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Changes in taste-traits of pork cuts during dry aging (#412)

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Introduction

Fresh meat often extends the aging period to make it taste better. It is now well known that post-mortem aging is related to meat palatability attributes in terms of tenderness, juiciness and flavor because of a structural breakdown of muscle by proteases enzymes. Because dry-aging leads to concentration of major nutrients such as protein, fat, minerals etc., when the dry-aged meat is chewed, fat-like juicy materials are released which lead to increased flavor, umami and other sensory attributes. However, most studies have been conducted on dry-aged beef, and very little research has been done on dry-aged pork. Therefore, the changes in taste compounds and sensory characteristics of pork belly and shoulder blade cuts which are commonly used for traditional Korean meat cooking "Gogi-gui", were investigated during 21 days of dry-aging.

Methods

Ten belly and shoulder blade cuts were divided into wet-aging (vacuum packed) treatment and dry-aging (without packed) treatment, and were aged at 2°C in a refrigerator for 21 days. The contents of nucleotides and free amino acids, sensory panel scores and electronic tongue analysis were investigated at different aging periods (1, 7, 14 and 21 days).

Results

The IMP content decreased with increasing aging period (Fig. 1). The content of inosine and hypoxanthine increased as the aging period lengthened to 21 days, and those of the dry-aged pork cuts increased at a faster rate than wet-aged pork cuts. The hypoxanthine content of the dry-aged pork cuts on 21 days of aging was significantly ($p<0.05$) higher than those of wet-aged pork cuts. Dry-aged pork cuts did not differ in total free amino acids and glutamic acid contents from wet-aged pork cuts until the 7th day of aging, but has increased significantly ($p<0.05$) thereafter (Fig. 2). After 21 days of aging, the most free amino acids except Asp, Cys, and Met in dry-aged pork cuts were increased significantly ($p<0.05$) as compared to wet-aged pork cuts (Table 1). The overall palatability score of dry-aged pork cuts evaluated by trained panel were higher than those of wet-aged pork cuts, although the juiciness score decreased more rapidly than wet-aged pork. When relative umami and sourness intensity values evaluated by the electronic tongue system were computed from baseline in first day of aging, umami intensity of dry-aged pork cuts increased more rapidly and the values were significantly ($p<0.05$) higher than those of wet-aged pork during 21 days of aging (Fig. 3). Contrarily, the sourness values of dry-aged pork cuts decreased more rapidly compared to wet-aged pork cuts, and there were significant ($p<0.05$) differences in sourness between wet- and dry-aged pork cuts on the 14th and 21st day of aging. However, there were no significant ($p>0.05$) differences in bitterness, astringency, saltiness, and richness (aftertaste of umami) between wet- and dry-aged pork cuts during 21 days of aging.

Conclusion

The taste compounds of dry-aged pork cuts increased rapidly during 21days of aging, and the contents of inosine and hypoxanthine of dry-aged pork cuts were higher than those of wet-aged pork cuts. The total free amino acids of dry-aged pork cuts also increased more rapidly compared to wet-aged pork cuts. Consequently, sensory flavor and palatability scores of dry-aged pork cuts were higher than wet-aged pork cuts, although juiciness score decreased more rapidly. The faster increasing and higher umami intensity was observed in dry-aged pork cuts from electrical tongue analysis, and this was thought to be the main reason for the better sensory palatability of dry-aged pork compared to wet-aged pork.

Notes

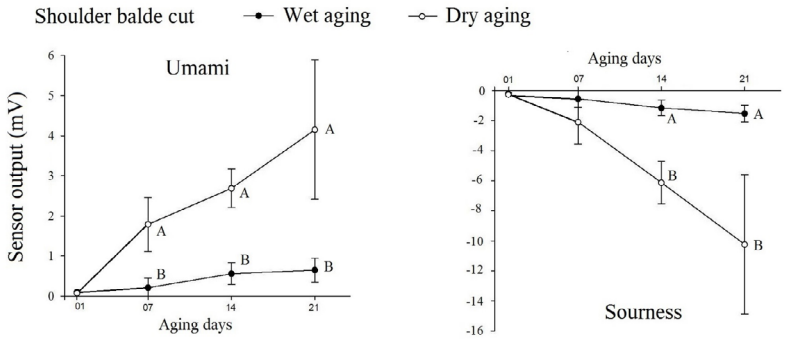

Fig. 3. Relative changes in umami and sourness of wet- and day-aged pork cuts
Different letters indicate significant differences ($p<0.05$) between wet- and dry-aged pork cuts.

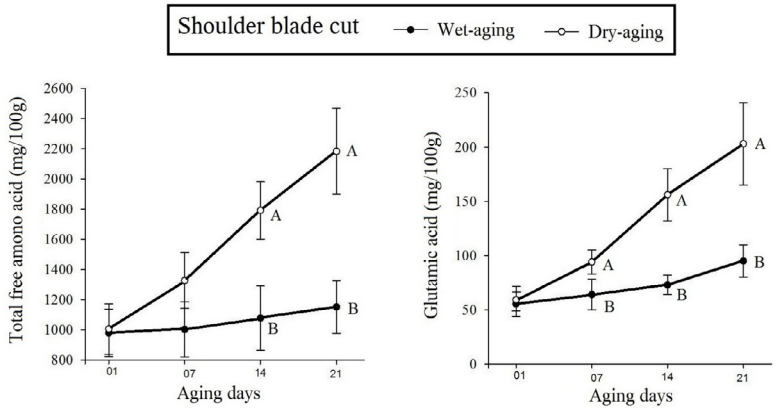

Fig. 2. Changes in concentration of total free amino acids and glutamic acid in dry-aged pork
Different letters indicate significant differences ($p<0.05$) between wet- and dry-aged pork cuts.

Notes

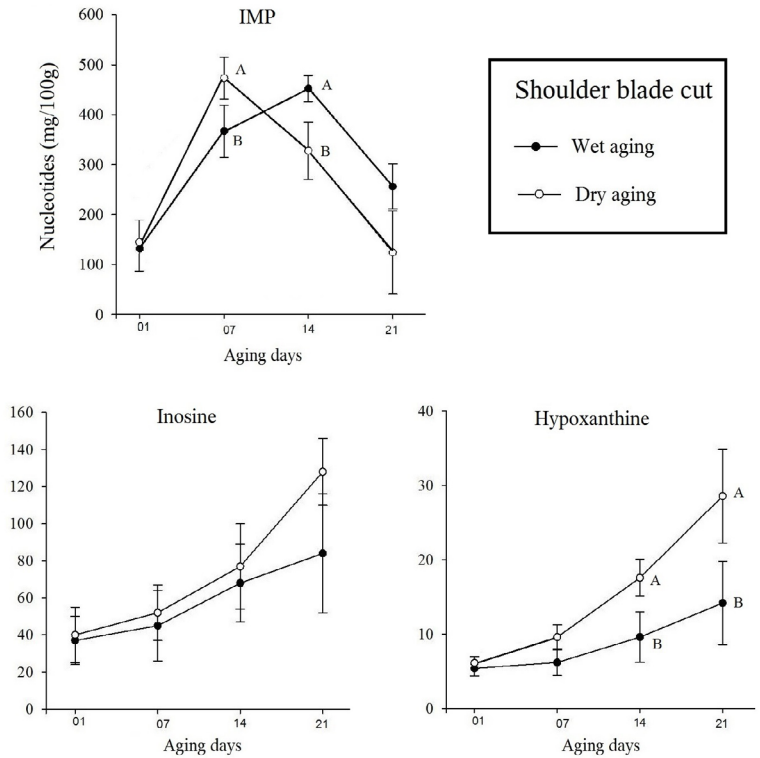

Fig. 1. Changes in nucleotides content of wet- and dry-aged pork
Different letters indicate significant differences ($p<0.05$) between wet- and dry-aged pork cuts.

Notes