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Organoleptically and nutritional evaluation of value added cutlet supplemented with fresh pea shells (*Pisum sativum* L.)

Amita Beniwal, Savita Singh, Veenu Sangwan and Darshan Punia

Abstract
In the present investigation an attempt has been done to get nutrients rich cutlet by value addition of fresh pea shells. In this connection, fibrous coat of pea pods were removed and digestive layer was utilized for value addition of cutlets. The study result show that after incorporation of fresh pea shells (30%) in cutlets, the mean score for sensory characteristics were increased and fell in the category of" liked very much". The nutritional parameters showed a significant ($p< 0.05$) increased in term of protein (4.09 to 4.95gm/100gm), crude fiber (1.00 to 1.62 gm/100gm) and dietary fiber (1.51 to 2.69 gm/100gm) content of value added cutlet a significant decreased was notice in term of energy and carbohydrates. A significant increasing trend was observed in minerals content like magnesium (49.86 to 108.64 mg/100gm) and calcium (22.33 to 70.67 mg/100gm) which was increased two times compared to their control. From the present investigation it was concluded that value added cutlet provide appreciable amount of nutrients.

Keywords: Cutlet, acceptability, pea shells, nutritional, significant

1. Introduction
Pea (*Pisum sativum*) is the maximum essential vegetation of the temperate climatic regions pleasant the cause of each human intake and animal feeding [1]. In India, approx 1 million ton of pea peel waste generated yearly, based on annually production of peas, of that huge range is discarded as waste [2]. Due to seasonal production of peas, its limited supply in some areas, which create the need for its preservation by drying [3], It's create a huge amount of pea waste. The waste generated from vegetables or fruits or by products are good source of bioactive compounds, which can be utilized to develop functional and supplemented foods by industries [4] due to their nutritional and techno-functional properties [5]. The value added foods alternative way to consume plant components in diet that may have helps to prevent heath diseases like colon irritation, degenerative diseases and constipation and improve nutritional status [6, 7, 8].
Now a day's industrial by-products gained attention in recent advancement and researches due to low cost and protect environment by reduction of bio waste [9]. Pea pods storage is difficult due to high moisture content [10] and it contain good source of fiber and other nutrients. However, changing amount of ingredients to decrease calorie content can compromise balance, mouth feel, flavor and presentation. Cutlet is a famous street food in India and it's varying from state to state that loved by millions of people. In the present investigation an attempt was carried out to get nutritionally cutlet by value addition of fresh pea shells. Pea shells are good source of nutrients like minerals, vitamins, proteins and phytochemicals. Aim of the present work was to develop fresh pea shells and supplemented with cutlet and comparison with control on the basis of sensory and nutritional attributes.

2. Methodology
2.1 Procurement of Material
Fresh peas were obtained from the vegetable market, Hisar in a single lots.

2.2 Preparation of samples
Pea pods shelled and washed to remove dirt and foreign matters. After that, pods were dipped in Meta bisulphite 0.2% solution and then dipped in hot water at 60 ^{0}C for 10 minutes. The pea shells outspread over filter paper to drain water.

Separated the layer (inner fibrous) manually and the edible portion chopped finely and blends with potato in different ratio to developed cutlet.

2.3 The proportion of potato and pea shells for preparation of cutlet: For Cutlet the ratio of boiled potato and pea shells was 100 (Control), 90:10 (Type I), 80:20 (Type II) and 70:30 (Type III).

2.4 Ingredients used for cutlet: Onion 10 gm, Bread crumbs 8gm, green chilli 1 small, salt ($^1/_4{}^{th}$), gram masala ($^1/_5{}^{th}$) and amchur powder ($^1/_5{}^{th}$) tsp, Oil for frying, red chilli powder 1 pinch.

2.5 Method of developed cutlet

Chopped fresh pea shells were added to mashed potatoes and added bread crumbs, green chilli, salt, gram masala, amchur powder, and red chilli powder and mixed. For cutlet heated oil in a Kadahi, added finely chopped onions and turned slightly brown, added the mixture. Saute for 2-3 minutes. After cooling mixed well and divided the mixture into equal portions. Rolled cutlets in breadcrumbs on both sides. Heated oil in a Kadahi. Dropped the cutlets gently in hot oil and cooked till golden brown in colour (Plate 1).

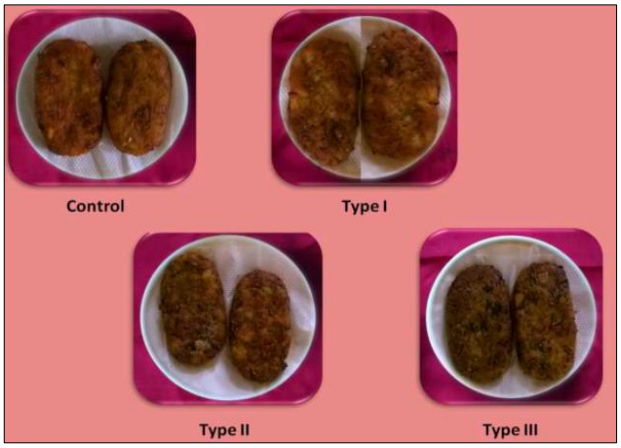

Plate 1: Cutlet

2.7 Method

a. **Organoleptic evaluation:** Organoleptic evaluation was conducted by semi-trained panel (15) members from the department of Food and Nutrition by adopting 9 Hedonic scales [11].
b. **Nutritional evaluation:** The dried cutlet was analyzed for the nutrients content (samples were performed in triplicates). Proximate composition (moisture, crude protein, crude fat, ash, crude fiber) examined by the standard methods [12] and total carbohydrate calculated by difference method, whereas energy estimated by multiplication factor. The dietary fiber [13] and total minerals [14] determined by standard methods.
c. **Statistical analysis:** Data analyzed by using standard statistical method [15] ANOVA and SE with three replication at the significant ($p< 0.05$).

4. Result and Discussion

4.1 Observations

Table 1: Cooking observation of cutlet

Products types	Observation of cooking per 100gm			
	Total Cooked wt.	No. of pieces	One piece cooked wt.	Total Dry wt.
Cutlet				
Control	88g	2	44g	39.02g
Type I	90g	2	45g	37.10g
Type II	94g	2	47g	36.28 g
Type III	98g	2	49g	34.78g

Types described in section 2.3

The cooking properties e.g. weight is referred as a body's relative mass/the quantity of matter occupied by it, giving rise to a downward force or the bulkiness of a thing, according to the data depicted in the table 1, the weight of the cutlet increased as the fresh pea shells was added this may be due to the higher moisture content in pea shells. The result shows that after drying weight was decreased when compared to control.

4.2 Organoleptic evaluations

Table 2: Mean scores of organoleptic characteristics of cutlet

Product	Sensory characteristics					
	Colour	Appearance	Aroma	Texture	Taste	Overall acceptability
Scores of Cutlet						
Control	7.80±0.13	7.90±0.10*	7.90±0.10	8.00±0.00*	8.00±0.00*	7.92±0.06
Type I	7.70±0.15	7.80±0.13	7.90±0.10	7.80±0.13	8.00±0.00*	7.82±0.08
Type II	8.00±0.15*	7.90±0.18*	8.10±0.10*	7.90±0.18	8.00±0.15*	7.96±0.10*
Type III	7.40±0.16	7.70±0.15	8.00±0.00	7.80±0.13	7.80±0.13	7.70±0.07

Values are mean ± SE of 15 independent observations, Types described in section 2.3, * shows the higher score

The results showed that (table 2) the value added cutlets got the higher mean scores when compared to Control. However, the organoleptic mean scores for all types of cutlet fell under the category of 'like very much". Joshi and Mathur (2015) evaluated the acceptability of products was more in shallow frying as compared to deep frying by using leaf mixture powder. Similarly in present study the colour and appearance score was less in deep frying (Cutlet) compared to shallow frying (*Tikki*). Mogra *et al.* (2012) reported that as the level of cauliflower leaf powder was increased the mean scores increased and value added *tikki* scored as 'like very much' at 10% level. The highest scores for all the attributes were obtained by cutlet with 20% level of fresh pea shells supplementation. This clearly shows that fresh pea shells has influence on sensory characteristics of cutlet which might have been due to addition of fresh pea shells have a major role in fries food to crispier or tastier and enhance the colour, texture or taste. Similar results reported by Diksha and Modgil (2021) on *tikki* of Indian street food which the mean score fell in the category of 7 to 8 mean score of sensory.

4.3 Nutritional Composition
4.3.1 Proximate Composition

Table 3: Proximate compositions of cutlet (%dry weight basis)

Product	Proximate composition (dry matter basis)						
Cutlet	Moisture*	Crude protein	Fat	Crude fiber	Ash	Total CHO	Energy (Kcal/100g)
Control	55.66±0.42	4.09±0.08	6.19±0.21	1.00±0.03	3.50±0.06	66.89±1.77	338.74±1.50
Type I	52.28±0.40	4.37±0.06	6.27±0.10	1.14±0.04	3.72±0.06	62.62±1.16	324.39±1.76
Type II	61.40±0.49	4.64±0.04	6.41±0.06	1.49±0.04	3.93±0.08	57.33±1.55	305.58±1.45
Type III	64.51±0.43	4.95±0.06	6.58±0.12	1.62±0.04	4.20±0.04	50.83±1.53	282.34±1.54
CD ($P \leq 0.05$)	1.51	0.20	0.43	0.12	0.20	5.02	5.19

Values are mean ± SE of three independent determinations, * = on fresh weight basis, Types described in section 2.3

The moisture content significantly increased in all types developed cutlets (55.66 to 64.51%). Apparently, a significantly increasing trend in protein content was observed in all types of cutlets ranged from 4.09 to 4.95%. A non significant difference existed among all types of cutlets in term of fat content varies from 6.19 to 6.58%. The incorporation of fresh pea shells in cutlets showed significantly increasing trends in term of crude fiber ranged from 1.00 to 1.62%. The ash content of the cutlets ranged from 3.50 to 4.30% was showed a significantly increased between Control and fresh pea shells incorporated cutlets. Total carbohydrates content also decreased significantly in incorporated cutlet (66.89 to 50.83%), whereas a non significant difference was observed between Control and Type I cutlet. The results obtained in present study were almost similar to the *tikki* prepared with 10% supplementation of cauliflower leaf powder with 60.74% moisture, 3.99g protein, 3.55g fat, 1.71g fiber, 3.25g/100g ash as reported by Mogra *et al.* (2012). Acc. to Nazni and Jaganathan (2014) a study on nutritional parameters of different street and home mad foods showed the range of nutrients in cutlet like protein (5.4 to 13.0gm), ash (4.5 to 7.10gm), carbohydrate (2. 5 to 4.6 gm) and fiber (50 to 60 gm). The higher fat content was found in homemade cutlet (value added) due to the facts that adding good quality of oils was used in cooking. Diksha and Modgil (2021) reported almost similar results of *tikki* nutrients (street vendor) e.g. ash (3.63 to 5.60%), crude fiber (0.78 to 1.85%), crude protein (3.20 to 5.27%) and carbohydrate (51.50 to 61.64%)

4.3.2 Dietary fiber

Table 4: Dietary fiber content of cutlet (dry weight basis)

Product	Dietary fiber		
Cutlet	Total Dietary fiber	Insoluble dietary fiber	Soluble dietary fiber
Control	1.51±0.05	1.12±0.05	0.39±0.01
Type I	1.91±0.04	1.44±0.03	0.46±0.02
Type II	2.31±0.06	1.77±0.06	0.54±0.01
Type III	2.69±0.07	2.07±0.06	0.62±0.01
CD ($P \leq 0.05$)	0.18	0.16	0.04

Values are mean ± SE of three independent determinations, Types described in section 2.3

The finding of study indicated (Table 4) that the addition of fresh pea shells brought about a significant increase in dietary fiber content in cutlet than their Control that indicated that fresh pea shells are a good source of dietary fiber. Total dietary fiber in cutlet from 1.51 to 2.69% was increased significantly after incorporation of pea shells in cutlet at different levels.

4.3.3 Total minerals

Table 5: Total mineral content of cutlet *(*mg/100g, dry weight basis)

Product	Total minerals						
Cutlet	Calcium	Iron	Zinc	Magnesium	Potassium	Sodium	Manganese
Control	22.33±1.45	1.38±0.02	0.60±0.01	49.86±1.51	261.67±6.14	13.63±0.27	0.34±0.01
Type I	37.95±2.89	1.56±0.03	0.66±0.01	69.44±1.16	277.91±3.46	14.31±0.18	0.35±0.01
Type II	55.45±3.15	1.75±0.04	0.73±0.01	89.05±3.46	293.68±2.30	14.98±0.17	0.36±0.01
Type III	70.67±2.89	1.94±0.04	0.78±0.01	108.64±3.40	310.02±2.31	15.75±0.14	0.37±0.01
CD ($P \leq 0.05$)	8.87	0.11	0.04	8.77	12.86	0.66	NS

Values are mean ± SE of three independent determinations, Types described in section 2.3

The results (table 5) revealed that calcium content of fresh pea shells incorporated cutlet increased two times in Type II (55.45mg) and three times in Type III (70.67 mg) as compared to the values of Control (22.33 mg) cutlet. It is evident from data that iron content was increased to a significant extent after incorporation of fresh pea shells in cutlet (1.38 to 1.94 mg). A non significant difference in zinc content was observed among all the types of cutlet whereas a significant difference was noticed in Type II and Type III cutlet.

The results showed that incorporation of fresh pea shells to cutlet (49.86 to 108.64 mg) brought about a significant increase in their magnesium content showed in Type III cutlet increased two times as compared to Control. A significant difference was seen in all types of cutlet (261.67 to 310.02 mg) for their potassium content. All types of developed cutlet (13.63 to 15.75 mg) differed significantly among them for their sodium content indicated that the incorporation of fresh pea shells brought about a significant improvement. It was observed that the incorporation of fresh pea shells to cutlet did not bring any significant change in manganese content. The results obtained for calcium and iron content revealed that the values were lower than the values reported by Mogra *et al.* (2012) in cauliflower supplemented *tikki* (1320 mg

calcium and 4.8mg/100g iron). A contradictor results of higher calcium was reported in present study with the Nazni and Jaganathan (2014) a study on nutritional parameters of different street and homemade cutlet like calcium and iron was noticed 8 to 12.2 mg and 0.17 to 1.60 mg respectively. Diksha and Modgil (2021) reported the minerals content in *tikki* (street vendor) e.g. iron (4.04 to 4.11 gm), zinc (1.00 to 1.52 gm) and calcium (2013 to 47.769 gm).

5. Conclusion

An analytical result of this experiment showed that the nutrient composition of cutlet revealed a significant increase in crude protein, crude fiber, and dietary fiber and total minerals (calcium, iron, zinc, magnesium, potassium and sodium) after supplementation of fresh pea shells at different levels and significantly decreased the carbohydrate and energy content. Due to its high nutritional properties, this could be a significant role in alleviating the protein-energy malnutrition of developing countries.

6. References

1. Mmihailovic V, Mikic A, Eric P, Vasiljevic S, Cupina B, Katic S. Protein pea in animal feeding. Biotechnology in Animal Husbandry. 2005;21(5-6):281-285.
2. Upasana, Vinay D. Nutritional evaluation of pea peel and pea peel extracted byproducts. International Journal of Food Science and Nutrition. 2018;3(1):65-67. ISSN: 2455-4898. www.foodsciencejournal.com
3. Garg M, Sharma S, Varmani GS, Sadhu DS. Drying kinetics of thin layer pea pods using tray drying. International Journal of Food Nutrition. 2014;3:61-66.
4. Sagar AN, Pareek S, Sharma S, Yahia ME, Lobo GM. Fruit and vegetable waste: bioactive compounds, their extraction, and possible utilization. Food Science and Food Safety, 2018. DOI: 0.1111/1541-4337.12330
5. Aparicio IM, Cuenca AR, Suárez MJV, Revilla MAZ, Sanz MDT. Pea pod, broad bean pod and Okara, potential sources of functional compounds. Food Science Technology. 2010;43:1467-1470.
6. Carle R, Keller P, Schieber A, Rentschler C, Katzschner T, Rauch D. Method for obtaining useful materials from the by-products of fruit and vegetable processing. Patent application, 2001. WO 01/78859 A1.
7. Kiran B, Neetu S. Utilization of vegetable waste as a source of dietary fiber rich muffins and biscuits for old age. International Journal of Food Science and Nutrition. 2017;2(6):31-34. ISSN: 2455-4898.
8. Sahin SA, Kasoju N, Luthra A, Bor U. Review Indian medicinal herbs as source of antioxidant, 2008. https://www.researchgate.net/publication/222569024.
9. Gowe C. Review on potential use of fruit and vegetables by-products as: a valuable source of natural food additives food science and quality management, 2015, 45. ISSN 2225-0557. www.iiste.org ISSN 2224-6088.
10. Garg M. Nutritional evaluation and utilization of pea pod powder for preparation of jaggery biscuits. Journal Food Process Technology. 2015;6(12):552.
11. Peryam DR, Pilgrim FJH. Hedonic scale method of measuring food preferences. Food Technology, 1957, pp. 9-14.
12. AOAC. Official methods of analysis. Association of Official Analytical Chemist International. 17th Ed. AOAC International, Gaithersburg, MD, USA, 2000.
13. Furda I. Simultaneous analysis of soluble and insoluble dietary fiber. In: The Analysis of Fiber in Foods. W.P.T. James and O. Theander, Eds. Marcel Dekker, New York, NY, 1981.
14. Lindsay WL, Norvell WA. Equilibrium relationship of Zn, Fe, Ca and H with EDTA and DTPA in soils. Soil Science Soc. Am. Proc. 1969;33:62-68.
15. Sheoran OP, Pannu RS. Statistical Package for agricultural workers. O. P. Stat College of Agriculture, Kaul, CCS Haryana Agricultural University, Hisar. India, 1999.
16. Joshi P, Mathur B. Development of value added products from the leaf powders of dehydrated less utilize green leafy vegetables. Nutrition and Food Science. 2015;45(2):302-309.
17. Mogra R, Banga J, Rathi P. Nutrient composition of cauliflower (*Brassica oleracea* var. Botrytis) leaf powder and its acceptability in fast food snacks. Food Science Research Journal. 2012;3(2):167-171
18. Diksha, Modgil R. Quality evaluation and value addition of Indian street food: Potato cutlet (Tikki) The Pharma Innovation Journal. 2021;10(4):185-189.
19. Nazni P, Jaganathan A. Standardization and proximate analysis of street foods sold in Salem district. International Journal of Agricultural and Food Science. 2014;4(3):94-99.