Effect of aging period on turkey meat quality (age 6 months)

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ABSTRACT: An experiment was conducted to determine the effect of aging period on turkey meat quality. Aging periods were divided into 6 groups (0, 6, 12, 24, 36 and 48 hours) which there are 5 replicates in each. Completely randomized design (CRD) was used. The study showed the consumer acceptance by using satisfy scale 5 levels of the score, the results showed that textural quality of the meat of 4, 5 and 6 group was more consumer acceptance score than 1, 2 and 3 group which was significantly difference ($P< 0.05$). For textural quality values were 3.08, 3.17, 3.22, 3.92, 3.88 and 4.11 in the group 1, 2, 3, 4, 5 and 6, respectively. For meat quality from the measurement, results showed that the pH at 48 hours, cocking loss percentage, compression force and shear force were significantly difference ($P < 0.05$) which values were 5.82, 5.79 5.76, 5.43, 5.16, 5.04, 24.08, 24.24, 24.45, 25.27, 27.17 and 27.44 percent; 40.14, 37.73, 37.44, 35.05, 34.73 and 27.63 N ; 8.72, 7.62, 7.41, 6.46, 4.54 and 4.31 kg.

Keywords: Turkey, aging and meat quality

Introduction

It is well recognized that poultry meat is cheaper and tasty meat. In Thailand, turkey is typically raised for meat consumption. There is an opportunity for turkey farmer to increase number of turkey for a large market. There are many types of turkey such as Norfolk Black, Mammoth Bronze, American Bronze, Beltsville Small White, British white and Hybrids which are raised in Thailand. There are two types of turkey breed that recommended and encouraged by the DLD: American Bronze and Beltsville Small White. However, we had been known that, turkey meat is more stiffness, which made it more difficult to be cooked. In this experiment was aimed to study the effect of incubation periods of turkey meat on the quality of turkey meat.

Material and Methods

Turkeys (Beltsville Small White) about 6 months old were used in a completely randomized design, (CRD). There were 6 groups and each group was 5 replicates.

Group 1 incubated 0 hour
Group 2 incubated 6 hours
Group 3 incubated 12 hours
Group 4 incubated 24 hours
Group 5 incubated 36 hours
Group 6 incubated 48 hours

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Cutting for examination meat quality (Sanchai, 2010), random tender loin for examination consumer acceptance to the meat was determined using the sensory panel method (Sirilak, 1979). There were 100 participants who tasted the meat and responded to the questionnaires which had 5 values as 5= considered the meat as very delicious, 4=considered the meat as delicious, 3=considered the meat as moderate, 2=considered the meat as mediocre, and 1=considered the meat as an unacceptable product, pH meat, cooking loss and drip loss (Devine, 1999), chemical elements (protein, fat and moisture) (Bhutharit, 2010) shear force, pressure (Van Oeckel et al., 1999) and water holding capacity were measured at 0, 6, 12, 24, 36 and 48 hrs. of aging time.

Statistical analysis

Data was statistically analyzed according to a Completely Randomized Design (CRD) (SAS, 1996). Significant differences between treatments were determined using Duncan's News Multiple Range Test (DMRT).

Results and Discussions

Consumer acceptability of turkey meat is at different incubation periods, using trial panelists. The appearance, color, odor, flavor and overall acceptability were not significant difference. For texture, consumers acceptance in groups 4, 5 and 6 than in group 1, 2 and 3 was significant difference($P < 0.05$), which shows that in the period of incubation affects the texture and considering the level of consumer acceptance that consumer acceptance in group 4, 5 and 6 in the like.

The quality of the meat was found that the percentage of drip loss and the water holding capacity was not significant difference. In group 6 found the drip loss was considered to be low while the determination of pH at 48 h, pressure and shear force were decreased and significant different ($P < 0.05$) in incubation more. The aging period had influenced muscles to use energy for metabolism which directly affected the function of the enzyme on the meat and responsible for the degradation of protein fibers after the meat through a process to permanently shrink (rigor mortis) (Bhutharit, 2010). Enzyme neutral groups proteinase (calpain I, calpain II) were responsible for the degradation of protein fibers in form of sarcoplasmic protein, myofibillar protein and collagen protein affect to deterioration of the fiber protein and texture of meat was soft (Devine, 1999). In the same way measuring the percentage of drip loss during cooking that the period of incubation was longer in effect, the percentage of drip loss increased and significant different ($P < 0.05$) and Raksaksiri et al. (2013); Van Oeckel et al. (1999) the period of incubation increased carcass quality to consumption of turkey meat. The shear force of turkey meat was high and toughness in all experiments. This affected the adoption of certain products shades.

Table 1 Shows the consumer acceptance of meat turkeys at different incubation period.

Items	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
appearance	3.63±1.72	3.54±1.07	3.59±0.78	3.61±2.14	3.71±1.37	3.56±1.22
Color	3.61 ± 1.17	3.53±1.11	3.57±1.79	3.52±1.44	3.54±1.08	3.53±1.37
Smell	2.92 ± 2.14	3.07±1.18	3.02±1.08	2.97±1.82	2.94±1.08	3.02±1.32
texture	3.08± 1.24[a]	3.17±1.01[a]	3.22±0.72[a]	3.92±1.46[b]	3.88±1.17[b]	4.11±1.21[b]
Taste	3.64 ± 1.88	3.63±1.13	3.63±1.73	3.67±1.17	3.93±2.08	3.81±1.76
Overall acceptance	3.80 ± 1.77	3.82±1.86	3.82±1.75	3.86±2.02	3.97±2.06	4.06±1.66

Note: [ab] Different letters in the same line are statistically significant (P <0.05).

Table 2 Shows the quality of turkey meat in different incubation period.

Items	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Drip loss (%)						
day 1	0.14 ± 1.17	0.11 ± 1.22	0.13 ± 1.13	0.16 ± 1.82	0.13 ± 1.64	0.38 ± 1.25
day 2	1.12 ± 1.87	1.15 ± 1.03	1.15 ± 1.47	1.19 ± 1.73	1.15 ± 1.43	1.19 ± 0.83
day 3	1.54 ± 0.97	1.56 ± 1.32	1.54 ± 0.22	1.66 ± 1.62	1.66 ± 1.28	1.76 ± 1.92
day 4	1.87 ± 1.29	1.92 ± 0.21	2.02 ± 0.21	1.99 ± 0.81	2.11 ± 0.27	2.19 ± 1.11
day 5	2.02 ± 1.77	2.06 ± 1.01	2.06 ± 1.81	2.07 ± 1.28	2.06 ± 1.78	2.07 ± 0.82
day 6	2.47 ± 0.75	2.52 ± 1.73	2.54 ± 0.23	2.66 ± 2.08	2.62 ± 2.11	2.66 ± 1.23
day 7	2.69 ± 0.75	2.72 ± 0.23	2.76 ± 0.23	2.86 ± 0.58	2.82 ± 2.13	2.86 ± 1.27
pH at 45 mn	6.82 ± 1.07	6.84 ± 0.48	6.85 ± 0.48	6.88 ± 0.08	6.87 ± 0.21	6.79 ± 0.34
pH at 1 hr	6.79 ± 0.70	6.82 ± 0.13	6.83 ± 0.13	6.86 ± 0.23	6.84 ± 0.16	6.77 ± 0.11
pH at 6 hr	6.74 ± 1.01	5.99 ± 0.08	5.99 ± 0.08	6.83 ± 0.22	6.79 ± 0.18	6.74 ± 0.28
pH at 12 hr	6.65 ± 0.15	5.96 ± 0.03	5.97 ± 0.03	6.80 ± 0.32	6.76± 0.13	6.71 ± 0.21
pH at 24 hr	6.07 ± 0.27	5.86 ± 0.16	5.88 ± 0.16	6.76 ± 0.12	6.66 ± 0.07	6.67 ± 0.18
pH at 36 hr	5.94 ± 0.11	5.96 ± 1.01	5.81 ± 1.01	5.98 ± 0.13	5.74 ± 0.13	5.71 ± 0.06
pH at 48 hr	5.84±1.76[a]	5.79± 1.31[a]	5.76± 0.39[a]	5.43 ± 2.13[b]	5.16± 1.14[b]	5.04 ± 2.03[b]
Cooking loss (%)	24.08 ± 1.72[a]	24.24 ±1.10[a]	24.45 ±1.10[a]	25.27 ±1.27[a]	27.17±2.11[b]	27.44 ±1.13[b]
Pressure (N)	40.14± 1.02[a]	37.73± 1.81[a]	37.44± 0.76[a]	35.05± 1.18[a]	34.73± 2.08[a]	27.63± 0.82[b]
Shear force (kg)	8.72± 1.17[a]	7.62± 1.33[a]	7.41± 1.81[a]	6.46±2.09[a]	4.54± 1.77[b]	4.31±1.39[b]
WHC	0.94± 1.13	0.92±1.14	0.94±1.22	0.97± 0.75	0.91±1.24	0.91± 0.18

Note: [ab] Different letters in the same line are statistically significant (P <0.05). mn= minute, hr= hour, WHC= water holding capacity

Conclusion

The incubation period had the effect on turkey meat quality at 6 months, in term of texture. The pH meat and shear force of the meat were decreased. Represents the period of aging was directly affected the tenderness of meat and will continue to process food products for consumption. However, the period of incubation also affected to an increased percentage of drip loss during cooking up but had no effect on the percentage of drip loss during storage. It showed no effect

economically (Fresh turkey meat prices 365 baht per kilogram. Price surveys in supermarkets, around Hua Hin area, Prachuap Khiri Khan Province on July 8, 2014) suggests the development or promotion of turkeys. It is a great alternative for farmers who are looking for career development. We need to get a knowledge of cultural management system, meat management system and product development to add more value.

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