The Pharma Innovation Journal 2023; 12(7): 3001-3004

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(7): 3001-3004

www.thepharmajournal.com
Received: 01-04-2023
Accepted: 04-05-2023

Arabati Shivaji
Department of Livestock Products Technology
P V Narsimha Rao Telangana Veterinary University,
Hyderabad, Telangana, India

Anitha Nalla
Department of Livestock Products Technology
P V Narsimha Rao Telangana Veterinary University,
Hyderabad, Telangana, India

Pittala Anil
Department of Veterinary and A.H. Extension Education
P V Narsimha Rao Telangana Veterinary University,
Hyderabad, Telangana, India

Corresponding Author:
Arabati Shivaji
Department of Livestock Products Technology
P V Narsimha Rao Telangana Veterinary University,
Hyderabad, Telangana, India

Shelf life study of hariyali chicken kebab under refrigerated storage

Arabati Shivaji, Anitha Nalla and Pittala Anil

Abstract
A study was conducted to evaluate the shelf life of marinated hariyali chicken kebab with control raw chicken were evaluated for Physico-chemical, Microbiological and Sensory parameters for 7 days under refrigerated storage conditions. Generally the shelf life of the chilled raw chicken meat is three to four days. When we marinate the portioned chicken with spices, the shelf life of the product increases. Hence the raw boneless chicken meat is marinated with hariyali spice mix to increase the shelf life. There was slight deteriorative changes observed in the scores of Physico-chemical, Microbiological and Sensory qualities as storage progressed from 1-7 days in both control and marinated chicken samples. From this present study, it can be concluded that the shelf life of Hariyali chicken kebab could be safely stored for 6 days under aerobic packaging at refrigerated temperature (4±1 °C) without any undesirable changes in quality.

Keywords: Hariyali chicken kebab, marination, shelf life

1. Introduction
Meat consumption patterns have been changing over the past 50 years. Currently, the consumption of broiler chicken meat is almost double compared to other meats, and it is estimated that chicken consumption will increase even more within the next decade (NCC, 2016) [6]. Kennedy *et al*. (2004) [3] reported that consumers perceived chicken meat as having "added value" in terms of health because of its low fat content, reduced waste and convenience. This increase in consumer demand for chicken meat has led to progressive changes in selection criteria of broiler chicken. In 1965, chickens were marketed mainly as whole carcasses, while today the cut- up/pieces and the further processed products represent up to 90% of the chicken market (NCC, 2015b) [5]. In this regard, producers have improved the growth rate and feed conversion. More recently, marination has been used in meat and poultry to improve tenderness, juiciness, flavour, colour and cooking yield (Yang and Chen, 1993) [10]. Marination consists of soaking a food in various food stuffs and flavourings (Lemos *et al*., 1999; Guerrero- Legarreta and Hui, 2010) [4, 2]. It's is a method of reducing aging time required for meat tenderization (Guerrero- Legarreta and Hui, 2010) [2]. The most required functions of poultry meat marination are the extension of shelf life and the improvement of the microbiological culinary and technological quality (taste, tenderness, water retention and mass yield) (Okolocha and Ellerbroek, 2005) [7]. Hariyali Chicken Kabab (Green Chicken Kabab) is one of the most famous Indian Kabab dish generally served in almost every Indian Restaurant. Hence the research was undertaken to evaluate the shelf life of hariyali chicken kebab at refrigeration storage.

2. Materials and Methods
The study was conducted to compare the shelf life of marinated hariyali chicken kebab with raw chicken under refrigerated storage conditions. Different meat quality parameters were studied viz. pH, Moisture, Drip loss %, total plate count, coliform, E.coli, Staph. aureus and Yeast and mold count.

2.1 Experimental design
Broiler birds were procured from local market of Mahabubnagar and slaughtered in sneha chicken processing plant, addakal adopting traditional halal method. After deboning, breast and thigh muscles were collected from carcass. Then the visible fat and connective tissue residues were removed using a sterile, sharp stainless steel knife. Cut up portion of chicken Breast and thigh boneless pieces of selected size and weights of 20 g-25 g are used for hariyali

chicken kababs. The boneless meat was marinated with hariyali spice mix and packaged into LDPE bags and kept at 4±1 °C for a period of 7 days. The raw chilled chicken meat (without marination) used as a control. Physico-chemical, microbiological and sensory characteristics of both control and marinated chicken samples were analyzed for 7 days under refrigeration storage.

Table 1: Formulation of Hariyali spice mix

S.No.	Name of the ingredient	Quantity (gm)
1	Curd	15.0
2	Salt	5.0
3	Curry leaves	10.0
4	Mint leaves	15.0
5	Coriander	10.0
6	Spinach	15.0
7	Green chilli	10.0
8	Refined oil	10.0
9	Cloves	5.0
10	Cardamom	5.0

Table 2: Formulation of Marination: Hariyali chicken Kebab

S.no	Product	Quantity
1	Chicken boneless (kg)	1.0
2	Lemon juice (ml)	8-10
3	Hariyali spice mix (gm)	155

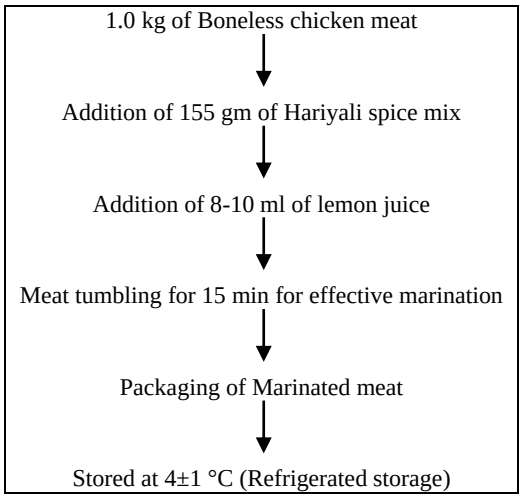

Fig 1: Processing Flow chart

2.2 Shelf life study
Shelf life study was conducted for both control and marinated samples. Overall shelf life study was carried out for 7 days stored at below 4 °C. The date of slaughter is considered as 1st day. On each test day, 3 samples of control and marinated products were assessed in triplicates for physic-chemical, sensory and microbiological evaluation.

2.3 Sensory Evaluation
An effective method for sensory evaluation of both samples were analysed by 5 trained panellists and 5 semi trained panellists. Each panellist was asked to rate the liking quality attribute according to appearance, colour, odour, texture and overall acceptability of each sample using 9-point Hedonic scale (1 = dislike extremely, 2 = dislike very much, 3= dislike moderately, 4 = dislike slightly, 5 = neither dislike nor like, 6= like slightly, 7 = like moderately, 8= like very much and 9 = like extremely).

2.4 Physico-chemical parameters
2.4.1 pH
The pH of meat sample was determined as per Trout *et al*., (1992) [9]. The homogenate was prepared by blending 10 g sample with 90ml distilled water using an Ultra Turrax tissue homogenizer (Model IKA T-25, Janke and Kenkel, IKA Labor Technik, Germany) for one minute. Then the pH was recorded by immersing combined glass electrode of digital pH meter (Thermo Orion, Model 420 A^+, USA) into the meat homogenate.

2.4.2 Drip loss
Drip loss of meat samples were determined by the method of AOAC (1995) [1]. Drip was measured after thawing the frozen meat sample and comparing the thawed meat sample weight with the initial weight of the frozen meat.

$$\text{Drip loss (\%)} = \frac{\text{Initial weight of the frozen meat sample} - \text{Final weight of meat sample after thawing}}{\text{Initial weight of the frozen meat sample}} \times 100$$

2.4.3 Moisture
The moisture content was determined in accordance with the procedure laid down by the Association of Official Analytical Chemists (A.O.A.C., 1995) [1]. Sample was taken into a Pre weighed moisture cup and dried in a pre-heated oven at 100±5 °C for 16-18 hrs and cooled in a desiccator followed by recording of weight of the dried sample. This process of heating and cooling was repeated till a constant weight was achieved. Moisture content was expressed in percent on fresh weight basis.

$$\text{Moisture (\%)} = \frac{\text{Final weight of meat sample after drying}}{\text{Weight of the meat sample}} \times 100$$

2.5 Microbiological analysis
2.5.1 Total plate count
23.5 g plate count agar obtained from Hi-Media Laboratories Pvt Ltd., Mumbai (Code No.M091) was suspended in 1000 ml distilled water and boiled to dissolve the media completely and sterilized by autoclaving at 15 lb pressure at 121 °C for 15 min. Final pH of the media was adjusted to 7.0±0.2. Duplicate sets of petri dishes were inoculated aseptically with 1 ml aliquots from appropriate dilutions. About 20ml of plate count agar, melted and maintained at 44-46° C, was poured gently. The plates were incubated at 37±1° C for 48 h. Plates showing 30-300 colonies were counted. The number of colonies were multiplied with reciprocal of the dilution and expressed as $\log_{10}$ cfu/g.

2.5.2 Coliform count
A quantity of 41.5 g of violet red bile agar (hi-Media laboratories Pvt. Ltd., Mumbai (Code M 049) was suspended in 1000 ml of distilled water. It was then boiled to dissolve the medium completely and cooled to 45 °C. The final pH of the medium was 7.4±0.2 at 25 °C. Pour plate with overlay technique was followed for inoculation of suitable sample dilutions and the plates were incubated at 35±2 °C for 24 hours. The colonies that appeared on the plates were counted and expressed as $\log_{10}$ cfu/g.

2.5.3 *Staphylococcus aureus*
Collect the samples and prepare for serial dilutions. Add 1 ml of inoculum to petri plate containing Braid Packer agar for determination of *Staphylococcus aureus*. These plates are incubated at 37 °C for 24h. All the plates were examined visually for colony count and report the results in terms of colony forming unit per gram of sample (cfu/g).

2.6 Sensory Evaluation
An effective method for sensory evaluation of raw carcass were analysed by 5 trained panellists and 5 semi trained panellists. Each panellist was asked to rate the liking quality attribute according to colour, odour, texture and overall acceptability of each sample using 9-point Hedonic scale (1 = dislike extremely, 2 = dislike very much, 3 = dislike moderately, 4 = dislike slightly, 5 = neither dislike nor like, 6 = like slightly, 7 = like moderately, 8= like very much and 9 = like extremely).

3. Result & Discussion
3.1 Physico-chemical parameters
The Physico-chemical parameters (pH & Drip loss) of control and marinated chicken samples increased during the storage (7 days) at refrigeration temperature, which might be due to accumulation of metabolites that resulted due to microbial growth. Quio *et al.* (2002) [8] reported an increase in the pH of chicken breast meat due to accumulation of amines and ammonia by psychotropic bacteria. The Moisture content of control and marinated chicken samples decreased during the storage (7 days) at refrigeration temperature.

Table 3: Physico-chemical parameters of samples

Days	Control Sample			Hariyali chicken Kebab		
	Ph	Moisture	Drip loss	pH	Moisture	Drip loss
1st	5.5	73.88	0.75	5.4	69.16	0.53
2nd	5.6	73.12	1.62	5.8	68.24	0.62
3rd	5.8	70.52	2.02	5.7	68.47	1.87
4th	5.9	68.43	2.94	5.5	68.17	1.96
5th	5.9	66.74	3.03	5.5	67.94	2.04
6th	6.0	66.17	3.74	5.6	67.58	2.22
7th	6.2	64.66	3.99	5.8	66.87	2.87

3.2 Microbiological parameters
The microbiological parameters of control and marinated chicken samples increased during the storage (7 days) at refrigeration temperature. As per the Results there was not much increase in the microbial load of TPC, Coliform, *Staphylococcus aureus* and Yeast & Moulds in Control sample from 1st day to 4th day. There is no deterioration from 1st to 4th day but it started deterioration from 5th day onwards. Where as in Hariyali chicken kebab, the deterioration observed from 7th day of storage.

Table 4: Microbiological parameters of samples

Days	Control Sample				Hariyali chicken Kebab			
	Total Plate count (cfu/gm)	Coliforms (cfu/gm)	Staph. aureus (cfu/gm)	Yeast & Mold (cfu/gm)	Total Plate count (cfu/gm)	Coliforms (cfu/gm)	Staph. aureus (cfu/gm)	Yeast & Mold (cfu/gm)
1st	32×103	15	Nil	12×102	10×103	02	Nil	09×102
2nd	35×103	17	Nil	23×102	18×103	03	Nil	16×102
3rd	37×103	19	03	31×102	29×103	06	Nil	25×102
4th	38×103	22	07	45×102	30×103	14	Nil	31×102
5th	49×103	26	10	54×102	34×103	13	02	33×102
6th	53×103	28	12	59×102	37×103	19	02	36×102
7th	98×103	32	13	87×102	59×103	26	09	54×102

3.3 Sensory parameters
The sensory parameters of control and marinated chicken samples decreased during the storage (7 days) at refrigeration temperature. From 1st day to 7th day marinated samples got the highest rating compared with the control sample.

Table 5: Sensory parameters of samples

Days	Appearance		Color		Odour		Sliminess		Overall Acceptability	
	C	T	C	T	C	T	C	T	C	T
1st	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
2nd	9.0	9.0	8.0	8.0	8.0	9.0	9.0	9.0	8.0	9.0
3rd	7.0	8.0	7.0	8.0	7.0	8.0	7.0	8.0	7.0	8.0
4th	6.0	8.0	6.0	8.0	6.0	8.0	6.0	8.0	6.0	7.0
5th	4.0	7.0	5.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
6th	2.0	7.0	2.0	7.0	2.0	7.0	2.0	7.0	2.0	7.0
7th	1.0	6.0	2.0	6.0	1.0	5.0	1.0	6.0	1.0	5.0

C- Control sample: T- Hariyali Chicken kebab
(1= dislike extremely, 2= dislike very much, 3= dislike moderately, 4= dislike slightly, 5= neither like nor dilike, 6= like slightly, 7= like moderately, 8= like very much and 9= like extremely)

4. Conclusion
Present research was carried out with objective to evaluate the shelf life of marinated hariyali chicken kebab with control raw chicken. Based on the Physico-chemical, Microbiological and sensory analysis of the result, it was concluded that, the raw chicken (without marination) has the only shelf life of 4 days at refrigeration storage but the raw chicken marinated with hariyali spice mix (hariyali chicken kebab) is further increased the shelf life from 4 days to 6 days without any undesirable changes in quality.

5. References

1. A.O.A.C. Official Methods of Analysis, 16th Edn., Association of Official Agricultural Chemists, Washington, D.C; c1995.
2. Guerrero-Legarreta I, Hui YH. Handbook of poultry science and technology; c2010. p. 81-101.
3. Kennedy OB, Stewart-Knox BJ, Mitchell PC, Thurnham DI. Consumer perception of poultry meat: a qualitative analysis., Nutr. Food Sci. 2004;34:122-129.
4. Lemos ALSC, Nunes DRM, Viana AG. Optimization of the still- marinating process of chicken parts. Meat Sci. 1999;52:227-234.
5. NCC. How broilers are marketed. National Chicken Council. Accessed Jan 2016, 2015b.
6. NCC. Per capita consumption of poultry and livestock, 1965 to estimated 2016. National Chicken Council. Accessed Jan. 2016.
7. Okolocha EC, Ellerbroek L. The influence of acid and alkaline treatments on pathogens and shelf life of poultry meat. Food Control. 2005;16:217-225.
8. Qiao M, Fletcher DL, Northcutt JK, Smith DP. The relationship between raw broiler breast meat colour and composition. Poult Sci. 2002;81(3):422-427.
9. Trout ES, Hunt MC, Johnson DE, Claus JR, Kastner CL, Kropf DH, *et al*. Chemical, physical and sensory characterization of ground beef containing 5 to 30% fat. J Food Sci. 1992;57:25-29.
10. Yang CC, Chen TC. Effects of refrigerated storage. pH adjustment, and marinade on color of raw and microwave cooked chicken meat. Poult. Sci. 1993;72:355-362.