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Effect of age of dam on the carcass performance of progeny in Japanese Black cattle

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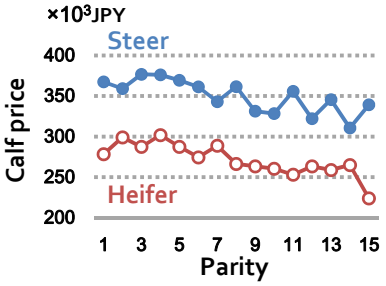
INTRODUCTION

Production system of Japanese Black cattle

- Breeding farmer

Birth → 8~10 months → Calf market → Fattening farmer → Calf market → 20 months → Carcass

Calf price by parity of the dam



- It is believed that performance of calf from aged dam is not good
- Calves from aged dam are sold for lower price

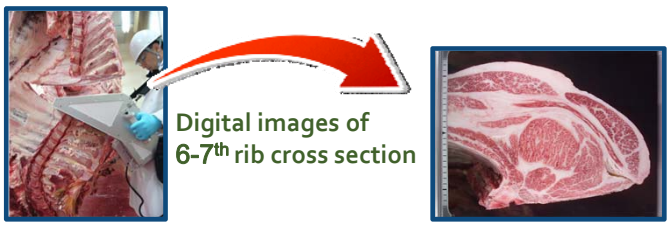
Objective

- To investigate the effect of age of dam on the carcass performance of the progeny in Japanese Black cattle

DATA&METHODS

Data

- Grading traits from 14,074 heads for Japanese Black(JB) cattle [Steer : 9,852 / Heifer : 4,222]
- Collected between 2000 and 2009 in Hokkaido
- Digital images were taken for image analysis
- Image analysis traits from 11,704 heads



Age class of dam

Category of age of dam

Intrapartum age (years)	Class
~ 3	1
3 ~ 5	2
5 ~ 7	3
7 ~ 9	4
9 ~ 11	5
11 ~ 13	6
13 ~ 15	7
15 ~	8

Statistical analysis

- Analysis (1)
  By the GLM procedure using SAS
  → Least squares(LS) means
- Analysis (2)
  By the REML method using AIREML programs
  → BLUE

RESULTS

- Analysis (1)

Table 1 LS means of the age class of dam for carcass traits

Age class of dam	Carcass grading traits						Image analysis trait	
	n	CW(kg)	REA(cm²)	RT(cm)	SFT(cm)	BMS No.	n	MP(%)
1	2,249	415.4	55.0	7.5	2.6	5.4	1,869	41.9
2	2,784	416.8	54.5	7.4	2.6	5.1	2,309	41.0
3	2,361	417.8	53.9	7.4	2.7	4.7	1,939	39.6
4	2,373	417.1	54.1	7.4	2.6	4.5	2,030	38.5
5	1,935	416.3	53.9	7.4	2.7	4.3	1,590	38.3
6	1,221	415.0	54.0	7.4	2.7	4.2	982	37.7
7	702	411.1	53.4	7.3	2.7	4.1	587	36.9
8	449	407.4	52.9	7.3	2.7	4.0	396	36.4
		**	**	**	**	**		**

** : $P < 0.01$
CW : carcass weight, REA : rib-eye area, RT : rib thickness, SFT : subcutaneous fat thickness, BMS : beef marbling standard(1-12), MP : marbling percent
Fixed effect : market year-month, sex, sire, fattening farm, and age class of dam
Covariate : age of animal

- Analysis (2)

Table 2 BLUE of the age class of dam for carcass traits

Age class of dam	Carcass grading traits						Image analysis trait	
	n	CW(kg)	REA(cm²)	RT(cm)	SFT(cm)	BMS No.	n	MP(%)
1	2,249	0.0	0.0	0.0	0.0	0.0	1,869	0.0
2	2,784	2.7	- 0.4	0.0	0.0	- 0.1	2,309	0.4
3	2,361	4.1	- 1.0	0.0	0.1	- 0.4	1,939	1.2
4	2,373	4.8	- 0.6	- 0.0	0.0	- 0.5	2,030	- 1.6
5	1,935	4.7	- 0.6	0.0	0.1	- 0.5	1,590	1.4
6	1,221	5.1	- 0.3	0.1	0.1	- 0.4	982	- 1.5
7	702	1.6	- 0.8	- 0.0	0.1	- 0.5	587	- 2.0
8	449	- 1.9	- 1.1	0.0	0.1	- 0.5	396	- 2.0

Fixed effect : market year-month, sex, fattening farm, and age class of dam
Random effect : animal additive genetic effect
Covariate : age of animal

DISCUSSION

- For growth traits, progeny from Aged dam are inferior to that from younger dam
  → Milk production of aged dam is less
  Milk production in JB reduce since the age of 9
  Terada (1983)

- For BMS and MP, the difference of LS means between age class 1 and 8 is 1.4 and 5.5%, respectively

But From analysis (2) ~genetic analysis~

The difference among age class of dam is considerably smaller than that of analysis (1)

Conclusion

- For analysis (1), BMS and MP decrease with the increment of the age class
- Considering the pedigree and environment factor, there is little effect of dam's age