

Sensory attributes of chevon patties extended with soy protein

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ABSTRACT

The present study was conducted to prepare soy protein (soy crumbles) extended chevon meat patties to determine effect on sensory attributes of the product. The sensory characteristics such as appearance, flavor, texture and juiciness of soy protein extended chevon patties were studied at different storage interval under refrigeration temperature and exhibited non significant variation upto 30% soy protein added patties. While overall acceptability for 30% soy extended chevon patties was significantly higher than the control and other treatments ($p < 0.5$). All Sensory attributes decreased significantly ($p < 0.05$) with advancement of storage period.

Keywords: Chevon Patties, Sensory attributes, soy protein

Annual production of chevon is 4.75 MT in the world and India contributes 12.6% of total chevon produced in the world. Chevon production is 14% of the total meat produced in India (FAO, 2011). Chevon is popular because it is low in fat and cholesterol (Johnson, 1989). The merit is that it is of lean type and thus preferred in the world market.

Patty, a popular comminuted, ethnic meat product of India, enjoys a high degree of preference among the consumers due to its characteristic flavour and pronounced chewability. Traditionally it is prepared by mixing ground meat with dry spice mix, condiment and salt. It is pan fried using vegetable oils (Pawar *et al.*, 2002).

The increasing utilization of soy protein in comminuted meat products is due to several factors, including abundance, low cost, desirable texture, good fat and water binding capacity and good nutritional properties (Kumar and Sharma, 2003).

Hence, the present study was conducted to prepare soy protein (soy crumbles) extended chevon meat patties and to determine its effect on sensory attributes of the product.

MATERIALS AND METHODS

The experiment was conducted in the Department of Livestock Products Technology, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar. Fresh Goat meat was procured from local market of Pantnagar. Meat was purchased within 2-4 hours of slaughter. Manual deboning was carried out in the Department of Livestock Products Technology, and all the separated fat and connective tissue were removed manually. The meat obtained was washed with clean water. It was then packed in low density polyethylene (LDPE) bags and stored overnight at 4 ± 1 °C in refrigerator. Soy protein (soy crumble) were procured from American Soybean Association branch in Gurgaon, Haryana. For the preparation of Condiment mixture, onion, ginger, garlic and green chillies were peeled, cleaned and chopped. Then blended in the ratio of 3:1:2:1 in Philips Mixer grinder to the consistency of a fine paste and stored in a pet jar for subsequent use. The spice powder was mixed in required proportion to obtain dry spice mix (Table 1). All the chemicals and media used in the study were of Analytical grade and were obtained from standard firms.

Table 1: Composition of spice mix

Spice	% of mix.
Anise	10
Black pepper	10
Capsicum	15
Caraway	10
Cardamom	4
Cloves	2
Cinnamon	4
Cumin	20
Dry ginger	10
Turmeric	15

Preparation of Chevon patties

On the basis of literature available and various preliminary trials, five group of Chevon patties with one control and four treatments in which chevon was replaced with soy crumbles @ 10%, 20%, 25% & 30% levels were prepared as per formulation given in Table 2.

Table 2: Formulation for the preparation of chevon patties

Ingredient %	Control (Con)	Treatment1 (Soy10)	Treatment2 (Soy20)	Treatment3 (Soy25)	Treatment4 (Soy30)
Lean chevon	100	90	80	75	70
Soy protein (soy crumbles)	-	10	20	25	30
Vegetable fat	10	10	10	10	10
Condiment	10	10	10	10	10
Egg liquid	9	9	9	9	9
Table salt	2	2	2	2	2
Spice	6	6	6	6	6
Sodium nitrite	150ppm	150ppm	150ppm	150ppm	150ppm
STTP	0.2	0.2	0.2	0.2	0.2

Sensory Evaluation

The sensory quality of samples was evaluated using 8 point descriptive scale (Keeton *et al.*, 1984) where 8 denoted extremely desirable and 1 denoted extremely poor. A sensory panel (semi trained) of seven judges drawn from post-graduate students and staff of Veterinary College, Pantnagar were requested to evaluate the product for different quality attributes *viz*: colour and appearance, texture, juiciness, flavour and overall acceptability.

Statistical analysis

Statistical analysis of the data obtained, was done by using ANOVA technique according to the method described by (Snedecor and Cochran 1989) by completely randomized design (CRD).

RESULTS AND DISCUSSION

Evaluation of sensory attributes

Colour and Appearance

The effect of storage period and interaction between storage period and treatment on colour/ appearance of chevon patties was found to be highly significant ($p < 0.01$) but interaction between them was non significant (Table 3). A declining trend for colour/ appearance score was observed with the advancement of storage period. The overall mean for colour/ appearance score was found to be higher at 0th day which decreased to a lower score at 14th day. Cunningham and Bower (1977) documented that evaluation of all meat and soy substituted cooked patties which were stored for 10 days did not have any palatable difference but patties containing soy were lighter than 100% chicken patties.

Flavor

A non significant effect of treatments and interaction between storage periods was observed on flavor scores of the chevon patties (Table 3). The overall mean value for flavor was found to be higher for group Soy30 in comparison to Con (Table 3). A significant declining trend for flavor score was observed in both groups with the advancement of storage period. Nayak (2004) reported a similar trend in tofu extended meat patties.

Table 3: Effect of treatment and control on sensory attributes of chevon patties during storage

Treatments	Control	Soy (30%)	Day Mean
Storage Period		Appearance/ color	
0 day	6.400±0.400 ^{ax}	7.2000±0.374 ^{ax}	6.8000±0.387
7 Day	6.2600±0.166 ^{bx}	6.520±0.235 ^{bx}	6.390±0.201
14 Day	5.240±0.335 ^{cx}	5.120±0.115 ^{cx}	5.180±0.225
Treatment Mean	5.968±0.300	6.280±0.241	
Storage Period		Flavour	
0 day	7.000±0.000 ^{ax}	7.400±0.244 ^{ax}	7.200±0.122
7 Day	6.260±0.166 ^{bx}	6.520±0.235 ^{bx}	6.390±0.201
14 Day	4.220±0.252 ^{cx}	4.320±0.198 ^{cx}	4.270±0.225
Treatment Mean	5.906±0.139	6.073±0.225	
Storage Period		Texture	
0 day	7.440±0.232 ^{ax}	7.540±0.227 ^{ax}	7.300±0.230
7 Day	6.200±0.200 ^{bx}	6.920±0.000 ^{bx}	6.590±0.100
14 Day	5.240±0.200 ^{cx}	5.220±0.200 ^{cx}	5.230±0.200
Treatment Mean	6.166±0.210	6.580±0.142	
Storage Period		Juiciness	
0 day	6.20±0.200 ^{ax}	6.00±0.227 ^{ax}	6.100±0.214
7 Day	5.260±0.200 ^{bx}	5.340±0.271 ^{bx}	5.300±0.219
14 Day	4.200±0.166 ^{cx}	4.200±0.136 ^{cx}	4.200±0.151
Treatment Mean	5.22±0.0.188	5.18±0.211	
Storage Period		Overall acceptability	
0 day	7.000±0.000 ^{ax}	7.60±0.244 ^{ay}	7.300±0.122
7 Day	6.260±0.166 ^{bx}	6.92±0.049 ^{by}	6.59±0.108
14 Day	5.240±0.175 ^{cx}	5.22±0.262 ^{cy}	5.23±0.219
Treatment Mean	6.17±0.114	6.58±0.185	

Mean values bearing same superscript in the same row and column do not differ significantly (P < 0.05)

Texture

The data presented in the Table 3 revealed that the effect of storage period on texture of chevon patties was found to be highly significant (p<0.01). The overall mean

values of Con were found to be less than the Soy30 treatment. A declining trend of texture score ($p < 0.05$) was observed with the advancement of storage time (Table 3). A significant decreasing trend was noticed irrespective of soy protein (soy crumble) addition during storage period. It might be due to increase in pH and bacterial load with the advancement of storage period.

Juiciness

The effect of storage period on juiciness of chevon Patties was found to be highly significant ($p < 0.01$) as per the data presented in Table 3. A non significant effect of treatment and interaction between storage periods was observed. A significant ($p < 0.01$) reduction in the juiciness score was observed with the advancement of storage period.

Overall acceptability

Overall acceptability scores of chevon patties presented in Table 3 revealed that there was significant ($p < 0.05$) variation in the mean values of overall acceptability due to treatments and storage period. A significant ($p < 0.01$) declining trend was observed in the score of overall acceptability of chevon patties with increasing storage period. Gujral *et al.* (2002) concluded that addition of 20% texturized soy protein significantly decreased overall acceptability of baked goat patties. The acceptability score also decreased with increasing storage period. The reduction in score of acceptability might be due to adverse effect on other sensory attributes namely colour, flavor and texture.

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