EFFECT OF HOT BONING AND CUTS VARIATION ON EATING QUALITY OF SAUCED BEEF

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I. INTRODUCTION

Hot boning was beneficial to reduce energy usage and operating costs in beef processing plants [1] but reported to deteriorate beef eating quality [2]. Traditionally, sauced beef, a very popular delicacy in China, is usually processed using hot boned-low value beef cuts such as Rump, Topside, Knuckle and Shank. Whether high valued beef cuts such as Striploin, and aging processing could produce higher quality of sauced beef is uncertainty. Therefore, in this study, the eating quality of beef obtained from either pre-rigor, rigor onset, and after aging, and different beef cuts were evaluated, to select the best raw material to produce high quality sauced beef.

II. MATERIALS AND METHODS

Four beef cuts including Striploin, Knuckle, Topside and Shank were hot-boned removed from both sides of 9 Chinese crossbred yellow cattle carcasses at 1 h postmortem, and then transferred to the lab in foam box with ice in 2 h. The four beef cuts were sub-cut and trimmed to about 500g. Those sub-cuts and steaks then vacuum packaged and stored at 3 ± 1 ^{o}C, with those sub-cuts without package and cooked directly were regarded as pre-rigor samples, and sub-cuts at 10 to 12 h postmortem were rigor mortis samples. Other sub-cuts were aged for 2d or 7d. The procedure of cooking sauced beef and consumer panel evaluations were as descripted by previous study [3]. One hundred and twenty panelists participated in the sensory testing. The testing was carried out 6 sessions with 20 panelists each time. Each consumer tasted four samples for tenderness, flavor, juiciness, elasticity, chewiness, overall evaluation by using a hedonic scale from 1 to 9 (1=dislike extremely, 5 = neither like nor dislike, and 9 = like extremely). The serving order of the samples was based on randomly and balance principle. One-way ANOVA was conducted by using SPSS software (Version 18). Tests of differences were considered significantly different at $P < 0.05$.

III. RESULTS AND DISCUSSION

The results of sensory evaluation were presented in Table 1. Sauced beef produced by Shank exhibited relative higher evaluation scores than other cuts in every aspect of eating quality, and sampling time had no effect on its those sensory scores. So hot boned Shank is good enough to produce high quality sauced beef and aging is not needed. Knuckle took the second place in eating quality. Postmortem time affects tenderness, flavor, juiciness, elasticity, chewiness and overall evaluation of sauced beef significantly ($p < 0.05$). Sauced beef produced by using pre-rigor and postmortem 7d Knuckle were better than produced using Knuckle of rigor mortis and postmortem 2d. So hot-boned Knuckle is also good raw material to produce high quality sauced beef. Every aspect of eating quality of sauced beef produced by Striploin was affected by postmortem time. Striploin of pre-rigor and postmortem 7d produced better sauced beef than those collected from rigor mortis and postmortem 2d. But the scores of eating quality of sauced beef produced by

Striploin was lower than those produced by Shank and Knuckle. So it not recommended to cook sauced beef by using Striploin considering its much higher price. Topside was not affected by postmortem which similar to Shank, but Topside always got a low evaluation scores, indicating this cut is not suitable to cook sauced beef.

IV. CONCLUSION

Hot boned Shank and Knuckle were good beef cuts to produce sauced beef. Meanwhile, Striploin is not a good choice to produce sauced beef because it produced a lower eating quality product while has a higher price. Even though it is a traditional practice, Topside should not use to produce sauced beef for its lowest eating quality and the fact is, even aging processing cannot improve it.

Table 1 Eating quality of sauced beef cooked at different postmortem time

Cuts		Pre-rigor	Rigor mortis	Postmortem 2d	Postmortem 7d
Striploin	Tenderness	5.4±0.3^{a}	4.8±0.2^{b}	4.8±0.4^{b}	5.7±0.4^{a}
	Flavor	6.1±0.5^{ab}	5.8±0.2^{b}	5.9±0.1^{b}	6.4±0.2^{a}
	Juiciness	5.6±0.3^{a}	5.3±0.1^{a}	5.3±0.5^{a}	5.4±0.4^{a}
	Elasticity	5.7±0.2^{a}	5.3±0.2^{b}	4.7±0.3^{c}	5.5±0.4^{ab}
	Chewiness	5.7±0.2^{a}	5.0±0.3^{b}	4.7±0.1^{c}	5.3±0.1^{a}
	Overall evaluation	5.5±0.3^{b}	4.9±0.1^{c}	5.1±0.2^{c}	6.0±0.3^{a}
Knuckle	Tenderness	6.6±0.1^{a}	5.4±0.2^{b}	5.4±0.4^{b}	6.5±0.6^{a}
	Flavor	6.3±0.4^{a}	6.4±0.1^{a}	6.0±0.6^{a}	6.3±0.3^{a}
	Juiciness	6.0±0.4^{a}	5.5±0.3^{a}	5.7±0.5^{a}	5.5±0.6^{a}
	Elasticity	5.9±0.4^{a}	6.0±0.5^{a}	5.2±0.3^{b}	5.5±0.3^{ab}
	Chewiness	6.2±0.3^{a}	5.9±0.7^{ab}	5.3±0.5^{b}	5.7±0.7^{a}
	Overall evaluation	6.5±0.2^{a}	5.8±0.1^{b}	5.7±0.3^{b}	6.3±0.5^{ab}
Topside	Tenderness	5.7±0.3^{a}	4.9±0.4^{a}	4.9±0.9^{a}	5.5±0.4^{a}
	Flavor	6.0±0.7^{a}	5.6±0.7^{a}	5.4±0.7^{a}	5.6±0.3^{a}
	Juiciness	5.2±0.3^{a}	5.2±0.5^{a}	4.7±0.5^{a}	4.7±0.5^{a}
	Elasticity	5.6±0.5^{a}	5.1±0.8^{b}	4.4±0.5^{a}	4.8±0.3^{a}
	Chewiness	5.5±0.5^{a}	4.7±0.6^{a}	4.8±0.8^{a}	5.2±0.5^{a}
	Overall evaluation	5.1±0.1^{a}	5.0±0.5^{a}	5.2±0.7^{a}	5.3±0.5^{a}
Shank	Tenderness	7.3±0.6^{a}	7.0±0.1^{a}	7.5±0.2^{a}	7.4±0.2^{a}
	Flavor	6.4±0.3^{a}	6.2±0.6^{a}	6.4±0.5^{a}	6.4±0.1^{a}
	Juiciness	6.3±0.4^{a}	6.3±0.6^{a}	6.4±0.4^{a}	6.4±0.6^{a}
	Elasticity	6.3±0.3^{a}	6.4±0.1^{a}	6.4±0.4^{a}	6.6±0.2^{a}
	Chewiness	6.8±0.4^{a}	6.7±0.6^{a}	6.9±0.4^{a}	6.9±0.3^{a}
	Overall evaluation	6.9±0.2^{a}	6.6±0.4^{a}	7.0±0.6^{a}	6.9±0.2^{a}

Note: The means with different letter of a, b are significant different at the 0.05 level ($P < 0.05$) within rows.

ACKNOWLEDGEMENTS

This work was supported by earmarked fund for China Agriculture Research System-beef (CARS-37), and funds of Shandong “Double Tops” program (SYL2017XTTD12).

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