

EFFECT OF CUT AND AGING ON COOKING LOSS AND SHEAR FORCE OF CULLED KABINBURI COWS

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Abstract – This research was conducted to compare meat quality of culled kabinburi cows more than 12 years of age among various cuts (Top side, Knuckle, Rump, Loin) and aging periods (1,7,21d). This research was conducted at Nongkwang Livestock Research and Breeding Center, Ratchaburi province,in 2008. There were 9 culled Kabinburi cows used in this research. The result showed that rump had the lowest cooking loss compared with other cuts (31.77%), Loin had the lowest shear fore compared with other cuts (3.09 kg). In Loin cuts, aging period of 21 day had the lowest shear fore, but no significance compared with 14 day. In rump cuts, aging period of 14 day had the lowest cooking Loss compare with other ageing period. It was concluded that the optimum aging period for good quality was 14 day to preserved of meat quality with optimum cooking loss and shear force.

Key Words – cow, meat, Aging, Cooking Loss, Shear Force

I. INTRODUCTION

The action and interaction of several ante-mortem and post-mortem factors affect the development of meat quality. Ante-mortem factors include age, breed and gender, as well as the nutritional status and composition of the animal. The type of feed (e.g.grass vs. grain) also contributes significantly to flavor. Post-mortem factors include the length of ageing ultimate pH and method of cooking. Of all these factors the final end-point temperature is considered the most important in production flavor in beef (Spanier &Miller, 1996) The flavor of meat is not necessarily a linear function of the fat percentage (Risvil,1994). However, it is widely accepted that cooking alters the flavor precursors of food to yield a product with a more pleasing taste (Spanier & Miller,1996)

The relationship of beef flavor and juiciness to particular muscles and animal age, as defined by dentition, has been investigated in the Thailand, but a little information. The effect of feed on flavor could also be deduced to certain extend, as within the Thailand production system young animals are mostly grain fed in feeding, while older animals ate mostly grass fed. The old animals are culled old animals which were almost exclusively grass fed, e.g. older dairy cows and stud animals. In order to make meaningful recommendations to the consumer, it was decided to investigate these aspects which influence cooking loss, juiciness and flavour of beef. By the research of overall lean-meat aroma (Wasserman& Talley, 1968) and flavour are not determined by the degree of fatness (Patterson, 1975), this variable as such was not investigated. The objective of this study was therefore to determine the effect of cuts and aging period on cooking loss and shear force of culled Kabinburi cow (Simmental x Brahman) at Nongkwang Livestock Research Breeding Center.

II. MATERIALS AND METHODS

There were 9 culled Kabinburi cows. This research was conducted at Nongkwang Livestock Research and Breeding Center, Ratchaburi province, in 2008. They were culled due to problems of low fertility and more than 12 years of age. Animals were fed with Pangola grass (*Digitaria eriantha*) , rice straw, an concentrates (12% CP). They were slaughtered at Changmai Meat Research unit. Four cuts of Rump, Knuckle, Topside, and loin were collected to examine cooking loss (Devine *et al.*, 1999) and shear force. Bocard *et al.*, 1981). Data

were analyzed by analysis of variance using (SAS, 1994).

III. RESULTS AND DISCUSSION

The result showed that rump had the lowest cooking loss compared with other cuts (31.77%) followed with Loin (36.15%). Loin had the lowest shear force compared with other cuts (3.09 kg/cm²), followed with rump (10.20 kg/cm²). In Loin cut, aging period of 21 day had the lowest shear force (2.55 kg/cm²), but no significance compared with 14 day. In rump cut, aging period of 14 day had the lowest cooking loss (28.99%) compare with other ageing period. However, it is necessary to compare cooking loss and shear force, between aging within cut. It should be sufficient information. In this results, the meat from culled cows had high shear force and decreased in 21 day aging. But in 21 day aging had more cooking loss, so the optimized for culled cow meat, 14 day aging was optimized.

Table 1 paragraph Factors of cuts and aging on cooking loss and shear forces.

cut	aging (day)	Cooking Loss (%) [*]	Shear force (kg/cm ²) [*]
Top Side		35.32±4.62	11.93±3.33
	1	36.80±2.12	14.53±3.68
	14	32.16±6.43	11.71±2.41
	21	37.01±2.57	9.55±1.60
Knuckle		35.69±4.23	17.94±4.91
	1	34.72±5.36	22.09±4.64
	14	34.63±3.38	17.45±4.21
	21	37.72±3.34	14.28±2.10
Rump		31.77±4.89	10.20±3.09
	1	31.83±3.89	12.96±3.13
	14	28.99±6.04	9.73±2.07
	21	34.49±3.03	7.91±1.53
Loin		36.15±4.51	3.09±1.08
	1	35.08±2.81	3.93±1.05
	14	35.61±2.76	2.77±0.95
	21	37.76±2.35	2.55±0.76

^{*} Different letter in the same column means significant difference of means between effects (P<0.05)

The difference in cooking losses was due to more moisture being lost when the cuts were

surrounded by dry air (dry heat cooking method). The evaporation loss increased, and the loss of moisture when cooking by moist heat was captured, resulting in higher drip loss (moist heat cooking method) (McCrae & Paul, 1974). In some research, the shins, ST, fillet, prime rib, wing rib and loin were contrasted against the thick flank, chuck had less total cooking loss. On the other hand, the cuts that were cooked by dry heat cooking method, fillet, prime rib, wing rib and loin were contrasted against topside and rump and the least amount of total cooking loss, and the thick flank, chuck the most. Spanier and Miller (1996) also described the differences between cuts. They found that different primal cuts react uniquely to heating because of the distinct fibre types, PH, relative fat deposition and intercellular components. Similar results were found by Luchak *et al.* (1998) and Rhee *et al.* (2004)

IV. CONCLUSION

In conclusion, it is recommended that it is necessary to compare cooking loss and shear force, between aging within cut. It should be sufficient information. The quality of meat from culled cows is high shear force. These meats can be used to cook food considered by cooking loss and shear force. The meat from culled cows had high shear force and decreased in 21 day aging. But in 21 day aging had more cooking loss, so the optimized for culled cow meat, 14 day aging was optimized.

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