Journal of Meat Science, July 2014, Volume 10(1): 1-4

Physico-Chemical and Microbial Profile of Fresh Rabbit Meat

J.N. Swami, S.N. Rindhe, M. Shashikumar, S.S. Raut and Anil Dange

ABSTRACT

Present study was conducted to assess certain physico-chemical and microbial quality of rabbit meat sold at retail shops. Rabbit meat samples were collected in sterile LDPE; brought to laboratory for further evaluation. The pH of fresh rabbit meat was 5.60± 0.01 and the TBARS value ranged between 0.11 to 0.24 with mean value of 0.18± 0.01mg malonaldehyde/ kg. The tyrosine values were ranged between 18.09 and 21.12 with mean value of 19.60 ± 0.42 mg/kg. The Extract release volume value of fresh rabbit meat sample was 21.90 ± 0.15 ml. The standard plate count of fresh rabbit meat was in the range of 4.52 to 4.69 log cfu/gm with a mean value of 4.60 ± 0.02 log cfu/gm. *E. coli* count of fresh rabbit meat was observed to be between 2.10 and 2.18 log cfu/gm with an average of 2.14 ± 0.04 log cfu/gm. The moisture content of fresh rabbit meat samples varied from 71.50 to 72.83 % with mean value of 72.16 ± 0.42 %. The protein content of fresh rabbit meat ranged from 19.03 to 21.40 % with mean value of 20.21 ± 0.06 % while the fat content was found to be in the range of 6.40 to 6.63 % with an average of 6.50 ± 0.02 %.

Keywords: *Rabbit meat, Physico-chemical and microbial quality*

Journal of Meat Science, July 2014, Volume 10(1): 5-8

Development of Low Fat *Goshtaba* with Sodium Alginate

Heena Jalal, Syed Arshad Hussain, M. Mansoor Bhat, Mir Salahuddin and Asif H. Sofi

ABSTRACT

A study was conducted with an objective to evaluate the effect of sodium alginate @ 0.1% (on weight basis) of batter on the quality of low fat *Goshtaba*. The raw emulsion was evaluated for physico-chemical parameters (pH, emulsion stability, proximate composition) while cooked product was evaluated for both physico-chemical and sensory parameters. All the physico-chemical parameters of raw emulsion except pH, protein and ash content showed significant ($P<0.05$) differences. However, in case of cooked product moisture, protein and fat content showed significant ($P<0.05$) differences. Similarly, in case of gravy, protein and fat (%) values showed significant ($P<0.05$) differences. Overall palatability scores were found significantly ($P<0.05$) better in low fat *Goshtaba* formulated with sodium alginate as compared to control samples. It was concluded that incorporation of sodium alginate improved quality and acceptance of low fat *Goshtaba* with 10% fat.

Keywords: *Fat replacers, Low fat Goshtaba, Meat product, Sodium alginate*

Journal of Meat Science, July 2014, Volume 10(1): 9-14

Evaluation of Antioxidant Effect of Spices and Condiment Mix as Nitrite Replacer in Chicken Mince

M. Goswami, P.P. Prabhakaran and V.K. Tanwar

ABSTRACT

The present study was carried out to compare the antioxidant effect of spices and condiments mix with nitrite added to chicken mince stored at 4 ± 1^0C. The treatments include control (C), turmeric added @ 1000 ppm (T), heated turmeric (120^0C for 15 min on hot plate added @1000 ppm (HT), turmeric @1000 ppm added along with 4% gingar and 4% garlic (GGT), meat masala (Agmark "Catch Masala") added @ 1000 ppm (MM) and sodium nitrite added @ 200 ppm (N). Physico-chemical properties viz. pH, thiobarbituric acid values (TBA) and free fatty acid values (FFA) were evaluated on 0, 3, 6 and 9^{th} day of storage. All the treatments showed better antioxidant effects than control. Among the treatments, the highest value of pH was found in GGT (5.95±0.02) and the lowest was found in T (5.86±0.04). In TBA, the lowest value was found in HT (0.55±0.09) and the highest was observed in T (0.65±0.11) among the treatments. The lowest PV among the treatments was found in HT (1.56±0.17) and the highest value was observed in N (2.03±0.21). The lowest FFA value was observed in HT (1.17±0.19) and T (1.58±0.33) had the highest FFA among the treatments. Heat treated turmeric and ginger garlic turmeric paste had the best antioxidant properties can be used as nitrite replacer for natural anti-oxidants in complex food like chicken mince.

Key words: *Fat oxidation, Garlic, Ginger, Heated turmeric*

Journal of Meat Science, July 2014, Volume 10(1): 15-22

Effect of Clove Powder and Modified Atmosphere Packaging on the Oxidative and Sensory Quality of Chicken Meat Caruncles During Ambient Storage (35±2°C) Conditions

Parminder Singh, Jhari Sahoo, K. Manish Chatli and Ashim K. Biswas

ABSTRACT

The individual as well as synergistic effect of modified atmosphere packaging and clove powder as natural preservative on the oxidative and sensory quality of chicken meat caruncles during storage at 35±2°C at 70% R.H. for 60 days was evaluated. For this, four different batches of chicken meat caruncles were prepared i.e. CA (control, aerobic packaging), CMAP (Control, 50:50 CO_2/N_2 modified atmosphere packaging), TA (treated with 0.2% clove powder, aerobic packaging) and TMAP (treated with 0.2% clove powder, 50:50 CO_2/N_2 modified atmosphere packaging). In oxidative quality, TBARS value of TMAP sample was significantly lower ($P<0.05$) than CA sample and was marginally lower than CMAP and TA samples. TA and TMAP samples showed significantly higher ($P<0.05$) DPPH % inhibition as compared to control counterparts (CA and CMAP). The ABTS % inhibition was significantly higher ($P<0.05$) in TA (88.26) and TMAP (89.81) as compared to CA (56.93) and CMAP (71.43) samples. Among sensory attributes, colour /appearance was significantly higher ($P<0.05$) in TA batch than CMAP and TMAP. Flavour score of TA sample was significantly higher ($P<0.05$) than CA. Crispiness of TMAP was significantly higher ($P<0.05$) than TA. The scores of all the samples for after-taste, meat flavour intensity and overall acceptability did not vary significantly among themselves. The use of $50\%CO_2+50\%N_2$ (MAP) in combination with 0.2% clove powder was effective for maintaining the oxidative and sensory quality of chicken meat caruncles at ambient storage conditions.

***Keywords**: Chicken meat caruncles, Clove powder, Modified atmosphere packaging, Oxidative quality, Sensory attributes*

Journal of Meat Science, July 2014, Volume 10(1): 23-27

Optimization of Processing Conditions and Level of Extenders Used for the Preparation of Extended Restructured Mutton Chops

Heena Sharma, B.D. Sharma, Suman Talukder, S.K. Mendiratta and R. Giriprasad

ABSTRACT

Appropriate binding of meat pieces and high water retention are two most important factors in marketing high quality processed meat products. Here, the non-meat ingredients play pivotal role and can improve the appearance, palatability and texture of the finished products. In this experiment, processing conditions viz., massaging time (8 min, 10 min and 12 min) and cooking time (35 min, 40 min and 45 min) as well as the level of extenders viz., pea hull flour (3%, 4% and 5%) and boiled and mashed potato (3%, 4% and 5%) were studied at different levels to see the effect on sensory attributes. Massaging times did not significantly influence the sensory scores but 10 min of massaging time was optimum. Sensory scores at cooking time of 45 min were significantly higher ($P<0.05$) for texture than other timings. Cooking time of 40 min was selected as optimum. Level of pea hull flour and boiled and mashed potato were selected at the level of 5% as the texture and binding scores were significantly lower for this level. Thus, it can be concluded that extended restructured mutton chops could be prepared by massaging the chunks of meat for 10 min and extension of product was brought by using peahull flour (5%) and boiled and mashed potato (5%).

Keywords: *Restructured mutton chops, Massaging time, Cooking time, Peahull flour, Potato, Extenders*

Journal of Meat Science, July 2014, Volume 10(1): 28-35

Utilization of Barley in the Development of Fiber Enriched Chevon Cutlets

Pramod Kumar Singh, Sunil Kumar, Z. F. Bhat and Pavan Kumar

ABSTRACT

A study was conducted to evaluate the possibility of utilization of barley as a source of fiber in the development of fiber-enriched designer chevon cutlets. Three levels of barley flour viz. 2, 4 and 6 percent were incorporated replacing lean meat in the formulation. The products developed were assessed for various physicochemical, sensory, texture and colour parameters. pH, crude fiber, ash content, texture parameters like hardness, adhesiveness, springiness, cohesiveness, chewiness, gumminess and product redness value showed significant ($P<0.05$) increasing trend whereas flavor, juiciness and overall acceptability decreased significantly ($P<0.05$) with increasing levels of incorporation. Based on various physicochemical and sensory parameters, chevon cutlets containing 4 percent barley flour were optimized as best.

Keywords: *Cutlets, Chevon, Barley, Fiber, Quality characteristics*

Journal of Meat Science, July 2014, Volume 10(1): 36-43

Effect of Clove Oil on the Storage Quality of Aerobically Packaged Fiber-Enriched Chevon Cutlets

Pramod Kumar Singh, Sunil Kumar, Z. F. Bhat and Pavan Kumar

ABSTRACT

A study was conducted to evaluate the potential of clove oil as a natural preservative in muscle foods by assessing its effect on the storage quality of fiber-enriched chevon cutlets. Chevon cutlets containing optimum level of the barley flour (4 percent) treated with and without clove oil (100 ppm) were aerobically packaged in low density polyethylene pouches along with control (chevon cutlets without barley flour and without clove oil - T_1, chevon cutlets with barley flour and without clove oil -T_2, chevon cutlets without barley flour and with clove oil - T_3 and chevon cutlets with barley flour and with clove oil - T_4) and evaluated for storage quality for 15 days under refrigerated conditions ($4\pm1^{o}C$). The products were analyzed for various physico-chemical, microbiological and sensory parameters. TBARS value (mg malonaldehyde/kg), total plate count (log CFU/gm), psychrophillic count (log CFU/gm) and yeast and mould count (log CFU/gm) showed significant ($P<0.05$) increasing trend whereas pH and all the sensory parameters decreased significantly ($P<0.05$) with increasing days of storage. Coliforms (log CFU/gm) were not detected throughout the period of storage. The products containing clove oil showed significantly ($P<0.05$) lower values than control samples for various parameters like TBARS value, total plate count, psychrophillic count and yeast and mould count.

Keywords: *Cutlets, Chevon, Barley, Clove oil, Refrigerated storage*

Journal of Meat Science, July 2014, Volume 10(1): 44-50

Optimization of the Level of Tapioca Starch in Chicken Meat Caruncles

Parminder Singh, Jhari Sahoo, Manish K. Chatli Ashim and K. Biswas

ABSTRACT

The present study was conducted to optimize the level of tapioca starch for the development of chicken meat caruncles (CMC). Three different levels of tapioca starch replacing - 50% (T-1), 60% (T-2) and 70% (T-3) of refined wheat flour, were undertaken along with control (100% refined wheat flour) for this study. All the variants were assayed for physico-chemical, proximate composition, texture profile, colour profile and sensory attributes. The cooking yield (%) was significantly higher ($P<0.05$) in T-2 than control group. Hydratability of T-3 sample was significantly lower ($P<0.05$) than control and T-1. Water absorption index of control samples was significantly lower ($P<0.05$) than the treated samples. The fat (%) of T-1 was significantly higher ($P<0.05$) than T-2 and T-3. Crude fiber (%) was found to be significantly lower ($P<0.05$) in T-1 than T-2 and T-3 samples. Hardness of T-2 was significantly higher ($P<0.05$) than control. There was no significant variation between adhesive force and stringiness of control, T-1, T-2 and T-3 samples. In colour profile, the L^* and a^* value of control was significantly lower ($P<0.05$) than T-1, T-2 and T-3 samples. Among the sensory attributes colour, flavour, crispiness, after-taste and meat flavour intensity were non-significant between control and treated batches. Overall acceptability was significantly higher ($P<0.01$) at 60% tapioca starch replacement level (T-2) as compared to others. On the basis of sensory quality, 60% incorporation of tapioca starch in place of refined wheat flour was adjudged as optimum in chicken meat caruncles.

***Key Words**: Chicken meat caruncles, Tapioca starch, Spent hen meat, Physico-chemical parameters, Sensory attributes*

Journal of Meat Science, July 2014, Volume 10(1): 51-54

Effect of Slaughter Age and Sex on Carcass Characteristics and Composition of Macherla Brown Sheep

P. Vinaya Babu, B. Eswara Rao, T. Srinivasa Rao

ABSTRACT

Twenty four local Macherla Brown lambs of both sexes in the age group of 9 and 12 months were slaughtered to study the carcass characteristics and composition. Pre-slaughter weight, dressing per cent and carcass weight were significantly ($P<0.01$) higher at 12 months of age than 9 months. Dressing per cent on pre-slaughter weight was significantly ($P<0.01$) higher in males compared to females. Except for dressing per cent all the other carcass traits and by products yield varied insignificantly ($P<0.01$) between male and female lambs. Moisture content was significantly ($P<0.01$) lower and protein content was significantly higher as age of animal advanced from 9 to 12 months. However, no differences were observed significantly in fat and ash contents. The study showed that sex had no influence on proximate composition of meat from Macherla Brown sheep. It was concluded from the study that slaughter age of 12 months was found to be superior for quantitative and qualitative meat production.

Key Words: *Macherla brown, Carcass characteristics, Sex, Slaughter weight*

Journal of Meat Science, July 2014, Volume 10(1): 55-59

Sensory Attributes of Pork Pickle Incorporated with Fermented Bamboo Shoot

D.M. Chavhan, M. Hazarika, M.L. Brahma, R.A. Hazarika and Z. Rahman

ABSTRACT

This study was conducted to evaluate the organoleptic quality of pork pickles prepared by replacing vinegar with fermented bamboo shoot (FBS) at different levels (50% and 100% replacement). Organoleptic evaluation of the products revealed that all the products were equally acceptable as no significant differences were observed, however, pork pickle with FBS powder and extract were preferred more compared to FBS extract. The costs of FBS incorporated pickle products were found to be lower than the control product. Based on the above study, it can be concluded that FBS products can be used to replace the conventional chemical preservative in pork pickle which are cheaper, organoleptically tastier and highly acceptable. There is high prospect of using these natural indigenous products commercially in manufacturing pork pickle in India.

Key words: *Fermented bamboo shoot, Organoleptic evaluation, Pork pickle, Sensory attributes*

Journal of Meat Science, July 2014, Volume 10(1): 60-67

Effect of Irradiation and Curry Leaves Extract on Quality Attributes and Shelf Life of Chicken Emulsion

T. Ravi, M. Shashi Kumar, M. Muthukumar, K. Sudhakar Reddy and N. Krishnaiah

ABSTRACT

The present study was conducted to evaluate the effect of irradiation and antioxidants on quality attributes and shelf life of the chicken emulsion during refrigerated storage. Four treatments evaluated include: Control (without irradiation and antioxidant), T1 (irradiation without antioxidant), T2 (butylated hydroxyl anisole–(BHA) - 0.02%) and T3 (450 ppm equivalent curry leaves (*Murrayakoenigii*) phenolics. Total phenolic contents (mg per gram of powder) as tannic acid equivalent of curry leaves was ranged from 6.78 to 7.27. There was a concentration dependent increase in reducing power (absorbance value of 0.3 at 50 µg phenols to 0.9 at 50 µg phenols) and 1,1-diphenyl 2-picrylhydrazyl (DPPH) radical scavenging activity (70% at 50 µg phenols to 85% at 250 µg phenols) of curry leaves extract. Highly significant differences ($P<0.05$) in pH, TBARS (Thiobarbituric acid reactive substance) values and microbial counts was observed between control and treatment groups and also between storage periods. Incorporation of curry leaves extract significantly ($P<0.05$) lowered TBARS values. During storage, all the samples showed significant ($P<0.05$) decrease in pH and an increase in TBARS values and total plate counts, psychrotropic counts and lactobacilli counts. *Escherichia coli* and Salmonella were not detected in all the treatment groups. No significant ($P>0.05$) difference was noticed in sensory attributes among the control and treatment groups up to 7 days of storage. However, the deteriorative changes were faster in control samples. Thus, the present study indicated the promising potential of irradiation as an efficient method for reducing microbial load in meat products and curry leaves extract may be used as a potential source of antioxidants to protect against oxidative rancidity.

Keywords: *BHA, Chicken emulsion, Curry leaves, Irradiation, Lipid oxidation, Natural antioxidants*

Journal of Meat Science, July 2014, Volume 10(1): 68-73

Organochlorine Pesticide Residues in Broiler and Desi Chicken Meat of Hyderabad

K. Sunil Kumar, Nadeem Fairoze, M. Muthukumar and B. M. Naveena

ABSTRACT

An experiment was conducted to estimate certain organochlorine pesticides (DDT-Dichlorodiphenyl Trichloroethane, HCH–Hexachloro Cyclo Hexane and Cyclodiene compounds (aldrin, dieldrin, endrin, endrin aldehyde, endosulfan, endosulfansulphate, heptachlor and heptachlor epoxide) residues in meat samples of broiler and desi chicken collected from retail markets of Hyderabad. A total of 60 samples (each 15 meat and fat samples of broiler and desi chicken) were analysed for the presence of organochlorine pesticides (OCPs) residues using a gas chromatograph equipped with an electron capture detector. The percentage of contamination was higher in broiler meat samples (70 percent) compared to desi chicken (6.66 per cent). Among the OCPs - DDT, HCH, aldrin, endrin, heptachlor and endosulfan residues were detected in broiler meat where as, only DDT and HCH residues were detected in desi chicken meat. The overall concentration of DDT, HCH, aldrin, endrin, heptachlor and endosulfan residues in broiler meat were 0.101, 0.167, 0.085, 0.035, 0.02 and 0.057 ppm, respectively and the overall concentration of DDT and HCH residues in desi chicken meat were 0.05 and 0.03 ppm, respectively. The study revealed that the market samples of desi chicken meat had lower incidence and levels of residues as compared to that of broiler chicken meat samples and the concentration of pesticide residues in both broiler and desi chicken were higher in fat samples compared to meat samples. Further, the levels of pesticide residues recorded in the study were lower than the maximum residue limit prescribed by Food Safety Standards Regulations (Contaminants, toxins and Residues), 2011.

Key words: *Organochlorine pesticide residues, Broiler chicken, Desi chicken, Meat, Fat*

Journal of Meat Science, July 2014, Volume 10(1): 74-79

Improvement in Textural Properties of Mackerel (*Rastrelliger kanagurta*) Surimi by Using Seaweed (*Sargassum tenerrimum)* Extract as Natural Gel Enhancer

Snehal S. Shitole, Amjad K. Balange, Shardul S, Gangan and Sajid Maqsood

ABSTRACT

Surimi is a Japanese term for washed fish mince which can be used as a base material for manufacturing different analogue products like shrimp, lobster, crab analogues etc. Low cost and lean fish is generally used for making surimi but its overexploitation resulted in its stock depletion recently. Dark muscle fish like mackerel can be an alternative raw material but it has low gel forming ability. An attempt has been made in the present investigation to extract phenolic compounds from seaweed (*Sargassum tenerrimum)* and use as cross-linker in mackerel (*Rastrelliger kanagurta*) surimi to enhance its gel forming ability. Seaweed extract contained total phenolic compounds of 16.24 ± 0.32 mg tannin/ gm of dry seaweed powder, added at different levels (0.5 – 2.5% of total weight of surimi) in mackerel surimi to check the effect on the properties of gels from mackerel surimi. Surimi added with 2.0% seaweed extract had the increases in gel strength by 32.45% and also lowered expressible moisture content. Decreases in whiteness ($P < 0.05$) and increase in pH ($P > 0.05$) were observed with increasing seaweed extract concentration, compared with control sample. SDS-PAGE data revealed the slight disappearance of myosin heavy chain with the incorporation of 1.5 and 2% seaweed extract in mackerel surimi gel. Thus, the seaweed extract @ 1.5 or 2% can be used as surimi gel enhancer for mackerel without affecting its sensory properties.

Key words*: Cross-linking, Gelation, Seaweed, Mackerel, Surimi*