Milk Processing System of Amdo Tibetan Pastoralists and Its Transition in Qinghai Province, China

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Abstract: The languages and cultures of the Tibetan people vary geographically and they are rapidly disappearing due to modernization. The authors focused on the milk culture (milk processing system and milk product usage), which supports the pastoral subsistence and accurately described the milk processing techniques to preserve the Tibetan culture, and analyzed the diversity and characteristics of the Tibetan population from the perspective of the milk culture. The purpose of this paper is to understand the milk processing system currently utilized by the Amdo Tibetan pastoralists in Qinghai province, China and to examine the recent changes to their milk processing system and its factors. Amdo Tibetan pastoralists have used milk processing techniques, such as the fermentation process, cream separation process, and the additive coagulation process. They have established the fermentation process as the central milk processing technique in which they churned fermented milk to make butter, and heated, fermented, and drained buttermilk to make fresh dried cheeses. The cream separation process and the additive coagulation process were used only temporarily. They rapidly transitioned to using the cream separation process to manufacture most milk products like butter and fresh dried cheese when the Chinese government introduced the cream separator in the 1980’s. They only kept the fermentation process to make sour milk out of raw milk. These recent changes in the milk processing techniques were most likely caused by the fact that sour milk was a staple in their dietary lifestyle and the huge reduction in labor when they switched to using cream to make butter instead of fermented milk. The technical innovation was externally influenced, then adopted or unadopted according to the will and choice of the local people, resulting in a transition of culture.

Key Words: Amdo, Milk processing system, Tibetan Pastoralist, Transition, Yak.

1. Introduction

The authors have conducted an onsite research on the Tibetan pastoralists’ milk culture (milk processing system and milk product usage) in the mountains of Tibetan Autonomous Region (Hirata, 2004a), Sichuan Province, China (Hirata, 2004b), Qinghai Province, China (Hirata et al., 2015), and Jammu and Kashmir, northern India (Hirata, 2009a). With the Amdo and Kham, along with the groups spread out in Sichuan, the languages and cultures of the Tibetan people vary geographically (Matsuoka, 2000; Goldstein, 2012). In order to analyze the diversity and characteristics of such diverse groups of Tibetan people, the authors have focused on and furthered their studies on the milk culture that has basically sustained the subsistence of pastoralism. The milk culture, developed over long periods of time, had altered easily with the recent rapid social and political changes. This is why it is extremely important to describe the current milk processing system, the milk product usage, as well as the old techniques and systems before the changes occurred in order to preserve the Tibetan cultures.

The Chinese government implemented various policies, which affected the pastoralists and the milk culture. Many nomadic pastoral households were forced to move to urban and/or village areas due to the recent Eco-migration policy and the Nomadic Settlement programme (Ptackova, 2012; Gyal, 2015; Bessho, 2015). The Chinese government also introduced the cream separator in the 1980’s, which led to its use in almost all of the Tibetan nomadic pastoral households. Although the necessity to improve the quantity and quality of milk products in Tibetan pastoralists was pointed according to the modernization (Qiangba et al., 2001; Dong et al., 2003; Dong et al., 2007), it is not reported the influences of a modern technology into the milk processing system. The authors conducted a study in the Amdo pastoralists’ region in Qinghai Province in inland China to investigate how the introduction of the cream separator had changed the pastoralists’ milk processing system. Amdo refers to the region that spans the uppermost stream to the riverbed region of the Yellow River (Xining to suburb of Lanzhou). It is also called Qinghai Tibet, because it is mostly in Qinghai, but the Amdo region also extends into the southern part of Gansu and the northern part of Sichuan. The 14 million Tibetan people living in this region traditionally, living mainly off of the subsistence of pastoralism and agriculture (mainly crop cultivation), are called the Amdo
people. They speak the Amdo language, one of the three main dialects of the Tibetan language, and mainly practice Tibetan Buddhism (Bessyo, 2004).

The purpose of this paper is to first understand the current milk processing system practiced by the Amdo Tibetan pastoralists in Qinghai Province, China and then to analyze how and why the milk processing system had changed in the recent years. The surveyed households raised yak or ndzome, a female hybrid of yak and cow, and processed the milk products using those raw milk. The onsite research was conducted in August 2014 and August 2015 for a total of one month. The phonological transcription of the Tibetan words is based on the literature by Ebihara (2010).

This paper will develop a discussion using the milk processing system and systematic analysis formulated by Dr. Sasuke Nakao (Nakao, 1972). Nakao focused on the first process applied to milk and presented the following four milk processes: 1) fermentation process, 2) cream separation process, 3) additive coagulation process, and 4) heat condensation process. To explain, 1) in the fermentation process, fermentation is the first stage of processing milk and the fermented milk is further processed to make other milk products. The process of lactic acid fermentation in which sour milk is made is included in this process. Then, milk fat and protein are extracted from the fermented milk. 2) In the cream separation process, the cream is first separated, followed by the processing of cream and skim milk to make other milk products. The technique of the heating/cream separation process separates the cream by first heating the milk and letting it stand to let the fat float to the surface. The technique of the no heating/cream separation process separates the cream by letting the milk stand without heating or by using a cream separator. 3) The technique of the additive coagulation process adds coagulant to milk first to make cheese. The coagulants include rennet, sour milk, plant-based organic acid, and plant enzyme. 4) The technique of the heat condensation process entails boiling and reducing milk. This paper will continue the discussion using Nakao’s milk processing system and systematic analysis.

2. Research Region

2.1. Ecological environment

Qinghai Province is located in a mountain region at an average altitude of over 5,000 m above sea level. The temperature in the capital of Xining at 2,261 m above sea level is only just above 20°C during the hottest month of the summer and falls to about −10°C in the winter (Canty and Associates LLC, 2015) (Fig. 1). The temperature falls as elevation rises, and in Tanggulashang at 4,535 m above sea level, the highest temperature of the month does not even reach 15°C in the summer and drops to about -20°C in the winter. At over 3,600 m above sea level, the land is mainly used as a natural grassland for grazing livestock, because it is too cold to cultivate crops. At about 3,700 m above sea level, it marks the timberline and at about 4,700 m above sea level, all plants cease to grow. The annual precipitation is 360 mm in Xining and the rainwater allows the pastoralists to cultivate wheat, barley, rapeseed, potatoes, corns, etc. Qinghai’s ecological environment can be characterized as being cold and sub-humid, and as the elevation rises, the pastoralists’ main subsistence transitions from agriculture to pastoralism. These ecological characteristics have developed the elevation-based agriculture and pastoralism in the Tibetan highlands.

2.2. Research households

The authors observed and interviewed nomadic pastoral household A and settled pastoral household B from Meshul Township, Zêkog County, Huangnan Tibetan Autonomous Prefecture in eastern Qinghai, and agro-pastoral household C from Garang Tibetan Autonomous Township, Xunhua Salar Autonomou County. The authors used these three households as a case study to examine the milk processing system of the pastoralists in eastern Qinghai, since the milk
processing techniques tended to be shared within a region (Hirata, 2013).

The nomadic pastoral household A consists of seasonally-nomadic pastoralists who own about 70 yaks and about 300 sheep in the pastoral region of Meshul Township located 3,400 m above sea level. They leave their sheep with their relatives who practice pastoralism nearby. They obtain their milk from the yaks throughout the year. The authors stayed with household A and conducted participant observation and interviewed the wife of the head of the house (36 years old).

There are about 230 households living in the central village of Meshul Township where there is a hospital, a town hall, and many retail stores and restaurants lining the streets. The settled ex-pastoral household B lives here. They used to be seasonal nomads about 20 years ago and were not involved in agriculture, but they were forced to settle down in Meshul Township, 3,500 m above sea level, under the Chinese government. When they were nomadic, they had an established subsistence raising 50 yaks, 100 sheep, and a horse. They do not currently raise any animals in Meshul Township. The authors interviewed the wife of the head of Household B (48 years old) about their milking method and the milk processing system from 20 years ago.

The agricultural-pastoral household C settled down in Garang Tibetan Autonomous Township located 2,550 m above sea level with a population of about 120 households. Household C mainly cultivates wheat along with barley, rapeseed, potatoes, beans, and sesame seeds on their one hectar farm. At 2,000-3,000 m above sea level, agriculture becomes the main production activity. Until three years ago, household C raised two ndzomo while living in the village. They have since sold the ndzomo and are not currently raising any livestock. They are the case of agro-pastoral household, because they rely on the subsistence centered mainly on agriculture, but have also raised livestock and obtained milk from those animals in the recent past. The authors interviewed the mother of the head of the house (73 years old) about the milking method and the milk processing system that they used until three years ago.

2.3. Dairy livestock and the milking method

The yak is raised for milk production currently (Fig. 2). The Amdo Tibetan pastoralists in the Qinghai Province do not milk sheep. The yak is milked twice a day in the morning and evening during the summer season. They are able to get about one liter of milk per milking per yak. The yak is milked once a day in the morning during the winter, and while the amount of milk will decrease, they are able to milk them throughout the year. If the yak does not become pregnant, they can milk the animal for two consecutive years.

The calf is used to promote milk secretion from the yak. The mother yak is tied to a day, which is a leash attached to the ground. After about a minute of suckling, they pull away the calf and tie it close to its mother. The milking is done from the left side when facing the mother yak, while squatting without either knee touching the ground. The pastoralist carries a ramte’ar on the hip, which is a hook that attaches the receptacle for the milk, and milks the yak with both hands. The milking takes about five to eight minutes. They leave some milk in the udder after the milking so that the calf can feed again for about ten more minutes. After the morning milking, the mother yak and the calf are separated and taken out to pasture with different herds. After the evening milking, the mother yak and the calf are tethered separately to the day for the rest of the night.

2.4. Milk processing system

The Chinese Communist Party introduced and implemented the cream separator in the Amdo region in the 1980’s. The Tibetan pastoralists did not take to it at first, but as they became aware of its usefulness, the cream separator eventually infiltrated the pastoral households until almost all the households were using it for milk processing. The milk processing system was largely influenced by the use of the cream separator. The following sections will discuss the current milk processing system using the cream separator, followed by the milk processing system before the introduction of the cream separator.

2.5. Milk processing system since 1980: after the introduction of the cream separator

The nomadic pastoral household A purchased a manual cream separator in 2000. Since 2011, they have been using an electric cream separator (Fig. 3). They get their power from solar power generation. The raw milk is called oma. In the Amdo region, they use the techniques of both fermentation process and the cream separation process to process oma into various milk products (Fig. 4).
2.5.1. Fermentation process

The fermentation process is only used to make sour milk. The raw milk is first heated to pasteurize and then cooled to a temperature slightly warmer than body temperature. The raw milk is then heated to pasteurize and removed from the pasteurization apparatus. It is then cooled to a temperature between 38 and 40°C before being added to the milk. The starter, called *rbo*ma, is then added. The container is then covered with cloth to keep the milk warm and left to stand for several hours. This will yield sour milk called *co*. *co* is usually served as-is and is not processed into butter or cheese except of using it as a coagulant. It is consumed every day, particularly at night, because it is known to help with sleep. In this manner, the pastoralists use a specialized milk processing technique called the heating/lactic acid fermentation process, in which they heat raw milk to pasteurize and add lactic acid bacteria as a starter to make sour milk.

As described above, the characteristics of the fermentation process currently in use can be summarized as follows: 1) It is only used to make sour milk out of raw milk, and 2) It only uses the milk processing technique called the heating/lactic acid fermentation process.

2.5.2. Cream separation process

The pastoralists milk the animals twice a day in the morning and at evening during the summer. They leave the milk they obtained in the evening outside until the following day and mix it with the morning milk. The raw milk left overnight forms a layer of yellow liquid cream on the surface, but they do not separate the cream at this time, but mix the entire thing with a ladle and then combine it with the milk obtained in the morning.

The raw milk is warmed to about 65°C and then poured into a cream separator to separate the cream and the skim milk. The cream is called *mar* and the skim milk is called *ohl*u. The cream *mar* is rarely eaten straight, but is used to make butter. A single processing only yields a little bit of *mar*, so they will accumulate two to three days’ worth of *mar* before they can churn it into butter. It is churned for about ten minutes by hand. The butter, also called *mar*, is washed twice with water and stored in a container. It is never salted. The butter *mar* is eaten with *htsampa*, a roasted barley flour (Fig. 5), or with *kori*, a type of bread, and is considered an essential and important ingredient in the Amdo Tibetan pastoralists’ everyday diet.

The butter *mar* is kept in a cool place in a wooden box or a sack to be stored for the winter when pastoralists do not process any butter. It is never salted. The butter *mar* is eaten with *htsampa*, a roasted barley flour (Fig. 5), or with *kori*, a type of bread, and is considered an essential and important ingredient in the Amdo Tibetan pastoralists’ everyday diet. The butter *mar* is kept in a cool place in a wooden box or a sack to be stored for the winter when pastoralists do not process any butter. The butter is heated to create an oil called *markh*o for lighting, but this oil is not used for human consumption. The buttermilk that is produced when churning butter is called *mart*yo. The *mart*yo is usually discarded without being used.

The skim milk *ohl*u that is produced with a cream separator is used to make unmatured dry cheese called *chw*ora and *myent*o. To make *chw*ora, sour milk *co* is first added as a
coagulating agent to increase the acidity of the skim milk. It is then curdled by heating. Next, the curd is poured into a cloth pouch and hung overnight to drain the whey. The whey is called tehorha. The resulting cheese is taken out of the pouch and crumbled into small pieces by hand, and spread out on a cloth or a plastic sheet. The cheese lumps have no elasticity and they break apart easily by hand into small (three mm) grains. They become unmatured dry cheese called tehora if they are left to dry under the sun for several days. The amount of co added is the same amount as the skim milk to which it is added. If the co has become too fermented and its acidity too high, then the amount of co added to the skim milk should be reduced. The tehora is often mixed into htsampa with butter and milk tea (Fig. 5). The tehora can be stored for several years simply by putting it in a bag and storing it in a cool place. The whey tehorhka is used for making bread, washing hair, or tanning leather, but most of its volume is discarded.

The mgente or, on the other hand, is made while the skim milk is still warm. A small amount of the whey tehorhka that had been accumulated for several days is added to the skim milk and then left out to be warmed by the sun during the day. The skim milk’s temperature will be about 40°C. The whey is added as a starter culture, for it contains lactic acid bacteria that grew naturally during the few days it was left out. In the evening, when the skim milk had fermented enough, it is heated to about 65°C to promote curdling. The curd is subsequently poured into a cloth pouch and hung for about a day to promote dehydration. The cheese lumps inside the pouch have become elastic and are shaped into 1.5 cm cubes with a knife. The cheese apparently does not develop this elasticity if the accumulated whey is added to the skim milk and let stand for several days regardless of whether there was too much or too little fermentation. The cheese lumps are dried under the sun to make unmatured dry cheese mgente or. The mgente or is sometimes called otc or. The phrase otc or comes from combining the words, ohlu (skim milk) and tehorhka (whey). The mgente or is only made two or three times a year. When it is ready to be eaten, it is soaked in water to soften and used in soups. It is eaten in place of meat when there is a meat shortage.

Thus, the characteristics of the cream separation process can be summarized as follows: 1) The cream separator is used to separate the cream mar and the skim milk ohlu, 2) The pastoralists do not directly consume cream, 3) The cream is used to make butter mar, 4) Two types of cheeses (tehora and mgente or) are made from skim milk, 5) The sour milk co is added as a coagulating agent to make tehora, 6) Mgente or is made with the whey tehorhka that had been accumulated for several days, which acts as a starter culture. The no heating/cream separation process uses the cream separator to artificially separate the cream without having to heat raw milk. It becomes a vital technique that the present day Amdo Tibetan pastoralists use almost every day to make butter and cheese, which are very important to their dietary lifestyle.

2.6 Milk processing system before 1980: before the introduction of the cream separator

Before the cream separator was introduced in the 1980’s, raw milk oma was made with three milk processing techniques: the fermentation process, the cream separation process, and the additive coagulation process (Fig. 6). The settled nomadic household B and the agro-pastoral household C used almost the same techniques. The following section will discuss the two households as one example, but it will be noted when a technique used applies to only one of the households.

2.6.1 Fermentation process

The heating/lactic fermentation process to make sour milk co from raw milk had been in use before 1980. In other words, this milk processing technique uses the following sequence of heating raw milk, adding sour milk from the previous process as a starter, wrapping in cloth to keep warm, and letting it stand for several hours. Even before 1980, co was consumed, but not used also to process into butter or cheese.

Before 1980, the pastoralists utilized the no heating/natural fermentation process to make butter or cheese, which is different from the heating/lactic acid fermentation process. In this process, they put aside fresh raw milk in a container without heating it. The milk is left to stand in the container for a few days to promote natural fermentation (Agro-pastoral household C). The surface will be covered in foam when it has been fermented and has become high in acidity. This naturally fermented milk is also called oma and is not given a special name. It is churned inside a wooden tub called ozo with a plunging dasher called ohita to be processed into butter (Fig. 7). It is churned approximately a few thousand times, a work which takes a whole day. If the temperature of the naturally fermented milk falls too low, it is warmed. The ozo has a lid with a hole for the dasher. It is characterized by a twenty cm collar around the hole to keep the naturally fermented milk from popping out. In the past, they have also used a sheepskin pouch, which they rolled around on the ground to churn butter (Settled pastoral household B). The no heating/natural fermentation process was mainly used to make butter and cheese.

Other methods also included churning raw milk immediately by simply adding sour milk co to increase acidity, without undergoing natural fermentation (Settled pastoral
The butter is called tara. The amount of sour milk added was approximately one third of the amount of raw milk to which it was added.

The butter is called mar. It is washed twice with water to remove buttermilk, and cooled by soaking in cold water for about thirty minutes. Then they remove enough moisture from the butter, shape it, and place it in a wooden box to be eaten with their everyday meals. They stuffed it in a hcawa, yak or sheep hides and kept it in a shade inside a tent if they wanted to preserve it for a long time. It is possible to keep butter for ten years when stored in a hcawa.

The buttermilk that is left after collecting butter is called tara. Tara is thought to be healthy and was drunk plain. Also, the unmatured dry cheeses, tehora and munentebr were processed from tara. The tehora is made, not by adding sour milk co, but by heating to curdle tara. The co is not added, because tara already has high acidity from the fermentation. The curd is poured into a sack, hung overnight to drain water, crumbled into small pieces by hand, and laid out for drying under the sun to process the unmatured dry cheeses, tehora as the same procedure as now. When processing munentebr, the tara is also left out to ferment without the addition of previously accumulated whey, because tara already contains a significant amount of lactic acid bacteria. It will ferment on its own. The process of making munentebr is also the same as now: after the tara has been sufficiently fermented, it is curdled by heat, and then the curd is drained of moisture in a sack,
shaped, and left out to dry in the sun.

The no heating/natural fermentation process utilizing unheated, naturally fermented raw milk or raw milk acidified with sour milk is used specifically to churn butter or to make cheese by heating and dehydrating the buttermilk. Its sequence is independent of the heating/lactic acid fermentation process, which is used to make sour milk by heating raw milk and adding starter culture.

Based on the descriptions above, the characteristics of the fermentation process can be summarized as follows: 1) The raw milk is churned after the natural fermentation or the addition of sour milk, 2) The churning process relies on two techniques, using either a churning tub and a plunging dasher or a leather pouch, 3) As food, butter was the end product of milk fat separation, 4) The unmatured dry cheeses were made by heating, fermenting, and removing water from buttermilk, 5) The no heating/natural fermentation process (for making butter and cheese out of naturally fermented milk or sour milk added to raw milk) and the heating/lactic acid fermentation process (for making sour milk) were independent processes, 6) The butter and cheese were mainly made with the no heating/natural fermentation process.

2.6.2. Cream separation process

Before 1980, the cream separation process was mainly performed in the winter when the temperature was low. The raw milk was left overnight without heating and the cream was separated when it floated to the surface. This cream is called okha. The okha is served as is or spread on a bread. At the settled pastoral household B, they churned the okha about one hundred times by hand to make butter mar. Since the cream only yielded a small amount of butter, it was mainly used to make dairy-based sweets called chon. The chon is a mixture of cheese, sugar, hitampa, and butter, which is hardened by heating in a pot. The chon was also used as an offering, because the butter made from the cream had a whiter hue. The agro-pastoral household C mixed the cream with raw milk that had left to stand for several days, and then they churned it to process butter. The cream was seldom separated, only when they needed raw milk when they had visitors. The settled pastoral household B called the skim milk that was left after they separated the cream oholu and the agro-pastoral household C called it ocay. Both oholu and ocay were used to make milk tea, which they drank many times a day. As described, the pastoralists used the no heating/cream separation process, which allowed them to obtain cream by separating the cream that floated to the top after the unheated raw milk was left standing overnight.

The characteristics of the cream separation process used until the 1980’s can be summarized as follows: 1) The cream was made mainly in the winter and not every day, 2) The cream was used mainly as offerings. It can be said that the cream separation process was not one of the main milk processing techniques used by the Amdo Tibetan pastoralists.

2.6.3. Additive coagulation process

The settled pastoral household B also used the additive coagulation process to make cheese by adding a coagulating agent to raw milk before the 1980’s. They used sour milk co as the coagulating agent.

They used unheated raw milk that had been left out for too long and had started turning to naturally fermented milk in the additive coagulation process. They added the sour milk co to this highly soured milk, and then heated it to curdle it. They can make the unmatured dry cheese, tehora if they drain the curd in a cloth pouch and dry it under the sun. They did not make a lot of tehora, because it was oily from having been made with a fatty whole milk of yak. They used the fermented milk coagulation process under the additive coagulation process to make their cheeses.

The characteristics of the additive coagulation process can be summarized as follows: 1) Sour milk is used as the coagulating agent, 2) Cheese was not made every day, because it was too oily. Therefore, it was not considered the main milk processing technique of the Amdo Tibetan pastoralists.

2.7. Changes in the milk processing system

The Chinese government introduced the cream separator to the Amdo region in the 1980’s. This next section will recreate how the introduction of the cream separator changed the milk processing system of the Amdo Tibetan pastoralists. It will also elucidate how the techniques changed or disappeared following the introduction of the cream separator, and analyze the background of how each technique was selected.

2.8. The transition process of the milk processing system since the 1980’s

Through interviewing settled pastoral household B and agro-pastoral household C, it became apparent that the pastoralists, at least those living in the eastern Qinghai Province, used the fermentation process, the cream separation process, and the additive coagulation process before the 1980’s (Fig. 6, Fig. 8-1).

When the cream separator was incorporated, the cream separating process changed from the natural method of leaving the milk until the cream naturally separated to one that artificially separated the cream (Fig. 8-2). Traditionally, the pastoralists only separated cream in the cold winter, but because the cream separator can separate cream in mere minutes, they began separating cream year round. The cream separator not only separated cream from raw milk in a short time, but its use led to a more frequent and proactive butter
processing using the separated cream. By the 2000's, the cream separator had spread rapidly, even making its appearance on store shelves in rural areas. Eventually, there was no need to rely on the no heating/natural fermentation process.
The manufacturing of tehora and mgente or also changed from the no heating/natural fermentation process to the cream separation process (Fig. 8-3). In other words, the pastoralists started making tehora and mgente or using skim milk produced with the cream separator. Since skim milk produced with the cream separator does not undergo fermentation, they started adding co as a coagulating agent to make tehora. To make mgente or, they added whey that they accumulated for several days to the skim milk as a starter culture. Now that they can make tehora by adding sour milk co as the coagulating agent to the skim milk, they no longer had to utilize the additive coagulation process of adding co to raw milk to make tehora.

Despite the changes, the process of making sour milk co had remained the same around the time when the cream separator was introduced. This was because the heating/lactic acid fermentation process specialized in making sour milk by heating raw milk and adding a starter culture to produce sour milk, and its process was independent from the no heating/natural fermentation process. Furthermore, the pastoralists continued to make co from raw milk, because 1) it was eaten every day, and 2) it was delicious, because it was made from whole milk. The current milk processing system takes its shape when tracking the changes that had taken place since the introduction of the cream separator (Fig. 8-3).

In summary, the cream separation process became the central milk processing technique of the Amdo Tibetan pastoralists as a result of the introduction of the cream separator. At the same time, the fermentation process and the additive coagulation process were incorporated into the cream separation process. Even after the introduction of the cream separator, the Amdo Tibetan pastoralists continued to use the heating/lactic acid fermentation process under the fermentation process to make co, because it was an independent process from the no heating/natural fermentation process and because co was an essential staple food item in their everyday diet.

2.9. The factors that caused the cream separator to become popular among the Amdo Tibetan pastoralists

The cream separator is now used by all the Amdo Tibetan pastoralist households. At first, the Amdo Tibetan pastoralists did not take to the cream separator, because 1) butter made with the cream separator did not taste good, and 2) they could not make tara or fermented buttermilk after churning butter. However, when they understood the cream separator made it easier for women to make butter, it gradually increased its popularity. Making the women’s work easier was precisely the reason why the cream separator infiltrated the Amdo Tibetan pastoralist society.

The cream separator reduced the butter making effort of churning fermented raw milk in a tub with a plunging dasher, which used to take an entire day to a mere ten minutes from start to finish. The women’s chores after getting up in the morning included milking livestock, processing milk, cleaning manure, cleaning the house, cooking, maintaining the furnace (put in manure as fuel and clean out coals), preparing meals, putting away dishes, collecting water, etc. With such a busy workload, it was extremely appealing to the women to be able to reduce the work and time it took to churn butter to just ten minutes. This was the motive that made the cream separator so popular with the Amdo Tibetan pastoralist society. In other examples, the cream separator became popular with the Arabian pastoralists in Syria (Hirata, 1999), Turkish pastoralists in Kazakhstan (Hirata, 2002), and Uyghur pastoralists in China (Hirata, 2006) for the same reason. The cream made with the traditional method is called okha, but the cream made with the cream separator has come to be called mar. Mar originally meant butter, and it is symbolic that the cream is called mar, because it acknowledges that the butter is derived from cream and also sets up the expectation that the cream is the raw material for processing butter.

Even though the butter made from cream does not taste as good and this process does not yield the healthy fermented buttermilk tara, the cream separator was accepted into the Amdo Tibetan pastoralist society, because of its ability to lighten women’s workload. The technical innovation was externally influenced, then adopted or unadopted according to the will and choice of the local people, resulting in the transition of culture.

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References


中国青海省におけるアドモ系チベット牧畜民の乳加工体系とその変遷

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要旨: チベット系の人びとの言語や文化は地域により多様である。このような多様なチベット諸集団の文化は、近代化の中で、急速に失われつつある。著者らは、牧畜という業を支える乳文化を着目し、チベット諸集団の文化の保全のために乳加工技術を正確に記述すると共に、乳文化の視座からチベット諸集団の多様性と特徴を解析してきた。本稿の目的は、中国青海省のアドモ系チベット牧畜民が現在採用している乳加工体系を把握し、アドモ系チベット牧畜民の乳加工体系の近代化過程とその要因を分析することにある。アドモ系チベット牧畜民は、発酵乳系列群、クリーム分離系列群、凝固剤使用系列群の乳加工技術を利用してきた。発酵乳をチャーミングしてバターを加工し、発酵により酸化性のバターミルクを加熱・発酵・脱水することにより非熟成乾燥チーズを加工するという発酵乳系列群が中心的な乳加工技術を成していた。クリーム分離系列群や凝固剤使用系列群の乳加工技術は、一時的に利用されるに留まっていた。1980年代に中国政府がクリームセバレーターを紹介することにより、バターまたは非熟成乾燥チーズといった多くの乳製品、クリーム分離系列群の乳加工技術が急速に変革新しく進化していた。発酵乳系列群では、生乳からの乳酸加工の加工のみが継承される状況にある。これらの近年の乳加工技術の変化は、酸乳がアドモ系牧畜民の食生活において不可欠な食材であったこと、バター加工の原材料が発酵乳からクリームへと変わることにより労働力が大幅に軽減されたことにより生じたものと考えられる。外部から影響を受けた技術革新は、現地に暮らす人びとの意思によって取捨選択され、その結果として文化は変化していくのである。

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