MEAT QUALITY CHARACTERISTICS OF *LONGISSIMUS* MUSCLE OF PUREBRED PIGS FOR COMMERCIAL PIG IN KOREA

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Abstract – This study was conducted to compare the meat quality characteristics of *longissimus* muscle of purebred pigs in Korea. A total of 99 *longissimus* muscles (18 Landrace, 62 Yorkshire, and 19 Duroc) were used for analysis of meat quality characteristics. Duroc pig was the highest in the redness (a*) value among the pigs ($p<0.05$). Also, the Duroc pig had significantly lower cooking and drip loss values (24hr and 14day) than the other pigs. The fat content and pH value of Duroc were higher than those of the other pigs ($p<0.05$), but the moisture content was the highest in the *longissimus* muscle of Landrace pig ($p<0.05$). As a result, it is suggested that Duroc pig is superior in terms of meat quality compared with the other two breeds, and this information about purebred pigs may be helpful for improvement of pork quality in Korea.

Key Words – meat quality, *Longissimus* muscle, purebred pigs

I. INTRODUCTION

Pork consumption in South Korea has been steadily increasing over the last fifty years. Pork consumption in 1970 per head was 2.6 kg, and it was increased to 20.9 kg per head in 2013 [1]. Also, one of the most pork-consuming countries in the world is South Korea [2]. In Korea, three-way crossbreds (Landrace×Yorkshire, F1 ♀ × Duroc ♂) was utilized as mostly commercial pigs. Recently, interest of breeder has been increasing for improving meat quality due to Free Trade Agreement and consumer's needs [3]. For these reasons, the meat quality improvement of pigs is essential. However, although information on purebred pigs has investigated in previous studies, recent data on comparison of the respective meat quality of purebred pigs used for commercial pigs in Korea is rare. Therefore, this study was conducted to compare the meat quality characteristics of *longissimus* muscle from purebred pigs in Korea and to provide scientific information on producing high quality pork to meet the consumer's needs.

II. MATERIALS AND METHODS

A total of 99 pigs were used in this study, including 18 purebred Landrace gilt, 62 purebred Yorkshire gilt, and 19 purebred Duroc gilt pigs. Landrace, Yorkshire and Duroc were raised from November 2015 to May 2016 by Korean Feeding Standard for Swine (KFSS) at Great Grand Parent (GGP) farm in Yeonggwang Jeollanam-do. The *longissimus* muscles from Landrace, Yorkshire and Duroc pigs were swiftly transferred to Chungbuk National University's meat science lab after conventional slaughtering at slaughter house in Jeollanam-do. Meat quality characteristics (pH, meat color, shear force, WHC, drip loss, cooking loss, moisture, fat, protein, and ash) were analyzed. The results were analyzed using the SAS package Release 9.4 (SAS Institute, Cary, NC, USA) and the significance was defined at $p<0.05$.

III. RESULTS AND DISCUSSION

The comparison of meat quality characteristics of *longissimus* muscle from purebred pigs is presented in Table 1. The water holding capacity, shear force, and drip loss (48hr) values had no significant differences among the pigs. The lightness and yellowness values of Landrace were the highest among the pigs, whereas the redness (a^*) value of Duroc was significantly higher than the other pigs ($p<0.05$). The cooking loss, drip loss (24hr), and drip loss (14day) values of Duroc were significantly lower than the other pigs ($p<0.05$).

The comparison of proximate composition and pH of *longissimus* muscle of purebred pigs is presented in Table 2. The moisture content of Landrace was significantly higher than those of Duroc and Yorkshire pigs ($p<0.05$), but the fat content was high in the order of Duroc, Yorkshire, and Landrace ($p<0.05$).

There were no significant differences in the protein and ash contents among the pigs. The pH of *longissimus* muscle of Duroc was the highest among the pigs ($p<0.05$).

Table 1. The meat quality characteristics of *longissimus* muscle of purebred pigs in Korea

Traits		Duroc (n=19)	Landrace (n=18)	Yorkshire (n=62)
CIE L*[1)]		54.60±4.94[b]	56.42±4.56[a]	55.31±4.61[ab]
CIE a*		6.83±1.31[a]	6.12±1.41[b]	6.06±1.28[b]
CIE b*		9.41±1.12[c]	10.11±1.33[a]	9.78±1.24[b]
Shear force (g)		1738.40±319.84	1733.01±512.22	1710.66±410.43
WHC (%)[2)]		59.12±4.13	58.80±4.76	60.18±5.34
Cooking loss (%)		26.08±4.01[b]	28.95±3.40[a]	27.95±4.57[a]
Drip loss (%)	24hr	4.43±1.93[b]	6.03±2.56[a]	6.45±3.66[a]
	48hr	5.66±4.13	6.78±2.51	6.43±3.09
	14day	8.15±2.77[b]	9.56±3.01[a]	9.31±2.67[a]

[1)] L*: lightness, a*: redness, b*: yellowness.
[2)] Water holding capacity
[a-c]Means±SD with different superscripts in the same row differ significantly($p<0.05$).

Table 2. The proximate composition and pH of *longissimus* muscle of purebred pigs in Korea

Traits	Duroc (n=19)	Landrace (n=18)	Yorkshire (n=62)
Moisture (%)	72.37±1.76[b]	73.81±2.06[a]	72.84±2.52[b]
Fat (%)	4.44±1.47[a]	3.27±0.73[c]	3.95±0.94[b]
Protein (%)	21.52±2.46	21.69±2.13	21.96±2.26
Ash (%)	1.20±0.13	1.21±0.18	1.23±0.18
pH	5.75±0.14[a]	5.63±0.12[b]	5.63±0.13[b]

[a-c]Means±SD with different superscripts in the same row differ significantly($p<0.05$).

IV. CONCLUSION

As a result, the cooking loss and drip loss values of *longissimus* muscle from the Duroc breed were lower than Landrace and Yorkshire. Also, the *longissimus* muscle of Duroc breed had rich redness, high pH, and high fat content. In conclusion, in terms of meat quality characteristics of purebreds for the Korea crossbred pig, Duroc showed excellent results compared to Landrace and Yorkshire.

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