

Change of General Element, Mineral, Nucleic acid and Meat Color of Chicken According to Breeding days

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Abstract— This study investigated to general element, mineral, nucleic acid and meat color of a part of breast of a large size chicken according to breeding days(30, 36 and 42 days). In general element of chicken, moisture and protein content were decreased, but lipid content was increased relatively as increasing breeding days of chicken. Lightness value(L*) of chicken was darkness falls gradually and dark more at 42 days in a large size chicken according to increasing breeding days of chicken, otherwise yellowness value(b*) was increased. In physical characteristic, weight loss by heating was decreased, but shearing force was increased little by little. Ca among minerals was increased according to increasing days but P content was appear to be decreased with the passing of breeding days. Inosine associated with taste was appear to be increased with the passing of breeding days.

Keywords— general element, mineral, nucleic acid, meat color

INTRODUCTION

A production method of meat chicken in Korea was fixed into small chicken(approximately 1.5 kg) and the propensity to consume was consumed by a roast chicken than meat cut. But the foreign produced a large size chicken of approximately 2.1-2.7 kg and was in circulation with meat cut. Meat cut of chicken was produced more according to breeding with a large size and it was not only export promotion, but also satisfy the demand of chicken breast was increased with a diet recently. And it also expected to decrease of import for chicken breast. Recently, the size of Japan and the United States retail market of meat cut were each 70% and 90%, so invigorate the circulation

market. Otherwise meat cut in Korea was made from selection chicken of 30-33 days and over 1.2 kg, therefore the size of Korea's retail market is 25% approximately. National Institute of Animal Science has been established the manufacturing technology by production research since 1993, but it's need the new manufacturing technology for production of meat cut, because feed system and breeding days was improved all the while by development of breeding technology.

MATERIALS AND METHODS

We purchased 1 day starter and breeds in a henhouse. The early feed(CP : 21%, ME : 3,030 Kcal/㎏) gave for 10 days, the turn feed(CP : 18.5%, ME : 3,050 Kcal/㎏) gave 25 days and the latter feed(CP : 17.5%, ME : 3,100Kcal/㎏) gave until before shipment. Random selection and processing of a male performed at 30, 36 and 42 days and analyze general element, mineral, nucleic acid and meat color of chicken breast and leg.

RESULTS AND DISCUSSION

The change of general element of breast according to breeding days showed in Table 1. Moisture content, crude protein, crude fat and ash were each 75.04%, 24.49%, 0.12% and 0.87% at 30 days, and each 75.42%, 23.98%, 0.31% and 0.91% at 36 days. Therefore crude protein was decreased a little, and crude fat and ash were increased a little at 36 days than 30 days. Moisture content, crude protein, crude fat and ash were each 75.04%, 24.49%, 0.12% and

0.87% at 42 days (a large size chicken), so moisture and crude protein content showed decrease, and crude fat and ash showed increase. pH change of chicken showed in Table 2. 30, 36 and 42 days were each 6.05, 6.07 and 6.05, so it was not different each others for muscle pH as breeding days. Meat color change of chicken showed in Table 3. Lightness (L^*) among meat color was lower follow to increasing days as 74.56 at 30 days, 74.37 at 36 days and 73.26 at 42 days. Redness (a^*) change was appear to same pattern with lightness as 2.24 at 30 days, 2.05 at 36 days and 1.36 at 42 days, but yellowness (b^*) was increased according to increasing breeding days as 5.34 at 30 days, 6.15 at 36 days and 8.06 at 42 days. Mineral change of chicken breast showed in Table 4. . Ca among minerals was increased according to increasing days as 58.5 at 30 days, 59.2 at 36 days and 60.1 at 42 days. Otherwise P, K and Mg were opposite to Ca as each 2411.6, 3848.5 and 267.1 at 30 days, 2335.0, 3776.9 and 364.5 at 36 days and 2251.2, 3578.3 and 256.7 at 42 days. But Fe and Cu were not appear to be a regular pattern by breeding days. Physical characteristic of chicken according to breeding days showed in Table 5. Weight loss by heating was decreased with the passing of breeding days as 24.02% at 36 days, 19.73 at 36 days and 18.01 at 42 days, especially at 42 days that it was decreased approximately 25% compared with 30 days. The taste like chewing was increased according to increasing of chicken weight because shearing force was increased with the passing of breeding days as 1.66 $\text{N}/0.5 \text{ inch}^2$ at 30 days, 1.90 $\text{N}/0.5 \text{ inch}^2$ at 36 days and 2.10 $\text{N}/0.5 \text{ inch}^2$ at 42 days. Water holding capacity (WHC) was decreased little by little with the passing of breeding days as 55.01% at 30 days, 54.38 at 36 days and 53.23 at 42 days, but decrement between 30 and 42 days was limited in WHC as approximately 1.75%.

Change of nucleic acid material of chicken breast showed in Table 6. IMP content was 137.78 $\mu\text{g}/100 \text{ g}$ at 30 days, 107.54 $\mu\text{g}/100 \text{ g}$ at 36 days and 116.41 at 42 days, so 42 days (a large size chicken) was decreased

15.5 % that it was compared with 30 days. Inosine content associated with taste showed 121.00 $\mu\text{g}/100 \text{ g}$ at 30 days, 130.37 $\mu\text{g}/100 \text{ g}$ at 36 days and 131.23 $\mu\text{g}/100 \text{ g}$ at 42 days, so 42 days was increased approximately 7.8% compared with 30 days. Hypoxanthine content showed a similar pattern with Inosine as 10.24 $\mu\text{g}/100 \text{ g}$ at 30 days, 12.04 $\mu\text{g}/100 \text{ g}$ at 36 days and 12.23 $\mu\text{g}/100 \text{ g}$ at 42 days.

CONCLUSION

Moisture and protein content were decreased, but lipid content was increased relatively as increasing breeding days of chicken. Lightness value (L^*) of chicken was darkness falls gradually and dark more at 42 days in a large size chicken according to increasing breeding days of chicken, otherwise yellowness value (b^*) was increased. In physical characteristic, weight loss by heating was decreased, but shearing force was increased little by little. Ca among minerals was increased according to increasing days but P content was appear to be decreased with the passing of breeding days. Inosine associated with taste was appear to be increased with the passing of breeding days.

Table 1. Change of chemical component in chicken breast according to breeding days (unit : %)

Items	Moisture	C. Protein	C. Lipid	Ash
30day	75.04±0.65	24.49±0.17	0.12±0.01	0.87±0.12
36day	75.42±0.41	23.98±1.54	0.31±0.12	0.91±0.09
42day	74.64±0.98	23.74±0.38	0.46±0.12	0.94±0.08

Table 2. Change of pH on chicken according to breeding days

Items	30day	36day	42day
pH	6.05±0.12	6.07±0.13	6.05±0.13

Table 3. Change of meat color on chicken according to breeding days

Items	Lightness(L*)	Redness(a*)	Yellowness(b*)
30day	74.56±1.55	2.24±1.17	5.34±1.73
36day	74.37±4.29	2.05±1.77	6.15±3.48
42day	73.26±3.80	1.36±2.02	8.06±4.45

Table 4. Change of mineral components on chicken breast according breeding days (unit : ppm)

Items	Ca	P	K	Mg	Fe	Cu
30day	58.5±3.1	2411.6 ±77.8	3848.5 ±290.3	267.1 ±7.4	14.5±0.9	0.84 ±0.14
36day	59.2±2.5	2335.0 ±53.7	3776.9 ±66.9	264.5 ±7.0	10.1±1.5	1.08 ±0.02
42day	60.1±3.1	2251. 2±35.6	3578.3 ±244.6	256.7 ±11.2	12.4±2.5	1.06 ±0.13

Table 5. Physical character of chicken according to breeding days

Items	Cooking loss (%)	Shear force (N/0.5inch ²)	Water holding capacity(%)
30day	24.02±1.30	1.66±0.17	55.01±0.57
36day	19.73±0.53	1.90±0.03	54.38±1.50
42day	18.01±1.03	2.10±0.11	53.26±0.70

Table 6. Change of nucleic acid on chicken breast according to breeding days (unit : mg/100g)

Items	IMP	Inosine	Hypoxantine
30day	137.78±59.39	121.00±22.98	10.24±1.75
36day	107.54±21.50	130.37±6.18	12.04±0.16
42day	116.41±1.59	131.23±4.15	12.23±0.32

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