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Reproductive Performance of Australian Brahman Experiencing Subfertility in Ang Thong Province

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ABSTRACT

Reproductive performance of Australian Brahman under Thai small farm production system was evaluated during the years 1990 to 1993 in Ang Thong province. In 1991 one thousand and four hundred breeding females of Brahman commercial grade were imported from Australia under the provincial livestock development project. An average of 1.73 heads per family and 810 households from 8 districts were involved in this project. After 2 years of rearing the calving average was 86.25% whereas repeat breeder and anestrus rate averages were 6.25% and 5.84%, respectively. The incidences of imperforated cervix, endometritis, uterine atony, ovarian aplasia, ovarian dystrophy, cystic ovary, cystic corpus luteum, imperforated hymen, segmental aplasia of uterus, vulvo-vaginitis of 70 subfertile females were 5.71%, 1.42%, 1.42% 5.71% 34.28%, 5.71%, 2.00%, 2.85%, 1.42% and 22.85%, accordingly.

Key words : reproductive performance, subfertility, breeding female, Australian brahman

INTRODUCTION

The government of Thailand planned to import more than 50,000 Australian Brahman breeding females under the Northeastern Livestock Development project during the years 1991 to 1993. The mentioned project had been extension-oriented with no research support and very little evaluation and monitoring activities. It was documented that an average of 80% calf crop was expected which was quite risky as far as farmer's experience and the feed availability were concerned. Warnick *et al.*, (1967) reported the puberty age of 18 months for the Brahman raised in Southern States of the United States to have at least 300 kg body weight. Leeruttanachai *et al.*, (1989) reported an average calf crop of 57% under Tak livestock development station in northern Thailand. The low conception rate of Brahman as reported by many researchers (De alba *et al.*,, 1961 and Maule, 1982) alarmed the problems of infertility under Thailand beef promotion project.

It was, therefore, postulated that if the specification of breeding females was changed to meet the theoretical requirement with careful follow up of data and feeding supports, less damaged should be found. The project with research and development attached to the beef development project was then initiated. Ang Thong Province was selected for the first time in 1991 to compare its result with the original beef development project in the Northeast. This present study aimed at (1) evaluating reproductive performance of Australian

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Brahman raised by small farmers, (2) identifying feed availability and quality under Ang Thong provinces' project and (3) recommending research methodology to solve infertility problem under original small farm production system.

MATERIALS AND METHODS

Questionnaires on production system were used in obtaining data on 1,319 Australian Brahman females from 7 districts of Ang Thong Province. Close observation were made on non-productive females including heifers and first calf females as per details in Table 1. Data collection was started in September 1992 and completed in December 1993. Chi-squares test for each categorical data was employed to evaluate different proportion of various response variables. Rectal palpation with the aids of vaginal speculum were equipped to check and evaluate infertility problems in these females. Analyses of all data were carried out using SAS (1985).

RESULTS AND DISCUSSION

Two parts of results were reported in this study ; (1) reproductive organ characteristics and (2) feed availability and quality.

A. Characteristics of reproductive organ of problem cows

Two groups of breeding female facing infertility were studied for their reproductive organ characteristics. These groups were (1) heifers and (2) females with one calving experience. It was observed from 46 noncycling heifers to have an average size of cervix diameter, uterus diameter, left ovary diameter, right ovary diameter, and diameter at uterus opening of 2.05 cm, 3.83 cm, 1.46 cm, 1.75 cm, and 2.76 cm, respectively. Table 2 showed reproductive organ characteristics of the two groups. When observed on females experiencing one calving, it was found that the respective diameter were 2.18 cm, 4.14 cm, 1.68 cm, 2.16 cm, and 2.83 cm. It was notice that older cow experiencing one calving had larger size of internal reproductive organs.

Table 1 Population structure of Australian Brahman in Ang Thong province after one year importation and raised in small farms.

District	Breeding female (Head)	Productive female (Head)	Not conceived (Head)	No heat (Head)	Sold (Head)	Dead (Head)
Muang	193	114	8	7	59	5
Pa Moke	212	106	10	17	73	6
Chai Yo	256	147	12	39	51	7
Po Thong	114	53	16	7	34	4
Sa Waeng Ha	102	77	7	5	10	3
Wiset Chai Charn	234	150	24	34	18	8
Sam Ko	208	122	14	58	10	4
Total	1,319	769	91	167	255	37

The normal breeding female had an average cervix diameter and length of 2.05 cm and 10 cm as calculated from 24 heads. Australian Brahman females facing subfertility problem in this study had smaller than the average size for the internal reproductive organs.

From 70 infertile females under study it was found that the major problem of infertility was associated with 57.13% small ovary in the left wing (less than 1 cm) and vaginitis. (table 3) It was also found that 82.8% of the infertile females had abnormal reproductive organs. The intermediate amount of problem was found to be affected by (1) no left ovary (2) metritis, and (3) cystic ovary. The rest of the symptoms were associated with metritis, soft uterus, imperforated hymen, and under developed size of reproductive organ.

B. Feed availability and quality

Ang Thong province was located in the central region with an average temperature of 28.8 °C, 74.1% average relative humidity, and 942 mm

Table 2 Characteristics of reproductive organs of infertile Australian Brahman breeding female in AngThong province.

Group 1/	Number	Diameter (centimeter)				
		Cervix	Uterine horns	Left ovary	Right ovary	Uterus opening
1	46	2.05 ± 0.58	3.83 + 0.77	1.46 + 0.67	1.75 + 0.61	2.76 + 0.60
2	24	2.18 + 0.52	4.14 + 0.75	1.68 + 0.58	2.16 + 0.50	2.83 ± 0.58

1/ 1 = Heifer
2 = Female experiencing one calving

Table 3 Characteristics of reproductive organs of infertile Australian Brahman breeding female as determined by rectal palpation and vaginal speculum.

Symptoms	No. of heifers	No. of cows	Total	Percent 1/
Imperforated cervix	2	2	4	5.71
Endometritis	1	1	2	2.85
Uterine atony	1	-	1	1.42
Ovarian aplasia	4	-	4	5.71
Ovarian dystrophy	18	6	24	34.28
Follicular cyst	3	1	4	5.71
Imperforated hymen	2	-	2	2.85
Segmental aplasia of uterus	1	-	1	1.42
Vulvo-vaginitis	12	4	16	22.85
Combined Total	44	14	58	82.85

1/ Calculated from all infertile females.

of average precipitation per year. High precipitation was found between May and October where roughage quantity was abundant. Different types of roughage were collected from each district to identify their scientific name and quality. An average dry matter percentage was found to be 25.01% with 9.26% protein combined from all 7 districts as shown in Table 4. Three districts (Muang, Pa Moke, and Sam Ko) had above the average roughage quality. Chai Yo, Po Thong, Sa Waeng Ha, and Wiset Chai Charn had lower roughage quality but was not lower than 7% protein which regarded as critical level for deficiency.

It was found that only 3.33% of farmers gave concentrate to their cattle at all time. An average of 1.5 kg of concentrate from local mix was given to animals in this group. Thirty five percent of farmers gave concentrate periodically and 61.6% never gave any kind of concentrate to their animals. Mineral mixture was given at all time in 33% of the households whereas the rest seldomly applied salt to the animals.

Since infertility was usually associated with quality of feed availability, it was interesting to see this relationship. Limited data on the exact amount of roughage the animal had access on resulted in no definite answer. However, from the rough observation on association of percentage of protein in the roughage and percentage infertile female showed no correlation. From the data in Table 5, with an average of 9.26% protein from existing natural herbage and 12.66% of infertility, it was reasonable to state that these parameters were ranged in the normal situation. If the farmers wanted to reduce infertility problem, more input on feed and feeding must be added.

It was recommended that under this low input or so called "subsistence" production system only local halfbred cattle would be the best fit to the environment. If the farmers did not have to pay an extra high cost for Australian Brahman females and minimal interest to be loan from the bank, there would never be any complaint about infertility from farmers. This was one example of putting the right genotype into the wrong production system.

CONCLUSION AND RECOMMENDATION

From the study of 70 subfertile females of Australian Brahman under Ang Thong Province's project, it showed that they had small internal reproductive organs. There was no correlation between roughage quality and percentage of noncycling females. These 70 females contributed to 12.66% of all breeding females in the project which was in the normal range for the beef cattle of commercial grade under small farm condition.

Major factors associated with subfertility were the small size of internal reproductive organs and inadequate and unbalanced feed ration. Eventhough the size of these reproductive organ could not be said to be inferior genetic defect, it did not generate the normal hormonal secretion. The visual appraisal for breeding efficiency of these females could not be made easily due to different concepts of selection criteria among selectors. One wrong concept was to believe that the taller female is the better. This was not accepted theoretically because estrogen usually depressed epiphyseal growth of long bones.

It was recommended that some synchronization of hormone should be conducted with better feeding management. Small experimentation on these subfertile females with cost and analysis studies should be valuable information for the farmers in making their decision on the future herd fertility improvement.

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Table 4 Roughage types and quality available for Australian Brahman inAng Thong province.

District	Types of roughage	% Dry matter	% Protein
Muang	*Brachiaria mutica*	20.84	13.40
	Hymenachne acutigluma	25.27	9.66
	Leptochloa chinensis	23.75	10.28
	Ischaemum rogosum	27.76	6.02
	Cynodon dactylon	50.58	8.06
	Combined Average	29.64	9.48
Pa Moke	*Brachiaria mutica*	21.89	11.81
	Eriochloa procera	24.13	10.05
	Echinochloa colonum	26.41	7.56
	Combined Average	24.14	9.81
Chai Yo	*Brachiaria mutica*	19.56	11.49
	Eriochloa procera	23.84	7.36
	Panicum repense	23.46	7.31
	Combined Average	22.29	8.72
Po Thong	*Brachiaria mutica*	20.16	9.92
	Leptochloa Chinensis	21.28	9.45
	Ischaemum rogosum	27.76	6.02
	Cynodon dactylon	54.36	7.49
	Combined Average	30.89	8.22
Sa-Waeng-Ha	*Brachiaria mutica*	23.52	8.71
	Echinochloa crusgalli	22.68	8.14
	Combined Average	23.10	8.43
Wiset Chai Charn	*Brachiaria mutica*	19.27	8.55
	Hymenachne acutigluma	24.39	10.63
	Eriochloa procera	25.38	8.22
	Combined Average	23.01	9.13
Sam Ko	*Hymenachne acutigluma*	24.48	10.43
	Leptochloa chinensis	22.92	10.25
	Oryza ridleyi	18.63	12.35
	Combined Average	22.01	11.01
Combined average		25.01	9.26

Table 5 Roughage quality and percent of subfertility in seven districts of Ang Thong provinces.

District	Percent protein of roughage	Percent subfertile breeding female
Muang	9.48	3.63
Pa Moke	9.18	8.02
Chai Yo	8.72	15.23
Po Thong	5.22	6.14
Sa Waeng Ha	8.43	4.90
Wiset Chai Charn	9.13	14.53
Sam Ko	11.01	27.89
Combined Average	9.26	12.66

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