International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 7, pp: 367-369 www.ijaem.net ISSN: 2395-5252

Production of Butter from soya bean seeds

Poorani . V
Department of Food Technology, JCT college of Engineering and Technology, Pichanur, Coimbatore, Tamil Nadu.

Date of Submission: 25-09-2020 Date of Acceptance: 08-10-2020

ABSTRACT: Nutritional, textural, microbiological and sensory evaluation was performed in soybean butters produced from defatted flour, cooked, sprouted and fried seeds. Commercial peanut butter served as control. Soybean butters had the highest significant amounts of moisture (3.69- 5.44 g/ 100 g) and protein (25.78- 29.89 g/ 100 g). Commercial peanut butter had the highest significant amounts of fats (58.73 g/ 100 g) and caloric value (2773.16 KJ/ 100 g). The peroxide value of commercial peanut butter was lower (0.13- 10.40 meq /kg) than that of soy butters (0.20- 30.20 meq /kg) over the storage period of 5 months/ 25°C. For microbiological evaluation, sprouted and cooked soy butters were much stable than commercial peanut butter. In texture analysis, sprouted soy butter was less significant hard (1.18dN) and the least adhesive(1.34e NS-1) and chewy (0.48d N) of all treatments. Fried soy butter had the
lowest overall acceptability (6.27c) of sensory scores among all the soy butters; but sprouted soy butter had the highest (7.54ab) one. Results could be useful in improving soy butter processing, predicting storage stability and delivering soy butter to consumers who are more concerned about soy products as a functional food and low- fat content other than commercial peanut butter.

Keywords: Soybean, butter, different treatments, Nutritional value, sensory attributes.

I. INTRODUCTION:

Soybean with its high protein and fat contents is suitable for roasting and Preparing a vegetable butter. Soy butter is a new product that is not Commercially available in many parts of the world and could be used as a Spread and filling for a wide variety of savoury and confectionery food recipes and formulations. Soy butter offers all Positive attributes of soybeans that well- balanced protein compared to other Protein sources distinguished by a relatively high amount of lysine and can Provide all of the essential amino acids required for children and adults. Also, it Is rich in the unsaturated fatty acids, oleic, linoleic, and linoleic which make up 85% of the oil. Besides, it is a good source of minerals, B vitamins, folic acid,and isoflavones, which are credited with slowing cancer development, heart Disease, and osteoporosis Not only, soynut butter has less total and saturated fat than peanut butter where a one serving tablespoon of soynut butter significantly saved 5.5 g fat and 85 calories than peanut butter But also, it is a good alternative for people with peanut allergyMoreover, as a Result of soybean health benefits and its technological and functional properties; Soy flour and proteins additionally incorporated into peanut spreads and peanut Butters, respectively. Efforts have been directed to use some technological treatments, whether To improve the nutritive value or to enhance the sensory and technological Qualities of soy products. It has hypothesized that sprouting before butter Making would result in advantages associated with the sprouting process. Sprouting triggers a sequence of metabolic changes resulting in improve Nutritional quality of legumes and reduction of the antinutritional factors such as Trypsin inhibitor (TI) by 60% and phytic acid. Lipoxygenase I, II and III are degraded during sprouting; preventing the Forming of volatile compounds thereby improving odour and flavour scores.

Processing of soybeans using cooking improves texture, palatability as Well as nutritional and sensory quality characteristics and that the degree of Improvement depends on the temperature, moisture content and duration of Cooking.

Blanching and roasting of the kernels are two important processing steps involved in the nut and nut butter manufacturing industry to improve the flavour, color, texture and overall acceptability (OAA) of the product. Moreover, roasting extended the shelf life of grains, reduces the antinutritional factors and denaturing proteins which improving their digestibility.

During roasting, caramelization and browning reactions Occur and result in forming of brown pigments. Pyrazines are the most abundant compounds formed during roasting and are

International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 7, pp: 367-369 www.ijaem.net ISSN: 2395-5252

Responsible for toasted and roasted flavours in foods

Frying of nuts is an alternative process to dry roasting, resulted in products With high added value. These products are the preferred snacks for exporting Purposes. Frying against dry roasting of nuts protects the surface of the product Against oxidation during storage by incorporating the frying oil with higher Stability than that of the nut lipids.

Materials:

- Soybean seeds and defatted soybean flour (5 g fat/ 100 g flour)
- The Plate count Agar medium
- Yeast and mould agar medium
- Carboxymethyl cellulose (CMC)
- Peanuts
- Vegetable oil
- hydrogenated vegetable oils
- honey
- salt
- vanilla
- granulated cane sugar

II. METHODS:

Technological treatments of soybean seeds:

Soybean seeds were sorted, cleaned of impurities, washed, and then subjected to Some technological treatments before manufacturing of soybean butters. The seeds were soaked in acidified water (20 ml vinegar/ 100 ml water) for 12 h at 25°C. Then, the excess water was drained and seeds were Further rinsed with distilled water. For sprouting, rinsed seeds were placed into Single layer filter paper in sterile tray and placed in the incubator at 25° C, 90% relative humidity for 72 h. The sprouted seeds Were blanched for a period of 10 min at 70°C. For cooking, rinsed seeds were Cooked for 30 min at 100° C. Samples were roasted in a convection oven at 100° C for 2h. For frying, rinsed and roasted seeds Were deeply fried at 180° C in sunflower oil till golden brown color and crunchy Texture appeared. Samples from sprouting, cooking and frying treatments were Allowed to cool at 25° C, grounded into powder using Braun mill 650, micron sieve. Three replicate Of 100 g seeds were carried out for each run.

Manufacturing of soybean butters:

Soybean butters were manufactured from defatted soybean flour, cooked, sprouted And fried dry milled samples. The samples were Blended in a food processor in speed 12 for 2 Min. Sugar, honey, salt, vanilla, CMC and 8 g of oil were added to the soybean Samples and were mixed for 7 min. Then, another 8 g of oil was added and mixed For 5 min; the rest 8 g of oil was added to the mixture and mixed for 5 min. The Proper composition of the formulation for 100 g formula was 65 g soy sample, 24 g Oil, 6 g granulated cane sugar, 1.5 g honey, 0.5 g CMC, 1.5 g salt and 1.5 g vanilla. Soybean butters were poured into sterilized glass jars, then autoclaved at 121°C/ 20Min, left to cool and stored at 25°C until analysis.

Proximate analysis:

Moisture, protein, fat, crude fiber and ash contents of the commercial peanut Butter and the above mentioned soybean butters were determined . The nitrogen content was estimated by the semi micro Kjeldahl method, and the nitrogen conversion factor used for the crude protein calculation was 6.25. The carbohydrate content was calculated by subtracting the contents of crude protein, fat, ash, and moisture from 100 g of commercial peanut butter and soy butters. The proximate compositions of different butters were averaged from four replicates. The results were expressed on a dry basis.

Total calories of commercial soybean butters

It is Calculated by the formula,

Totalcalories= Fat X 9 + Protein X 9+ Total CarbohydrateX 4.

Textural profile analysis (TPA) :

The texture measurement of each butter averaged from 5 replicates. Back extrusion cell with 35mm diameter compression disc was used. Two cycles were applied, at a constant crosshead velocity of 1 mm / s, to 25 % depth, and then returned. From the resulting forced- time curve, firmness (N), cohesiveness, gumminess (N), chewiness (N), springiness, resilience and adhesiveness (Ns) were calculated using the TPA graphic.

Sensory evaluation:

- texture
- taste
- flavour
- color.
- Spreadability
- overall acceptability

Nutritional values:

soybean butters had the highest significant amounts of moisture, protein and total carbohydrates; whereas, commercial peanut butter had the highest significant amounts of fats, crude fiber and caloric value. A fluctuation was observed

in ash content between all treatments. In concern, Flour butter exhibited the least significant fat content and this is due to the use of defatted flour that contain 5 g fat/ 100 g flour. While, fried butter exhibited the highest fat content between soybean butters and this is due to frying pre-treatment that adds around 10% more fat calories to the nuts.

Also, sprouted and cooked butters are distinguished by higher protein content. Flour from sprouted and heat treated seeds exhibited nutritional and functional uses of the soy proteins. Soy proteins are highly digestible (92% to 100%) and contain all essential Amino acids. FDA approved that 25 g soy protein/ day may reduce the risk of heart Diseasebecause they are well- known to have the lowering effect on total and LDL-cholesterol.

From the above mentioned data, soy butters showed high nutritive value which in turn, are considered to be an added value, especially for who are concerned about soybean and its products as an important functional food and low- fat content other than commercial peanut butter.

III. CONCLUSION:

The soy butters prepared from defatted flour, sprouted, cooked and fried seeds Were compared to commercial peanut butter, in terms of nutritional, Microbiological, textural and sensory values. Soy butters had higher protein and Lower fat content compared to commercial peanut butter. Sprouted and cooked Soy butters they might, however, be more susceptible to oxidation, but less Invaded by total bacteria, yeasts and molds. Sprouted soy butter was less Significant hard and the least adhesive, gummy and chewy of all treatments. Also, it had the highest sensory hedonic score, while fried soy butter had the Lowest one. Results of this study could be used in improvement of soy butter Processing via soaking, sprouting, blanching, cooking and roasting and Prediction of oxidation and microbial stability during storage. Besides, an added Value for who are concerned about soybean and its butter as an important Functional food and low- fat content other than commercial peanut butter.

REFERENCES :

[1]. Agrahar- Murugkar, D. (2014). Effect of sprouting of soybean on the chemical Composition and quality of soymilk and tofu. Journal of Food Science and Technology, 51, 915- 9

[2]. Ahmed, J., Ramaswamy, H.S., Kasapis, S. & Boye, J.I. (2009). Novel Food Processing: Effects on Rheological and Functional Properties. Chap.8 Pp118 CRC Press Boca Raton London New York.

[3]. AOAC (2007). Association of Official Analytical Chemist. Official methods of Analysis. (18th. Ed). Washington, DC.

[4]. AOCS (1991). Official methods and recommended practices of the American

[5]. Oil Chemists' Society, Champaign, IL, Methods Cd 8-53.

[6]. FDA Soy Health Claim, (2003). Soy foods Guide pp1- 24.

[7]. Maria, E.C. & Carelli, A.A. (2010). Peanut oil: Compositional data. European Journal of Lipid Science and Technology, 112, 697-707.

[8]. SAS (1996). SAS/ STAT1 User's Guide, Version 8. SAS Inst, Inct,Cary, NC.

[9]. Wood roof, J.G., (Ed.), 1983. Peanuts: Production Processing, Products, 3rd Ed., AVI Publ. Co, Westport. Conn., pp: 414.

[10]. Zhan, S. & Ho, S.C. (2005). Meta-analysis of the effects of soy protein Containing isoflavones on the lipid profile. American Journal of Clinical Nutrition, 81, 397- 408.