

A COMPARISON OF LIMOUSIN AND CHAROLAIS CROSSBRED CATTLE FOR GROWTH PERFORMANCE AND CARCASS QUALITY

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Abstract – This experiment was conducted to study growth performances and carcass performances of Limousin and Charolais crossbred (LN and CN). They were fattening at Chaiyaphum Livestock Research and Breeding Center and contracted farm in 2010. There were 14 LN and 13 CN used in this experiment. They were started to fattening with 12-15 months of age. The two groups were housed and fed separately in individual pens. Both groups were fed 12% CP concentrates, Pangola grass, rice straw. The target slaughter live weights were determined 450 kg. The average starting weight for these cattle was 245.20 kgs. The CN was 23.95 kgs heavier than the LN ($P>0.05$). Daily gains were 0.08 kgs or 10.27% higher for the CN. Carcass dressing percentages were 54.26 and 56.95% for CN and LN respectively ($P<0.05$). Loin eye area were 70.47 and 74.04 cm² for CN and LN respectively ($P<0.05$). The marbling, fat and lean color measurements were similar.

Key Words – limousine, charolais, growth, carcass

I. INTRODUCTION

This project is part of animal genetic resources conservation and sustainability utilization. In this project, the Native cattle was used as base genetics crossing with *Bos taurus* to establish F1 commercial cattle for beef meat production. The experiment was conducted to compare slaughter performance between F1 Limousin x Native (LN) and F1 of Charolais x Native (CN). The F1 offspring were allocated to finishing in individual pen at Chaiyaphum Livestock Research and Breeding Center and contracted farm in 2010. They were fed to the market end point of 450 kg. This experiment was designed to achieve the targets for 3 years including time preparing F1 calves. Cattle targeted for the beef meat demonstration restaurant at Tak Livestock

Research and Breeding Center. They were in fattening period for 180 days.

Growth ability and meat performance are of great economic importance in beef cattle. Many authors were concerned with genetic evaluation of growth ability in beef breeds [1, 2]. Large variations in growth performance and carcass composition traits exist among different beef breeds [3, 4, 5, 6, 7]. Therefore, breed comparison experiments provide valuable information on the suitability of different beef breeds for different production and market conditions. The differences in production traits between Charolais and Limousin breeds have been previously studied in bulls [8], cows [9], and steers [10, 11]. However, the effects of different breed and dietary treatments on production traits of fattened cattle are not entirely clear and need to be elucidated. Therefore, the objective of the present study was to determine the effects of F1 breed of CN and LN on the growth and carcass composition characteristics.

II. MATERIALS AND METHODS

Animal

Two F1 of LN and CN cattle were used in this study.

1. Fourteen Limousin x Native cattle (LN)
2. Thirteen Charolais x Native (CN)

These cattle were fattened at Chaiyaphum Livestock Research Breeding Center and contracted farmers. Animals were fed with Pangola grass (*Digitaria eriantha*), rice straw, and concentrates (12% CP) followed the instructions of Livestock Research and Breeding Center. They

were slaughtered at Tak Livestock Research and Breeding Center. The target slaughter live weights were determined 450 kg by the reasons of tender, low fat meat, and optimized cost. The data of carcass performance were collected. Different types of data were collected: growth performance [body weight, average daily gain (ADG)], carcass performances (carcass percentage), and economic performance (net income per head). Data on all growth and carcass traits were presented as mean±standard deviation. Data on various growth and carcass traits were analysed by T-Test [12].

III. RESULTS AND DISCUSSION

Growth performances and economic potential of Thai beef cattle

After 15 month of age and 250 kg of weight, these 2 groups of cattle, LN and CN were fattening in individual pens. They were fed with ad lib of Pangola grass and rice straw after received 1.5 % body weight of 12 %CP concentrate in the morning. The CN cattle had higher ADG as 0.828 and 0.751 kg/d respectively ($P<0.01$) (Table 1). These 2 groups were F1 crossbred between *Bos Taurus* and *Bos indicus*. They were bred for slaughter program. They could get higher heterosis for higher growth performance, easy raising, good adaptive, low cost production [13].

The CN can get more benefit per head, 8,632.40 bath/head. Farmers could finish 10 – 20 cattle per year, and they could earned money more than 86,324 bath per year. They could earn from finishing beef cattle while having other occupation, such as government employee, company employee, and other agriculture occupation. Beef cattle finishing was good occupation with good income for farmers and provided protein consumption to consumers.

Carcass performances of Thai beef cattle Carcass percentage was significantly bigger ($P < 0.01$) for LH cattle compared with CN (Table 2). Although CH cattle tended to have lower carcass fat, the differences were not significant. The CH animals produced proportionally less ($P < 0.01$) kidney fat than other breed in Barton et al [4]. But in Cross et al.

[14], there is no significant differences comparing with other breeds.

Table 1 Growth performance and economic potential of LN and CN cattle

	LN	CN
No.(head)	14	13
W1 (kg)**	233.23 ^b ±3.66	257.18 ^a ±30.61
W2 (kg)**	368.33 ^b ±5.77	406.15 ^a ±48.35
ADG (Kg/day)**	0.751 ^b ±0.012	0.828 ^a ±0.099
DMI (Kg/day)	14.35±0.22	15.82±1.88
FCR (concentrate)	6.01±0.06	6.01±0.01
Net income/head (bath/head)**	7801.77 ^b ±126.80	8632.40 ^a ±1061.79
Total cost/head (bath/head)**	15219.07 ^b ±234.04	16752.22 ^a ±959.82

** Different letter in the same row means highly significant difference of means between genotypes ($P<0.01$) LN=Limousin x Native, CN=Charolais x Native, W1=initial weight, W2=final weight, DMI=dry matter intake

No significant differences were recorded in the proportion of bones and tendons. Because these 2 groups, LN and CN had slaughter age less than 2 years.

And the other reasons of no significance difference, because in this research, these 2 groups of cattle had slaughter weight less than 450 kg for the target of low fat, juicy meat, tender meat, and optimized production cost. The carcass weight was an important factor affecting meat quality through its effect on fattiness [15]. Rossi et al. [16] described that a premium product could offset the feed cost.

Table 2 Carcass performance of LN and CN cattle

	LN	CN
No.(head)	14	13
%Carcass**	56.95 ^a ±0.56	54.26 ^b ±1.42
Loin area (cm2)	74.04±7.62	70.47±1.85
%Lean meat **	35.87 ^b ±3.15	46.35 ^a ±7.34
Fat Thickness (cm)	0.27±0.21	0.26±0.01
%Fat	6.45±0.97	5.81±0.90
%Bone and Tendon	7.72±0.41	7.38±.33

** Different letter in the same row means highly significant difference of means between genotypes ($P<0.01$) LN=Limousin x Native, CN=Charolais x Native

IV. CONCLUSION

Significant breed differences in growth, slaughter and some carcass traits were observed in the present study. The F1 CN and LN breeds tended to achieve higher live weight gains during the experiment, produced less fat and had higher percentage of meat.

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