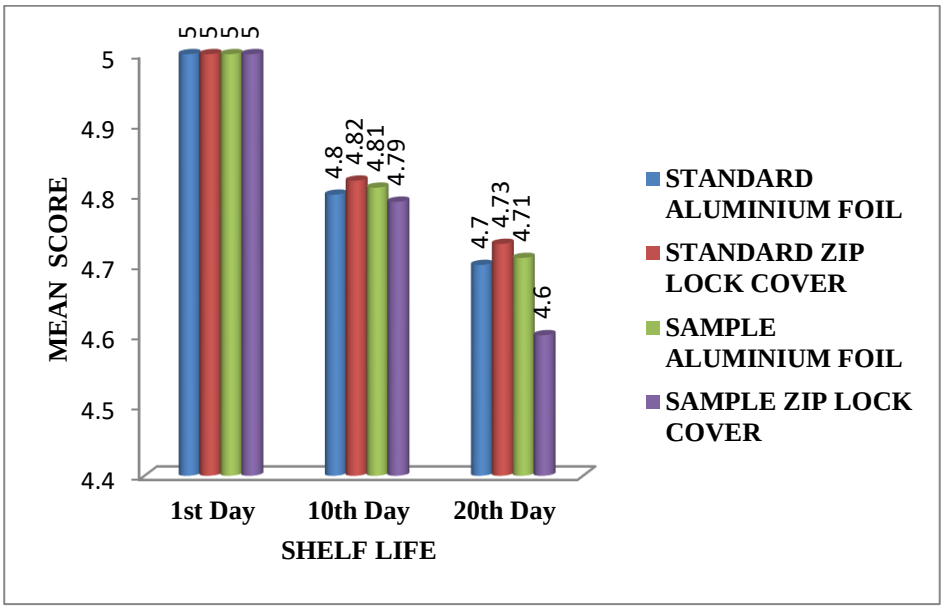
SHELF LIFE STUDY

It was clear that there was no microbial growth in both the standard and the selected products in both the package materials namely aluminum foil and zip lock cover even at the end of the storage study period,

therefore it is concluded that both the standard and selected products has a shelf life of 20 days.

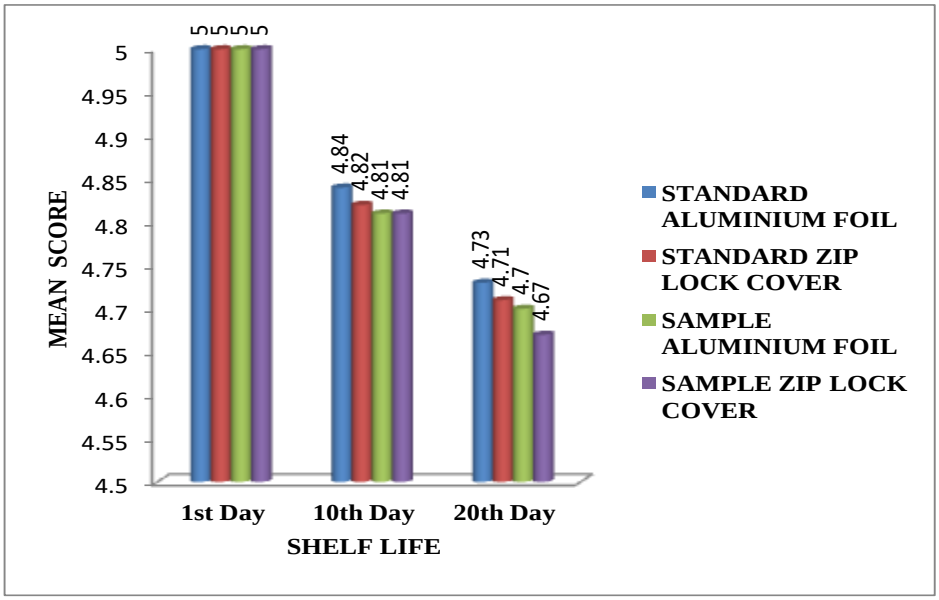
Graph1

Sensory Scores of Standard and Sesame Seed Incorporated Somas

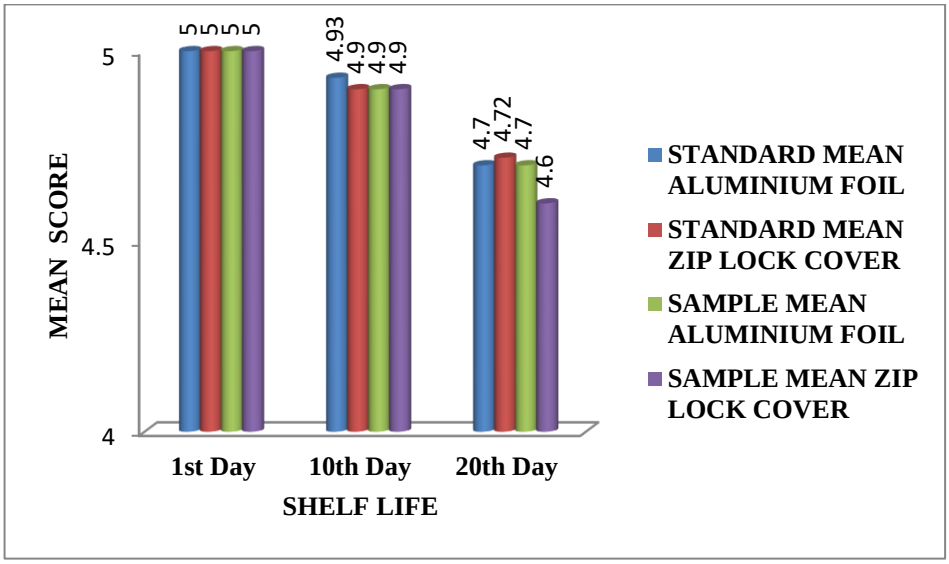


Graph 2

Sensory Scores of Standard and Turkey Berry Incorporated Somas



Graph 3
Sensory Scores of Standard and Niger Seed Incorporated Somas



Graph 1 -3 shows the mean sensory scores obtained during the storage study period. It is noted that the scores remained almost the same during the storage. So it can be stated that they had a shelf life of 290 days.

CONCULSION

Underutilized seed powders can incorporate into traditional snack items to enhance the nutrient content without affecting the sensory attributes of the products. Use of such nutrient rich foods will help to decrease the consumption of junk foods that cause a number of health problems in all age group of population.

REFERENCES

1. Virginia Paul., Ruch., Paul Ajit., Development of nutritious snacks by incorporation of amaranth seeds, watermelon seeds and their flour. INDIAN JOURNAL OF COMMUNITY HEALTH,26 (01). (2014).
2. Ashakiran., Deepthi R., Fast Foods and their Impact on Health. JKIMSU.1(2). (2012).
3. Kanchana., Arun A., Vijayalakshmi. S., A Research on Reminiscence and Acclimation of Oryza Sativa Flakes Snacks Among Adolescents. Curr ResNutr Food Sci .5(3). (2017)
4. Pal., Ajay., Khanum., Farhath., Bawa., Amarinder, Nutritional, Medicinal and Industrial Uses of Sesame (Sesamumindicum L.) Seeds - An Overview. Agriculturae Conspectus Scientificus (ACS) (acs@agr.hr); Vol.75 (4). (2010).
5. Grussu, D., Stewart, D., McDougall, G. J. Berry polyphenols inhibit α-amylase in vitro: identifying active components in rowanberry and raspberry. Journal of Agricultural and Food Chemistry, 59(6). (2011).
6. Ernest Teye .,Robert Agbemafle .,Francis PadiLamptey Development and Examination of Sweet Potato Flour Fortified with Indigenous Underutilized Seasonal Vegetables. Beverages. 4(1). (2018)
7. Rohini Jain., Neerja Singla., Formulation and nutritional evaluation of food products supplemented with niger seeds. Nutrition& Food Science, Vol. 46(4).(2016)