Camel Milk and Its Global Perspectives

The Ancient Superfood Nourishing Bodies and Healing the Earth

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The milk - A main push behind camel domestication

- Camel a gift of nature to the drought-stricken people of drylands (domesticated for milk as natural pharmacy and food)
- The human wisdom domesticated the animal which can cope with the harsh and hostile ecosystems
- Such ecosystems emerged with the onset of the natural climate change thousands of years before
- The main and the important task given to the camel was to provide food in the conditions where other type of livestock had difficulties to sustain. (FOOD SECURITY IN CHALLENGING ENVIRONMENTS)

Anthropocene's Greatest Challenges: How Climate Change Threatens Global Food Security

The soaring heat and global warming are making the production system stressful for other livestock, leading to increasing ecological footprints as well as chemical drain in livestock products for the consumers.

Dramatic change in precipitation pattern, sustaining livestock production in extensive systems, is becoming a challenge.

Biodiversity loss, many reasons, restrictions
The phenomenon of fire hazards is an alarming fact.

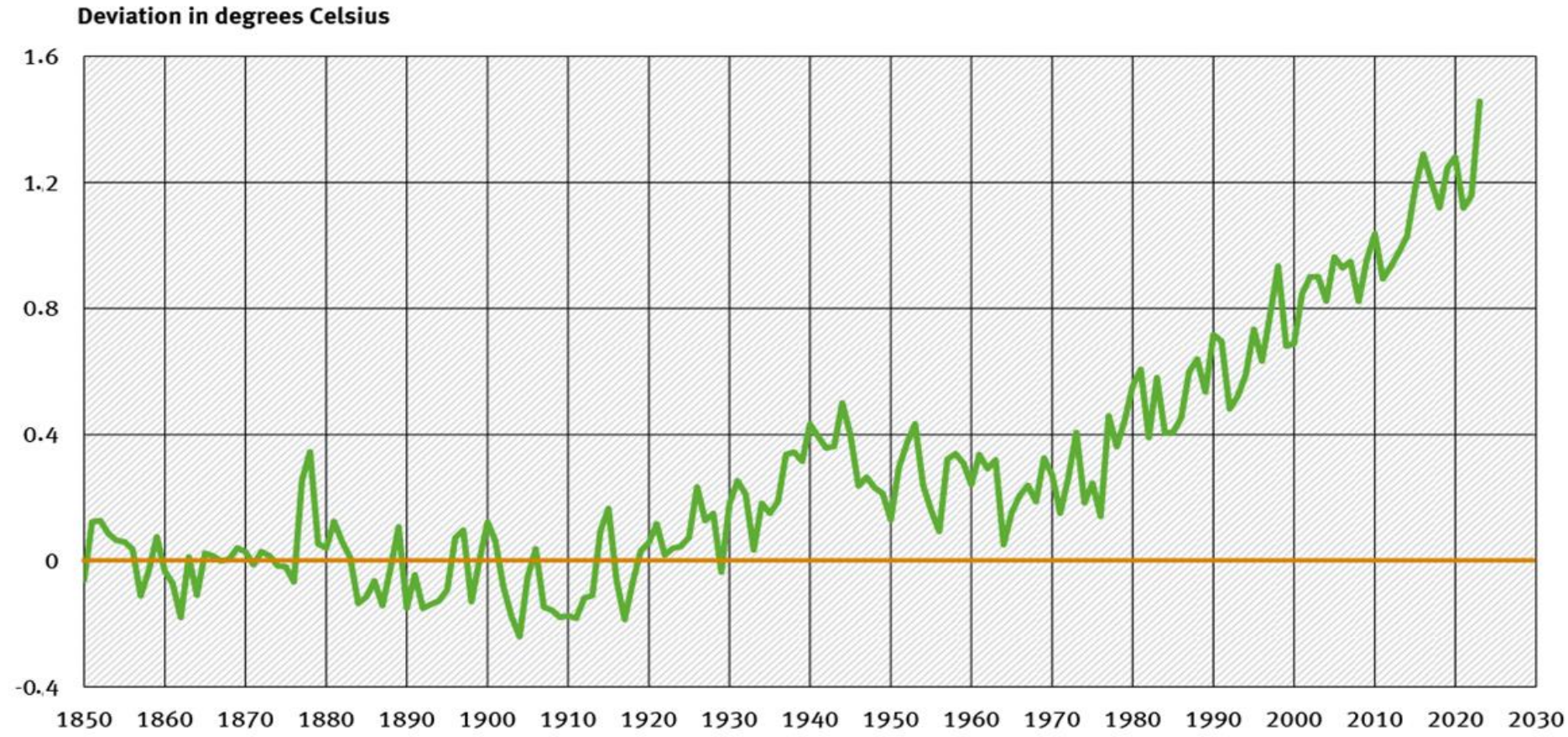
Not productivity but Efficiency in production systems is a real challenge if we look at the more comprehensive model considering all the inputs and its environmental costs.

Food— a bulk or function? Functional food vs. junk food

Alarming global warming, adaptation is the

Either to address the demand — or generate the demand?

Deviation from global mean surface temperature 1850 to 1900*



* The zero line corresponds to the global average surface temperature from 1850 to 1900.

Source: Met Office Hadley Centre, Climate Research Unit; HadCRUT.5.0.2.0 model; median of 200 calculated time series /retrieved 02/2024)

Camel! A Perfect Bio-model Ensuring Sustainability

- Camel power of adaptation under Climate
- Anatomical and Physiological features of the dromedary Camel excels camel over other livestock in challenging climates
- Camel Genetic power (Special DNA) to sustain production in stressful conditions (high, low, dry and humid)
- Camel as a food factory (milk & meat) and storage of energy (hump) for challenging situations when there is no food
- The most efficient biological machine in food and water conversion into food (milk & meat) and work
- In the same climate the cow needs 8-10 times more water per unit of milk and meat production
- Camel produced 1 kg milk/1.9 kg dm intake compared to cow (native) which consume 9.1 dm to produce same quantity in same environment (Africa, Epstein)

Hemophysiological Adaptations in Camelidae

- The camel can dehydrate without compromising blood viscosity
- The camel's blood plays a principal role in adaptive mechanisms to high heat load and dehydration
- Blood composition and volume remains relatively constant, and hemoglobin function remains normal
- The erythrocytes of the camel are oval shaped and non-nucleated which resist osmotic variation without rupturing; these **cells can swell to twice** their initial volume following rehydration

The Camel: Thriving in Harsh Climates with Zero Inputs

Nature's Ultimate Survivor – Adapting, Enduring, and Excelling

- **Why Camels Excel in Harsh Conditions:**
- **Survival of the fittest**
  - Can lose **40% of body weight** from dehydration—and recover in minutes.
  - **Efficient kidneys & intestines** minimize water loss.
- **Heat & Cold Adaptation**
  - **Thick fur** reflects sunlight by day, insulates against cold at night.
  - **Tolerates -50°C to 50°C**—surviving deserts and freezing steppes.
- **Sand & Storm Defenses**
  - **Nostrils seal shut**, **double eyelashes**, and **transparent eyelids** protect against sandstorms.
  - **Wide, padded feet** prevent sinking into dunes.
- **Nutrient Efficiency**
  - Extracts moisture & nutrients from **thorny, dry plants** other animals can't digest.
  - **Fat-storing hump** sustains energy for weeks without food.

Some case studies from the different quarters of the world

The Camel Resilience and Sustenance - Australian

Feral Camel is a Proof

The humans destroyed the natural large herbivores of Australia some 40,000 to 50,000 years ago.

Again, human reintroduced large herbivores (camels) and forced humans to do so (first introduced into Australia in the 1840s).

Now the camel has the largest feral population of Arabian camels.

Camels are found in deserts including the Great Sandy, Gibson, Great Victoria, and Simpson deserts

They are thriving very well without any inputs

Africa: pastoralists replacing cattle with camels

After concurrent droughts, the herders in the Horn of Africa are now investing in one-humped camels, whose highly sought-after milk is increasingly consumed.

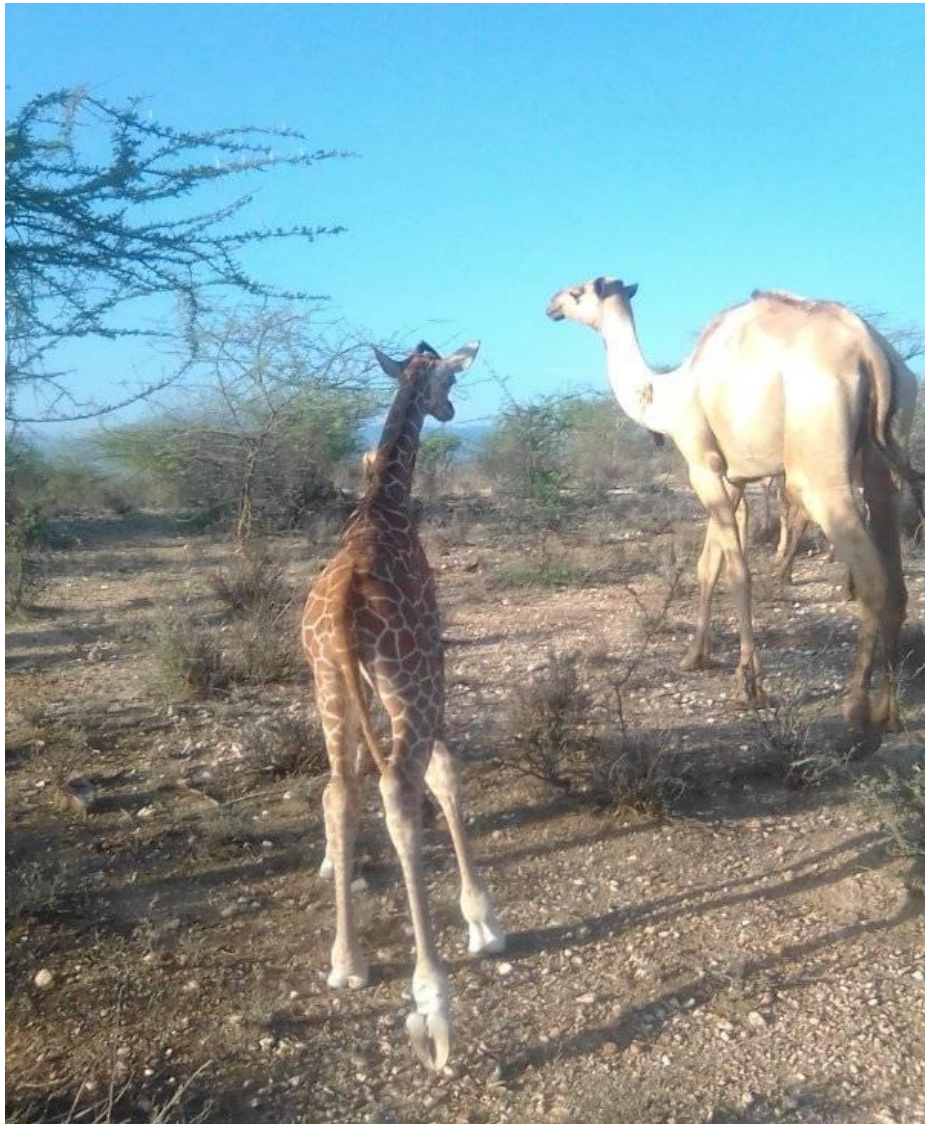
In Kenya, Boran people, whose culture has been traditionally tied to cattle herding, are now turning to camel keeping.

The demand for camel milk as there is more appreciation about the natural pharmacy

A move from cattle herding to camel keeping among Kenyan farmers is more than an economic transition, it represents a fundamental shift in age-old customs.

The reasons behind this shift is the camels' adaptation and resilience power.

Camels have an extraordinary ability to survive for a long time without water and to live on harsh scrub vegetation, and they produce rich, nutritious milk over long periods.



Health - Fergana Valley Uzbekistan

- Heart Touching Camel Milk Story from Fergana Valley of Uzbekistan
- People come to the farm for healing milk from other regions like Kyrgyzstan, Tajikistan, sometimes from Russia
- They bring in patients with diabetes mellitus and liver disease
- They believe that camel milk cleanses the blood
- We plan to conclude an agreement with Turkmenistan and increase the number of camels to 100 in the future (ARVANA BREED)
- https://camel-idee.com/le-lait-de-chamelle-en-ouzbekistan/

Ecological Role - Revitalization of Mother Earth

- Camel is a great companion animal and an ecosystem management tool.
- Their feet/footpad do not harm the soil and the vegetation.
- They enrich the soil microbiome and revitalize the ecosystem.
- Mouth saliva - enzymatic affect
- Seed dispersal as camel manure ball (CMB) are natural seedballs
- It rolls and fly with the winds and reaches to far flung region
- A seedball can nourish a seed for up to 3 months.

One Health - Planetary health is our health

- We are the part of the planet
- Our ecosystem is one of the major player of the planets
- Camel evolves and revitalize the ecosystem
- The camel contribute and goodness of the ecosystem
- Camel helps in nutrients cycle
- The important biological recycle machine
- Transforming the tougher vegetation of the drylands/desert into compost for the soil microbiome

CaM in Challenges
Demand increased in COVID conditions

- COVID 19, Increased media coverage of climate change and consumers shifting to more natural, immune-boosting “super-foods”
- in COVID, puts camel milk higher up on the daily agenda
- The demand for camel milk increased
- The famous train story in India (a woman tweeted for help from the PM)
- The camel keepers’ communities were the least affected population of the COVID 19 epidemic

37°C

Hindustan Times @100

2025 Predict & Win HT Premium Games HT Photo Contest

Waqf amendment bill live Festival of Crickit Quiz Photos + 11 more

Covid-19 update: Railways delivers 20l of camel milk to Mumbai woman after her tweet to PM

New Delhi | By Press Trust of India

Apr 11, 2020 11:35 PM IST

Renu Kumari, the mother of the child, had tagged Prime Minister Narendra Modi in a tweet, in which she highlighted her son’s plight.

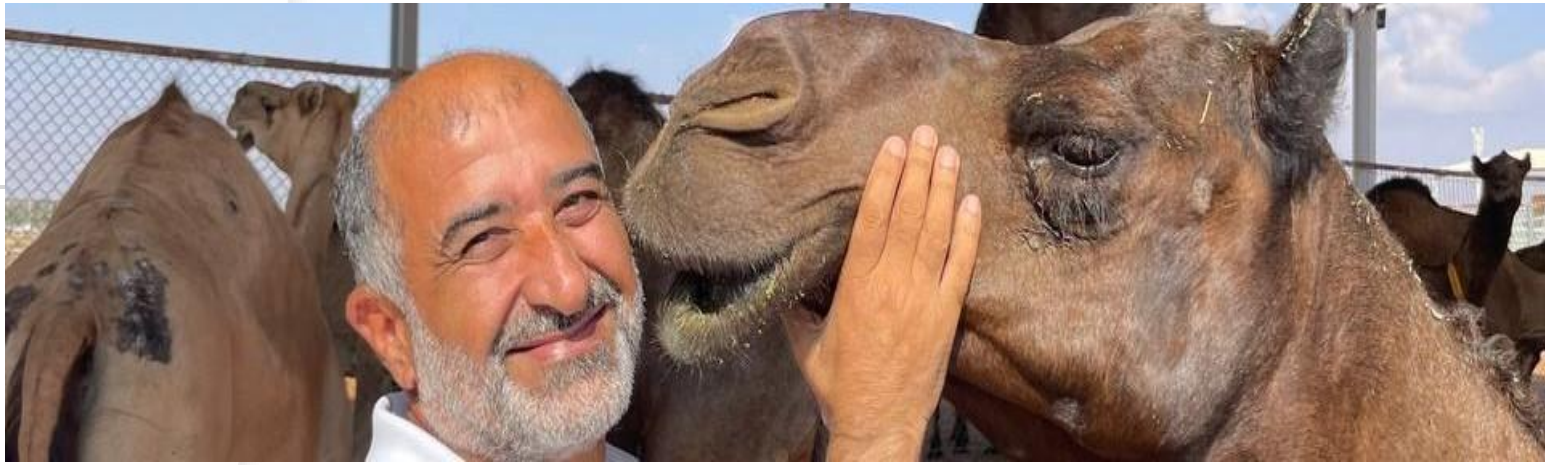
People from all across the country put forward several suggestions on Twitter, including Bothra, who contacted Advik Foods, the first brand of camel milk products in the country based in Rajasthan.(AFP File Photo)

The railways transported 20 litres of camel milk to a family in

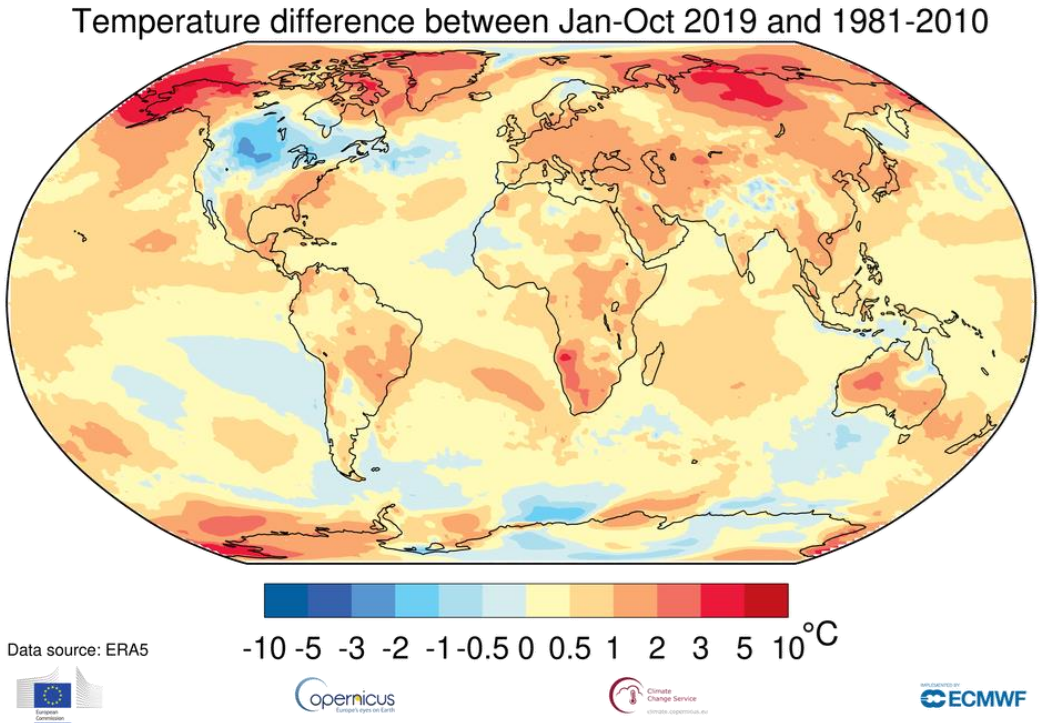
A simple comparison (mg/l)

Kroll et al. 2012

Specification	Lactoferrin	Lysozyme	Immunoglobulins G
Human	700-2000	100-890	40-54
Cow	80-500	0.73-0.60	100-800
Buffalo	50-320	0.13-0.15	460-1300
Camel	200-728	0.73-5.00	2000
Goat	98-150	0.25	100-400
Ewe	140	1-4	500



Camel is Making Space in New Spheres



Many communities replaced cattle with camel pastoralism in Africa because of climate change

New and modern camel dairies are emerging to cope the high demand for camel milk (Camelait is the pioneer)

Australia is the new habitat (almost 1 million camels)

Camel dairies are emerging in Europe, the US, and Australia

Camel4Life International – A Camel Advocacy Forum

- More than 280 members from all the continents
- A force behind ethical dairying
- Advocacy at policy level at international, regional, and global levels
- Research communication and collaboration development (the concept of CGRDN)
- Business support, mainly related to camel milk (Ethical Camel Dairying)
- Cooperation with the camel milk consumers with information

http://camel4all.info/

Why a World Camel Day?

- In 2009, I conceptualized the idea of a world camel day (WCD) with the objectives:
  - To spread awareness about the importance of camels
  - Highlight the healing power of camel milk
  - Conserve and enrich the habitats of the camel
  - Empower the camel keepers at policy levels
  - Bring the camel under the eyes of policymakers at national and international levels

21 June is the longest and hottest day of the year

Camel sustains its abilities of production in such harsh and hostile environments

The Conceptualization of Camel Production Systems – Basic Policy

To Use Camel as a Food Security

We need to adapt a 4 ***prong policy***

i. Sustainable and natural model (Nomadic/Semi-nomadic)
ii. Commercial semi-intensive system
iii. Family dairy livestock (Agri-pastoral)
iv. Semi-intensive lactating herd (Semi-intensive peri-urban)

The Semi-intensive Camel Dairying tops other Models

- Low input system in provision of comfort in the same E conditions
- Low water requirement (drink 8-10 times less than dairy cow per liter milk produced)
- Longer period of reproductive efficiency 8-10 parities
- Strong reproductive efficiency, lesser complications
- Better feed conversion efficiency
- Shorter list of diseases
- Lesser milk dents because of climatic conditions and sudden change in system

Variability among the individual Naqa (lactating camel)

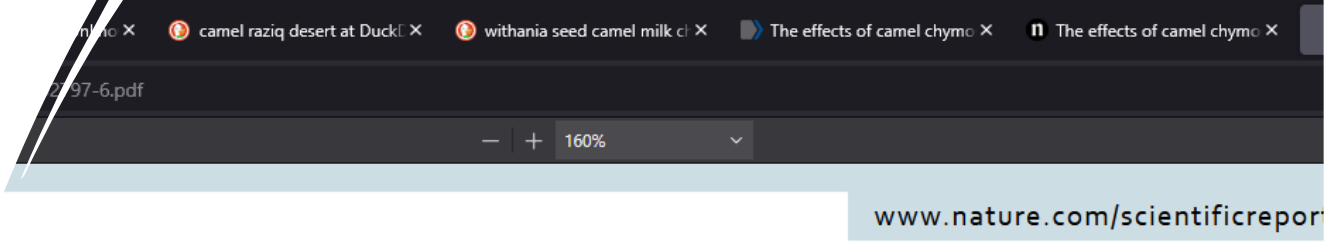
Cow	DIM	Daily Yield %	Daily Avg. Yield	Avg. AMT
2	298	-16	13.4	5.7
11	234	-22	11.1	6
12	294	-5	4.9	4.2
14	440	-2	5.5	5.2
15	207	6	14	5.8
17	244	4	7.6	5.5
22	217	16	15.8	5.5
28	290	-20	6.7	5.3
32	246	0	18.4	7.8
33	244	8	21.7	7.3
35	352	-7	3.6	4.5

CaM Products development – Cheese is a challenge as well as a hope

Contrast to the common perception, we produced cheese and butter from CaM at home

A research proposal on CaM cheese with UAEU

- Dr. Raziq floated idea of making camel milk cheese with herb Withania
- Already took the herbs with me
- A typical and leading study has already been conducted by UAEU
- We already made camels cheese on trial basis with camel chymosin
- The production is good
- We are working on the idea to further work on camel milk cheese
- I have the herbs (Withana coagulan's seed) and the camel milk powder



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The effects of camel chymosin and *Withania coagulans* extract on camel and bovine milk cheeses

Mustapha Mbye[1], Huda Mohamed[1], Abdul Raziq[2] & Afaf Kamal-Eldin[1,3]✉

Withania coagulans **(*W. coagulans*) extract and camel chymosin have aspartic protease capable of coagulating milk for cheese production. This study investigated the quality of camel and bovine mil cheeses coagulated using *Withania* extracts, came chymosin, and their mixture in two experiments In Experiment (1), a factorial design with four factors (*W. coagulans*, camel chymosin, incubation time, and incubation temperature) was performed. The effect of these factors on cheese's yield and hardness were assessed. An enzyme concentration corresponding to a 36 µg/L of milk of *W. coagula* 50 IMCU/L of camel chymosin, holding time of 4 h, and incubation temperature of 60 °C provided th optimal textural hardness for both camel and bovine milk cheeses. Seven treatments were analyze in experiment (2) were analyzed for physicochemical properties, yield, and sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGEitation). The results showed that pure Withania extra exhibited the lower coagulating effect resulting in cheeses with low yield, hardness, fat, protein, and total solids. The SDS-PAGE electropherograms of camel cheese showed several low molecular weight bands as compared to bovine cheese. This phenomenon is due to excessive proteolysis in ca cheese, which we believed is caused by the presence of endogenous enzymes.**

The production and consumption of camel milk (CM) have increased over the years. The global produc

Conceptualization of a continued R&D on CaM Cheese

Under the guidance of Dr. Tatyana, we successfully made cheese from camel milk. We have a series of trials to find the best possible procedure. We are making cheese with Withania seeds and other coagulants. #camelmilk_cheese **Tatyana Balabanova**

Conclusion

Camel has a tremendous potential to provide quality milk in a reasonable quantity

Re-define camel

The camel is a traditional breed, need to be understand more and better

Camel is not a machine

It must not be treated as a factory breed, having a symbiotic relationship with nature

Ethical Camel Milk

The camel welfare is different, need more dry space to walk, need salts to eat, need a quality social time

Natural Pharmacy

Camel milk must be considered as functional food

Grazing is blessing

Must strengthen the grazing system to have the phytochemical not pesticides in the milk

Advocate as a Native Product

Should provide to schools/education hubs, Emiratization process

The Dairy Olympics concept represents an inspiring vision—providing forum to all types of dairy

The fascinating journey of cheese-making will be expertly presented by Dr. Tatyana Balabanova

Thanks for your attention