

# Fermented Dairy Products in Central Asia: Methods for Making Kazakh *Qurt* and their Health Benefits\*

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## Introduction

Fermented milk products have been consumed almost everywhere for many thousands of years, especially in the Eurasian and European countries. These fermented milks include a wide variety of products such as yogurts, buttermilk, *acidophilus* milk, *kumiz*, *qurts* and many others. Such products are and have been often used by peoples living in Central Asia.

Central Asian nomadic groups keep sheep, and goats as well. Cattle and camels are also herded, even though most cattle can barely survive winters without delivered fodder. In the case of the Kazakhs, the main sources of protein in their nomadic diet are milk products, especially *qurt* (or *qurut* air dried cheeses). It is easy to prepare and preserve. *Qurts* will last a long time and are thus well adapted to the dynamic nomadic lifestyle.<sup>1</sup>

The name *qurt* means “dry” (*kuru*) in Kazakh and most other Turkic languages.<sup>2</sup> The Turkic *qurt* has many different forms such as *qurt* / *qurut* itself, *keş peyniri* in Turkey, *kishk* in Lebanon, *jub-jub* in Syria and *kushuk* in Iraq, the Jordanian *jameed*, Persian *kashk* (کَشک), the origin of many other forms, Kurdish *keşk*, Turkmen *gurt*, Azerbaijani *qurut*, Bashkir *korot* (корот), Tatar *qort*, *chortan* (*chor* meaning “dried”, “more than dried”), Armenian

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\* The author gratefully acknowledges her conference invitation, and the generosity of Professors Paul-David Buell, Angela Schottenhammer, and Dagmar Schäfer, and thanks also go to the sponsors: Eurasia Pacific Uninet (EPU), Austria; the History Department, University of Salzburg; the Max Planck Institute, Berlin; McGill University Canada; the Horst Götz Institute, Berlin; special thanks also for the support of the Birgit and Gad Rausing Foundation for Arts Research and the Crawford Foundation, Professor Eugene Anderson, and Madina Baidavletova without which the present article could not have been completed.

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1 Albalat 2011, 50, 54.

2 Tarakçı, Dervişoğlu, Temiz, et al. 2013, 284.

*chortan* (чортан), Kyrgyz *kurut* (кырут), Uzbek *qurt*, *qurut*, Uighur *kurut* (again said to be from *kuru*, dry,<sup>3</sup> in Mongolian *aaruul*, (ааруул), and *qurut*, in Tajikistan.<sup>4</sup> The word also exists as a Turkic loan word for a dry, salty cheese in Russian, *qurt*.

Thus many different varieties of *qurts* are prepared throughout Central Asia and beyond. The list above is by no means exclusive. Each area of the region has as a consequence developed its own methods for the preparation of these products, and thus there has arisen a large number of separate *qurt*, each with their own names as indicated above and with slightly different characteristics. Although *qurt* are produced commercially today, little is known about the technology for making *qurt*, especially those made in the home and in remote areas of the country. Carrying on the local traditions, each new batch is inoculated with a portion of the previous batch, preserving yeast and bacterial cultures as is done in the West with sour-dough breads.

### Technology of making *Qurt*

There is no doubt that souring and fermentation have played and are still playing a most important part in making milk safer and more wholesome in many parts of the world since the fermentation in particular produces by-products killing bacterial and other harmful organisms. Products to start and sustain fermentation are usually prepared in a traditional way. Besides natural methods of starting fermentation using inoculation, the following traditional fermented products are also used:

- Rennet or *mäyek*<sup>5</sup> in Kazakh;
- Starter or *qoraba*<sup>6</sup>;
- Cooked horse bone;
- Horse Jerky to confer a different taste.

Ideally, *qurt* made from sheep's milk is fermented using rennet mass formed in the stomach of a lamb, one that has just tasted colostrum for the first time. In ancient times, rennet was soaked in milk and washed-dried in a sheep's or goat's stomach. Study of the action of rennet on casein milk complex is the

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3 Fasmer 1964–1973, 429.

4 Soltani and Güzeler 2013, 2.

5 *Mäyek* is a rennet whey for coagulation of milk in cheese.

6 *Qoraba* is a Starter for mare's milk stored in wineskins.

subject of many studies, but the chemistry of the process is still not yet fully understood. A manufacturing process of *qurt* chemists is said to involve “loss of proteins albumin and globulin, joining casein enriched product”.<sup>7</sup>

*Qurt* is also made from cow, sheep, and goat’s milk in the summer months. Nowadays *qurt* is mainly produced in families for their own needs, but also by dairy processing plants for commercial purposes. Production methods are anything but standardized but the following is typical:

After clarification, raw milk is heated to 90–100 °C for about 15–20 minutes, and then cooled again to 40–45 °C. Fermentation is induced in the fresh milk by the addition of a carefully preserved yogurt from an earlier preparation (2–3%). After the production of yogurt, the milk is churned into butter and *ayran*,<sup>8</sup> a soured milk also used as a beverage, using wooden or leather churns. The *ayran* is then boiled to 90–100 °C for about 10 min until a white coagulum floats on the surface. When this coagulum is boiling in the pot, the bottom of the pot must be stirred with a wooden stick to prevent burning.<sup>9</sup>

When the boiling process is complete, the white coagulum is transferred into a *qurt* cloth. It is pressed in the cloth until the desired level of solidity is attained. The *qurt* is then salted up to 2–3% by weight with dry salt and transferred to cotton bags. The bags are hung from a platform in a warm room for 2–3 days. The bags are occasionally turned over to achieve a homogeneous dryness. *Qurt* with up to 60 to 70% total solids content can be maintained.

The *qurt* is shaped into a round or oval form, each with a weight of 30–40 g, and dried in the sun for 10–15 days. At the end of this period, the product obtained is the *qurt* as such and can be stored at ambient temperature for more than a year. It is used for soup production in winter and as a beverage, after reconstitution with lukewarm water, or as a starter culture for yogurt manufacture.

Boiled soured milk from cows can also be used. It is strained and formed into small balls that are left to dry in the sun. This kind of *qurt* is eaten as a snack by itself, or with tea, or it can be diluted in broth or porridge.<sup>10</sup>

Because of considerations of flavor and texture, and traditions of preparation, *qurt* can also be made by mixing in fruits such as strawberries, raspberries

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7 Fox 2000, 537.

8 Ayran is fermented mass made from sheep, goats and cows whole milk.

9 Nurzhanova 2010, 216.

10 Albalat 2011, vol. 3, 129.

and blackberries. Sometimes, with the mixture of green leaves, such as mint, dill, basil, or red pepper which give specific flavor.<sup>11</sup> Addition of beet or carrot juice can give some reddish color; then it is dried in the sun. Nowadays on the open market, you can see chocolate covered *qurt*, caramel covered *qurt*, even *qurt* with nuts and sunflowerseeds.

The modern industrial production of *qurt* in Kazakhstan has partly taken over and adapted some of the traditional methods and names. For example: Fresh *qurt*, foam *qurt*, hot *qurt*, tube or squeezed (*syqpa*) *qurt*, pebble (*mal-tatas*) *qurt*, puree *qurt*, white pebble *qurt*, powder *qurt*, butter *qurt*.

All of the mentioned products are soured by lactic acid bacteria but some, in addition, undergo an alcoholic (yeast) fermentation:<sup>12</sup>

*Fresh qurt* is made from cheese curd, which is not dried, but left half-tender. It serves as a good meal for those who cannot eat firm, dried *qurts*; it is considered safe for the elderly and it is a very nutritious food.

*Foam qurt* is floating on the surface of boiling *qurt*. This food is full of nutrition, and is recommended for children and elderly people. It is a custom for rural children visiting a *qurt* boiling home to lick the fresh *qurt* foam.

*Hot qurt* is a mix boiling *qurt* with butter. It is a healthy drink for breakfast. It is the best treatment for patients suffering from lung disease and the cold. Immunity from disease is indispensable in the kitchen too.

*Butter qurt* is a similar but less concentrated product, and may be unsweetened or sweetened; if the latter, it resembles sweetened condensed milk in texture.<sup>13</sup>

Not only are *qurts* made from boiled milk, but some are made straight from the *raw milk* before it is boiled. The milk is soured spontaneously by happenchance acid-producing streptococci and lactobacilli when exposed in open pans or vessels for one or two days at room temperature. It is usually used in villages where the milk is popular and plentiful.<sup>14</sup>

*Qurts* are made from *skimmed milk* too. These milks are boiled, often for a long time, so that they reduced in volume, and allowed to cool to some 45°C

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11 Zhumanov 2013, 156f.

12 Baber 1962, 405-422.

13 Myrzaakhmetova 2012.

14 Albala 2011, 50-54.

(or to some 52°C for the milk variety), inoculated with a starter from the previous day's yogurt, and then kept warm until they become clotted and viscous. For longer keeping, products are stored in jars under a layer of fat, or dried in the sun.

The method of making *qurt* was mentioned in William Rubruck's account of his journey to the court of the Great Khan Mongke in 1253–1255. Rubruck reported to King Louis IX of France about traditional foods of nomads: *cumus* and *curd*.

From cow's milk they first of all extract the butter, and boil it until it is completely boiled dry; then they store it in sheep's paunches which they keep for this purpose. Though they do not salt the butter, it does not go rancid because it has been subjected to such boiling, and they keep it for the winter. As for the milk left from the butter, they let it turn as sour as it possibly can, and boil it so that it curdles in boiling. The curd is dried in the sun, where it goes as hard as iron slag, and is then stowed in bags until winter. In the winter season, when they are short of milk, they put this sour curd, called *qurd*, into a skin, pouring hot water over it, and stir it vigorously until it dissolves in the water, which as a result turns completely sour. This water they drink as a substance for milk. They are particularly careful not to drink plain water.<sup>15</sup>

Russian historian and foremost expert on the history of Russian and Central Asian cuisine, and the author of numerous culinary books, William Pokhlyobkin, devoted a book on Central Asian cuisine where he carefully recorded a recipe for making *qurt* in his book *National Cuisines of Our Peoples*.

He noted that, in the kitchens of the peoples of Central Asia, Kazakhstan, the Caucasus and a number of autonomous republics products from milk and dairy products are widely used for soups, meat and flour dishes. Most of them are obtained by hovering milk, and the other tricks used for fermentation by the Turkic-speaking peoples are similar. These products are *qatyk*, *suzma*, *qurt*, *ayran*<sup>16</sup>, and clotted cream. Since the preparation of them are the same for many people, and because they are the basis on which to create other dairy products and dishes, it is advisable to provide a summary of their characteristics and methods of cooking.

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15 Shastina 1957.

16 *Qatyk* – fermented milk drink which is considered a more solid form of yogurt than *ayran*;  
*suzma* – sour milk strained in a canvas bag.

And there he gave the recipe for how to make traditional *qurt*.

*Qurt*: *Qatyq* (1 kg), sault (1 tb spoon), red powdered pepper (1 tea spoon) are stirred into a homogeneous mass, formed into balls the size of a walnut and layed out in the sun, covered with cheesecloth. After three days the *qurt* is ready. It can be stored in the pouch of canvas up to 1 month in a dry ventilated area.

*Qurt* is used as an appetizer, stimulating the appetite, for seasoning soups and porridge, as well as for the preparation of fermented products.

Tajik *qurt* is prepared in the same way as Uzbek, but without the red pepper. Tatar *qurt* is different from the *qurt* of Central Asian cooking and similarity between this *qurt* and *qurt* prepared elsewhere is only in the names.<sup>17</sup>



Fig. 1 From right to left: Kulshiken apa with her grandchildren Ayazhan and Aisulu

I had a chance to interview my grandmother Kulshiken, who has been making traditional Kazakh *qurt* for a long time. All her eighteen grandchildren and four great grandchildren cannot wait to visit her and taste her

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17 Pohlebkina 2004, 328.

home made *qurts*. They are always delicious. Here I am giving short passage from our interview:

“In 1952–1953 our grandmother had two goats. [...] We paid tax for them with *qurt* and butter. What I saw at that time when I was a child is that *qurt* from the goat milk was so white. And the butter was so delicious! Also from goat milk you can get *qurt*. And from sheep’s milk too you can make *qurt*. *Qurt* from sheep’s milk is so delicious. Basically *qurt* is made from sheep’s, goat’s and cow’s milk. But I didn’t see *qurt* from camel’s milk. And that is because there were no camels in our region. So, you will see. I will boil milk, and will show you how to make *qurt*. We buy milk from our neighbor. I am going to get ten liters of milk and try to make some *qurt*. And I will let you know when it is ready.”

### **Benefits of *qurt* for human health**

*Qurt* made in the villages of Kazakhstan is a nutritious product rich in protein and dietary minerals. Its fat content is considerably lower than cheese.

Dried *qurt* in particular is a nutritious food adjunct, and can be recommended for use in the diets of children, and in those of pregnant and lactating women. It not only contains high-quality proteins but has high calcium content.<sup>18</sup>

The benefits of *qurt* for human health are celebrated everywhere: in poems, in legends, in medieval travelers’ tales, even in space, in a spaceship launched in 1977 in Kazakhstan.

Because of *qurt* the nomads completely got rid of the carts that slowed the movement of any army. Soldiers went with the speed of the tank corps, consuming *qurts* in the dry steppes. Bag filled with *qurt*, strapped to the saddle, weighed quite a bit and replaced the soldiers’ field kitchens. And at the rest stops dissolved *qurts* in water with flour and jerky were perfect dinners, and no need to search for fuel for the fire, or take time for cooking.

Ivan Andreev, in his manuscript written in the XVIII century, “Description of the Middle Horde of Кыргыз-Каясакс (Описание Средней Орды Киргиз Каясов)” notes that Kazakhs mostly consume *kumiz*, made from fermented mare’s milk. From cows’ and sheep’s milk they make *qurt*, which looks like a dried cheese.<sup>19</sup>

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18 Oghbaei and Prakash 2008, 138-142.

19 Andreev 1998, 71.

The Mongols of the Imperial period not only prepared and used *qurt* in the same way as the recent Kirghiz-Kazakh, but gave the product the same name, *grut*.

Levshin writes, basing himself on Rubruck and others:

Only the rich could use Sarachinsk millet. For the poor, who mostly eat lamb, horse meat and gammon from thereof, considered *qurut* as a delicacy, and *qurt* which was prepared like our dry cheesecakes, similar to their sour cow's or sheep's milk. Every Kirghiz, going on a journey binds to his saddle, a bag filled with *qurt*, and spreading, when there is need, multiple pieces together in water; it quenches thirst and hunger.<sup>20</sup>



Fig. 2: Drying *qurt*<sup>21</sup>

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20 Levshin 1996, 304.

21 Semipalatinsk region, Pavlodar district, CGA RK (KP10438/10).



Fig. 2: Collecting dried *qurt*<sup>22</sup>

In Kazakh folklore *qurt* is mentioned frequently as a traditional Kazakh food of great nutritive value. In the traditional poem “Talayı and Aıym qyz” (Талайы мен Әйім қыз) Talayı, the main character takes cheese and *qurt* made from sheep’s milk on his journey. The story in this poem is common to many Kazakh traditional poems. Aıym qyz, “the girl Aıym”, is a daughter of rich man of the *auyl*, the Kazakh village. And when the time comes for her to get married, she could not find any worthwhile suitor, except Talayı, who was as servant at her house. But their relationship was rejected by her family and society. So they decided to escape to another village. On their journey Talayı got jerky and *qurt* made from sheep’s milk.

*Талайлы осы уағдамен атқа мінді,  
Бөктерді азықсалған қос қоржынды.  
Алғаны ірімшік пен қойдың құртты,  
Отарға барамын деп түнде жүрді.*<sup>23</sup>

Talayı then mounted his horse;  
Tied on two baskets full of food.  
Cheese and sheep’s *qurt* what they got.  
He was going to his pastures at night.

<sup>22</sup> Semipalatinsk region, 1907. S. M. Dudin, ed., Kunstkamera fund (1199-83).

<sup>23</sup> Azibayeva, Eleukenov and Qasqabasov 2005, 118.

*Батырдың азығы ет, сусыны құрт,  
Иштейді қызыл шайды ұқсап бізге.<sup>24</sup>*

A hero's food is meat and his beverage is *qurt*  
He doesn't drink red tea like the rest of us.

*Біртүнде тұлтықа айран құйып алды,  
Азыққа құрт, ірімшік түйін алды.<sup>25</sup>*

One night he poured out for himself into a dish,  
He tied up *qurt* and cheese for food.

*Qurt* is a dried diary product, very high in protein and mineral content; fat content is low, i. e. 5–10%. Thus it is a most valuable food under any circumstances. Other qualities of *qurt* as a nutritious product are also mentioned in connection with the Akmola camp for wives of homeland “traitors”, abbreviated ALZHIR.

In 1990 a former prisoner of the Akmola camp for wives of homeland “traitors”, Gertrude Platais, arrived in Kazakhstan. She related to the museum staff of the “ALZHIR” Museum her first meeting with local Kazakhs and how they reacted to the women prisoners.

One winter morning a female prisoner from Lake Zhalanash arrived with armfuls of reeds. After some time at the lake, elderly people and children had begun to throw stones at these women. The guards began to laugh out loud saying: “See!, not only in Moscow, but even in this village no one likes you.”

The abused women though, well, what are you elders teaching to your children?! But one woman stumbled over the stones, and when she fell next to them, she smelled milk and cheese. The women picked up a piece and put it into her mouth – it seemed to her very tasty. She collected these stones and brought them into the barracks. There were Kazakh women prisoners. They said that it was *qurt* - sun-dried salted curd.

The memories of Gertrude Platais later formed the basis of the poem “*Qurt, a Gem.*” Its author was a history teacher, Raisa Golubeva. She lives in the village Novoishimka in the Akmola region. Here is an excerpt from her poem:<sup>26</sup>

*О, Господи, да это ведь не камень.  
От него так пахнет молоком.  
И в душе затрепетал надежды пламень,  
А в горле встал ком.  
Так вот что придумали старики!  
Вот за что женщины детьми рисковали!*

Oh, Lord, this is not just a stone.  
I could smell the scent of milk from them.  
And in my heart fluttered the flame of hope,  
A lump rose in my throat.  
So this is what the elderly invented!  
That's why women were risking children!

24 Qosan, Qasqabasov and Qorabay 2006,50.

25 Qosan, Qasqabasov and Qorabay 2006,306.

26 Тоқаева 2011.

<i>Они нас от болезни берегли,</i>	They took care of us from disease,
<i>Они нас от безверия спасали.</i>	They saved us from unbelief.
<i>Они поняли, что мы не враги,</i>	They understood that we are not enemies,
<i>А просто несчастные женщины.</i>	And just unfortunate women.
<i>И чем смогли – помогли,</i>	And what they could - helped,
<i>Поразив нас своей человечностью.</i>	Impress us with humanity.
<i>Я молча поползла по льду,</i>	I crept silently across the ice,
<i>Собирая драгоценные камни.</i>	Collecting gems.
<i>Теперь я отвратила от них беду,</i>	Now I turned away from trouble,
<i>Спасая их от охраны.</i>	Rescuing them from protection.
<i>А ночью в холоднейшем бараке,</i>	A cold night in the barracks,
<i>На оскверненной палачами земле,</i>	On ground desecrated by executioners,
<i>Я, немка, молилась мусульманскому богу,</i>	I am German, praying to a Muslim god,
<i>Да ничего не просила себе.</i>	I asked nothing for myself.
<i>Я просила старикам здоровья,</i>	I asked for elderly health
<i>Женщинам-матерям – счастья.</i>	And for the Mothers - happiness.
<i>Особенно я молилась за детей,</i>	I especially pray for the children,
<i>Чтобы они не видели несчастья.</i>	That they not see misfortune.
<i>Я прошла все круги ада,</i>	I went through all the circles of hell,
<i>Потеряла веру и друзей,</i>	I lost my faith and friends
<i>Но одно я знаю,</i>	But one thing I know,
<i>Что только так и надо воспитывать детей.</i>	What is the only way to raise children.

Nowadays this story about Gertrude Platais is told to the visitors of the Museum and Memorial Complex for Victims of Political Repressions and Totalitarianism, “ALZHIR” in Astana, Kazakhstan.

Kazakh elders say that the secret of longevity is “white” products they have been consuming. This applies especially to *qurt*. Scientists have carried research on *qurt* and its benefits to human life. The main result was that *qurt* has a most important mineral – it is the source of calcium.

Calcium, which is so richly contained in *qurt*, improves metabolism and strengthens the bone tissues, so it is believed that frequent consumption of this product reduces the risk of osteoporosis. In addition, calcium is involved in the formation of collagen, so *qurt* helps in the fight against the withering of the skin.

If 100 grams of cottage cheese contain 227 energy value, *qurt* by contrast has 370.1. In 100 grams of *qurt* there are about 3 grams of protein, 3.2 grams of calcium and phosphorus compounds, and vitamins A1, B2, and D. Within the body, *qurt* helps to adjust the intestinal microflora, and promote a good

immune system. In addition, *qurt* is digested more quickly than milk, and it is considered as an absorbent food.<sup>27</sup>

*Qurt* has a lot of vitamin E, which slows down the aging process by enriching the blood with oxygen and prevents the formation of blood clots.

Also *qurt* contains a decent amount of vitamin D, which is vital in the prevention and treatment of cancer, as well as contemporary flu strains.

*Qurt* from goat milk is more useful for children who suffer from Rachitic, because it contains more sialic acid, which is part of the barrier immunity.<sup>28</sup>

The benefits of *qurt* for human health were broadly investigated during the Soviet Period by scholars. Programs in the Department Union Research Institute, together with an assistant minister, Ivanovich Kostin, and staff member Myasodeliya, together with the Moscow cheesemaking industry have studied Kazakh *qurt*. The *Qurt* was obtained in the form of tablets and powder. Freeze-dried *qurt* was given to astronauts. They were enjoying Kazakh *qurt* in space. This was well publicized in the Moscow newspaper “Socialist Industry”. And in 1977, 21 January Gizatulla Mengdihanov, along with other researchers for the development of the new composition of the resulting *qurt*, received a copyright certificate of the USSR (№557784).<sup>29</sup>

## Conclusion

Our research work showed that *Qurt* is a traditional dairy product with high nutritional value, and with a unique taste and aroma. Chemical composition and therefore sensorial properties of *qurt* samples are significantly different due to the ingredients used and the *ayran*, skim milk and other things added as starters, different manufacturing, packaging, and ripening conditions, *etc.* In order to have a standard product, all processing steps should be standardized. Packaging, storage and marketing conditions should also be improved over homemade *qurt* and to preserve all traditional taste and quality.

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<sup>27</sup> Kosherova 2011.

<sup>28</sup> “Kurut-syr kochevnikov”

<sup>29</sup> Muqanova 2012, 172-175.

## Bibliography

- Albala, Ken (ed.). *Food Cultures of the World Encyclopedia*. 4 vols. Santa Barbara: ABC-CLIO, 2011.
- Andreev, Ivan Grigor'evich. *Opisanie Sredney ordy kirgiz-kaysakov* [Description of Middle Hordes of Kirghiz-kaysaks]. Almaty: Gylym, 1998.
- Azibayeva, B., Sh. Eleukenov, and S. Qasqabasov. *Babalar Sozi* [The Word of Our Ancestors], vol. 22. Astana: Foliant, 2005.
- Baber, Franklin W. "Hygienic Aspects of the Processing of Butter, Cheese, Flavoured and Fermented Milks, and Ice-Cream", in: *Milk Hygiene. Hygiene in Milk Production, Processing and Distribution*, ed. by M. Abdusalam (Geneva: World Health Organization, 1962), 405-422.
- Fasmer, Maks R. (ed.). *Etimologicheskij slovar' russkogo yazyka* [Etymological Dictionary of the Russian Language]. 2 vols. Moscow: Progress, 1986 [online via [etymolog.ruslang.ru](http://etymolog.ruslang.ru)].
- Fox, Patrick F. *Fundamentals of Cheese Science*. Boston: Springer, 2000.
- Kosherova G. "Dästürlü tagamnyng tehnologiyasy buzylyp barady" [Technology of Making Traditional Food is Getting Worse], *Alash ainasy* 5 (2011), 173.
- "Kurut-syr kochevnikov". [Anon. article publ. online in 2012:] [www.time.kg/vremyag/3652-kurut-syr-kochevnikov.html](http://www.time.kg/vremyag/3652-kurut-syr-kochevnikov.html).
- Levshin A. I. *Opisanie Kirgiz-Kazach'ikh, ili Kirgiz-Kaysatskikh gor i stepey* [Description of Kirghiz-Kaisak or Kirghiz-Cossack Hordes and Steppes]. Almaty: Sanat, 1996.
- Muqanova, T. "Garyshqa sälem-sauqyt zholdagan qazaq kim edi?" [Who Sent a Gift to the Space?], *Zbuldyz* 5 (2012), 172-175.
- Myrzaakhmetova, Akhmaral. "Chupa-chups sorg'ansha, qurt zhe!" [Better Eat Qurt, rather than Chupa-chups!] (uploaded 2012) [online: [muslim.kz/kk/article/76-chupa-chups-sorgansha-qurt-je.html](http://muslim.kz/kk/article/76-chupa-chups-sorgansha-qurt-je.html), acc. 20.03.2017].
- Nurzhanova, A. *Tekhnologiya moloka i molochnykh produktov* [Processing Technologies of Milk and Dairy Products]. Astana: Foliant, 2010.
- Oghbaei, Morteza, and Jamuna Prakash. "Nutritional and Functional Properties of *Kashk*: Fermented Sheep Milk." *Journal of Food Science and Technology Nepal* 2008.4, 38-42.
- Pohlebkina, Vil'ya Vasil'evich. *Natsional'nye kukhni nashikh narodov* [Cuisines of Our Peoples]. Moscow: Tsentrpoligraf, 2004.
- Qosan, S., S. Qasqabasov, and S. Qorabay. *Babalar Sozi* [The Word of Our Ancestors], vol. 29. Astana: Foliant, 2006.

- Shastina, Nina Pavlovna (ed.). *Gil'om de Rubruk: Puteshestvie v vostochnye strany*, translated by Aleksandr Iustinovič Malein (1869–1938). Moskva: Gosudarstvennoye izdatel'stvo geograficheskoy literatury, 1957 [online: [kitap.net.ru/archive/13.php#28](http://kitap.net.ru/archive/13.php#28), accessed: 17.03.2015].
- Soltani, Mostafa, and Nuray Güzeler. “The Production and Quality Properties of Liquid Lashks”, *GIDA Research* 38.1 (2013), 1-7.
- Toqaeva A. “Istoriya lagerya s ekzoticheskim nazvaniyem ‘ALZHIR’ i yego uznits” [The History of the Camp with an Exotic Name “ALZHIR” and its women prisoners], *Radio Azattyq*, 05.20.2011 [online: [rus.azattyq.org/a/gulag\\_camp\\_kazakhstan/24179843.html](http://rus.azattyq.org/a/gulag_camp_kazakhstan/24179843.html)] (accessed: 17 03 2015)].
- Tarakçı, Zekai, Muhammet Dervişoğlu, Hasan Temiz, *et al.* “Review on kes cheese”, *GIDA* 35.4. (2010), 283-288.
- Zhumanov, M. “Qurt ondirisindegi zhanga tekhnologiyalar” [New Technologies in Qurt Production]. Paper presented at the conference “Seyfullin Reading – 9”, vol. 2, 2013 [online: [kazatu.kz/science/sf9\\_vet\\_238.pdf](http://kazatu.kz/science/sf9_vet_238.pdf)].