

# Camel Milk

## its Nutritional and Therapeutic Values



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أَفَلَا يَنْظُرُونَ إِلَى الْإِبِلِ كَيْفَ خُلِقَتْ ﴿١٧﴾

**Transliteration:** Afala yanthuroona ilal ibili kayfa khuliqat

*Al Ghashiya 88 : 17*

Will they not regard the camels, how they are created? - (Pickthall)

Do they not look at the Camels, how they are made? - ( Yusuf Ali)

What, do they not consider how the camel was created, - (Arberry)

The Amazing Camel and It's Creator



# THE CAMEL

If you doubted that God exists, meet the:

Very Technical  
Highly Engineered  
Dromedary Camel.

**Camel is a Horse made by a Committee ?**

# PREAMBLE



- Pakistan produces > **59 Billion liters milk per year**  
4<sup>th</sup> largest country in Milk Prod
- **Buff 62 %, Cow 35 % & Others 3 %** (Econ Survey, 2012-13).
- Per capita milk availability in the past (**171 liter**)
- Per caput milk 165 liter (FAO) (Pak Econ Survey, 2018-19)
- Still very low as compared to advanced countries
- World Camel population ~ 35 M
- Half of the population is in the horn of Africa
- Pakistan habitats 1.1 M (Pak Econ Survey, 2018-19)
  - Balochistan 37 %
  - Punjab 33 %
  - Sindh 23 %
  - KPK 7 % (ACO, 2006)



# CAMEL MILK Documentation

- Camel Population **1.1 M**, milk is sold either separate or mixed
- Not **appreciated, valued and estimated** properly till last few years.
- **Documentation** has started recently?
- Due to the **effort of CAP**



# ALLAH'S GIFT

- Allah Almighty gifted she camel to Prophet Hazrat Saleh (AS) some 3500 BC to **drink milk** only.
- Bedouins made a complaint to Allah about the climate and lack of food, Allah heard their voice and came to their aid. **“He sent the she camel to drink milk and they became well”** (Khan, 1974) **Bedouin Survival:**



# CAMEL DOMESTICATION

- To convert **desert vegetation into valuable food** items was the only reason for its domestication (Epstein, 1971)
- Lactates in **adverse conditions** (Yagil, 1984)
- Significantly **superior** to other animals of food production (Stile, 1987).



# EQUIVALENT MILK PROD

- A camel can produce one liter of milk from ~ **2 kg of vegetation DM** consumed; while for equivalent milk production a cow (AU) will need more than **9 kg of dry matter** (Stiles, 1983).





# CONTENTS AND COMPOSITION

- Camel milk is high in **vitamin C** and can be used for the treatment of many diseases, including TB and dropsy, etc. (Ilse, 2004).
- Milk of camel is sold to processing companies at the price of Rs 40-60 based on **fat %**.
- Camel milk on an average consists of 5.1% **lactose**, 4.8% **fat**, 3.8% **proteins** and 0.9% **ash** (Khaskheli et al., 2005).



# COMPARING WITH OTHER ANIMALS

- In the **arid areas**, camel is a much better provider of milk than cows (indigenous & exotic), sheep & goat (**Kiwuwa, 1973**)
- A **well-fed dromedary** camels produced  $\uparrow$  milk than even high-merit exotic cattle, their crosses, Sahiwal cattle and buffaloes (**Knoess et al. 1986**)
- Camels produces **more milk for a longer period of time** than any other species, while their requirement for feed is modest (**Wilson 1989; Farah et al, 2007**).



# MILK IS LIFE

- In Somalia, the pastoralists use the camel milk, the camelmen say, "Water is soul, but camel milk is life" (Elmi, 1989).



# MILK SELLING

- Milk selling in Indo-Pak had a Taboo
- The milk from **Afar camels in Ethiopia** was not allowed to be processed or sold (**Dahl, 1979**).
- It was to consume **as camel milk** to stay healthy.



# CAMEL MILK IN THE WORLD

Camel milk is relished throughout the world

Pakistan

India

IRAN

ME

African countries

Australia

USA

Europe





# MARECHA

(Best animal of Cholistan)



# BRELA: MILK BREED

- **Brela** is heavy and milch breed of camel, yield up to **10-15 lit/d.**
- Also suitable for draught purpose, though comparatively slow due to heavy body.
- Camel milk in various processed forms is an **esteemed dietary item.**
- This milk is very important for the nomads of Cholistan as **supplement of food esp. during the drought yrs.**



# Camel Dhoodh Melas in Cholistan 2015, 2018

Position #	Winner of the event	Address of the Winner	Milking			Total	Hrs
			Ist	2nd	3 <sup>rd</sup>		
<b>April 10-12, 2015</b>							
<b>Brela Breed</b>							
1	Shahid Khan s/o Shaheen Khan	Chak 127, Murad, B/Nagar	5.570	6.360	---	11.93	24 hrs
2	Muhammad Amin s/o Haq Nawaz	Chak 129, Murad, B/Nagar	6.155	5.610	---	11.76	24 hrs
3	Ata Muhammad s/o M Saeed	Chak 127, Murad B/Nagar	5.440	5.875	---	11.31	24 hrs
<b>Marecha Breed</b>							
1	Muhammad Ali s/o Ghulam M	Toba Qaim Sar, Yazman	4.590	5.000	---	9.59	24 hrs
2	Manzoor Ahmad s/o Waryam	Toba Jam Sar, Fort Abbas	4.625	4.220	---	8.84	24 hrs
3	M Ramzan s/o Hassan Bakhsh	Toba Jam Sar, Yazman	3.920	3.855	---	7.77	24 hrs
<b>March 19-21, 2018</b>							
<b>Brela Breed</b>							
1	M Saleh s/o Manzoor Ahmad	Murli Gargh	6.260	7.306	6.836	20.40	36 hrs
2	Haq Nawaz s/o Allah Ditta	Chanan Peer	5.978	6.874	7.090	19.94	36 hrs
3	M Manzoor s/o Allah Ditta	Chak # 80	5.385	5.630	5.626	16.64	36 hrs
<b>Marecha Breed</b>							
1	Haq Nawaz s/o Allah Ditta	Channan Peer	5.930	6.714	7.280	19.92	36 hrs
2	M Saleh s/o Manzoor Ahmad	Murli Gargh	3.750	5.294	4.662	13.71	36 hrs
3	Noor Ahmad s/o Jaggey Khan	128 M Chishtian	3.386	4.792	4.014	12.19	36 hrs



# KOHI CAMEL OF BALOCHISTAN

- The Suleiman mountainous region is the home of the nomadic and semi-nomadic camel herders
- They use camel for the **transportation** of their family luggage and its **milk** ( $10.2 \pm 0.43$  kg) as the important family food.
- They use camel milk for drinking as such, mix in tea, and change in yogurt and ***shalombey***.





# CAMEL MILK

- The camel milk is famous for its peculiarities especially for its **health responsive** aspects.
- Camel's milk having **low fat and high protein** respectively.
- That makes it superior.





# MILK PRODUCTION

Country	Milk yield (kg)	Lactation length (mo)	Av. milk yield (kg)
Pakistan	2920	16-18	8
India	2482	18	6.8
Somalia	1825	9-18	5
Tunisia	1460	9-16	4
Algeria	1460	9-16	4
Ethiopia	1825	12-18	5

*Raziq (2009)*



# MINERALS IN CAMEL MILK

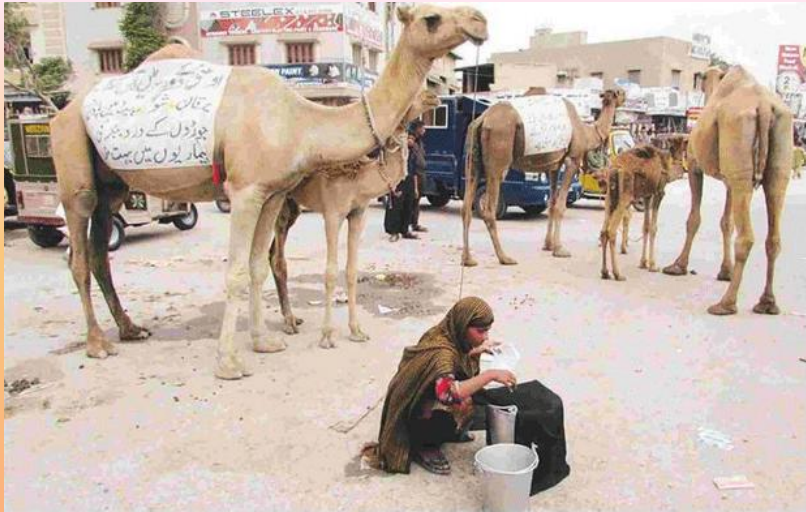
- All minerals except **Na** had showed a very minute variation among parities while Na contents followed a irregular pattern (Raziq 2009).
- **Na changes** were different among various parities.
- **Parity exerted a visible effect** on the various contents of milk.
- These irregularities may be due to
  - **the age of the animal**
  - **continuous herd's movement**
  - **nutritional management and**
  - **the seasonal difference**



# Mineral Composition of camel milk (mg/100g)

Parity	Na	Mg	Fe	Mn	Cu	Zn
1	40.53	15.36	0.55	0.067	0.24	1.12
2	61.07	14.84	0.58	0.062	0.19	1.27
3	43.62	14.98	0.51	0.065	0.26	1.20
4	39.89	14.52	0.52	0.06	0.19	1.68
5	68.90	15.81	0.55	0.073	0.22	1.93
6	42.52	14.75	0.56	0.073	0.27	1.34
Average	49.42	15.04	0.55	0.066	0.22	1.42

# CAMEL MILK IN PAKISTAN



# Wonder Milk

- Wonder milk Dairy is first Karachi based Pak milk brand
- Empowers camel herders
- Produced from Best Thar Camels
- As mal-nutritioned children in Africa are left with camel herders, it can be savior of millions of hungry and starving people.



# MARHABA CAMEL MILK

- Marhaba Camel in new brand (2013)
- Marhaba Milk, Marhaba Milk Bar
- They claim that its next super food
- Consider it health supplement





# CAMEL MILK @ UAF



Dept of Livestock Management  
at UAF has launched  
**DAACHI MILK** on  
World Camel Day 2014

Dr Ilse Rollefson has  
written an interesting  
Blog on this.



# CAMEL MILK @ UAF



**UAF**  
**DAACHI MILK**  
*a natural care*  
**Pasturized Camel Milk**  
**100 % Pure**

**Composition:**

Fat	4 %
Protein	3.7 %
Lactose	4.1 %
SNF	8.7 %
Specific gravity	1.030

**PRICE** Rs. 100

Best before 28 June, 2014  
Keep in refrigerator

**A registered product of University of Agriculture, Faisalabad-38040**



National Camel Conf June 25, 2019 at UAF



# ANMOL CAMEL MILK

- Anmol Milk Brand has been developed recently by L&DD Dept with the help of UVAS, Lahore (Mr Naseem Sadiq).
- This Brand is available in Lahore, Faisalabad on all Grocery Stores
- Fresh and pure milk from Cholistani Marecha and Brela she camels.



سنت نبویؐ ہی ہے۔ خدا اور شفا ایک ساتھ

قدرت کی آفت سے بچانے والا ہے  
اوپر ایت برائوں کے لیے ہے

انمول  
Camel Milk  
دودھ

مزید رہنمائی کیلئے ٹال فری نمبر 08000-9211 رابطہ کریں

100% PURE

اوغٹی کے دودھ میں وٹامن سی 23 ملی گرام فی لیٹر ہوتا ہے جو کہ باقی جانوروں کے دودھ کے مقابلے میں سب سے زیادہ ہے۔



دوسرے جانوروں کے دودھ کے برعکس اوغٹی کا دودھ بچوں میں اسہال اور الرجی جیسی شکایات سے بچاتا ہے



اوغٹی کا دودھ ذیابیطیس کے مریضوں کے لیے معجزے سے کم نہیں کیونکہ اس میں انسولین کی 50 پونٹ فی لیٹر موجود ہوتی ہے جو کسی اور جانور کے دودھ میں نہیں پائی جاتی۔



چکنائی کے بغیر دودھ وزن کم کرنے میں مدد کرتا ہے



دودھ کا استعمال جلد کو چمکدار اور جوان رکھتا ہے

مختلف جانوروں کے دودھ میں موجود اہم غذائی اجزاء

اجزاء	بھوس	اوبٹ	بھوس بکری	گائے	بھوس
پانی	85-87	83	88.9	87.8	85
لحمیات	3.5-4.5	5.4	3.1	3.2	3.2
چکنائی	3-4.5	6	3.5	3.9	6.5
نشاستہ	4.5	5.1	4.4	4.8	5.18
پوٹاش	63	95	95	66	66

قدرتی طور پر وٹامن کی اور شکر سالی کے دونوں میں اوغٹی کے دودھ میں مزید بڑھ جاتا ہے



مزید رہنمائی کیلئے ٹال فری نمبر 08000-9211 رابطہ کریں

محکمہ لائیو سٹاک اینڈ ڈیری ڈویلپمنٹ حکومت پنجاب اور یونیورسٹی آف ویٹرنری اینڈ اینیمل سائنسز، لاہور کا مشترکہ منصوبہ

# CAMEL DAIRY in CHOLISTAN



- Camel dairy is new initiative
- Camel Farming is Easy
  - In dry regions when bovines need lot of feed/water
  - in light and water scanty zones
  - eat native and salty desert spp.
  - de-desertification by UNESCO
- We are negotiating aggressively and trying to attract some international donors to establish a camel dairy in Cholistan (*inshaAllah*).



# CAMEL CHEESE

- It was believed that camel milk doesn't coagulate
- Rennet are used (vegetable and camel rennet)
- Camel cheese has become now specialty and trade
- Rashaida tribe in Sudan stores surplus milk, pulverize the dried curd

# CAMEL MILK PRODUCTS

- Balochistan herders converted into **defatted yogurt** is known as *Shalombey* (Raziq & Younas, 2009).
- Herders use *Shalombey* as drink while some salt is added.
- Sometimes herders add dried leaves powder of some herbs like *Shinshobey* (*Mentha longifolia*) for taste
- Therapeutic uses especially in summer.



**Kurth**  
made of the camel milk





# FACTORS AFFECTING MILK COMPOSITION

- Camel breed
- Vegetation type (Acacia or Salty bushes)
- Topography of the area
- Frequency of milking
- Stage of lactation
- Climate and ambient temp
- Time of study
- Analytical procedures



# CAMEL MILK PRODUCTS

Fermented milk products, like some are:

- Caucasus           kefir
- Armenia           matzoon
- India               dohdi
- Sardinia           gioddu
- Bulgaria           yoghurt
- Syria/Israel       lebben
- ME                 lebben



# INDIA

- National Research Center for Camel (NRCC), Bikaner, Rajasthan is a Research Institute, producing a lot many quality camel products.
- That it sells on subsidized rates to diabetics & to an alternative therapy center for children with disabilities.



# BUTTERFAT *from* CAMEL MILK

- Somewhat difficult to get butter fat separated from camel's milk due to
  - minute fat particles/globules and
  - their homogeneous presence.
- But the methods have been devised to separate the butter. They are seldom employed because of less appreciation of the milk and its by-products and lack of livestock extension activities (Qureshi, 1986).

# CHEESE *from* CAMEL MILK

- The processing of camel milk into **cheese** is **said** to be difficult (Yagil, 1982; Wilson, 1984)
- Majority of pastoral systems have produced at least one **type of cheese**.
- Fresh cheese with a high moisture content is perishable
- Shelf-life may be  $\uparrow$  to several months by air and sun drying (Abeiderrahmane, 1994).





# CAMEL DAIRY IN DUBAI

- A **best camel dairy of the world**
- A best value addition to camel milk for different products
- Camel Racing a big event
- Camel Dairy a best example
- Camel dairy model has been replicated by many countries





# CAMELICIOUS

## (Emirates)

- The Emirates Industry for Camel Milk & Products (**EICMP**), producer of the leading camel milk products ‘Camelicious’
- EICMP was established in 2003 and **launched its first product in 2006.**
- Exports to EU (27 countries)
- Once it was the largest camel milk **farm and factory in the world**, housing a herd of about 3,000 camels.



# Camel Milk Chocolate & Powder







# CAMEL MILK BUTTER

- In **Sahara**, butter is made by placing camel milk into a thin, hairless, goat-skin for 12 hrs.
- This skin is never washed with water. Inside temp **rises to 28°C**, a temp very similar to that used in the blender ([Lakosa and Rakin, 1964](#))
- Compared with cow, camel milk butter was found to have low saponification values, but a higher melting point and Iodine value ([Farah et al. 1989](#)).



# CAMEL MILK KEFIR



- Kefir derived from Turkish word **Kefir** “good feeling”
- Kefir is a primary product, made out of the camel milk.
- It is a **fermented milk** product.
- Ancient beverage of people from **Caucasus Mountains**, who attributed their long & healthy lives to traditional raw Kefir.



# SOMALIA & MAURITANIA

- Nutritional and Medicinal values were realized by **Somali Nomads** by centuries
- World has realized now.
- In **Mauritania**, some tribe use Calcium Phosphate and vegetable rennet
- Tiviski dairy produces “**Caravane**” cheese

# CAMEL MILK IN USA



- USA has ~ 5000 camels
- Camel milk is tested for antibiotic residues before selling
- People buy directly from Farms
- Used for Medical purposes or as a food of ethnic population
- Amish Farms in Mid West & Desert Farms Co
- Dr M Hinkle is a great Advisor



# AMISH IN USA

- Amish farmers, some of whom owned camels and used them for Christmas nativity scenes, to start milking the beasts.
- Seven camels were brought the Midwest to California.
- Selling the camel's milk and kefir in 50 California Whole Foods stores and by mail order.
- Camel milk retails for \$18 for a 16-ounce bottle, compared to about \$3.50 a gallon for the cow variety.
- “Camels don't give lots of milk, but what they do give is precious,”
- “They only give milk when they have a baby and lactation lasts from 10 mo to over a year.”
- A camel can produce about 2 gallons of milk a day, while a cow produces ~ 12.
- Nutritionally, camel milk and cow's milk are roughly equal: Camel's milk has less cholesterol than cow's milk, but it also contains less Vitamin A and B2.
- Milk tastes like regular milk, only slightly sweeter.
- The camel's diet plays a role: The less water it drinks, the sweeter the milk.

# LIVE EVERY DAY LIKE IT'S HUMP DAY

- The milk qualities drawing customers to “live every day like it’s hump day.”
- Some believe “It’s more for the well-aware, health-conscious community.”
- The Co estimates that 60 % its customers are the parents of children with autism.
- About 25 autistic children who were given camel’s milk, as opposed to cow’s milk, had lower levels of oxidative stress and showed improvements in behaviour.
- Study showed camel milk helping everything from diabetic wounds (in mice), to insulin resistance (in **28 Indians**), to allergies (if your allergy **is to cow’s milk**).
- “All in all, the research doesn’t amount to much,” wrote the physician **Harriet Hall** about the substance. “Camel milk can only be classed as experimental treatment.”
- Other options for those who want to avoid sugar, lactose, or cow’s milk proteins, such as **unsweetened almond milk**.
- For those who simply long to drink the mammary liquid of a dromedary, though, Desert Farms awaits.



# DESERT FARMS – CAMEL MILK

- **Camel milk** has been used for centuries as a natural remedy in the Middle East, Asian and North African cultures.
- Nomads and Bedouins still rely on **camel's milk** nutritional and medicinal properties, while generations of tribes have lived on **camel milk** entirely with a few dates for months in the harsh desert climate.
- **Desert Farms** has now captured their ancient knowledge and locked **camel milk** tight in a bottle. In the USA, the benefits of **camel milk** is now being embraced by health-conscious consumers, children with autism & people with diabetes.
- Desert Farms' camels live in small family farms in the USA where the average herd is about 6 camels. All Desert Farms camels are pasture-raised and eat a complex diet of hay, grass and alfalfa pellets.
- Containing only milk from USA-based camels and bottled entirely in America, **Desert Farms - Camel Milk** is available in several distinct varieties (Raw Camel Milk; Raw Camel Milk (Frozen); Raw Camel Milk Kefir; Pasteurized Camel Milk and Raw Camel Milk Colostrum).

# Camel Association in MI, USA

The **Troyer Family**: Farming and Living with Organic Convictions



Colostrum



Quarter Bottles



Association on  
Camel



# NUTRITIONAL VALUE (1)



- NUTRITIONAL richness value is because of:
  - More Protein than cow's milk
  - Less fat than cows milk
  - Less lactose than cow' milk
  - Cholesterol is low (than cow/goat)
  - 3 X higher Vit C
  - 10 X higher Fe than cow's milk
  - More Vitamins & Minerals
  - K, Mg, Cu, Mn, Na & Zn are ↑ than cow

# NUTRITIONAL VALUE (1.2)



- NUTRITIONAL richness value is because of:
  - Fat with fewer short-chained FA
  - Higher conc. of linoleic acid among PUFA, essential for human nutrition
  - ↑ in PUFA & B Vit
  - ↓ in Vit A and B-12 than cow milk

# MEDICINAL VALUE (2)



- Natural gift to humanity (medical remedy)
- Rich source of protein with potential antimicrobial & protective activities
- Lactoferrin (lactotransferrin) a multifunctional protein
- Lactoferrin (7 g/L in colostrum, 1 g/L in milk)
- Rich source of insulin (~52 units in 1 liter)
- Lactose intolerant persons
- Low fat makes it good choice (for arteriosclerosis, high blood pressures and heart diseases)
- Camel milk modulates the immune system



# MEDICINAL VALUE (2.1)

- Acts as anti-allergent
- Camel milk therapy to control diabetes and allergies
- The herder accepts its role as remedy of **liver disfunctioning, arthritis, long bone pain** and **aphrodisiac** contents.
- That's why the herders rely on camel as **potential milch animal** in the drought years.

# MISCELLANEOUS VALUE (3)



- More immunoglobulin contents
- Close to human milk than any other
- Therapy for AIDS patients and autism children
- Milk Properties discussed keeps camel healthy
- Lot of cosmetics also produced from camel milk.
- Bedouins believe it has a curative power



# BENEFITS TO DESERT PEOPLE

- Desert people depend on Camel for many things.
- Not only as a **best form of transportation**, but its their grocery store.
- Source of income & food security for poor herders
- **White Gold of Desert**
- Camel gives **very rich milk**
- Converted to **butter, cheese and other products.**
- Natural medical remedy.
- More **minerals makes survival against heat stress**

# CLIMATE CHANGE & FOOD SECURITY

- Camel is **best example** to stay in production during adverse & difficult environs.
- To produce with less feed, water & aridity
- Face and avoid **heat stress** in deserts
- **Water conservation** properties
- Provides milk as **food supplement** in deserts to Rohi nomads



# DREAM COME TRUE?

- Dev of infrastructure, milk collection, value addition, Camel dairying, appreciation of camel milk, R&D (on production & health) is required to put smile of the faces of Camel herders and Rohi people.
- **Know our Camel** and its attributes
- We have the best Camels, but best Scientists are...
- We have to save **Camel and its herders**
- **We need to stop illegal trade**, We can't do it alone? We have to have a **holistic approach and mutual cooperation**
- CAP is trying to contribute little, need your cooperation to make it happen.





# CONCLUSION

- Camel is **woven in the socio-economic system** of the herders
- The **camels** are the main stay of the **pastoral communities & nomads in difficult environs.**
- Low Fat, high Protein, Lactose tolerance and other nutritional and medicinal values make the camel milk and its products a **superior food.**
- Lot of attention on **R&D** is required on camel production and health.



**Drink camel milk  
Be happy &  
Be healthy**



**THANK YOU**