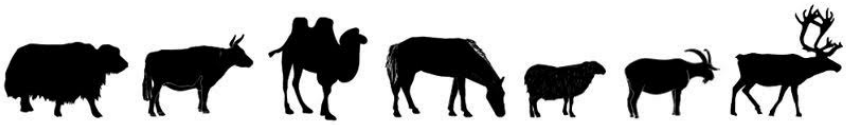

DAIRY LIVESTOCK

DID YOU KNOW?

Mongolia is a land of milk and...more milk! Archaeological evidence confirms that Mongolians have been nomadic dairy herders for more than 5,000 years, and today they milk more livestock species than any other country on earth.

Throughout Mongolia, seven different species are milked every day: yaks, cows, Bactrian camels, horses, sheep, goats, and reindeer.

The milk of these animals have different properties, making them ideally suited for producing different dairy products - from yak butter to goat yogurt to fermented mare's milk. Each animal is adapted to a different region, and in northern Mongolia, yak milk products are a local delicacy.

Yak, *Bos grunniens*

Known locally as **сарлаг**, yaks were originally domesticated in Tibet and then migrated to northern Mongolia in prehistory. Yaks produce a rich creamy milk ideally suited to making yogurt, butter, and even vodka!

Cattle, *Bos taurus*

Cattle (**үхэр**) are not native to Mongolia, but rather were first domesticated more than 10,000 years ago in the Near East. They were brought to Mongolia around 5,000 years ago by migrating herders, and they have been important dairy livestock ever since.

Camel, *Camelus bactrianus*

The two-humped Bactrian camel (**тэмээ**) is native to the Gobi desert in southern Mongolia. It was traditionally used to pull heavy loads and its milk is made into *khormog*, a light acoholic drink.

Horse, *Equus verus caballus*

Horses (**адуу**) are native to the Eurasian steppe and have been hunted by humans since the Paleolithic. Starting in the Bronze Age, people began milking them, and today they are used to make a fizzy alcoholic called *airag*, a kind of horse milk champagne.

Sheep, *Ovis aries*

Hairy sheep were first domesticated in the Near East, and they later acquired a mutation that turned them wooly. Wooly sheep (**хонь**) were brought to Mongolia 5,000 years ago, and their wool and milk has contributed to Mongolian society ever since.

Goat, *Capra hircus*

Goats (**ямаа**) were brought to Mongolia together with cattle and sheep around 5,000 years ago. Their milk is important for making yogurt, and their hair is combed to produce cashmere.

Reindeer, *Rangifer tarandus*

Reindeer (**цаа**) are native to the taiga and they have thick fur that allows them to survive extreme cold. In Mongolia they are milked only in the far north of the country. Reindeer produce very little milk, but they are is highly prized and excellent for making butter and other creamy products.

MILK NUTRITION FACTS

Per 100 g	Yak	Cattle	Camel	Horse	Sheep	Goat	Reindeer
Nutrients (g)							
Lactose	6	4.5	4	5	5	4	3
Protein	6	3	4	2	6	5	11
Fat	5	3	5	1	8	3	16
Water	83	88	85	89	82	85	68
Vitamins (mg)							
A	0.01	0.05	0.1	0.0	0.03	0.03	nd
B1	0.02	0.05	0.01	0.01	0.04	0.02	nd
B2	0.05	0.17	0.12	0.00	0.16	0.05	nd
C	0.5	0.0	3	4	0.4	0.2	nd
E	0.04	0.07	0.15	0.02	nd	0.06	nd
Minerals (mg)							
Calcium	156	113	150	33	193	153	320
Iron	0.1	0.03	0.3	0.05	0.1	0.1	nd
Magneisum	17	10	8	13	20	24	19
Potassium	132	130	186	85	138	185	156
Sodium	56	43	66	10	51	52	48

This informational poster was produced by the scientists of the Heiroom Microbes Project and the Dairy Cultures Project at the Max Planck Institute for the Science of Human History in parntership with the Blessed by Yak women's cooperative.

INFORM | EDUCATE | INSPIRE

DAIRY

Why rising demand for camel milk is good news to Kenyan farmers

The camel is better known for its ability to transport heavy loads (up to 600kg) and survive in deserts without water or food for days. Many people do not know that its milk is highly nutritious and tasty

BY JACKSON OKATA
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An American mother, Christina Adams, was in 2005 looking for a solution to alleviate her son's autism symptoms, when she came across a man with a camel. After a discussion with him, she became interested in camels, believing that their milk would be a good substitute to cow milk, which caused allergic reactions in her son.

Ms Adams, from California, who would later become an author of several publications on camel milk and an editorial board member of the Journal of Camel Science, decided to look for camel milk but could not find any in her country then.

"There wasn't any available in America, so I had to fly it in from the Bedouin people, somewhere in Israeli," she said during a webinar held by camel farmers and experts across the globe, on the 20th World Milk day in June.

"I gave my son the milk and there was a significant improvement overnight," she recalled.

This led to her further research and today, the author, whose son registered a 30 per cent improvement due to camel milk, has become one of the authorities on it, having published a number of books and held many lectures.

She is one of many people to discover the wonders of camel milk. However, the camel is better known for its ability to transport heavy loads (up to 600kg) and survive in deserts without water or food for days. Many people do not know that its milk is highly nutritious and tasty. This very hardy animal could also overtake the cow in preference, as more consumers opt for its milk.

Over the last few years, global demand for the milk has been on the rise, especially in Europe, America and Asia. According to Australia-based camel farmer Jeffry Flood, camel milk is increasingly being sought by people struggling with allergies from cow milk both in Europe and the Americas and supply cannot match the demand.

> **Camel milk is the best alternative to human milk, especially for children with severe food allergies or eczema because it does not have protein allergies**

"Much of the camel milk used in Australia is imported from the Arab world, Asia and East Africa," said Flood, a panelist during the webinar.

The experts at the e-meeting said that camel milk is highly-sought-after for its anti-inflammatory and anti-microbial abilities. It also has strong protective proteins, nutritious value, and natural immune-boosting levels. It is also known to reduce diabetes and coronary heart disease. It is rich in iron, Vitamin B, and unsaturated fatty acid content. It is also said to be three times richer in Vitamin C than cow milk.

Dr Tahereh Mohammadabadi pointed out that the fatty acids in camel milk are better for human hearts, as they contain more mono-unsaturated and polyunsaturated fatty acids than cow milk.

"Camel milk is the best alternative to human milk, especially for children with severe food allergies or eczema because it does not have protein allergies," the associate professor at Khuzestan Agricultural Sciences and Natural Resources University in Iran said.

The milk is also known to work across a range of physical and behavioural issues, making it a highly effective alternative.

"Parents of children with autism remain a key and growing market, as studies show the milk is safe and effective and can lead to behavioural and medical improvements," Ms Adams said.

According to the experts, climate change across the globe is also pushing dairy farmers into camel rearing because they survive well in tough, drought-ridden, hot climates and browse on prickly bushes and shrubs unlike cows.

Another panelist, Dr Abdul Raziq Kakar, a UAE-based camel dairy specialist from Pakistan and Camels4All blogger, told the webnair: "The camel saved humans for generations in the desert. In arid areas and hot weather over 45 degrees Celsius, we see cows suffer as they need 8-10 times more water than camels to produce 1 litre of milk."

Mr Flood, also the CEO of Summer Land Camels in Queensland Australia, added that camels are more adaptable than cows or sheep to climate change and can survive for weeks without water and still produce milk that is high in vitamins and immune properties.

According to the Kenya Camel Association, the growing demand presents farmers with a great opportunity to reap big. "Drought and the fact that 89 per cent of Kenya is classified as arid and semi-arid land means many are shifting from cows to camels, even in southern Kenya," said Dr James Chomba Njanja, vice-chair of the association in a press release.

He added that though the camel milk industry in Kenya is undervalued, it could rival other foreign exchange earners. Kenya has about three million camels in the semi-arid and arid areas of the northeastern region.

Global demand

In 2019, the global camel milk products' market was valued at $10.2 billion. The International Society of Camelid Research and Development (ISOCARD) has advised camel farmers to expect a steady rise in the global camel milk space. This will require increased camel milk production.

"The global camel market is projected to grow at more than 10 per cent for the next decade, meaning more camel milk will be required in the future," said Dr Bernard Faye, a veterinarian, and chair of ISOCARD. Africa and the Middle East account for almost 60 per cent of the world camel livestock revenue. Kenya, Somalia, Ethiopia, and Sudan consume the most camel milk per capita in Africa. Saudi Arabia is the leading world camel milk market, with an annual per-capita consumption of 33 litres. "North America is expected to grow the fastest as diabetic consumers switch to camel milk to control sugar levels," said a statement from the Kenya Camel Association.

Data

Statistics show that the world consumes nearly 3 million tonnes of camel milk every year. However, the total annual camel milk production per year could well be between five and six million tonnes. Some 70 per cent of camel milk is consumed by the camel owners and never reaches the market.

Price

A litre of unprocessed camel milk goes for between Ksh80 and Ksh100, while a litre of the processed product retails at Ksh150 in local supermarkets. However, the price could be higher for those targeting the export market.

A farmer with 10 camels, each giving him three litres of milk, twice a day can easily make Ksh2,400 daily or Ksh72,000 per month selling his milk at Ksh80 per litre.

Breeds

According to www.Infonet-biovision.org, the camel is designed to trap and save moisture, which makes it easily adapt to desert conditions. Camels can walk for 3-5 days on very little or no food. Naturally, camels are fond of feeding during cooler evenings and prefer resting when the day is hot. Common breeds, including the Somali, Borana, Turkana, and Pakistani camels, have a lactation period of between 1 and 1.5 years. All the breeds begin calving at between 4-6 years.

The milk production of the above breeds ranges from between 1 to 7 litres. The Somali breed can give between 3 to 5 litres, with the Rendille/Gabbra breed giving 1 - 3 litres of milk per day. Turkana breed gives between 1 and 2.5 litres of milk per day, while the Pakistani camels produce between 4 and 7 litres per day.

Sexual maturity

At the age of between 4 and 5 years, female camels start becoming sexually active and can give birth when 5 or 6 years old. Sexual maturity varies with breed and is also dependent on health and nutrition of a specific camel. Camels that are well fed tend to sexually mature faster. Male camels attain sexual maturity at five years.

Camel Nutrition

Good camel growth, reproduction and production are dependent on nutrition. This has a direct link to fertility, foetal growth, birth weight and also the future milk yields. Sufficient proteins, energy, roughage, minerals and water are key to camel nutrition. A camel requires 8 to 10 hours of grazing daily. Food consumption varies, depending on breed, body size, and availability.

Water consumption per camel is lower than for other livestock but also depends on accessibility of water as well as the water content in forage. During dry seasons, camels will need a watering interval of between 5 to 8 days, but this can change during wet seasons minimal amounts of water will be required

पत्रिका

Camel milk improves autistic child's motor skills

It tastes just like milk!

BOOK CORNER...

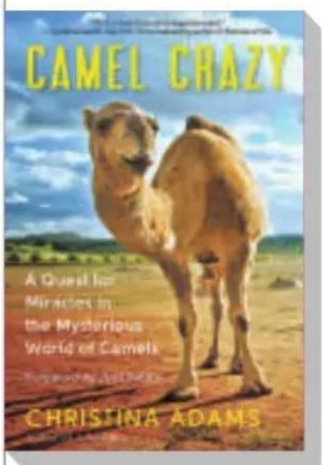
SWAPNA SARITA MOHANTY

On the occasion of Children's Day, Patrika Plush has spoken to Christina Adams, a journalist, author of Camel Crazy: A Quest for Miracles in the Mysterious World of Camels and above all, mother of a boy with autism. In a candid chat, she talks about camel milk discovery, how her son reacted after having it, challenges faced by camels in India, and many other things.

How did you get the idea that camel milk would help your son?

I was at a children's book fair in California. I was the mother of 7-year-old son with autism. I'd just spent years researching and publishing a book. While my son was reading a book, I saw a camel. I wondered, why is a camel here

Q How did you get it in the country and how hard was that?



There was nearly no information on camel milk online. I found an article by two Israeli doctors, reporting that children in Israel with autism improved on camel milk. This confirmed my idea. I called an Israeli number. Over various Skype discussions, he and I formed a hypothesis about camel milk and autism. Then he helped me fly in some frozen bottles of Bedouin camel milk.

How did your son react?

After a serving of milk at bedtime, he was so different the next morning. He had more expressive and emotional language, saying, I love you guys, you do so much for me. He showed improved motor skills (cutting his food, putting on his shoes, walking down steps without dragging, picking up his backpack). He also was much calmer.

Q How did this movement grow from just one child to the world now?

I only told a few people at first, worried that they would overwhelm US customs by doing the same thing. I also got federal permission from the USDA. Later, I learned Amish farmers were milking camels, and their milk had the same result in my son. So I published a magazine article called Got Camel Milk? It went viral and set off a global movement.

Q Challenges face camels in India?

It s long been used as a healing substance by nomadic people in India. It has been freely given to sick people. Raika and other camel herding societies in Rajasthan did not sell camel milk traditionally. Some are starting to sell it now because the families of sick people need it, and the camels value is dropping due to laws restricting their sale outside Rajasthan and the use of trucks instead.