

Short Communication

QUALITY STUDIES ON TENDERIZED SPENT CHICKEN MEAT PICKLE*

Normally spent hens are considered as a by-product of egg industry. Meat from spent hens is tough and fatty to be used for table purposes. In India the present availability of spent layer hens has been estimated to be 100 million and spent broiler hens to be four million, producing 110 million metric tonnes of dressed chicken meat (Kondaiah and Anjaneyelu, 1996). Moreover the meat can be made more tender by proper tenderization methods and made more acceptable by comminution. Pickling of food has been known for centuries as a means of preservation and a method of imparting desirable flavour and taste to the food.

Devitre and Cunningham (1984) observed that breast fillets of White-Leghorn hen soaked in 0.002 per cent papain solution were significantly more tender than those soaked in ficin and bromelin. The present study was undertaken to examine the quality characteristics of fresh tenderized spent chicken meat pickle prepared by using a recipe to suit to Indian palate.

Broiler breeder hens in the age group of 72 weeks were slaughtered and processed as per procedure described by Bureau of Indian Standards (ISI,

1973). The boned meat from spent hens were made in to pieces of 2.5 to 3.5 cm size, soaked in papain enzyme solution having the strength of 0.002 per cent for 60 minutes and used for the preparation of chicken meat pickle. A recipe was developed (boned chicken meat-100g, garlic-25g, ground black pepper-10g, salt 30g, vinegar-200ml, red chilli powder-30g, cumin seed-5g, minced ginger 10g, spices mixture 20g, refined gingelly oil 200 ml, turmeric powder 10g, water 100 ml) to suit Indian palate.

The ingredients turmeric and salt were pasted over the meat pieces and kept aside for 15 minutes. Then along with some water these pieces were boiled until it was half-done, dripped, sieved and fried well in small quantity of oil. The fried pieces were kept aside. The other quantity of oil was then used for browning the other ingredients, except vinegar. In this, chicken pieces already fried were added and mixed thoroughly. After cooling, vinegar was added. The pieces along with ingredients were put into six glass bottles. The representative samples were taken from glass bottles and analysed for moisture, protein,

* Part of the M.V.Sc. thesis submitted by the first author to the Kerala Agricultural University

fat and total ash by A.O.A.C. (1990) methods. Rancidity was evaluated by 2 - thiobarbituric acid (TBA) test as described by Witte *et al.* (1970). Total bacterial counts were determined by plate count method as described by Bureau of Indian Standards (ISI, 1980) and expressed as colony forming units per gram of sample.

Organoleptic evaluation was carried out by a taste panel consisting of six members by using seven point hedonic scale for flavour, tenderness, juiciness and overall acceptability. Statistical analysis of the data was carried out according to Snedecor and Cochran (1970).

The overall mean values of moisture, protein, fat and total ash of fresh tenderized chicken meat pickle are presented in the Table. The mean per cent of moisture, protein, fat and

total ash were 64.97, 21.23, 11.60 and 1.16 respectively. The values obtained in the present study for spent chicken meat pickle are in agreement with those reported by Chatterjee (1973) for curing of poultry meat, Puttarajappa *et al.* (1996) for broiler meat pickle and Reddy and Rao (1997) for pickled spent chicken cut-up-parts.

Dawson *et al.* (1975) assumed that the 2-thiobarbituric acid number above 2.00 may be associated with the development of rancidity in meat samples. The TBA value obtained for fresh tenderized spent chicken meat pickle in the present study has been found to be within the acceptable range. Puttarajappa *et al.* (1996) observed that the TBA number of fresh broiler pickle averaged 0.57 and Reddy and Rao (1997) observed that the TBA number of fresh pickled spent chicken cut-up-

Table. Qualities of tenderized spent chicken meat pickle

Quality traits	Mean \pm S.E.
I Proximate composition (%)	
a. Moisture	64.97 \pm 0.20
b. Protein	21.23 \pm 0.26
c. Fat	11.60 \pm 0.25
d. Total ash	1.16 \pm 0.07
II 2-thiobarbituric acid number (mg malanaldehyde number/kg)	0.22 \pm 0.00
III Total bacterial count log. No. (Colony forming units per gram)	2.60 \pm 0.03
IV Organoleptic scores*	
a. Flavour	6.50 \pm 0.34
b. Juiciness	7.33 \pm 0.49
c. Tenderness	7.60 \pm 0.21
d. Overall acceptability	7.00 \pm 0.36

* 7 - Excellent, 6 - Very good, 5 - Good, 4 - Fair, 3 - Poor, 2 - Very poor, 1 - Undersirable

parts was 0.24. The observation of the present study is in close agreement with those reported by the above authors.

The total bacterial counts of fresh tenderized spent chicken pickle averaged $2.60 + 0.03$ unit of cfu/g. The findings of present study are also in agreement with the values reported by Chatterjee (1973) for curing of poultry meat, Puttrajappa *et al.* (1996) for broiler meat pickle and Reddy and Rao (1997) for pickled spent chicken cut-up-parts.

Organoleptic evaluation revealed that tenderized spent chicken meat pickle prepared as per the recipe was quite acceptable with regard to flavour, juiciness, overall acceptability and especially for tenderness.

**M. Murugan and
K. Narayanankutty***

Centre for Advanced Studies in Poultry Science, College of Veterinary and Animal Sciences, Mannuthy- 680 651

References

- AOAC. (1990). *Association of Official Analytical Chemists*, 13th Ed. Washington, D.C.
- Chatterjee, A.K. (1973). Some aspects of poultry research in the area of poultry meat technology in India with special reference to curing and pickling. Short term course on processing, preservation, marketing of poultry and poultry products. *Div. of Poult. Res. IVRI, Izatnagar, India, Dec. 28-Jan 2*
- Dawson, L.F., K.F. Stevenson and Greason, E. (1975). Flavour, bacterial and TBA changes in ground turkey patties treated with anto oxidants. *Poult. Sci.* **54**(4): 1134-1139
- Devitre, H.A. and Cunningham, F.E. (1984). Tenderization of spent hen muscle using papain, bromelin, or ficin alone in combination with salts. *Poult. Sci.* **64**: 1476-1483
- ISI. *Bureau of Indian Standards* (1973). Code for handling processing, quality evaluation and storage. IS 7049, Monak Bhavan, 9, Bhadhur Shah Zapor Marg, New Delhi
- ISI Bureau of Indian Standards (1980). SP: 18(Part I) Microbiological methods, Mank Bhavan, 9-Bhadhur Shah Zapor Marg, New Delhi.
- Kondaiah, N. and Anjaneyelu, A.S.R. (1996). Prospects of poultry meat products. *Indian Farming.* **46**(6): 33-36

* Author for correspondence

- Puttarajappa, P., Nair, K.K.S. and Narasimha Rao, O. (1996). Studies on shelf - stable chicken pickle. *J. Fd. Sci. Tech.* **33**(6): 501-502
- Reddy, P.K. and Rao, E.B. (1997). Influence of pickling formulation and storage on the quality of chicken cut-up-parts. *J. Fd. Sci. Tech.* **34**(5): 431-433
- Snedecor, G.N. and Cochran, W.G. (1980). *Statistical methods*. 7th Ed. The Iowa State, College Press, Hiner Iowa, Oxford & IBH Publishing Co., Calcutta
- Witte, V.C., Kranse, G.F. and Bailey, M.L. (1970). A new extraction method for determining 2-TBA values of pork and beef during storage. *J. Food. Sci.* **35**: 582-585