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Effect of temperature on sensory quality and shelf-life of vacuum packaged Hanwoo tenderloin. (#160)

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Introduction

In Korea, Hanwoo beef export started since 2015. Shelf-life extend in exported meat is very important because of the additional shipping time. During storage, meat freshness and meat quality decline. Meat freshness and quality can be more preserved in lower storage temperature at the same condition. There was a lot of studies on below zero temperature storage of beef in the major beef export country; such as USA, Australia; but there were only a few studies was conducted in Korea on quality change of Hanwoo beef stored in below zero temperature. In this study, we investigate to appropriate storage period of Hanwoo tenderloin at a different temperature.

Methods

Total of three beef psoas major was used. These were each divided into 18 slice ($n = 64$) and assigned to each of six chilled storage periods (0, 7, 14, 21, 28 and 35 days) \times three chilling temperature (-1.5, 0, and 2 °C) combination. All slices were vacuum-packaged and storage in each temperature until experiment. In each storage periods, drip loss, pH, sensory quality, vbn, TBARS, total coliform, and total aerobic microbial count were measured. Data were analyzed using Duncan's Multiple Range Test to determine the differences between different temperature.

Results

Table 1. TBARS, VBN and Drip loss of Hanwoo psoas major stored at a different temperature.

Item	Temp.	Storage period(days)					
		7	14	21	28	35	
TBARS	-1.5	0.3786±0.2196	0.5738±0.2469	0.3474±0.1425	0.5088±0.1035	0.8296±0.3700	0.5308±0.2255
	0		0.4785±0.1248	0.3428±0.1058	0.5042±0.0691	0.4785±0.1527	0.6573±0.3868
	2		0.4785±0.1059	0.4923±0.2080	0.7132±0.1770	1.2659±0.6242	0.7929±0.3300
VBN	-1.5	7.93±0.61	8.26±0.31	8.31±0.34	8.26±0.31	8.77±0.33	8.14±0.22
	0		8.19±0.46	8.22±0.45	8.51±0.26	8.79±0.21	8.61±0.32
	2		8.33±0.57	8.41±0.43	9.33±0.14	9.19±0.33	10.08±0.64
Driploss	-1.5		4.85±0.97	4.86±1.48	5.57±1.28	5.16±1.15	5.59±0.99
	0		5.27±1.22	5.11±1.67	6.09±1.30	5.42±1.01	6.05±0.51
	2		6.02±1.41	5.78±1.67	5.84±0.94	5.59±0.92	6.42±0.86

The drip loss and VBN of Hanwoo psoas major at 35 day increased linearly with increasing storage temperature. But there was no significant in both traits. The TBARS wasn't show any tendency among storage time or temperature.

Notes

Table 2. Sensory quality of Hanwoo psoas major stored at a different temperature.

Item	Temperature	Storage period(days)				
		14	21	28	35	
Odor	-1.5	3.00±0.88	3.42±0.92	3.81±0.65b	3.42±0.79	4.11±0.72
	0	3.22±0.85	3.17±0.83	3.58±0.58b	3.64±0.70	3.89±0.74
	2	3.17±0.96	3.42±0.79	4.44±1.07a	4.50±0.75	4.92±0.82
Color	-1.5	5.56±0.68	5.17±0.69	5.19±0.73	4.78±0.63	4.89±0.74
	0	5.17±0.60	4.83±0.50	4.78±0.71	4.33±0.82	4.39±0.76
	2	5.06±0.62	4.97±0.75	4.61±0.83	4.72±0.65	4.06±0.52
Overall acceptability	-1.5	5.44±0.60	5.28±0.71a	5.08±0.75	4.72±0.56	4.81±0.65
	0	5.33±0.67	4.89±0.81b	4.72±0.73	4.06±0.62	4.22±0.63
	2	5.17±0.69	4.89±0.74b	4.67±0.82	4.28±0.73	3.94±0.52

Hanwoo psoas major stored at 2 °C showed the highest odor score and lowest color and overall acceptability score at the late stage of storage, but there was no significant difference. The odor score was increased linearly and color and overall acceptability were decreased linearly with increasing storage period.

Conclusion

In this study, Hanwoo beef psoas major stored in -1.5 °C temperature showed better sensory quality and shelf-life quality at 35-day storage. However, there was no statistically significant difference among temperature in this experiment. More experiment such as using large samples or extended storage period is needed.