Utilization of the Swamp Buffalo as Dairy Animal in Thailand

by

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Introduction

Water buffaloes of the milk type, in particular the Murrah breed, are kept in various parts of Thailand for dairy purposes by families originating from the Indian subcontinent. They are usually to be found in larger cities, such as Bangkok and Nakorn Pathom, or in the near vicinity. On these farms one can also see crossbreds between Murrah and Swamp buffaloes. Daily milk production in purebred Murrah has been claimed to be up to about 10 kg on one farm at Nakorn Pathom.

Table 1 Milk production in Murrah, Swamp buffaloes and crossbreds

Country	Breed	Total lactation (kg)	Daily Yield (kg)	Length of Lactation (days)	Reference
Philippines	Murrah	1383			Eusebio et al. (1965)
Taiwan	Murrah	1518	6.33	240	Lin (1975)
Thailand	Murrah	1461.5	4.76	306	Komarkul et al. (1963)
Indonesia	Swamp buffalo		ca. 2		Fischer (1959)
(Celebes)	Swamp buffalo		ca. 3		Cockrill (1974)
Philippines	Swamp buffalo	405***	1.5***	270	Castillo (1975)
Thailand	Swamp buffalo	333***	1.0***	330	Tephasdin (1959)
Malaysia	Crossbred		1.4-2.4		Devendra (1974)
Philippines	Crossbred	492***		300	Castillo et al. (1960)
Taiwan	Crossbred F1	824	3.43	240	Lin (1975)
Taiwan	Grade G1	2015	4.23	240	Lin (1975)

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*** Excluding amount consumed by the calf

The Thai Swamp buffalo, on the other hand, can be regarded as a dual purpose animal, producing draught power and then meat when the primary function has declined to the point of culling. The few studies made on milk production in the Swamp buffalo indicate a low yield (Table 1).

Few studies have been made on the composition of milk from Swamp buffaloes, but indications are that it compares favourably with milk from dairy buffalo breeds (Table 2) as far as fat percentage and other solid components of milk are concerned. The detailed analysis of water buffalo milk in general reveals a high nutritional value, with a higher total solidscount than cow's milk. Physical characteristics of buffalo milk are partly different from those of cow's milk. Two studies in milk characteristics from Thailand revealed a milk fat average of 9.27% (Tephasdin 1959) and 9.19% and 8.96% SNF (Visutharom 1959).

The water buffalo metabolizes carotene efficiently into vitamin A, and also the xanthophylls in green feeds, thus producing a white to bluish–white milk lacking the yellowish tone of cow's milk.

Table 2 Chemical composition of buffalo milk (Castillo 1975)

Composstion (%)	Philippines Carabao Davide (1975)	Italian buffalo Albonico et al. (1967–68)	Egyptian buffalo El–Salam and El–Shibini (1966)
Fat	9.65 (7.31–12.80)[a/]	8.5 (7.1–9.6)	7.14 (5.40–9.60)
Protein	5.26 (4.30–6.20)	4.5 (3.6–5.2)	3.63 (3.00–4.33)
Casein	4.24 (3.42–4.98)	3.6 (2.8–4.2)	3.04[b/] (2.67–3.52)
Lactose	5.29 (4.97–5.55)	4.6 (4.0–5.1)	4.99 (4.11–5.55)
Total solids	20.36 (19.09–21.33)	18.9 (16.8–20.8)	16.55[b/] (13.25–20.32)
Chloride	0.083(0.064–0.108)	0.065(0.065-0.034)	0.075(0.058–0.080)
Calcium	0.216(0.137–0.274)	0.203(0.179-0.241)	0.154(0.124–0.180)
Total Phos–phorus	0.177(0.098–0.247)	0.129(0.118-0.139)	0.112(0.096–0.140)
Titrable acidity	0.134 (0.11–0.22)	——	0.21 (0.16–0.27)

[a/] Figures in parenthesis are ranges

[b/] Calculated from original data of authors

Many uses for water buffalo milk have been reported. Specialities also exist in various regions where Swamp buffaloes are the sole or primary producers of milk for human consumption: Yoghurt in Malaysia (Devendra, Singh 1974), white soft cheese sweetened with sugar of the Aren palm in Central Sumatra (Fischer 1958), and white soft cheese, cottage cheese spread and pastillas de leche, a confectionary, in the Philippines (Castillo 1975).

Own observations

A farmer of Indian origin* living in Surin township has been milking native Thai Swamp buffaloes for many years. At the time of observation, the herd of Swamp buffaloes being kept for milk consisted of 25 animals, of which 8 cows were being milked. The greater part of the water buffaloes consists of about 70 working animals which are hired for work by farmers in surrounding areas who pay their dues in rice after the harvest. During the dry period between lactations some of the dairy Swamp buffalo cows may also be used for working.

Management and feeding

Milking of the buffalo cows commences 2 months after calving and is continued until the calf is about one year old, when the cow is in the last stage of a new gestation. This would mean a total lactation period of about 300 days, a dry period exceeding 2 months and an intercalving period of more than 12 months. The buffalo cows are separated from their calves when they are herded for the night under the house of the owner.

Feeding is almost exclusively in the pasture, thus accounting for seasonal variations in milk yield. During the dry season the animals are fed some fine rice bran which has been cooked.

Animal losses have occurred due to haemorrhagic septicaemia and rustling.

Milking

The buffalo cows are milked once a day early in the morning. It is necessary to subdue one of the cows, while the others do not resist milking. Letting-down of the milk is achieved through stimulation by the calf suckling for a short time before milking from two teats by hand. While two quarters of the udder are milked empty, the calf has access to the other two.

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* Unfortunately Mr. Paratserai died recently, but work on the farm is continuing.

Production

It was observed that 1 to 2 litres of milk were obtained per cow, but the owner claimed that during the rainy season production is higher due to the availability of better feed in the form of green grass, and also less molestation of the animals through insects, such as flies and especially mosquitos.

Raw milk is sold locally. This consists of about 5 litres per day, being sold at 6 Baht per litre. The milk is filled into bottles of two different sizes which are then distributed to customers. One consumer said that he added sugar to the milk after boiling it and drank it to keep in good health.

The rest of the milk is processed to ghee in the household, using simple but efficient methods (Figs. 3, 4, 5). Fresh milk is first boiled. After it has cooled down remnants of previous manufacture are added to act as a starter and cause the milk to turn sour. Depending on ambient temperatures the milk is usually fermented after one day. In cool weather the milk is warmed in order to hasten fermentation. The top layer is then scooped off and placed into an earthenware jar (Fig. 3) in which it is then churned (Fig. 4). The resulting solid phase (butter) is heated until ghee has been produced. About 10 litres of fresh milk are necessary to supply the amount of about 1 kg of ghee which is made everyday. The ghee is supplied to consumers locally as well as in other provinces, some being sent to Bangkok when specially ordered. The price is 60 Baht per kg.

Ghee has been descrcribed as "clarified butter" and is an excellent cooking fat of animal origin with good keeping qualities at room temperature, in widespread use especially among Indians and Pakistanis. Several different methods of manufacture have been described. Principally it is a method of conserving surplus butterfat.

A by–product of ghee manufacture is skim milk, of which the farmer consumes a little himself, while utilizing the greater part as pig feed.

Conclusion

In contrast to the Murrah and other superior milk producing water buffalo breeds the Swamp buffalo in Thailand and other countries has been selected for working qualities only, with meat as a secondary product, while dairy production was completely disregarded. Further investigation into the status of milking capacity of the individual animal could give interesting results. This aspect should also be seen in connection with morbidity and mortality in Swamp buffalo calves, which may in some cases be due to insufficient milk production in the dams.

On the other hand, cows producing healthy calves with rapid pre–weaning growth rates may tentatively be regarded as potentially good milk producers.

The utilization of milk from unselected Swamp buffalo cows on a small scale using simple methods of management could possibly lead to a further source of cash income for the farmer owning two or three buffaloes (about 60% of all farm holdings in Thailand). Buffalo milk can be used to provide children and adults with a rich addition to their diet. In India it has been suggested to make ice cream from buffalo milk in order to popularize its use. This could be regarded as one possible modern approach to the promotion of milk consumption in rural areas of Thailand where no fresh milk is available.

Summary

A brief description is given of management and milking in Swamp buffaloes on a farm at Surin. Suggestions are made for further research in milk production and for the promotion of buffalo milk production and consumption in rural areas.

Summary in Thai

ในจังหวัดสุรินทร์มีชาวอินเดียได้ทำการรีดนมกระบือพื้นเมือง เป็นเวลาหลายปีมาแล้ว ขณะนี้มีแม่กระบือ 25 ตัวที่กำลังรีดนมอยู่ 8 ตัว อีก 10 ตัวให้เช่าเพื่อทำนา ณ บริเวณใกล้เคียงกัน ได้ทำการรีดนมกระบือวันละครั้งเดียวในตอนเช้าเพียง 2 เต้า ส่วนอีก 2 เต้าที่เหลือมีน้ำนมประมาณ 1—2 ลิตร เก็บไว้ให้ลูกกิน ในฤดูฝนน้ำนมจะเพิ่มขึ้นเนื่องจากมีอาหารดีขึ้น คือมีหญ้าเขียวกิน แมลงและยุงที่มารบกวนลดน้อยลง แม่กระบือจะถูกรีดนมหลังจากที่ออกลูกแล้ว 2 เดือน จะหยุดรีดนมก็เมื่อลูกกระบืออายุใกล้จะครบหนึ่งปี และก็เป็นเวลาที่แม่กระบือท้องแก่จวนคลอดในเวลากลางคืนแม่กระบือจะแยกกันอยู่กับลูกกระบือ แต่ในตอนกลางวันจะอยู่ด้วยกันในทุ่ง ในบางครั้งกระบืออาจถูกใช้งานในระหว่างที่แม่กระบือก่อนออกลูก (ระยะที่ไม่รีดนม) อาหารพิเศษคือรำข้าวต้มจะได้รับในฤดูแล้ง

นมที่ได้ 1 ส่วนประมาณ 5 ลิตรต่อวันจะขายไปเป็นนมสดแท้ ๆ ส่วนที่เหลือเอาไปทำกีห์ (เนยเหลว) หางนมที่เหลือก็เอาไปเพื่อเลี้ยงหมู นมสดขายได้ลิตรละ 6 บาท เนยเหลวหรือกีห์กิโลกรัมละ 60 บาท ทำได้วันละประมาณ 1 กิโลกรัม โดยขายให้เจ้าประจำในจังหวัด และจังหวัดใกล้เคียง

Fig. 1 Swamp buffalo cow producing the most milk in the farm (over 2 litres from 2 quarters per day at the time of observation).

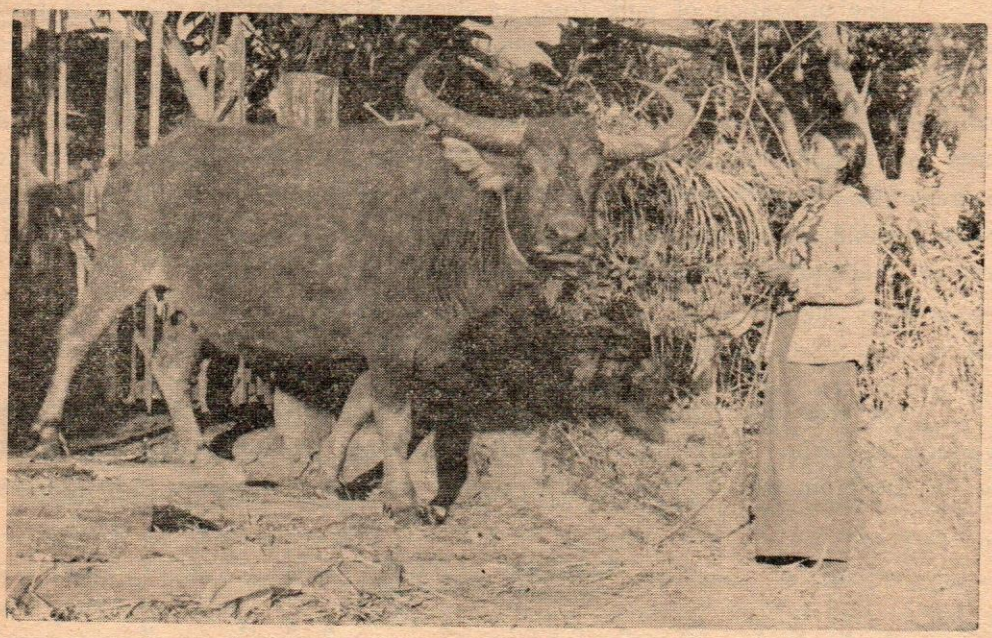


Fig. 2 Milking.

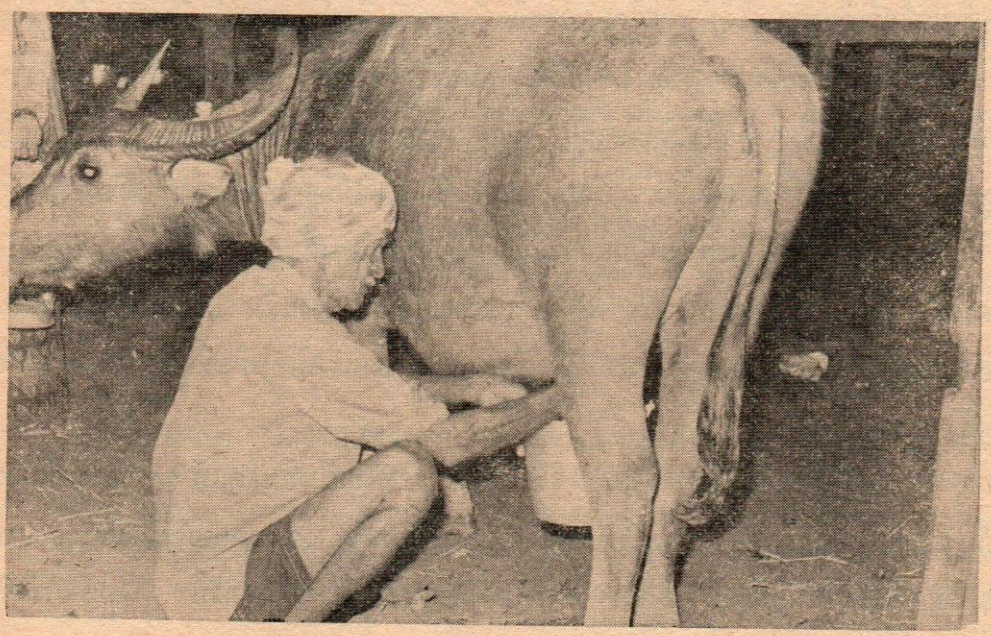


Fig. 3 Scooping off cream after fermentation (ghee production).

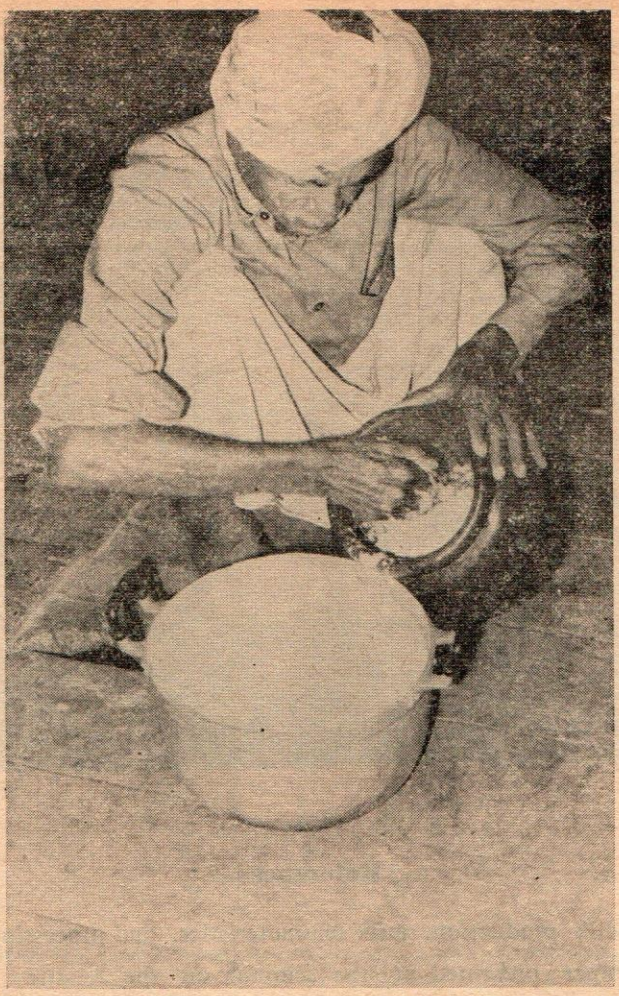


Fig. 4 Churning cream in order to separate butterfat (ghee production).

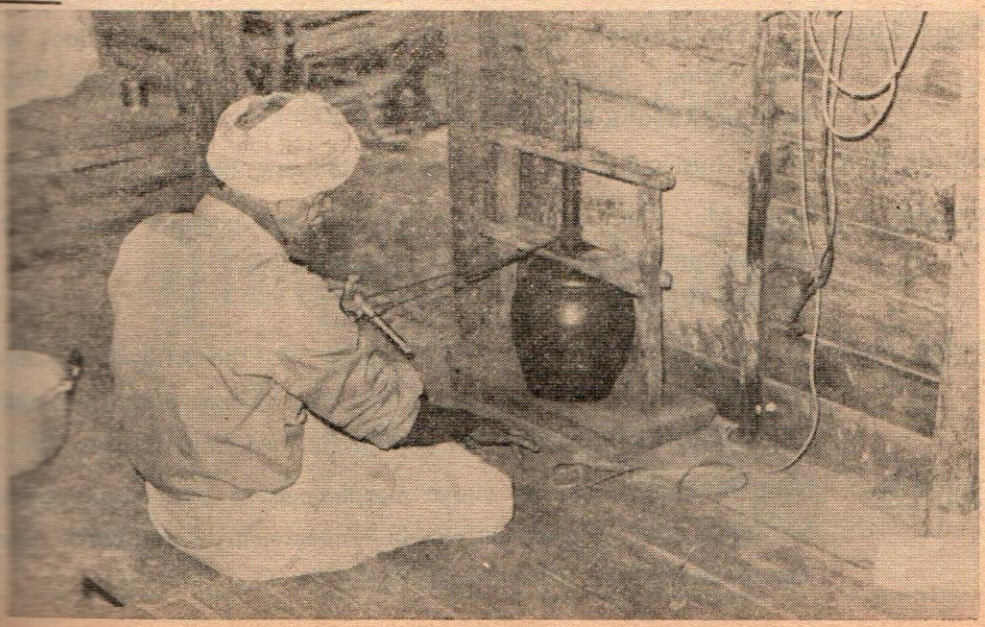
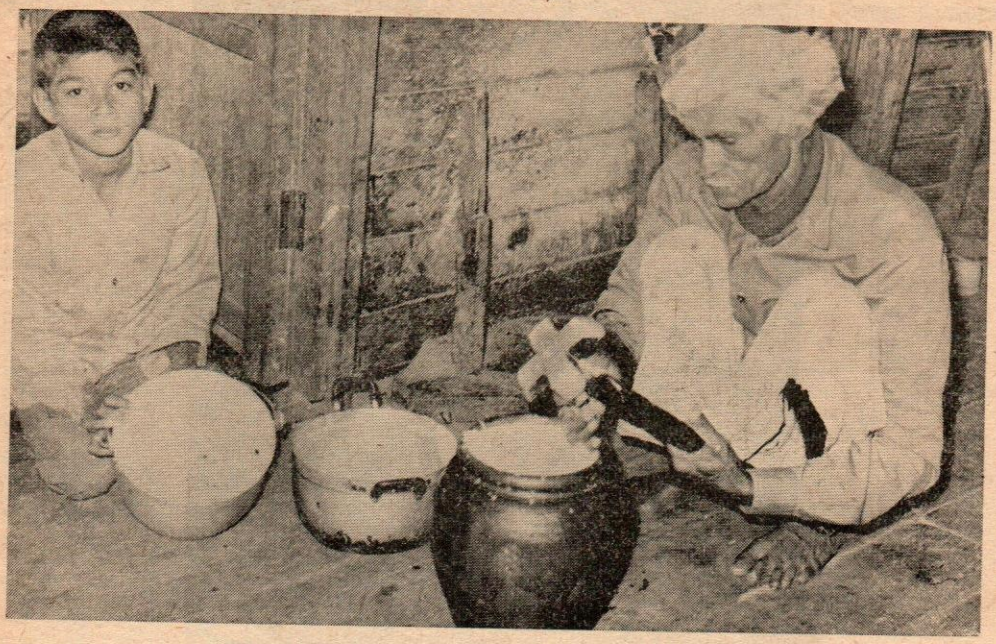


Fig. 5 Removing churn (ghee production).



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(All photographs by Usanagornkul, S.)

ด้วยอภินันทนาการจาก

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