

# COMPARISON OF CARCASS CHARACTERISTICS IN KOREAN BROILER

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**Abstract – The purpose of this study was to investigate carcass traits and body compositions of broiler. 841 market broilers were used in this study. The Broiler weights were gradually increased due to increased Ho (Korean traditional weight unit for chicken) scores. By-products yield tended to decrease as Ho scores increased, except liver, lung, kidney and stomach. In production of portion cuts, they had much production in order of breast, thigh, drumstick, tenderloin, wing, and drumtette. All cuts and by-products tended to increase as Ho scores increased. The Yield of breast and thigh were increased as Ho scores increased. In contrast, yield of drumette and wing were decreased as Ho scores increased. This information could be used for the industry to predict carcass traits and portion cuts composition.**

**Key Words – body composition, by-product, portion cuts**

## I. INTRODUCTION

Poultry industry in Korea has been remarkable growth since the beginning. The number of slaughtered broilers in January increased from 40 million to 70 million for 2005 to 2015 [Web-1]. The per capita consumption of chicken meat had increased tremendously from 3.1 kg to 11.55 kg for 1985 to 2013 [Web-2]. Recently, broiler industry has grown not only rapidly but also hugely and professionally. A number of broilers have increased about 78 million in 2014 from 17 million in 1983, even if a number of farms have decreased 1,517 in 2014 from 4,203 in 1983 [Web-3]. Broiler industry will be even bigger; the consumption of chicken meat hit an all-time high almost every year. However, contrary to industrial scale, only little attention has been paid to the investigation of carcass traits of broiler [1]. Especially, there is no data for body composition with different carcass weight although Korean

usually eats whole chicken meats, which still have skin and bone.

Additionally, demand for large broiler production caused by increasing meat consumption and welfare for animal due to the life of small size broiler is very short [2]. Because broiler industry and research have been focusing on small size broiler, it needs to investigate portion meats yield and composition with different carcass weight before production of large broiler [3].

In this study, we investigated characteristics of carcass traits and body composition in broiler of various carcass weights. Thus, our findings suggest that this monitoring will allow us to predicting a production of by-product and portion in chickens.

## II. MATERIALS AND METHODS

A total of 841 market broilers from various Ho scores (separated in the 4 groups according to body weight) were used. Broilers were slaughtered at experimental abattoir at National Institute of Animal Science, republic of Korea. The carcass yield was measured with different meat cuts after carcasses separation by prime cut such as breast, leg, wing, back, neck, tail, and fat. Then, portion meat composition was measured after carcass separation by breast, tenderloin, thigh, drumstick, drumette, and wings. For measuring by-products, the first by-product yields such as blood, head, etc were measured. The edible by-products yield was measured after excising and washing such as heart, liver, lung, ileum, esophagus, gizzard, etc.

The results were analyzed by SAS program (SAS, 1998). Analysis of variance and Duncans multiple range test were performed to classify significance ( $P < 0.05$ ).

### III. RESULTS AND DISCUSSION

Table 1 show the number of measured broilers and all measured traits with different Ho scores. The number of over 15 Ho scores broilers is smaller than that of experimental sample, because broiler industry has been focus on producing small size broiler.

Table 1 Carcass traits in broiler with different carcass weight

Ho scores <sup>1</sup>	N <sup>2</sup>	Live weight, g	Carcass weight, g	Carcass yield <sup>3</sup> , %
5-6	88	814±14 <sup>f</sup>	577±5.9 <sup>f</sup>	71.37±0.7 <sup>d</sup>
7-8	267	1039±4 <sup>e</sup>	764±3.4 <sup>e</sup>	73.78±0.2 <sup>c</sup>
9-10	205	1234±5 <sup>d</sup>	924±3.3 <sup>d</sup>	74.94±0.2 <sup>b</sup>
11-12	144	1536±6 <sup>c</sup>	1155±4.1 <sup>c</sup>	75.27±0.2 <sup>ab</sup>
13-14	103	1773±8 <sup>b</sup>	1333±4.9 <sup>b</sup>	75.26±0.2 <sup>ab</sup>
Over 15	34	2004±16 <sup>a</sup>	1526±10.5 <sup>a</sup>	76.23±0.3 <sup>a</sup>

Mean ± SD.

<sup>a-f</sup>Means in the same column with different letters are significantly differ (P < 0.05).

<sup>1</sup>Korean traditional weight units for chicken. 5-6 score, 451-650 g; 7-8 score, 651-850; 9-10 score, 851-1,050; 11-12 score, 1,051-1,250; 13-14 score, 1,251-1,450; over 15, more than 1,451.

<sup>2</sup>Number of measured broilers.

<sup>3</sup>Carcass yield = (carcass weight / live weight) X 100

We investigated the by-products production and yield with different Ho scores; head, leg, heart, liver, lung, proventriculus, esophagus, kidney, gizzard, skin of gizzard, duodenum, ileum, cecum, colon, and fat. The weight of by-products increased as the live weight increased, except to duodenum and colon. The yield of blood was no significant trend with Ho scores difference. The cold carcass yield was range of 71.37 to 76.23% and increased as Ho scores increased. The by-products yield tended to decrease as Ho scores increased except liver, lung, kidney, and proventriculus (data not shown).

Table 2 and 3 showed carcass composition and yield of breast with different Ho scores. Yield of breast was increased as Ho scores increased. In composition of breast, breast fillet was increased as Ho scores increased while bone was decreased. Tenderloin was not affected by Ho scores (data not

shown). These data support that large broiler is suitable for production of breast, which one of the most economically important part of the carcass. These results were similar to other study, which investigated comparison of slaughter age and breast yield; the more broiler aged, the more gain weight [4, 5].

Table 2 Composition of breast meat with different carcass weight (g)

Ho scores <sup>1</sup>	Entirety	Bone	Skin	Breast fillet	Tenderloin
5-6	153±2.33 <sup>f</sup>	5.8±0.2 <sup>d</sup>	16.7±0.5 <sup>f</sup>	108±1.8 <sup>f</sup>	22±0.5 <sup>f</sup>
7-8	215±1.43 <sup>e</sup>	6.3±0.1 <sup>cd</sup>	24.9±0.6 <sup>e</sup>	151±1.2 <sup>e</sup>	32±0.3 <sup>e</sup>
9-10	273±1.62 <sup>d</sup>	6.7±0.2 <sup>c</sup>	29.6±0.5 <sup>d</sup>	195±1.5 <sup>d</sup>	41±0.5 <sup>d</sup>
11-12	353±2.14 <sup>c</sup>	8.4±0.3 <sup>b</sup>	34.6±0.7 <sup>c</sup>	258±1.8 <sup>c</sup>	51±0.6 <sup>c</sup>
13-14	403±2.94 <sup>b</sup>	9.1±0.3 <sup>b</sup>	38.3±1.0 <sup>b</sup>	299±2.6 <sup>b</sup>	56±0.8 <sup>b</sup>
Over 15	463±5.27 <sup>a</sup>	11.2±0.7 <sup>a</sup>	44.3±1.5 <sup>a</sup>	344±3.9 <sup>a</sup>	63±1.5 <sup>a</sup>

Mean ± SD.

<sup>a-f</sup>Means in the same column with different letters are significantly differ (P < 0.05).

<sup>1</sup>Korean traditional weight units for chicken. 5-6 score, 451-650 g; 7-8 score, 651-850; 9-10 score, 851-1,050; 11-12 score, 1,051-1,250; 13-14 score, 1,251-1,450; over 15, more than 1,451.

Table 3 Carcass yield of breast meat with different carcass weight (%)

Ho scores <sup>1</sup>	Entirety	Bone	Skin	Breast fillet
5-6	18.8±0.3 <sup>d</sup>	0.72±0.03 <sup>a</sup>	2.05±0.06 <sup>c</sup>	13.26±0.19 <sup>d</sup>
7-8	20.8±0.1 <sup>c</sup>	0.60±0.01 <sup>b</sup>	2.39±0.06 <sup>ab</sup>	14.67±0.10 <sup>c</sup>
9-10	22.1±0.1 <sup>b</sup>	0.54±0.01 <sup>bc</sup>	2.40±0.04 <sup>a</sup>	15.81±0.11 <sup>b</sup>
11-12	23.1±0.1 <sup>a</sup>	0.55±0.02 <sup>bc</sup>	2.26±0.05 <sup>b</sup>	16.86±0.11 <sup>a</sup>
13-14	22.8±0.2 <sup>a</sup>	0.51±0.02 <sup>c</sup>	2.17±0.06 <sup>bc</sup>	16.92±0.15 <sup>a</sup>
Over 15	23.1±0.3 <sup>a</sup>	0.55±0.03 <sup>bc</sup>	2.22±0.08 <sup>bc</sup>	17.20±0.20 <sup>a</sup>

<sup>a-d</sup>Means in the same column with different letters are significantly differ (P < 0.05).

<sup>1</sup>Korean traditional weight unit for chicken. 5-6 score, 451-650 g; 7-8 score, 651-850; 9-10 score, 851-1,050; 11-12 score, 1,051-1,250; 13-14 score, 1,251-1,450; over 15, more than 1,451.

We also investigated production and yield of other portion meat such as leg and wing. The yield of thigh showed similar aspect as breast; increased as Ho scores increased. In contrast, yield of drumette and wing were decreased as Ho scores increased. In yield of fillet, there is no significant aspect in drumstick, drumette, and wing (data not shown). In production of different cuts, they had much production in order of breast, leg, back, wings, and neck. In portion cuts, they had much production in order of breast, thigh, drumstick, tenderloin, wing, and drummettet. All cuts and by-products tended to increase as Ho scores.

#### IV. CONCLUSION

In this study, we investigated carcass characteristics and body composition in Korean broiler with various carcass weights. Especially, the detailed investigation of body composition was utilized, such as bone and skin. The large broiler is suitable for production of breast; not only whole breast yield but also breast fillet yield was increased too. Therefore, these results could help make a decision whether producing large or small size broiler.

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