

## Proteolysis and texture characteristics in dry-cured loin from different pig breed (#443)

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### Introduction

The proteolysis plays a major role in the final product quality of the dry-cured meat, and it was affected by various factors such as animal breed, muscle type, and processing condition<sup>1</sup>. In the processing of dry-cured meat, the key enzymes of proteolysis were cathepsin and calpain, and such activity was determined by water activity, pH, and salt content in the product during processing<sup>2,3</sup>. Numerous previous studies have attempted to demonstrate the interrelationship between proteolysis and dry-cured meat<sup>4,5</sup>. However, most of the studies are concentrated on dry-cured ham, and few types of research have been done on dry-cured loin according to pig breed. The objective of the study was evaluated to proteolysis and textural characteristics on dry-cured loin from different pig breeds (Berkshire, BER; commercial crossbreed, LYD) through comparison of moisture content, pH, texture characteristics, and total free amino acid (TFAA) content.

### Methods

All pigs were maintained according to Korean standard feeding for swine and pigs were slaughtered at six-month-old (final weight of 110 kg). The six pork loins were obtained through two pig breeds and the half from Berkshire and the rest from crossbreed (LY×D). The visible fat and connective tissue of all pork loins were eliminated, and it was adjusted as 2.5 kg for each pork loins. The dry-cured loins from different pigs breed were manufactured by the same procedure. All loins were covered with sufficient seasoning mixture (salt, nitrite, and sugar) and left for 72 hours at 4°C. After rinsed the surface with tap water, the dry-ripening step was carried out for 30 days at 12°C at a relative humidity of 65-75%. The data were analyzed using the PROC ANOVA procedure with Duncan's multiple range test ( $p < 0.05$ ).

### Results

The moisture content, pH, TFAA, and texture characteristics of dry-cured loins were presented in Table 1. The dry-cured loins had significantly affect-

ed by pig breed in moisture content, water activity, hardness, and TFAA ( $p < 0.05$ ), and BER was higher than LYD in values of the items. According to the previous studies, cathepsin D, B, H, and L were the main enzymes in proteolysis of dry-cured ham, and those were affected by moisture content, water activity, and pH during dry-cured processing<sup>2,3</sup>. Followed to the results, high water content and water activity showed more activation for cathepsin B and H than low water content and water activity. Therefore, high activity of cathepsin led to more break down of proteins, and the more generated amino acid could be due to those phenomena in dry-cured meat. Also, proteolysis was very important for the formation of texture, taste, and flavor<sup>6</sup>. Additionally, the Harkouss et al. (2015) were reported that moisture content and hardness were shown to the positive relationship in dry-cured ham, and our results also showed the same results.

Table 1. Physicochemical properties on dry-cured loin according to the pig breed

Animal	Moisture (%)	Water activity	pH	TFAA (mg/100g)	Hardness (N)	Cohesiveness
BER	55.42 <sup>A</sup>	0.86 <sup>A</sup>	5.78	6512.58 <sup>A</sup>	17.28 <sup>B</sup>	0.51
LYD	50.85 <sup>B</sup>	0.81 <sup>B</sup>	5.75	4716.33 <sup>B</sup>	20.30 <sup>A</sup>	0.55
SEM	0.67	0.02	0.02	276.42	1.63	0.04
p-value	0.006	0.007	NS	<0.001	0.002	NS

<sup>A-D</sup> Means with different superscript capital letters in a column within each treatments differ significantly ( $p < 0.05$ ).

### Conclusion

This study presented that dry-cured loin collected from Berkshire was higher in proteolysis and was lower in hardness compared with dry-cured loin collected from the commercial crossbreed. Therefore, Berkshire could be more suitable for the manufacture to dry-cured loin caused by the sensory advantage of total free amino acid and hardness.