

A COMPARISON OF CARCASS TRAITS BETWEEN CHAROLAIS AND CULLED HOLSTEIN-FRIESIAN CROSSBRED IN DIFFERENT SLAUGHTER WEIGHT AND AGE

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Abstract –The investigation of carcass traits between Charolais and culled Holstein-Friesian crossbred was performed. A total of 100 crossbred cattle, were evaluated variability in marbling score and percentage of hot carcass, cold carcass, deboned primal cuts, bone-in primal cuts, fat and bone in the different level of slaughter weight (<450, 450-550 and >550 kg) and slaughter age (approximately 2-3 and 4-5 years). The results revealed that significant difference was found between breeds in percentage of bone ($p<0.05$) whereas culled dairy crossbred provided higher bone percentage. Debone primal cuts and percentage of fat were higher ($p<0.05$) at increase slaughter weight. Percentage of debone primal cuts from 4-5 years of Charolais was higher ($p<0.05$) than the other groups, while percentage of bone from 2-3 years of Holstein-Friesian crossbred was the highest ($p<0.05$). There was no significant difference between breeds, slaughter weight and age for marbling score and percentage of hot carcass, cold carcass and bone-in primal cuts.

Key Words – Carcass traits, Charolais crossbred, Culled Holstein-Friesian crossbred

I. INTRODUCTION

Meat from fattening beef such as Charolais crossbred remains in high demand on special markets. In Thailand, commercial beef production is not enough to meet domestic demand. The use of Holstein-Friesian crossbred that have been culled for fattening is the alternative. The dairy cattle are culled due to older age, less milk, accidents and health disorders, udder and reproductive problems. Dairy cow carcasses, especially from the main breed (Holstein-Friesian), conduce substantially to the beef production and returns from culled cows account for a significant part in the total returns of dairy farm [1]. The Charolais bulls presented a greater carcass weight and higher yield grade in addition a greater loin eye area. Nevertheless, Holstein bulls showed a greater marbling score, darker color, and more water biding capacity of the *M.longissimus dorsi* [2]. Therefore, the objective of this research was to study the carcass traits between Charolais and culled Holstein-Friesian crossbred in different slaughter weight and age. It was hypothesized that the use of cull dairy crossbred could be compensation for production traits compared to Charolais crossbred.

II. MATERIALS AND METHODS

The dataset of carcass characteristics in the present study was collected from 50 Charolais and 50 culled Holstein-Friesian crossbred cattle raised under the production system of the Beef Cluster Cooperative Limited, Nakhon Pathom. Both groups were fed with high concentrate diet and supplemented with grass, rice straw, cassava chip or pineapple cake for 4-8 months (culled Holstein-Friesian) and >6 months (Charolais) before slaughtering. The comparison of carcass was investigated in the different level of slaughter weight (<450 kg, 450-550 kg and >550 kg) and slaughter age (approximately 2-3 years and 4-5 years). Marbling score and percentage of hot carcass, cold carcass, deboned primal cuts, bone-in primal cuts, fat and bone were determined. The results were shown as least squares means. The data were analyzed using PROC Generalized Linear Model. Differences between means were estimated by the P-value difference option [3].

III. RESULTS AND DISCUSSION

The carcass traits of the culled dairy crossbred showed greater percentage of bone than the Charolais crossbred ($p<0.05$). While, marbling score and percentage of hot carcass, cold carcass, deboned primal cuts, bone-in primal cuts and fat were non-significant between breeds ($p>0.05$).

Debone primal cuts and fat percentage were higher ($p<0.05$) when slaughter weight increase. However, slaughter weight did not significantly ($p>0.05$) affect for the other carcass traits (Table 1). Seeger *et al.* [1] found similar results in effects on carcass weight variation were all highly significant ($p<0.001$). Briefly, carcass weights were higher at lactation numbers 4-6 whereas younger and older cows provided lower carcass weight.

Carcass traits of cattle crossbred at different slaughter age were shown that percentage of deboned primal cuts from 4-5 years was higher ($p<0.05$) than 2-3 years of Charolais crossbred and all groups of culled Holstein-Friesian crossbred. Fat percentage from 2-3 years of Charolais crossbred higher ($p<0.05$) than the others, while bone percentage from 2-3 years of culled dairy crossbred was higher ($p<0.05$) than other groups (Table 1). Due to dairy cattle gained more subcutaneous, intramuscular and visceral fat during growth, which returns the ability to deposit fat as an energy source for milk production and point out the capability for extended protein accretion [2].

Table 1 Carcass traits of cattle crossbred at different slaughter weight and age (LSMEANS \pm SE)

Carcass Traits	Slaughter weight, kg			Slaughter age, years			
	<450	450-550	>550	CHA		HOL	
				2-3	4-5	2-3	4-5
MS	1.09 \pm 0.50 ^a	1.64 \pm 0.17 ^a	1.65 \pm 0.41 ^a	1.52 \pm 0.27 ^x	1.33 \pm 0.28 ^x	1.16 \pm 0.35 ^x	1.85 \pm 0.32 ^x
HC, %	54.63 \pm 2.04 ^a	57.60 \pm 0.68 ^a	56.82 \pm 0.57 ^a	57.16 \pm 1.13 ^x	56.57 \pm 1.14 ^x	56.30 \pm 1.45 ^x	55.38 \pm 1.30 ^x
CC, %	52.99 \pm 2.03 ^a	55.90 \pm 0.68 ^a	55.08 \pm 0.57 ^a	55.53 \pm 1.12 ^x	54.88 \pm 1.14 ^x	54.58 \pm 1.44 ^x	53.62 \pm 1.29 ^x
DPC, %	54.74 \pm 1.71 ^{ab}	55.82 \pm 0.57 ^a	54.32 \pm 0.48 ^b	54.14 \pm 0.94 ^y	56.26 \pm 0.95 ^x	54.73 \pm 1.21 ^{xy}	54.73 \pm 1.09 ^{xy}
BPC, %	16.56 \pm 0.67 ^a	17.22 \pm 0.22 ^a	17.10 \pm 0.19 ^a	17.25 \pm 0.37 ^x	16.90 \pm 0.37 ^x	16.58 \pm 0.48 ^x	17.11 \pm 0.43 ^x
Fat, %	9.35 \pm 1.52 ^{ab}	8.71 \pm 0.51 ^b	9.81 \pm 0.43 ^a	10.51 \pm 0.84 ^x	8.85 \pm 0.85 ^{yz}	7.25 \pm 1.08 ^y	10.55 \pm 0.97 ^{xz}
Bone, %	13.50 \pm 0.88 ^a	12.49 \pm 0.29 ^a	12.60 \pm 0.25 ^a	12.00 \pm 0.48 ^y	12.45 \pm 0.49 ^y	14.22 \pm 0.62 ^x	12.78 \pm 0.56 ^{xy}

^{a,b} and ^{x,y,z} Means within a row without a common superscript letter differ ($P<0.05$). CHA = Charolais crossbred, HOL = Holstein-Friesian crossbred, MS = Marbling score, HC = Hot carcass, CC = Cold carcass, DPC = Deboned primal cuts, BPC = Bone-in primal cuts

IV. CONCLUSION

Comparison of carcass traits between Charolais and culled Holstein-Friesian crossbred showed significant in different slaughter weight and age in particular debone primal cuts, fat and bone percentage.

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