

Fattening Performance of Cattle in Thailand

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In 1958 two Japanese experts of cattle feeding were sent to Thailand to work on cattle fattening with an aim of contributing to the development of beef production. Their work was succeeded by another two experts, including the author, in 1960. The former team worked on beef production performance of Thai cattle with a long period fattening treatment, while the latter team carried out the short period fattening experiments. These works were done with the close cooperation with Thai scientists, to whom the author wishes to express his sincere gratitude. Results of these works, including that of the former team, will be described briefly.

Background and method of experiment

- 1) *Place of experiment:* A series of fattening experiments was done at the Mualek National Forage Crops Station located about 150 km north of Bangkok. Elevation of 300 m above sea level.
- 2) *Climate:* Maximum temperature is 36–37°C (in April), and minimum temperature 9–10°C (in January). Rainy season: April to October, and Dry season: November to March. Annual precipitation is 1,400 mm.
- 3) *Cattle:* Like other countries of south-east Asia, most of cattle in Thailand are indigenous, and Indian Brahmans (Zebu) has been introduced to cross them. The indigenous cattle are generally small in body size and late-maturing. Their body size was averaged as follows:

	Cow	Bull
Height at withers, cm	105	115
Body weight, kg	250–300	300–350

(typical 60 month old cattle)

The above figures are consistent with data of Otsuka¹⁾, who reported that average wither height was 114.7 cm (male) and 105.5 cm (female), based on surveys of native cattle conducted at many places of Thailand.

Farmers in Thailand keep cattle for dual purposes, i.e., bullock-cart draft and beef production. Native cattle are powerful in drafting despite of their small frame, quick in movement, and highly endurable. However, farmers seem not likely paying attention to the fattening, because they have no idea of feeding cattle with concentrates.

4) *Feeds:* Barley and wheat, popularly used for beef production in temperate countries are not produced in Thailand. As it is not desirable to use imported feeds, the author tried to use domestic materials which are easily available to farmers, such as rice bran, broken rice, corn meal and soybean cake meal. These materials were mixed so as to give a suitable nutritional level.

Roughages were mainly green Guatemala grass, Para grass, and rice straw. Small amount of Mauritious grass, Napier grass and other grasses were also used.

Results of fattening

1) Long period fattening

Shimoda & Matsuoka²⁾, members of the former team, obtained the result indicated

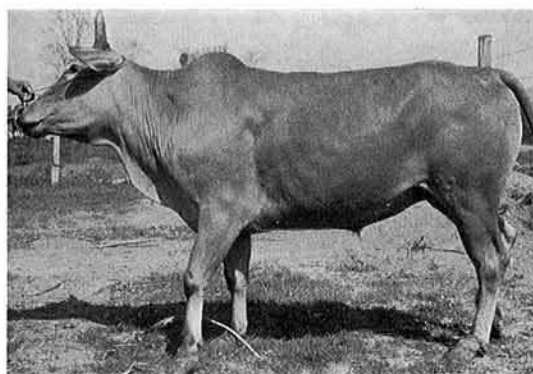
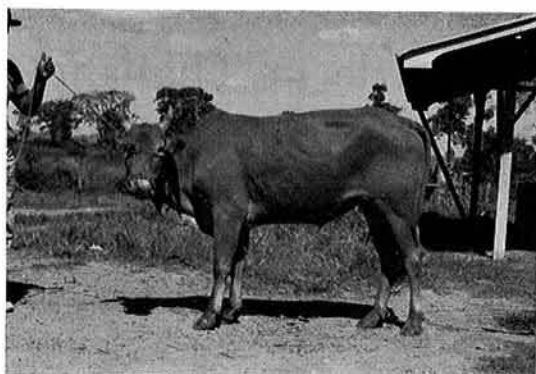


Plate 1. Result of 120 day fattening of a steer
right: at the end of the fattening with 78 kg of body weight gain
left: at the start of the fattening

Table 1. Results of long period fattening test

Sex Cattle number	1	2	Cow 3	4	av.	5	6	Steer 7	av.	av.
Estimated age at start (month)	29	22	55	29	33.8	52	43	42	45.7	38.9
Body weight at start, kg	235	243	257	256	247.8	265	289	308	287.3	264.7
Final body weight, kg	356	461	405	489	427.8	552	477	553	527.3	470.4
Total gain, kg	121	218	148	233	180.0	287	188	245	240.0	205.7
Daily gain, kg	0.28	0.52	0.35	0.55	0.43	0.68	0.45	0.57	0.57	0.49
Amount consumed, kg										
concentrates	1979	2425	2211	2407	2256	2652	2477	2926	2685	2440
green grass	2944	2889	2905	2974	2928	3176	3303	3508	3329	3100
rice straw	471	562	496	543	518	566	569	640	592	550
Weight of carcass, kg	228	293	255	321	274.3	355	306	338	333.0	299.4
Dressing percentage	66.5	65.7	65.1	68.5	66.5	65.8	65.8	62.8	64.8	65.7

in Table 1. The fattening treatment lasted for 420 days, including 60 days for accustoming cattle to the experimental condition. Average daily gain of body weight for the whole period was 0.49 kg (0.43 with cows, and 0.57 with steers). Many graded breeds in temperate countries give an average daily gain of 0.8 to 1.0 kg under the similar feeding conditions. Low values of Thai native cattle may be due to the unimproved performance and to tropical hot climate, not favorable to fattening even though native cattle are stout.

However, it is worthy to note that Table 1 shows wide variations among each animal, ranging from 287 kg of gain in 420 days

(0.68 kg of average daily gain) with animal No. 5 to 121 kg of gain (0.28 kg of average daily gain) with animal No. 1. Therefore, the selection of good feeder cattles like No. 5 at a start will give a considerably good fattening result.

Table 1 indicates that native cattle consumed 2,400–2,500 kg of concentrates, 3,100 kg of green grasses and 550 kg of rice straw during a period of 420 days to obtain 205 kg of body weight gain. Concentrates consumed to increase 1 kg of body weight was averaged 11.9 kg. Even with the animal No. 5 it was 9.2 kg, whereas it may be 7 kg at the most with graded breeds. This result suggests that the improvement of native cattle by

using exotic breeds is needed.

2) Short period fattening

The principle of cattle fattening is to practice long period fattening for animals with high fattening ability to produce best beef, while other animals are used for short period fattening. Therefore, the second team carried out the short period fattening experiment to find out an economical fattening system with unimproved native cattle.

The study consisted of four experiments

1. 120 day fattening with steers³⁾
2. 120 day fattening with cows⁴⁾
3. Simple fattening system which can easily be adopted by farmers for beef production
4. Comparison between indigenous cattle and zebu cross⁶⁾

Results obtained are shown in Table 2. Average daily gain in the 120 day fattening treatment was about 0.6 kg. It was greater than that (about 0.5 kg) of 420 day treatment. However, even in the case of the latter, daily gain in an initial 120 day period was also 0.6 kg, although the daily gain in the subsequent 300 day period was only 0.44 kg.

This result shows that native cattle increase their body weight at a rate of 0.6–0.7 kg/day when they are fed with concentrates after being grown in malnutrition, but if they are kept at a fairly good nutritional condition before fattening treatment they will show only 0.4–0.5 kg of daily gain. After body weight reached 300 kg, the rate of increase slowed down remarkably. How could this critical level of weight be raised up is an important question for economical fattening of native cattle.

Table 2 indicates that native cattles consumed about 500 kg of concentrates and 1,200–1,500 kg of green grasses in 120 days, and converted these materials to 75 kg of body weight gain. An increase of 1 kg of weight required 6.0 kg of concentrates, 7.1 kg of T.D.N. and 1.0 kg of D.C.P. Standard rates for graded breeds are 5 kg of concentrates, 6 kg of T.D.N. and 0.7 kg of D.C.P.

Dressing percentage of cattle after 120 day fattening was 59.4%; it is not lower than the value (58–60%) of Japanese cattle treated by the short period fattening. Thus, native cattle are characterized by higher dressing percentage. In Japan, native cattle

Table 2. Results of 120-day fattening test (shown by per head average of each test)

Sex	Steer				Cow	
	1	3	4	av.	2	av.
Test number						
Heads of cattle used	6	6	6	18	4	22
Estimated age at start (month)	36.0	49.0	48.3	41.9	45.3	42.5
Body weight at start, kg	207.8	256.7	212.0	225.5	207.3	222.2
Final body weight, kg	281.3	314.3	302.7	299.4	287.0	297.2
Total gain, kg	73.5	57.6	90.7	73.9	79.7	75.0
Daily gain, kg	0.61	0.48	0.76	0.62	0.66	0.63
Amount consumed, kg						
concentrates	493	519	483	—	481	—
green grass	737	1523	1386	—	1211	—
hay (Paragrass)	8	—	—	—	—	—
T.D.N.	486.8	585.3	523.4	531.8	528.7	531.2
D.C.P.	67.6	85.7	77.9	77.1	71.8	76.1
Weight of carcass, kg	156.1	177.7	159.9	164.6	158.3	163.4
Dressing percentage	59.1	60.7	59.3	59.6	58.7	59.4

had become larger in size by crossing with exotic breeds, but the dressing percentage had shown a decreasing tendency.

Although the quality of beef obtained by long period fattening is naturally better than that obtained by short period fattening, the palatability test of loin steak of the latter showed a highly appreciable result.

Native cattle and zebu were treated by 120 day fattening and the result is summarized as follows:

- (1) Ability of zebu to increase body weight by the fattening treatment was not lower than that of native cattle.
- (2) The zebu required less amount of nutrients to gain 1 kg of body weight, indicating higher ability of converting feeds to animal tissue.
- (3) Average dressing percentage of zebu was lower than that of native cattle.
- (4) Quality of meat of zebu was inferior to that of native cattle in tenderness and flavour.
- (5) Meat of zebu was pale in color than that of native cattle.

Attempt to up-grade native cattle by use of zebu breeds would result in promoting growth and enlarging body size, but there is a danger to cause a decreased dressing percentage and meat quality.

Some problems related to beef production

1. Cattle are an important protein resources in the diet of people in southeast Asia. However, in Thailand cattle are used mostly for farm works, particularly rural transportation, and farmers are not paying enough attention to beef production. In view of the anticipated world-wide shortage of meat resources, it seems to be very important to develop beef production in tropical countries.
2. It is necessary to select breeds of native cattle with good performance as well as

to improve management practices enabling them to exhibit their full potential before the introduction of exotic breeds. In this connection, production of good pasture and forage as well as good management of grasslands are required. Improvement of milking ability will also be effective in increasing body size of native cattle, because calves are usually underfed with milk.

3. Farmers in Thailand used to castrate their best group of male calves for the purpose of using them as draft animals after they mature. This custom causes so-called negative selection. Best calves should be used for improving their herds.
4. Only castrated males are used as draft animals whereas females are used only for calving. However, it is desirable to use females as draft animals so that castrated males could be used for beef production. For that purpose, it is necessary to improve body size of cattle so that females are big enough to be used as draft animals.

References

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