EFFECTS OF FATTENING DURATION ON WEIGHT GAIN, MEAT COMPONENTS AND ECONOMIC EFFICIENCY IN BEEF CATTLE

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ABSTRACT

The study was carried out from March to December 2007 in order to determine effects of fattening duration on weight gain, meat components and ecconomic efficiency in beef cattle. Sixty nine beef cattle, including 27 Lai Sind bulls, 27 Brahman bulls and 15 culled Lai Sind cows were fattened with feedlot system in Trang Huong Vien farm (Dau Tieng District, Binh Duong Province). The experiments were designed by one factor of fattening duration (3, 4 and 5 months). The diets were calculated by NRC with green feed of Panicum maximum TD58 + concentrate. The ratio of concentrate/ roughage was 60:40 based on dry matter. Results showed that fattening duration for Lai Sind bulls and culled Lai Sind cows should be 3 months and for Brahman bulls should be 4 months. With this condition, weight gain can be reached to 922g-1,060g and 741g/head/day for Lai Sind bulls – Brahman bulls and culled Lai Sind cows respectively. It can be concluded that we can develop a beef industry based on local cattle and local feedstuffs.

Keywords: fattening, Lai Sind bulls, Brahman bulls, culled cows

1. BACKGROUND

Beef cattle production is interested in many countries in the world for meat demand of billions people. Technology of beef cattle production is improved to suit breeding, feeding and products of consumers, especially fattening period. There are many improvements in studies on developing beef cattle production in Vietnam. Sindize projects have gotten effects. Many researches of cross and pure-breeds have also good results.

Many tropical beef cattle breeds such as Charolais, Santa Gertrudis, Simmental, BBB, Hereford became to know and used to improve native cattle to increase meet products in many countries in the world. In Vietnam, studies of crossbreeding between local cattle and these breeds have been implemented. After that, fattening methods for the crossbreeding offspring are of interest for scientists. There are many questions on this topic to be answered, and the priority of research interest is considered base on the conditions of each country.

However, in the past time, some researches were interested in evaluating growth and reproductive abilities of cattle but not in fattening technology. Therefore, the fattening cattle still have low growth rate with low carcass and lean percentages, and meat compositions have not met the customer's demands, thus can not come into restaurant, supermarket; and can not compete with imported products though the price of these meat are much higher.

The aims of this project is to evaluate the effects of fattening duration on growth ability, meat-components and economic efficiency of Laisind and Brahman bulls, and culled female cows. The results will contribute to the basic knowledge to put up beef cattle fattening process for smallholders and beef cattle farms.

2. MATERIALS AND METHODS

2.1. Time and venue

Time: From 03/2007 to 12/2007.
Venue: Trang Huong Vien Farm (Dautieng, Binhduong).

2.2. Materials

- Cage facility ($6m^2$): solid cage, private bunk, cement floor with playing yard of $10m^2$
- Cattle: Include Laisind bulls, Brahman bulls, 14-16 months old and Culled cows 6-8 years of age (4-5 litters); average weight of Laisind: 192kg, average weight of Brahman: 215kg, average weight of culled cows 217kg, body score 2-3 (5 level).
- Feeds:Including *Panicum maximum TD58* + concentrate with he ratio concentrate/roughage was 60:40 based on dry matter. Feeding time: 3 times/day, measuring feed intake and remains.

2.3 Contents

Study on effects of fattening duration on growth ability, meat components and economic efficiency of Laisind and Brahman bulls, and cows.

2.4 Methodology

2.4.1 Experimental design

Table 1. Cattle and treatment diagram

Groups	Fatting time		
	3 months (T3)	4 months (T4)	5 months(T5)
Laisind bulls	9	9	9
Brahman bulls	9	9	9
Culled cows	5	5	5

2.4.2 Factors and methods

- Weight gain: individual weight measure by electrical weight with fixed time before feeding in the morning and then measures weight gain/period during fatting period.
- Feed: individual feed intake weekly
- Components: Carcass and lean meat percentage
- Feed cost/kg weight gained.

2.4.3 Data analysis

Statistical analysis of ANOVA one factor using MINITAB

3. RESULTS AND DISCUSSION

Effects of fattening duration on growth ability and meat components

Table 2. Weight gain, components and feed cost in Lai Sind bulls

No	Factors	Unit	T3	T4	T5
1	No.of Cattles	head	9	9	9
2	Initial weight	kg	194±8	190±11	192±6
3	Finishing Weight	kg	277±5	287±9	311±12
4	Average daily weight gain	kg/h/d	0.922^{a}±0.03	0.804^{b}±0.05	0.799^{b}±0.11
5	Carcass percentage	%	47.2±0.7	47.6±1.2	48.0±1.3
6	Lean percentage	%	32.0±0.4	33.1±0.5	34.2±1.5
7	A.daily feed intake DM/kg WG	kg	7.14	8.60	8.50
8	Feed cost/kg weight gained	VND	23,730	27,350	27,000

Three month fattening duration gave the highest weight gain (922g/head/day) and lowest feed cost (VND 23,730/kg weight gained ($P< 0.05$) with carcass percentage of 47.2%- 48.0% and lean percentage of 32.0%-34.2% in Lai Sind. There was no significant difference among treatments.

Table 3. Weight gain, component and feed cost in Brahman bulls

	Factors	Unit	T3	T4	T5
1	No.of Cattles	head	9	9	9
2	Initial weight	kg	211±7	216±26	217±8
3	Finishing Weight	kg	302±14	343±28	351±8
4	Average daily weight gain	kg/h/d	1014[a]±0.20	1060[a]±0.07	0,893[b]±0,20
5	Carcass percentage	%	50.6±1.0	50.0±0.2	51.7±2.0
6	Lean percentage	%	33.1±0.5	34.1±0.5	34.8±1.1
7	A. daily feed intake DM/kg WG	kg	6.76	6.53	7.56
8	Feed cost/kg weight gained	VND	21,520	20,780	24,050

Data in Table 3 showed that, three and four month fattening duration gave high weight gain (1060g) and low feed cost (VND20,780đ/kg weight gained) (P< 0.05) with carcass percentage of 50.0%-51.7% and lean meat percentage of 33.1%-34.8% in Brahman bulls.

Table 4. Weight gain, components and feed cost for culled cows

	No.of Cattles	Unit	T3	T4	T5
1	Initial weight	head	5	5	5
2	Finishing Weight	kg	214±16	212±36	224±47
3	Average daily weight gain	kg	281±19	284±44	310±38
4	Carcass percentage	kg/h/d	0.741[a]±0.16	0.597[b]±0.12	0.570[b]±0.14
5	Lean percentage	%	48.3±1.8	47.6±1.9	46.5±2.3
6	A.daily feed intake DM/kg WG	%	30.7±1.6	31.2±1.5	30.8±1.9
7	Feed intake/kg weight gained	kg	9.07	11.25	11.77
8	Feed cost/kg gain	VND	28,850	35,800	37,470

Three month fattening duration gave the highest weight gain (714g) and lowest feed cost (VND28,850/kg weight gained (P< 0.05). There was no significant difference on components between fattening duration.

4. CONCLUSIONS

- Laisind bulls at 14-18 month old under 3-month fattening period showed a gaining rate of 922g/head/day with carcass and lean percentages of 47.2 and 32.0%, respectively and the feed cost of VND23,730/kg weight gained.
- Brahman bulls at 14-18 month old under 4-month fattening period can get a gaining rate of 1.060g/head/day with carcass and lean percentages were 50,0 and 36,3%, respectively feed cost of VND20,780/kg weight gained.
- Culled cows with low body conditions should be put through a fattening period to improve meat quantity and quality. After 3-month fattening period, these cattle can get the gain rate of 741g/head/day with carcass and lean percentage at 48.3 and 30.7%, respectively.
- There was no difference of carcass and lean percentages among different fattening durations. However, research on solutions for improving the carcass and lean percentages still need to be carried out.

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APPENDIX 1: ESTIMATED RATION FOR EXPERIMENTAL CATTLE

Body weight	Grass	Concentrate	Body weight	Grass	Concentrate
175	**11**	**3,6**	290	19	5,5
180	11	3,7	295	19	5,6
185	11	3,8	**300**	**21**	**5,6**
190	11	3,9	305	21	5,7
195	11	4,0	310	21	5,8
200	**13**	**4,0**	315	21	5,9
205	13	4,1	320	21	6,0
210	13	4,2	**325**	**23**	**6,0**
215	13	4,3	330	23	6,1
220	13	4,4	335	23	6,2
225	**15**	**4,4**	340	23	6,3
230	15	4,5	345	23	6,4
235	15	4,6	**350**	**24**	**6,4**
240	15	4,7	355	24	6,5
245	15	4,8	360	24	6,6
250	**17**	**4,8**	365	24	6,7
255	17	4,9	370	24	6,8
260	17	5,0	**375**	**25**	**6,8**
265	17	5,1	380	25	6,9
270	17	5,2	385	25	7,0
275	**19**	**5,2**	390	25	7,1
280	19	5,3	395	25	7,2
285	19	5,4	**400**	**26**	**7,3**

APPENDIX 2: CONSUMED FEEDSTUFFS OF EXPERIMENTAL CATTLE
(In average for whole time – kg/head/day)

Groups of cattle	Kind of feeds	*3 months of fattening*	*4 months of fattening*	*5 months of fattening*
Lai Sind bulls	Grass	16.47	16.54	16.27
	Concentrate	4.89	4.90	4.85
Brahman bulls	Grass	16.43	16.64	16.19
	Concentrate	4.90	4.95	4.82
Culled LS cows	Grass	16.15	16.12	16.13
	Concentrate	4.74	4.78	4.79