



Effects of slaughter age on the degree of marbling and fatty acid composition of marbling in Holstein steers

36-23

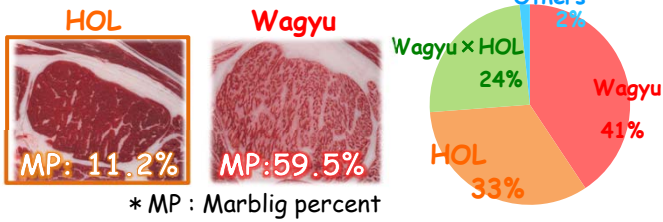
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* Introduction *

- In Japan, 1.2 million beef cattle are slaughtered per year.
- Holstein (HOL) accounts for 33% of total slaughter number.



* MP : Marbling percent

- However, few studies have focused on the effects of slaughter age on the resultant meat quality in HOL that has an average of slaughter age of 20 months in Japan.

* Objectives *

- The aim of this study was to investigate the relationship between the slaughter age and marbling features in HOL.

* Materials and Methods *

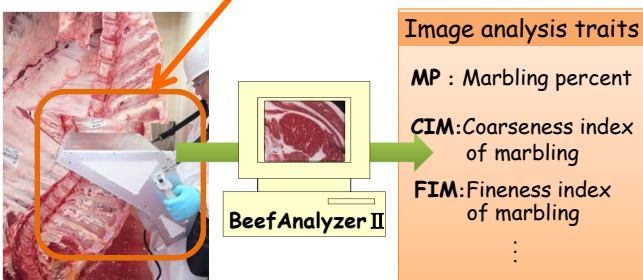
- HOL (n=280) at the age of 12~23 months were used.
- Carcass grading traits for meat quality are evaluated by visual appraisal according to the Japanese beef grading system.

Carcass trait – BMS: Beef Marbling Standard



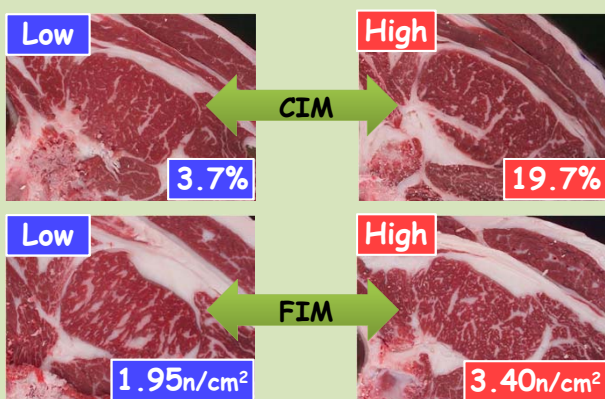
Poor ← → Excellent

- Digital images of the rib eye at the 6-7th rib were taken using mirror type photography equipment.



- Image analysis traits were calculated from digital images using BeefAnalyzer II software.

Image analysis trait – CIM & FIM



* CIM & FIM are compared between same degree of MP in above example

* Results and Discussion *

Table 1. Summary of statistics for carcass traits, image analysis traits and fatty acid compositions in HOL

Age	n	Carcass trait		Image analysis trait			Fatty acid composition	
		CW(kg)	BMS	MP(%)	CIM(%)	FIM (n/cm ²)	n	MUFA(%)
12	8	332.9	2.0	13.4	5.2	1.8	7	47.2
13	58	330.3	2.0	14.4	5.4	1.7	32	48.0
14	37	332.5	2.0	15.3	6.9	1.8	16	47.5
15	38	321.9	2.0	17.2	6.9	2.0	6	50.1
16	12	322.6	2.0	14.6	5.7	1.7	2	50.1
17	5	306.4	2.0	17.7	6.2	2.0	No data	
20	12	461.3	2.1	21.6	13.0	2.2	28	51.4
21	18	461.2	2.4	25.2	14.5	2.3	54	52.1
22	17	453.5	2.2	24.4	13.5	2.3	37	52.4
23	No data		No data		No data		2	51.5

* MUFA (Mono unsaturated fatty acid) have attracted attention for their relevance to proper eating quality and human health

- All traits showed an increasing tendency with increasing slaughter age.

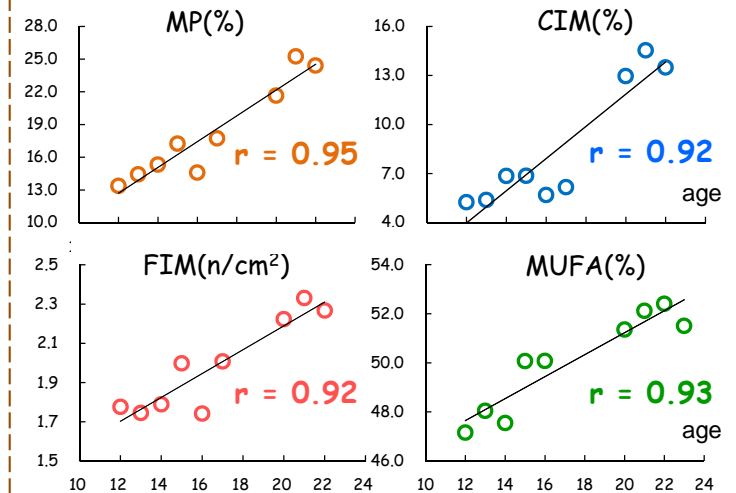


Fig 1. Correlation coefficient between the averages of MP, CIM, FIM and MUFA, and month of slaughter age

- Correlation coefficients for all traits were over 0.90 (P<0.01).

- From the linear regression equation, MP, CIM, FIM and MUFA increased 1.2%, 0.98%, 0.06, and 0.45% per month, respectively.

BMS and MP are indices of marbling, but...

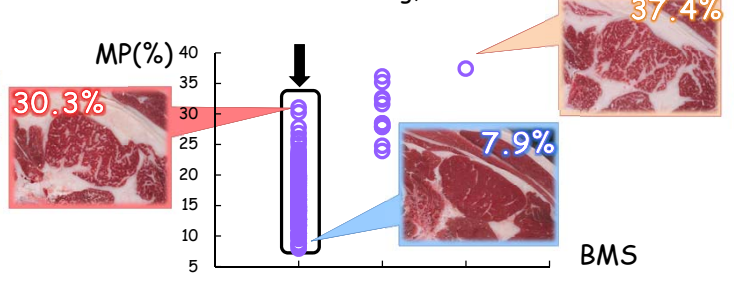


Fig 2. Relationship between BMS (carcass trait) and MP (image analysis trait)

- Large range of MP within the same BMS.

* Conclusion *

- Meat quality was greatly influenced by month of age in HOL.
- The results of this study indicated the utility of image analysis trait in the assessment of the marbling.