

higher than in cows milk, while levels of thiamin, riboflavin, folacin, vitamin B12, pantothenic acid, vitamin A, lysine and tryptophan were relatively lower than those of cow milk.

A report on FoodSafetyHelpline says camel milk is low in fat but has a high percentage of unsaturated fatty acids. In addition, components like long chain immunoglobulins are found in the milk, which some people say helps boost immunity in those who drink.

“From all the data presented it is clear that the camel produces a nutritious milk for human consumption,” according to a report from the [Food and Agriculture Organization of the United Nations \(FOA\)](#).

However, the FOA data does not show a difference between camels milk and cows milk in terms of specific health claims by proponents.

Federal law in the United States prohibits food producers, including milk producers, from making medical claims about their products. It is also against the law for producers to disseminate consumer testimonials about specific health benefits of the products. Such claims move products out of the food category and into the drug category of the Food and Drug Administration’s jurisdiction.

Producers seeking FDA approval for products claimed to have specific medical or health benefits must prove those claims with research and testing data that has been peer reviewed and met other requirements to ensure safety and effectiveness.

**Where can I buy it?**For the most part, camel milk is sold online in the United States, delivered to customers frozen via Fed Ex. However, in some cases it’s distributed direct to the customer. And some specialty stores sell it.

In California, it’s sold at nine Lassens stores and the marketing director said people can special order it at stores that don’t carry it.

A google search will lead a consumer to an array additional sources.

### **What does it taste like?**

Descriptions about its taste vary. Some say camel milk is sweet and delicious. Others say it tastes good but has a hint of salty flavor. Others say you start with just a shot glass to get used to it and then proceed to the point where you can drink all you want. Others say it tastes horrible. And still others say it tastes like milk, adding that’s because it is milk.

Of course, when it comes to any kind of milk, a lot of the taste depends on what the animal is eating and how it’s cared for. And also, taste can be impacted by how sanitary the milking operation, processing and storage facilities are.

In addition to raw, pasteurized and powdered forms, camel milk is also used to make products such as dietary fat referred to as hump fat, fermented kefir, soap, lip balm, lotions, bath soaps, facial washes, face masques and bath bombs.

## Supply and demand in the U.S.

The supply in the United States is limited for a variety of reasons: As a starter, it's not something the U.S. consumer is familiar with. Then, too, there aren't many camel dairies in the country, and those, for the most part, are small — very small. One in Ohio has only two camels. Price also enters into the picture. Frozen camel milk is generally going for about \$8 per pint, far more than \$3.50 for a gallon (8 pints) of whole cow's milk. That's not surprising considering that a camel will produce about only about 2 gallons a day compared with 8 to 12 gallons a day that a daily cow produces.

Some people conjecture that camel milk hasn't garnered much attention in the United States because camels are considered animals from "under-developed countries."

However, an earlier form of the camel used to live in the American West, Canada and South America. For unknown reasons, it became extinct more than 10,000 years ago. Some scientists say the animals migrated across the land bridge to Asia when the continents were joined.



**Is camel milk legal in the United States?**

In 2012, the Food and Drug Administration ruled that camel milk could be sold in the United States. But for sales to be legal, they must comply with the same state licensing requirements as other dairies in their state, with all of the necessary food safety and health standards in place.

For the most part, those standards require milk to be pasteurized, which involves heating it to 166 degrees F for 15 seconds, according to public health officials. Pasteurization kills viruses, parasites and bacterial pathogens such as E. coli, Listeria, Salmonella and Campylobacter.

These pathogens can cause serious illnesses, among them kidney failure and even death. High risk groups more likely to develop life-threatening illnesses are young children, pregnant women, old people, and other people with compromised immune systems, among them are cancer patients, HIV-positive patients, and transplant recipients.

**Raw milk, regardless of the animal**

On a national level, the FDA prohibits the distribution or sale of raw milk — milk that hasn't been pasteurized — across state lines.

As of April 2016, 13 states allow raw milk to be sold in stores as long as it meets state standards. Seventeen states allow raw milk sales on the farms where it was produced — again, as long as it meets state standards — and eight states allow acquisition of raw milk only through a herdsman-share agreement. Under that sort of arrangement, which is often referred to a “loophole” by public health officials, people pay for shares of an animal or herd and therefore aren't considered to be buying the milk. Overall, 20 states prohibit the sale of raw milk.

Although raw camel milk is advertised online, including on Amazon.com, that doesn't mean it can be sent out to anyone who orders it. Because each state has its own regulations on how raw milk can be sold and distributed, customers need to check their own states' regulations before ordering.

### **Meet three U.S. camel dairy farmers**

**Camelot Dairy:** As the owner of a Colorado dairy with 130 cows, Kyle Hendrix was plenty busy. But that didn't mean he wasn't worried about the future. He was beginning to realize that if you aren't shipping out huge quantities milk, “you're a nobody.”

“The guys here who are milking 2,000 cows, they're considered small,” he said. “The business has become a vicious cycle.”

Hendrix had already shown an independent streak when he left a multi-generation family beef cattle business and started a dairy farm. So it's not all that surprising that he was open to trying something new.

That “something new” turned out to be a camel dairy farm, which he aptly named Camelot Dairy. As he tells it, it was all a matter of happenstance.



At the Camelot Dairy in Colorado, Kyle Hendrix has a herd of 100 camels. He said many of his customers are from Somalia, where camel milk is routinely consumed. *Photo courtesy of Camelot Dairy*

It was the Christmas season, and someone in the area had brought in some camels for a nativity scene. That sparked his interest, enough so that he visited a man in Oklahoma who had been raising camels for 20 years. He was quickly sold on the idea of getting some for his farm.

“It was so cool to see a herd of camels,” he said.

His wife, parents and neighbors thought he was crazy when he started the camel dairy. Back then, in 2011, he had three cows, a bull and a calf.

“It was a tough go,” he said. “But we kept plugging along. Now we have 100 head and are either the largest or second largest Grade A camel dairy in the country. I feel good about where we’re at.”

But Hendrix quickly concedes that it takes a great deal of patience, experience and understanding to operate a camel dairy.

“It’s very labor intensive,” he said. “The calves have to be with their mom when you’re milking, and they only let down their milk for you for 90 seconds. You’ve got to learn how to do this.”

He uses milking machines to milk the camels. He uses a LiLi Pasteurizer, made by Bob White. The LiLi completely pasteurizes without homogenizing, separating or standardizing milk, maintaining its nutritional value and deliciously fresh flavor, according to the Bob White website.

Hendrix said the LiLi heats the milk to 163 degrees in a matter of seconds in a process referred to as “flash pasteurization.” He describes this as far superior to the slower method of vat pasteurization.

Hendrix said the raw milk is gently pulled through the machine, is taken up to the needed temperature for pasteurization, and when it comes out of the machine it is around 53 degrees. This temperature allows him to immediately cool the milk down to 40-45, at which point it can be bottled.

Once bottled, the milk, for the most part, is shipped to customers frozen via Fed Ex or delivered direct by one of his distributors if the customer is close enough for that.

Hendrix said he has two different markets: cultural and health. On the cultural side of the equation, he has a distributor who sells to Somali populations in Maine and the Twin Cities. Somalia is the world’s top consumer of camel milk.

“They (the Somalis) want to drink it like water,” he said. “If it could come from the tap, that would be fine with them.”

On the health side of the sales equation, customers are primarily mothers who believe camel milk is good for their children.

Bottomline, said Hendrix, “We have a good solid natural product.”

Demand is strong: “We’re moving every drop we produce,” he said. “It’s healthy milk that comes from an actual animal (as opposed to beverages such as soy and almond milk).”

Even though those plant-based milks are popular, Hendrix said many people are still looking for milk from other animals as an option to cow’s milk.

The camels are out on the pasture, fed a brome-orchard grass mix and a 14 percent concentrate of oats and barley, but no corn. No antibiotics are used.

“We want to keep everything as natural as possible,” Hendrix said.

As for the financial side of the ledger, camel cows are expensive, usually from \$15,000 to \$20,000 easily, said Hendrix.

“We’re limited in numbers,” he said. “There are only 2,500 to 3,000 dromedary camels in the United States.”

Dromedaries are the camels of choice in the United States for dairies.

As for food safety, Camelot Dairy’s milk is flash pasteurized and meets all state standards for Grade A milk.

“With a cow dairy, there’s always some bacteria problems coming up,” he said. “But we’ve had no issues with bacteria for the past 5 or 6 years.’

Considering the strong demand for raw camel milk, he feels frustrated that the law prohibits it to be sold across state borders. He’s also frustrated by customers who believe that only raw milk will do when it comes to certain health issues.

“One of the challenges is how we can change the mindset about raw milk,” he said. “People want raw camel milk, but we’re also seeing a lot of health benefits from pasteurized camel milk.”



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[The Camel Milk Cooperative](#), which distributes milk from some of the camel dairies in the United States, including Camelot Dairy, has information on its website about the nutritional comparison between raw and pasteurized milk, based on an analysis of samples submitted to Food Lab Inc.

“The results were remarkable,” says the cooperative’s website. “The differences in each sample were so small they could be equated to ‘rounding errors.’ “While some companies or sources may make claims about treating various medical conditions, we don’t make any medical claims or give medical advice. We only offer the best pure, Grade A milk for you to enjoy.”

When looking at the future, Hendrix said it’s going to be a roller coaster ride. Nevertheless, “We want to grow as big as we can,” he said

His advice to people who haven’t ever had camel milk is to give it a try.

“You don’t drink a whole glass at first,” he said. “You only need a tablespoon or a shot glass to begin with it. But once your body gets used to it, you can drink all you want.”

**Humpback Dairy:** Seven years ago, Sam Hostetler, an Amish man who has a wildlife farm in southwest Missouri, was approached by a doctor from the Middle East. She asked him what he thought at the time was a surprising question. Would he consider milking some camels.

“She said she had patients who wanted and needed the milk,” said Hostetler.

He had some camels, so he thought “Why not?” He started off very small-scale, filling the bottles by hand.

He soon saw a demand for the milk and expanded the herd. He now has 20 to 40 milkers, which he milks two at a time. He also chose a name for this new venture: Humpback Dairy. All of the dairy’s milk is Grade A, including the bottling plant.

Like Camelot Dairy, Humpback Dairy uses a LiLi pasteurizer to flash pasteurize its milk, but he also sells unpasteurized, raw milk. Missouri allows the sale of unpasteurized milk to individual customers, so he can sell raw milk within the state.

As in the case of raw cow milk, raw camel milk is perceived by some to be healthier than pasteurized milk.

“There are a lot of reasons people want it,” he said. “They have to believe in it or they wouldn’t be paying the price for it.”

Hostetler said most of the milk he sells is pasteurized simply because most of his customers are out of state. He works with three distributors. He can sell his raw milk only to people in Missouri. However, [in 2016 the FDA sent a warning letter to Hostetler](#) because he was found to be selling raw camel milk across state lines.

[Also, federal officials reported in late 2017](#) they were seizing more than 3,800 bottles of unpasteurized, raw camel milk product from Missouri that had shipped across the state line and into a Kansas. It was bottled for human consumption and all carried the Desert Farms label. Some of it had the Humpback Dairy label as well.

It wasn't the first time Hostetler was linked to a group of Amish-Mennonite farmers in Pennsylvania and the Midwest who are affiliated with Saudi entrepreneur, Walid Abdul-Wahab of Santa Monica, CA. Abdul-Wahab runs Desert Farms, which uses a network of camel dairy farms to sell camel milk, some of it raw.



In September 2016, the FDA sent a warning letter to Abdul-Wahab threatening to seize Desert Farms raw camel milk products, which included some from Humpback Dairy, that were stored in a Kansas warehouse. (Raw milk is not allowed to be shipped across state lines.) The agency also took issue with Desert Farms because of what it described as "illegal health claims" on its products.

Repeated requests from **Food Safety News** for information from Desert Farms went unanswered. This statement is posted on Desert Farms' website.

*"This product is not intended to cure or diagnose any illness. If you plan to use camel milk as a natural remedy, please consult your local physician and alternative health care practitioner before you introduce a new food to your children's diet."*

For the most part, says the site, small farms owned by Amish-Mennonite farmers spread across the nation produce the camel milk for Desert Farms.

This year, in a Jan. 6 letter to the FDA, Hostetler told the agency that he was willing to comply with a federal regulation that prohibits raw milk intended for human consumption from being transported across state lines. He said he doesn't make health claims about his dairy's milk anymore and that he's "fine with the FDA."

"We're in compliance," he said.

**Oasis Camel Dairy:** Gil and Nancy Riegler, owners of Oasis Camel Dairy east of San Diego, love their camels, and their camels apparently love them. As Nancy explains it to a visitor in a YouTube video, camel herds evolved where they didn't have many natural predators, which allowed the animals "to evolve with more highly developed social behavior."



Camel milk products from Oasis Dairy.

The Rieglers can even milk their camels, holding a small bucket under the teats, while the camel is standing out in a field with her baby next to her.

“Each of our camels is like gold,” said Nancy. “They’re very gentle.”

“They’re very calm and secure animals,” said Gil.

Although the couple and their children drink the camel milk from their dairy, which they describe as “delicious,” they don’t sell it as milk. Instead they use it to make soaps, lotions, lip balms, and even chocolate bars.



Camel milk chocolate from Oasis Dairy.

They also offer tours, workshops, clinics and camel rides to the public.

Gil said they’d be happy to sell the milk, but starting up a Grade A dairy would be too expensive. Even so, he can imagine starting one 10 years or so down the line.



When they launched the dairy — the first one in the state — they immediately discovered how strong the demand is for camel milk.

“We got requests for the milk all of the time and still do,” said Gil. “It’s really hard to say no to moms who believe it’s important for their children’s health. People are desperate for it.”

They’re not tempted to go that direction, though. At one time, a state dairy inspector actually showed up with papers for them to sign agreeing they wouldn’t sell any of the milk.

“He said we would get arrested if we sold any of it,” said Gil.

### **Surging global demand**

[According to a Technavio report](#), the global camel milk market will grow at a compound annual rate of 6.84 percent from 2018-2022.

A Technavio analyst said the latest trend gaining momentum in the market is the launch of new products such as chocolates and ice creams, kefir, and soaps made from camel milk.

“The demand for camel milk products is expected to remain high during the forecast period due to increasing awareness of health benefits of camel milk among consumers,” said the analyst.

One of the major drivers for this market is increasing camel milk production, which, in turn, is based on increasing demand. As a result, existing camel dairies are boosting production and new dairies are coming on line.

An example of this is the Australian Wild Camel Corp., which is planning to boost its herd size from 450 camels to 2,500 camels in the next two years.

Australia has a distinct historical advantage in this. In the 1840s camels were taken to the continent to help explorers travel. Afghan cameleers and the explorers helped establish transportation links, one of them a 1,900 mile link between Darwin in the north and Adelaide to the south.

But with the advent of trains and cars, the need for the camels plunged and they were let loose to roam the vast continent. With about 1 million of them roaming wild and causing environmental havoc, the government is keen to get rid of them. But even with culling by helicopter, the wild herd could double in the decade to 2020.

But, in their favor, wild camels can be caught and domesticated. Ambitious entrepreneurs can take advantage of this.

One such entrepreneur is Marcel Steingesser, owner of Good Earth, which has about 100 camels, but would like to expand to 3,300 by June 2020.

In India, the Food Safety and Standards Authority, in 2016 certified camel milk as safe for human consumption, thus sparking plans for a large processing plant.

The [Food and Agriculture Organization of the United Nations](#) has reported camel milk could play an important role in feeding increasing populations in desert areas.

*“What possible importance can camel milk have ... in a world beset with a multitude of problems? The answer to this is clear when we consider that one of the biggest problems confronting mankind today is malnourishment. Camel milk can certainly play a far more important role in the prevention of malnutrition than it does today. Growing and raising foodstuffs for the rapidly increasing human population is especially precarious in the hot and arid zones of the world – the very areas where the camel is one of the few animals not only to survive, but also to benefit man.”*

### **Camel facts**

Known as “ships of the desert,” camels are esteemed for their incredible ability to adapt to harsh conditions, whether it be the weather, desert landscapes, or lack of food and water. They can go for a week without water — some say even longer than that — and then when they get to water, they can drink 30 gallons in 13 minutes.

Thanks to their thick lips and tough mouths, they can eat thorns and other undesirable plants that most animals wouldn’t touch.

There are two kinds of camels, the dromedaries, which have one hump and are often referred to as Arabic camels. They live in parts of North Africa and the Middle East. The other variety, bactrian camels, which are the ones with the double humps, live in Central Asia. Dromedaries are the camels being milked at dairies in the United States and Australia. They account for 94 percent of the world’s camel population.

Dromedaries weigh from 880 to 1,300 pounds. Bactrian camels weight about 1,000 pounds. Both are tall, growing to a shoulder height of 6 to 6 1/2 feet.

Camels use their humps to store fat. They do not use them to store water. Rather, their respiratory system helps them cool down and store water. And their blood cells are oval shaped, which allows the water to travel through their system more efficiently.

As awkward as they look, camels can run at 25 mph (40 kph) for long periods. of time. If their owner is in a hurry, they can kick their speed up to 40 mph (67 kph) for shorter distances.

According to *National Geographic*, they can carry from 375 to 600 pounds on their backs. Besides being a reliable source of transportation, they also supply people with milk, meat, leather and wool.