



Fresh Pork Belly Characteristics and Bacon Quality Based on 3 Iodine Value Categories

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Objectives

To determine belly characteristics and bacon composition based on bellies categorized into three iodine value ranges.

Materials and Methods

Bellies were sourced from pork carcasses that had been sorted into three IV categories: 58 to 63/100 g (Low), 68 to 73/100 g (Intermediate), and 78 to 83/100 g (High) utilizing a Near-Infrared-Transmission Spectroscopy sensor unit. Each category contained 48 bellies, one from the left and right carcass, totaling 144 bellies. Belly length, width, and thickness, were measured. Belly firmness was objectively recorded, by placing each belly perpendicularly, skin side down on a metal bar. Distance between the bottom of the shoulder and ham ends was measured to quantify firmness. Bellies were then processed into bacon at a commercial facility. Protein, moisture, and fat measurements were all measured on a composite sample of bacon slices from 10 zones across each belly. Fatty acid analysis was conducted using gas chromatography. Iodine values were calculated using fatty acid composition by the AOCS (1998) protocol: $(C16:1 \times 0.95) + (C18:1 \times 0.86) + (C18:2 \times 1.732) + (C18:3 \times 2.616) + (C20:1 \times 0.785) + (C22:1 \times 0.723)$. Hydroxyproline content was quantified in the bacon fat to estimate collagen content. Fat was separated from 3 bacon slices per belly, then frozen and pulverized for a homogenous sample which was utilized for collagen analysis. This study was analyzed as a randomized

complete block design with a split plot, each pork carcass serving as an experimental unit.

Results

Belly IV for each category was different ($P < 0.05$), with average means of 76.9, 70.9, and 67.7 g/100g for High, Intermediate, and Low categories, respectively. Belly length, width, and thickness were not different among IV categories ($P > 0.05$). Low IV category bellies were firmer ($P < 0.05$) than Intermediate and High IV bellies. There were no differences in protein, moisture, and fat in bacon slices between IV categories ($P > 0.05$). Total concentration of saturated fatty acids from bacon slices was less ($P < 0.05$) in High IV bellies when compared to Intermediate and Low categories. There was no difference ($P > 0.05$) in total concentration of monounsaturated fatty acids between all three categories. Bacon slices from the High IV category contained a greater ($P < 0.05$) concentration of polyunsaturated fatty acids than the Intermediate and Low IV categories. Bacon slices from the High IV category had a greater amount of soluble and insoluble collagen compared to the Low IV category ($P < 0.05$). Bacon slices from High IV bellies had a greater ($P < 0.05$) amount of total collagen compared to the Low IV bellies.

Conclusion

Increasing IV contributed to softer pork bellies. Iodine value did not affect dimensional properties of pork bellies. Increased IV resulted in bacon with greater concentrations of polyunsaturated fatty acids and an increased percentage of connective tissue.

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