

# Swamp Buffalow

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## Uses of Domestic Water Buffalo Milk in South Sumatra, Indonesia

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**Abstract.** This study examines the uses of domestic water buffalo milk in south Sumatra, Indonesia, one of the few areas in not only Indonesia but also the Philippines where the rare practice of milking animals occurs in Southeast Asia. In south Sumatra, both milking domestic water buffalo (*Bubalus bubalis*) locally known as *kerbau pampangan*—and making milk products are frequently practiced. The research was thus conducted into the breeding and milking of domestic water buffalo and making of milk products in a Muslim village of the OKI District (Ogan Komering Ilir Regency), south Sumatra, using participant observation, interviews, and questionnaires, to understand the life and culture of the villagers. The findings revealed domestic water buffalo to be the main livestock used for the production and sale of either meat or milk products. Heated milk products, such as candy (*gulo puan*, *sagon puan*) and jelly (*jerry susu*) are produced, probably because fresh milk risks lactose intolerance or milk contaminants, but not yogurt (*dadihi*), which is produced in north Sumatra. Investigating such unique uses of milk in south Sumatra from an ecological anthropological viewpoint attests to an evident culture of milking domestic water buffalo in south Sumatra, and that arises from the relationship between the people and their livestock. Furthermore, although the murrh (*buffalo*) is rapidly replacing the domestic water buffalo, due to its higher milk yield, across Southeast Asia, the latter remains predominant in the area.

### 1. Introduction

On Sumatra Island, dairy milk is collected from domestic water buffalo (*Bubalus bubalis*) locally known as *kerbau pampangan* and this practice is one of the cultural characteristics of the area. This study investigated the milking culture of the domestic water buffalo present in the Ogan Komering Ilir Regency (OKI), District of south Sumatra. In Indonesia, dairy milk of domestic water buffalo is collected mainly in the Sumatra Island [1–2] in addition to that of horse and cattle in the Sumbawa Island. In Southeast Asia, the milking of animals is not implemented. However, conventional milking, especially of domestic water buffalo, is practiced in Indonesia and the Philippines, although it is not found in other Southeast Asian countries.

It is thought that the milking culture was introduced to Indonesia around the 11th century with the introduction of Hindu or during the Dutch colonial period in the 17th century. However, no historical records corroborate this. Previous studies have focused on dairy products of water buffalo called *dadihi* on the Sumatra Island; however, these studies have not mentioned other milk products and have not provided basic information about milking of water buffalos. This study has thus examined information that previous studies ignored, focusing on milk uses of domestic water buffalo.



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This study focused on the culture of water buffalo milking and derivatives, especially investing the management of domestic water buffalo and milk production, such as candy (*gulo puan*, *sagon puan*) and jelly (*jerry susu*) production, recently started under the project of local agencies in the OKI District of south Sumatra.

## 2. Research Outline

A survey was conducted in village B in the OKI District of south Sumatra, which is composed of a vast wetland along the Pampangan River, the tributary of the Musi River, one of the main rivers in south Sumatra (Figure 1). There are approximately 310 households located there, inhabited by the Palembang, who are Muslim.

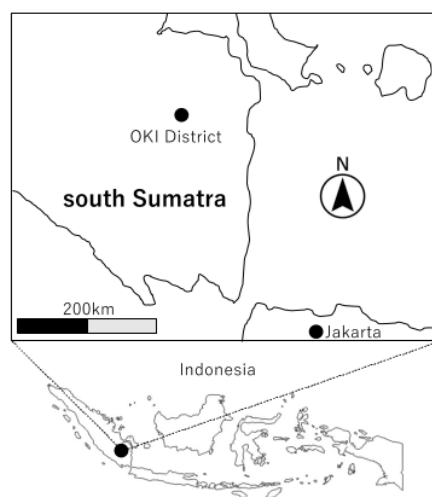


Figure 1. Location of research site (Prepared by Takashi Tsuji)

Most people living in this area are farmers. Their major subsistence activities include rice paddy cultivation, fishing, aquatic fish culture, rubber cultivation, and water buffalo breeding and milking. The water buffalo, cattle, goats, chickens, ducks, and some turkeys constitute their livestock, which is used for meat, sale, and during ceremonies. However, only the milk of water buffalo is collected. Temperatures during the research period ranged from 23 °C to 35 °C. There are two weather seasons: the dry season from January to June and the rainy season from July to December.

The fieldwork was conducted from August 29 to September 1 and September 5, for a total of five days in village B. The research methods employed were participatory observation, interviews, and questionnaire surveys. Grazing and milking water buffalo were researched relying on participatory observation. Basic information about the village and the methods of breeding and milk production were obtained through interviews. Socioeconomic conditions, milk used, and the number of livestock were randomly surveyed from 50 households by using a questionnaire.

## 3. Breeding of Domestic Water Buffalo in Village B

Because of the questionnaire survey, breeding of domestic water buffalo was mainly conducted compared to other livestock (Table 1). Between 1 and 36 (10.2 on average) water buffaloes were bred per household. However, approximately 50 water buffaloes were grazed, and people kept their water buffaloes in a group.

**Table 1.** Conditions of livestock husbandry in village B based on a questionnaire survey for 50 households

Livestock	Number	Average	Range
Water buffalo	174	10.2	1~36
Cattle	20	2.8	1~6
Goat	55	7.8	2~23
Chicken	204	20.0	1~25
Duck	62	10.3	5~30

Some 400 water buffaloes were found in village B and is recognized as an original species in the area; however, it is the Asian water buffalo, similar to that in other Southeast Asian countries. People classify their water buffaloes by body color—black (*hitam*), white (*albino*), and neutral color between black and white (*biring*)—in addition to the shape of horns and body. People do not mistake their own water buffaloes with those of others.

Water buffaloes are bred to pull carriages and for meat and milk production. They are not used for agricultural purposes because the use of tractors is widespread. People seldom slaughter water buffalo and grow for cross breeding to increase the population, in addition to milk and meat production purposes.

Water buffaloes were gathered in large cages and grazed in groups. Grazing starts at approximately 6 am and finishes at approximately 6 pm. Grazing was performed after milking (Figure 2). The grazing areas were forests, meadows, and riverbanks. During the rainy season, water buffaloes are grazed on flood plains, and boats are used to control them. There have been 14 types of feed grass reported, including para grass (*Brachiaria muticum*), rice grass (*Leersia hexandra*), and *Garnotia acutigluma*.



**Figure 2.** Grazing and milking of domestic water buffalo (Photo taken by Takashi Tsuji on August 29–30, 2019)

The price of an adult male (*jantan*) ranges between 20,000,000 and 25,000,000 IDR (Indonesian Rupiah; 1 IDR was equivalent to 0.00007 USD at the time of research) and female (*indukan*) between 15,000,000 and 18,000,000 IDR. The price of juveniles (*anak*) ranges between 6,000,000 and 9,000,000 IDR. Males are more expensive than females because they are traded at high prices, although females can produce milk. Young males in good condition that are around 7 years old are sold for meat production, and females are used in milk production for approximately 20 years.

#### 4. Uses of Domestic Water Buffalo Milk

A total of five households implemented milking of domestic water buffaloes in village B. Milking is practiced when the mother and the calf are together, binding a horn and rearfoot of mother to a pole, while the calf is suckling. Milking is a man's job, and it is conducted around 6–7 am. It approximately takes 10 min to milk a water buffalo. The unit of milking is called *cupak*, and 1 *cupak* equals 1.25 L. One

to two liters of milk are generally harvested from a water buffalo per day, although 1 L is obtained from three or four animals during the dry season. The price of milk depends on the season and ranges from 15,000 to 20,000 per *cupak*. It is expensive during the dry season, and milk production is scarce.

In village B, milk is processed mainly to produce candies (*gulo puan*, *sagon puan*), which are traditionally favored items among loyal people. Recently, the processing of jelly (*jerry susu*) has commenced. Yogurt (*dadihi*) was not found in the village, and it is not part of a tradition in South Sumatra, but rather that North Sumatra, according to local people.

*Gulo puan* is processed by heating milk mixed with sugar until there is no moisture, and *sagon puan* is more powder-like (Figure 3). Jelly is also heated during production, probably to prevent lactose intolerance [3] or milk contamination. People do not drink raw milk because this research found that some people find the taste or smell of milk repulsive. Jelly is a relatively new product made in 2018 to support the nutrition of children who dislike milk and to create local products under the joint project of the University of Sriwijaya, the Peatland Restoration Agency (Badasan Restorasi Gambut), and the Ibnul Fallaah Foundation (Yayasan Ibnul Fallaah).



Figure 3. Processing of *sagon puan* (Photo taken by Takashi Tsuji on August 30, 2021)

## 5. Conclusion

In village B, breeding and milking of domestic water buffalo were common. At the same time, the value of *kerbau pampangan* meat highlights the breeding and milking culture. People have chosen milk products such as a *gulo puan* and *sagon puan* from the environment. Milk is also used in other dishes, especially desserts or snacks. The culture is a product of swampland that is appropriate for water buffalo breeding and milking. It is also an adaptation to their given environment.

This research investigated the following: (1) domestic water buffalo, called *kerbau pampangan* in local language, is actively used for meat; (2) milking is conducted by men, whereas milk processing is done by women; and (3) the milk products (*gulo puan*, *sagon puan*) are traditionally produced by heating milk, whereas jelly (*jerry susu*) has recently been created. Yogurt (*dadihi*) was not found at the research site, and it was noted that it was part of food culture in North Sumatra [4]. This shows the local variety of milk uses on the Sumatra Island, and further systematic research on the use of water buffalo milk is required.

However, the milking culture of domestic water buffalo will be replaced by *murrah* (*buffalo*) to produce a high yield of milk by the Indonesian government in the future, similar to the case of the Philippines [4]. *Kerbau pampangan* is an important local resource in OKI District and maintains the cultural characteristics in transition, although socioeconomic improvement using *murrah* must be favorable for local people. In conclusion, unique milk uses of domestic water buffalo are supported by people's value and vast ecologically significant swamp areas appropriate for well-being between people and water buffalo in south Sumatra.

## 6. Acknowledgments

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