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Studies on development of process technology for preparation, sensory evaluation and storage study of green peas pickle

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Abstract
The Recent work has been carried out for the preparation of Green Peas Pickle. Green Peas Pickle is well known for heart-healthy minerals, such as magnesium, potassium and calcium. Diets high in these nutrients may be helpful for preventing high blood pressure, which is a major risk factor for heart disease. They may also have a positive effect on heart health. Anti aging properties associated with Green Peas contain the carotenoids lutein and zeaxanthin. These nutrients help protect your eyes from chronic diseases, such as cataracts and age-related macular degeneration. Lutein and zeaxanthin act as filters from harmful blue light, which contributes to cataracts and macular degeneration. Health benefits of Green Peas are a good source of vitamins C and E, zinc, and other antioxidants that strengthen your immune system. Other nutrients, such as vitamins A and B and cholesterol, help reduce inflammation and lower your risk of chronic conditions, including diabetes, heart disease, and arthritis. Here by, we have prepared three samples i.e. (T_1), (T_2) and (T3) with the variation of Green Peas, *viz*. 6.82, 7.88. and 6.5. (Overall Acceptability) Of these three sample T2 was selected for further development of Green pickle. The sensory score of sample T3 based on hedonic scale color (9), Flavour (8), Appearance (9), Texture (9), Taste (9) and Overall acceptability (8.8). Storage effect on product was good on up to 150 days at ambient temperature, score recorded of T2 sample.

Keywords: Green peas, pickle, proximate analysis, sensory evaluation, storage study

Introduction

The preservation of food in common salt or vinegar is known as pickling. It is one of the most ancient method of preserving fruit and vegetables. (Kokani *et. al.* 2019) [13]. Pickle is one of the oldest, and most successful method of food preservation known to human to meals and snacks. The optimization of pickle quality depends on maintenance of proper acidity, salt, concentration, temperature and sanitary conditions. Pickle products add spices to meals and snacks. The skillful blending of spice, sugar and oil with fruit and vegetable give crisp, firm texture and pungent, sweet-sour flavor (Nirmalayenagi *et. al.*, 2010).

Pickle serve as appetizers and help in digestion by aiding flow of gastric juice. The process of food preservation in common salt or in vinegar or in both is called pickling. Pickling with the help of vinegar and oils has been in practice from time immemorial in this country. In modern days, pickles of different fruits and vegetables are prepared with the mixture of salt, oil, vinegar and spices etc. In pickles, oil acts as preservative (*Shahjahan et. al., 2005*) [21]. Pickles are generally of three types namely pickles in vinegar, citrus juice, brine and oil. The presence of these ingredients, makes the product highly acidic in nature. A good packaging material for pickle can prevent spoilage. A good package for pickles should have the attributes such as aroma retention, excellent protection against light, moisture and oxygen, excellent integrity for containment, grease, oil and acid resistance, good aesthetics and appearance (Nirmalayenagi *et. al.*, 2010).

Pickles in South Asia are generally always home-made, and every district, village and family has its secret formulae, closely guarded and handed down from mother to their daughters. In many parts of India, the quality of the pickles made by a bride is considered as valuable as her jewelries. Indian pickles have a distinctly different character from the Western ones, in that they are stronger, sharper, hotter, and spicier than the ones from other parts of the world. In India, pickles are made with quite an amazing variety of oils, including those extracted from mustard and sesame. Pickles from the subcontinent differ from the Europe are the ground spice, the salt, the chillies and the laborious method of curing it in the strong tropical sun. With bewildering variety of pickles in the subcontinent, the two basics categories again reflect the fundamental cultural difference between India's north and south. Southern pickles are quite different in tone and temper from the Northern. The difference is the oil base, souring agent and choice of spices. Mustard oil is the popular pickling medium in North whereas, Mustard or sesame oil is popular pickling in South. The souring agents used apart from the pickled vegetables itself are lime juice in South whereas vinegar in North. (NirmalaYenagi*at. El.*, 2010).

Pickling is the result of fermentation by lactic acid-forming bacteria, which are generally present in large numbers on the surface of fresh vegetables and fruits. These bacteria can grow in acid medium and in the presence of 8-10 percent salt solution, whereas the growth of a majorityof undesirable organisms is inhibited. In the drysalting method several alternate layers of vegetables and salt (20- 30 g of dry salt per kg vegetables) are kept in a vessel which is covered with a cloth and a wooden board and allowed to stand for about 24 hours (Fruits and vegetable Preservation, Srivastava and Kumar, 2002) [22].

The green pea is the seed of the genus *Pisum sativum*. The pea is in the Leguminosae family. It is one of the most popular vegetables. In 1969, the pea crop in Canada was

valued at seven million dollars (Voisey and Nonnecke, 1973). In the United States the pea crop for 1989 was valued at approximately 119 million dollars (Judge, 1991). The consumer plays a very important role in influencing directions of the food industry. In a consumer survey, attributes important in selecting vegetables were rated. The survey showed that texture and flavor were the most important sensory attributes, followed by appearance and color (Schultz *et al*., 1984).

Green peas (Pisum sativum) with 2N = 14 is an important herb in our life. As a veg. protein it is accepted in our daily intake. Production is highest in the season of winter in India. Fresh green peas are available in market in between Oct-Dec. It is annual herb with soft trailing stem. Alternate arrangement of leaves. (Phyllotaxy). Flowers are either mauve or white. Small pods appeared after maturation of flower. Every pod contains 3-4 seeds and it's very tasteful to eat. Even in raw green peas are edible and steady supplies to prepare different dishes in winter. For large scale production these are sending to factories for marketable packaging. Dry peas are available and also in pulse section it is available in market. (strickberger mw, 1976) [19].

Material & Methods

Procurement of materials for Green peas *(pisumsativum)* pickle

Raw materials required during present investigation were procured from local market such as green peas, ginger, salt, oil, spices, mustard seeds, curry leaves, one dried chilli, vinegar, etc. The raw material were cleaned and made free from foreign matters.

Physical Properties green peas Pickle

Colour – The color of green peas pickle was determined by visual observation. Weight – Weight of green peas pickle was determined by analytical weighing balance. TSS – The TSS (Total Soluble Solids) in pickle was determined by using hand Refractometer and digital Refractometer.

Chemical Properties of green peas pickle

Different chemical properties of samples were analyzed 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.

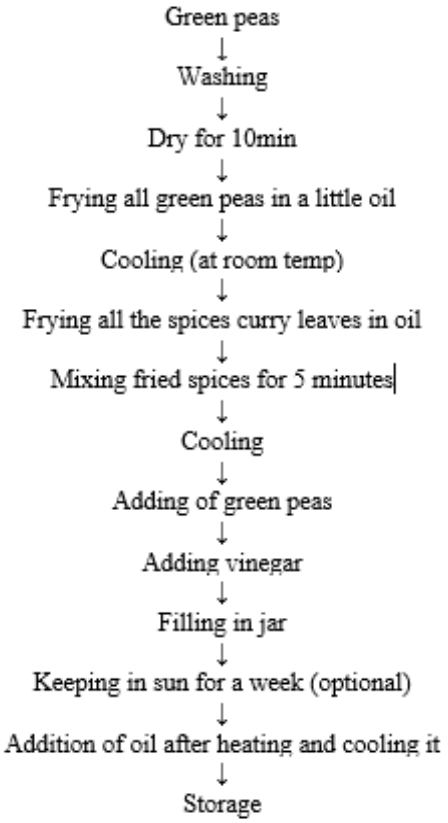
Sensory Evaluation of green peas Pickle

Prepared green peas pickle were evaluated for sensory characteristics in terms of appearance, colour, Flavour, taste, texture and overall acceptability by 10 semi-trained panel members comprised of academic staff members of the College of Food Technology, Saralgaon, Thane, 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. The format of sensory score card is as given in Appendix I.

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) [16]. The analysis of variance revealed at significance of $P<0.05$ level S.E. and C.D. at 5per cent level is mentioned wherever required.

Flow sheet 1: Preparation of green peas Pickle



Result and Discussion

Physical Properties of Green Peas

Table 1: Physical Properties of Fresh Green Peas

Parameter	Observation
Color	Green
Length	8.50mm
Width	6.50mm
Thickness	4.00mm
Weight	5.6

From the above table no.1 the physical properties of green peas in which color, Length, Width, Thickness and Weight was determined. The Green peas shown in Green color and length (8.50mm), width (6.50mm), Thickness (4.00mm) and weight of single green pea was (5.6). The value of colourwhich was determined by visual observation. The Length and width which was determined by Vernier Caliper meter and the weight was determined by Analytical weighing balance.

Table 2: Chemical Properties of Fresh Green Peas

Parameter	Observation
Moisture	63± 0.03
Fat	0.40± 0.09
Protein	5.42± 0.10
Ash	1.01± 0.12
Carbohydrate	14.45±0.12
Energy Value	81Kcal

From the above table no. 2 chemical parameter of Green peas was evaluated. The chemical properties of G in which Moisture (63 ± 0.03), Protein (5.42 ± 0.10), Fat (0.40 ± 0.09) Ash (1.01 ± 0.12) Carbohydrate (14.45±0.12) Energy Value (81Kcal). The values of chemical parameter which was nearby (USDA Government).

Table 3: Physical Properties of Green peas Pickle

Parameter	Observation
Color	Vibrant Green
Shape	Round pods
Texture	Smooth
Inside	Starchy and sweet taste

From the above table no.3, Color of Green Peas pickles was Vibrant Green which was determine by visual observation. All physical parameter observed by visual observation.

Chemical Properties of Green peas Pickle

The chemical properties of Green peas Picklesuch as pH, Acidity, moisture, TS, protein, and ash was carried out and the results obtained were tabulated in table in 4 no.

Table 4: Chemical Properties of Green peas Pickle (Selected Sample T2)

Parameters	Observation Sample (T2)
Moisture	63.4 ± 0.03
TS	16.4 ± 0.09
Protein	4.24 ± 0.10
Ash	2.01 ± 0.08
pH	4.47 ± 0.02
Acidity	0.795 ± 0.07
Fat	5.77 ± 0.02
Carbohydrates	48.30 ± 0.09
Energy Value	262.02±0.01

The value of chemical parameter mention in table no. 6 which was analyzed by AOAC Method. It was evident from Table 6. That pH value of Green peas Pickle was found to be 4.47±0.02, Moisture content was found to be 63.4±0.03%, TS 16.4±0.09%, Acidity 0.795±0.07%, Ash content 2.01±0.08%, protein content 4.24±0.10%, fat content 5.77±0.02%, carbohydrate 48.30±0.09% and the energy value is 262.02±0.01Kcal.

Storage studies of Green peas Pickle

Table 5

Sample Period (Month)	Color	Flavour	Texture	Visual Fungal growth	Remarks
0	No change	No off Flavour	Firm	No growth	Good
1	No change	No off Flavour	Slightly Soft	No growth	Good
2	No change	No off Flavour	Soft	No growth	Good
3	No change	No off Flavour	Soft	Slightly growth	Good
4	No change	No off Flavour	Extremely Soft	Slightly growth	Good
5	No change	No off Flavour	Extremely Soft	Slightly growth	Good

Green peas Pickles sample was used for storage studies at room temperature (27°C-33°C) for 0-5 months. The effect of storage time (0,1,2,3,4 and 5 month) on physical properties such as colour, Flavour& texture of the pickles were studied and represented. Green peas pickle would be assessed after Six months storage in Jars for keeping quality, taste & flavor. The pickle became soft after three month & slightly visual fungal growth after three month but otherwise remained satisfactory upto 6 month of storage.

Sensory evaluation of Green peas Pickle

Prepared Green peas pickle were evaluated for sensory characteristics in terms of colour, Flavour, taste, consistency and overall acceptability by 10 semi-trained panel members comprised of academic staff members of the College of Food Technology, Saralgaon, 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.

Sensory evaluation of Green peas Pickle

Table 6

Sample	Colour	Flavour	Appearance	Texture	Taste	Overall Acceptability
T0	8	8	8	8	8	8
T1	7.1	7.5	6.5	6	7	6.82
T2	8	7.9	7.5	8	8	7.88
T3	6	5.5	7.5	6.5	7	6.5

Conclusion

Green peas Pickle can be prepared by using polyethylene pouches found most suitable for packing with respect to its stability and acceptability. Development of soft texture during storage is the limiting factor for shelf life; the product remained chemically and microbiologically safe and stable during entire storage.

Reference

1. AOAC. Official Methods of Analysis 17th ed. Association of Official Analytical, 2000.
2. Chemists International. Washington, DC, USA.
3. Amjad Iqbal a*, Iqtidar A Khalil a, Nadia Ateeq c, Muhammad Sayyar Khan b. Nutritional quality of important food legumes Food Chemistry 97, 2006, 331–335.
4. Agropedia. Vegetable pea varieties. Website:http//agropedia.iitk.ac.in, 2015.
5. Baisya RK. Fruits and Vegetables processing industry in India. Its Problems and Prospects. Indian Food Packer,1980:34(6):29.
6. Bose TK, Som MG. Vegetables crops in India. Department of Horticulture. Bidhan Chandra KrishiViswavidyalaya, Kalyani 741235 India. NayaProkash, Calcutta- Six, 1986, 352-409.
7. C Chellaram. Chemical composition, shelf life studies and popularization on *pleuroploca trapezium* meat Pickle, Journal of Chemical and Pharmaceutical Research,2015:7(1):25-30.
8. Chopra RN. Indigenous drugs of India, The Art press, Calcutta, 1933.

9. Coggins JW. Green pea sheller. United State Patent, 1704427, 1929.
10. Gopalan C, Ramasastry BV, Balasubramanium SC. Nutritive value of Indian foods. Hyderabad: National Institute of Nutrition, 1991, 47.
11. Hosain MM, Jannat R, Islam MM, Sarker MKU. Processing and Preservation of Okra Pickle. Journal of Process Agriculture,2010:21(1&2):215-222.
12. Kirtikar KR, Basu BD. Indian Medicinal Plants (Lolit Mohan Basu), Allahabad, 1935.
13. Kokani RC, Dhakane SM, Solaskar AB. Studies on Formulation and Standardization of Dates Pickle. International Journal of Food Science and Nutrition,2019:4(5):172-174.
14. Mukherjee Sunit. Low cost food processing possibilities. Proc. IIndInd Conv. Food Science Technology, 1982, 76.
15. Pandey A, Singh A, Garg P, Raja RB. A Novel Method to Produce Low Salinity and Healthier Indian Lemon (citrus limonum). Annals of biological research,2011:2(1):187-194.
16. VG Panse, PV Sukhatme. "Statistical Methods for Agricultural Workers," 2nd Edition, Indian Council of Agricultural Research, New Delhi, 1967.
17. Ranganna s. Manual of Analysis of Fruits and Vegetables products. Tata McGraw-Hill publishing Co. Ltd., New Delhi, 1977, 634.
18. Richard D. 'A Carrot a day keeps cancer away'. The Times of India,1981:10:9.
19. Strickberger mw. Genetics. 2 nd ed. new york, ny: macmillan publishing co. inc, 1976, 914.
20. Saroj Singh KK. Standardization of recipe and Method for Mango Pickle. International Journal of Chemical studies,2018:6(2):2033-2037.
21. Shahjahan M, Miaruddin M, Rahman MM. Pickling and fermentation of fruits and vegetables [In: Processing of international workshop on agro Processing techniques of fruits and vegetables for income generation]. Bangladesh Agricultural Joydebpur, Gazipur, 2005.
22. Srivastava RP, Kumar S. Fruits and Vegetable Preservation, 3rd Edition. CBS Publisher and Distributors Private Limited, 2002, 235-252.
23. Thakur NS, Kumar D, Thakur A, Chauhan M, Kumar P. Studies on development and Storage Quality of Seedling Mango (*mangiferaindica*L.) Pickle of Himachal Pradesh. Indian Journal of Ecology,2017:44(6):690-696.
24. Vasugi C, Sekar K, Dinesh MR, Suresh ER. Evaluation of unique Mango accessions for whole- fruit pickle, *J. Hortl. Sci*,2008:3(2):156-160.
25. JankoČervenski*, Dario Danojević, Aleksandra Savić. Chemical Composition of Selected Winter Green Pea (Pisum Sativum L.) Genotypes, J. Serb. Chem. Soc,2017:82(11):1237–1246.
26. Yalc ın CO, Zarslan T. Akbas Journal of Food Engineering,2007:79:731–735.
27. Elashhab AO. Engineering Properties of Green Peas Pods. Global Journal of Advanced Research,2016:3(4):250-257. Issn: 2394-5788
28. Sonboier KK, Mahilang KKS, Minj P, Porte P, Taran T. Some Physical Properties of Green Pea, Int. J. Pure App. Biosci,2018:6(1):573-579.
29. AOAC. Official Methods of Analysis 17th ed. Association of Official Analytical Chemists International. Washington, DC, USA. Strickberger mw, 1976. genetics. 2 nd ed. new york, ny: macmillan publishing co. inc, 2000, 914.
30. Sonboier KK, Mahilang KKS, Minj P, Porte P, Taran T. Some Physical Properties of Green Pea, Int. J. Pure App. Biosci,2018:6(1):573-579.