

# A Global Perspective on Pastoralist Value

Mountain Ecosystems and Resources Management  
Summer Field School (Online)  
24 September 2021

## Convention on Biological Diversity Says:

- Many endangered species survive in zoos and botanical gardens
- Key ecosystems preserved through protective measures are not sustainable
- Species and ecosystems need freedom to evolve in their natural conditions
- Economic policies should create financial resources for those who would otherwise damage natural resources
- World is facing multiple crises, per former UN Chief Moon
- Ten years to act, per Moon
- Traditional methods can help sustain biodiverse life



## Indigenous & Tribal People Sustain Genetic Legacies

- Indigenous people, 4-5% of world population, live in regions that contain the majority of world's biodiverse resources
- Traditional healing can be key to medicine
- Pharmaceuticals are sourced from biodiverse plants, animals etc.
- These 'gene banks' are key to human and animal health
- Pastoral livestock uptakes appropriate nutrients and produces food directly = less harmful processing & local sustainability, soil health



## Pastoralists and Rangelands are Important to the World

- 54% of the world is rangelands, per Rangelands Atlas Database
- Rangelands are home to many nomadic and pastoral livestock keepers, who are often “underrated”
- This biodiverse resource can be exploited or experience desertification if not managed



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## Pastoralist Traditions Helped Save My Son

- I met a man with a camel in California (he had Middle Eastern roots) and thought it might help my son's autism symptoms
- I flew in frozen Bedouin camel milk from the Middle East
- He was having many problems due to ASD
- Nomadic people knew about camel milk's health benefits but not for autism



## My Own Clinical Experiment

- October 2007, gave ½ cup milk with cereal at bed
- Next AM, speech fluidity, eye contact, emotion & complex conversations
- “I love you, you do so much for me, you’re really great.”
- Within 3 days, crossed parking lots alone
- Behavior breakdowns stopped



First use of camel milk for ASD  
October, 2007

## The Results Were Amazing

- White bumps on cheeks faded
- Returned to public school
- Improved pragmatics & range
- Worked as an antidote to food intolerance
- Tolerated more foods
- Overall 30% improvement in ASD symptoms
- Got USDA permission to import
- I wrote an article that went viral and kicked off new interest in camel milk across the world

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2012 article went viral, inspiring parents & industry

# Nomadic-Inspired Treatment Recorded in Scientific Journal

- Wrote a journal article describing the case study
- Now cited 14 times



2013 GAHM Case Report  
generated scientific interest—now  
cited in research



## Example: Kids with Autism Before and After Camel Milk



## Camels Led Me to Greater Pastoralist/Nomad Awareness

- US, Middle East, India
- Spoke with cameleers from Somalia, Kenya, Mexico, Europe, Mongolia, Central Asia, Morocco, Mauritania, Israel, and many more
- Introduced camel people to others to build network
- Visited and reported on camels, usually in remote locations



## Pastoralist Products and Knowledge are Outside the Mainstream – Why?

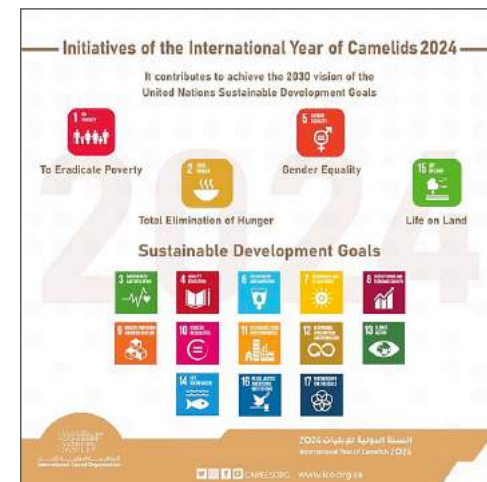
- Traditional livestock knowledge is held by rural cultures with low visibility and credibility
- They often are on the move and not 'connected' to settled areas
- Often conservative and insular societies
- Products now emerging
- Steep odds of survival
- We need to increase pastoralist/nomads' value to markets, society, and preserve their land access



Amish camel milk products from  
PA, US

## Example: International Year of Camelids 2024

- UN says: raise public awareness of camelids for food security and ecosystems
- Goal: increase consumption of goods produced from camelids, to contribute to the eradication of hunger, malnutrition
- The International Camel Organization of Saudi Arabia is also fostering awareness of camel value, etc.
- Also: World Milk Day, World Camel and Donkey Days, and other opportunities to raise livestock/pastoralist awareness



## Ways to Increase Pastoral/Animal Value and Survival

- Science
- Human Health
- Food
- Entertainment
- Textiles
- Crafts



## Camel Milk: A Small But Growing Health/Food Industry

- Camel milk is potential \$10.2B industry in 10 years (FAO)
- Camel are 2<sup>nd</sup>-fastest-growing herbivorous livestock animal
- Demand rising due to autism, health consumers plus Muslim meat/milk market
- Not supported by most govts yet
- When I started only a few world dairies
- Now many around the world
- 3 million tons of CM officially sold but 70% of camel milk is consumed by the camel owners & never reaches market
- Saudi Arabia a top CM market
- Fake/adulterated milk starting to appear (sign of success!)
- More studies emerging



# Camelids Demonstrate the Scientific Value of Pastoral Animals

- Camels are unique
  - Oval blood cells, unique biology and adaptations, etc.
  - Camel antibodies/immunoglobulins/IgGs resist pathogens (germs)
  - Camel/camelid-derived (llama) nanobodies have medical potential for diagnosis and therapies including COVID-19
  - Snakebite, cancer, platform for vaccines and immunotherapy, antiviral therapy, neutralize beta coronaviruses, etc
  - New study re: MERS-exposed camels possible COVID therapy use
  - Llamas Cormac and Fifi's antibodies promising for COVID



## Example: Diabetes Patient Report

- Rena Solomon (disaster rescuer known as “Angel in a Hummer”) diagnosed with Type 2 diabetes
- Was put on Metformin, Trulicity and insulin (Trulicity made her sick)
- Frozen cm helped but not enough
- Bought camels to try fresh raw milk
- Took 16 ounces a day for 6 months,, stopped insulin and Trulicity
- A1C dropped to 5.5 on CM and Metformin
- Blood sugar drops under 100 after fresh CM
- Pain in hands also stopped





## Donkeys Also a Highly Challenged Pastoralist Asset

- Milk used medicinally since ancient times (Romans, etc)
- Many qualities similar to camel milk (anti-tumor, anti-viral, anti-bacterial, etc)
- Helps infants, PANS/PANDAS, etc
- Turkana Kenyan pastoralists use for transport, are very distressed now
- Chinese etc demand for meat, hide, medicinal products = catastrophic slaughter (-800K Kenyan donkeys in 3 years)
- May be diminished as Kenyan species by 2023

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*Turkana Donkey Owners Association protests against the High Court decision that allowed the reopening of slaughterhouses, 2021  
Image: HESBORN ETYANG*

## Donkey Pastoralists Declining in India But Milk Listed for Sale

- Situation similar to Indian camels: grazing, age of herders, etc
- Dairy output very, very low but potentially valuable (Gujarat milk)



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*Chanabhai Rudabhai Bharwad demonstrates the process of milking a Halari. This milk is believed to be an immunity-booster and to possess many positive medicinal qualities ([ruralindiaonline.org](http://ruralindiaonline.org))*

## Traditional Fabrics and Handicrafts (Soaps, Cosmetics)



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## Entertainment, Tourism

- Racing
- Fairs/Festivals
- Milking contests
- Tourism
- Rides/Treks
- Time with animals



## US Amish-Mennonite Farm Family



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A farm-focused, low-tech,  
pastoralist-style group culture

## Worth Saving: Nomadic and Pastoral Value and Wisdom

- Livestock has been the backbone of society
- Camels and cattle form the wealth, status, trading ability of many cultures
- Their lifestyles can benefit us all
- Sudanese camels grazing on rich natural pasture have improved Omega-threes and offer human health benefits per study
- Animal soil interaction & droppings can improve habitat of smaller species, seed spreading, etc



Lahawein tribe on the move after rainy season

## Social and Lifestyle Value: A Nomad Speaks

- Meet Sidi Amar, a Toureg nomadic camel herder from Niger
- Sidi trains camels in the US and has lived here for many years
- Sidi exemplifies the great traits of nomadic life
- He can sleep anywhere, adjust to any group, understand animals
- “If I knew then what I know now, I would be a nomad, back home raising my camels.”



## Everyone Can Benefit from Pastoralist Ways

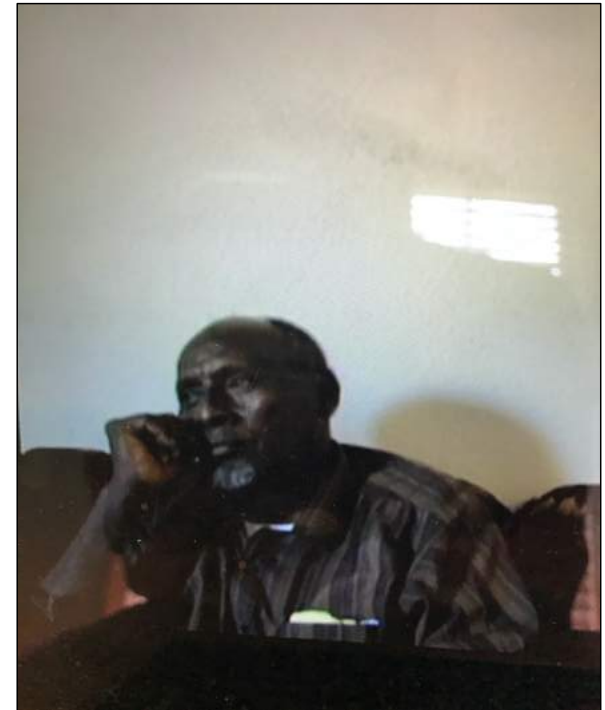
- Societies are healthier with outdoor interaction
- Nature helps destress us and enrich microbiomes
- Exposure to dirt, animals, sun, plants increases immune function
- Teach children to be comfortable with nature: plants, prepping raw foods, dirt, soil, unplugging from WIFI
- Echoing nomadic traditions increases skills, self-sufficiency
- Engaging with people from other ways of life strengthens our world and creates courtesy and respect
- Schedule these opportunities or they won't happen





## Engagement with Nature is Valuable to Humans

- “Forest bathing” increases human killer cells, has documented anti-cancer and calming effects in males and females, effects lasted 7 days
- Nomadic children had better health than settled children (Northern Kenya study)
- Somali seniors said they never saw children who could not learn or sit still
- They retain the wisdom of a pastoral way of life—a human ‘genetic legacy’
- If society could utilize their knowledge and monetize it through their biodiverse traditions (living in forest/jungle etc. on CM), people would benefit



## Pastoralists and Nomadic People Need Help

- Low demand for draft animals, water & grazing rights battles, discrimination, disinterest from youth, strict regulation, lack of finance hurts, clan conflict
- Loss of grazing increases camel illness and mange, etc
- Chilled transportation/storage challenges in dry, arid countries
- Belief systems and govt do not overall support camel milk sales, but it's slowly changing
- US 'pastoralists' (very traditional Amish and other camel farmers) are not nomads but share similar challenges
- Excessive milk regulations are burdensome
- COVID-19 outreach needed



# Camels Need Increased Support



This Camel Day  
**Support  
Camels**

From 4 lac in 2012, the population of Camels in India has dropped to 2.5 lac in 2020. How many camels do you think will be left with us by 2030?

**Why should we care to support them?**

Whether droughts or high temperatures, they are the ones who can survive it all! They're our future even when it comes to global warming.

**How do we support them?**

Spread Awareness.  
Support Camel Herders.  
Help Create a Camel-Friendly Economy

An Initiative by Aadvik Foods



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## Pastoralists/Rangelands Need Peace and Development

- Livestock can bring parts of society together
- Market value may create allies in troubled areas
- Mediation & technology may help herder-grazing disputes
- Camels take less water and feed—good for climate
- Crossing borders/cultures to help children & sick people, create safe zones for camels
- Remember the nomadic tradition of giving it to the sick for free/govt should support this by underwriting milk
- Early-stage science funding for pastoral resources
- Example: Dr. Ilse/LPPS has new mapping project for pastoralists



# Mongolian Rangeland Example

- Mongolia has wide intact rangelands
- Camel (Bactrian) products increasingly used in textiles, fashion, products for intl market
- Green Gold project is key to this effort
- They have 21 herder groups and code of practices
- The “Responsible Nomads” tracking system standardizes steps for sustainability via a rangelands data base mapping site
- Protects wildlife, habitats, rare plants
- Increases household and female income (common in camel cultures)

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## 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 **capnar**, 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 (**iyap**) 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 (**naasa**) 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 alcoholic drink.



### Horse, *Equus verus caballus*

Horses (**azyg**) 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 **alrag**, a kind of horse milk champagne.



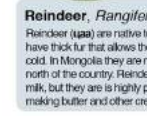
### Sheep, *Ovis aries*

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



### Goat, *Capra hircus*

Goats (**heesa**) 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 (**yaas**) are native to the tundra 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 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	6.45	4.3	5.3	3.4	3.1		
Protein	4.3	4.2	2.6	4.5	1.1		
Fat	5.3	5.1	8.3	3.16			
Water	83.88	85.89	82.85	88.68			
Vitamins (mg)							
A	0.01	0.05	0.1	0.0	0.03	0.03	nd
B1	0.03	0.05	0.01	0.01	0.04	0.03	nd
B2	0.05	0.17	0.12	0.06	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	159	33	160	153	320
Iron	0.3	0.03	0.3	0.05	0.1	0.1	nd
Magnesium	17	10	8	12	20	24	19
Potassium	132	130	166	85	138	163	156
Sodium	55	43	66	10	51	52	48

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

## The Next Generation Needs Exposure to Pastoralists, Biodiversity



# A Success: Camel Pastoralists Are Gaining Ground (Mostly)

- Since I began, things have changed a lot
- Now thousands of families across the world use camel milk
- New research continues
- New companies are distributing camel milk in many countries
- My dream of universal access to camel milk is coming true

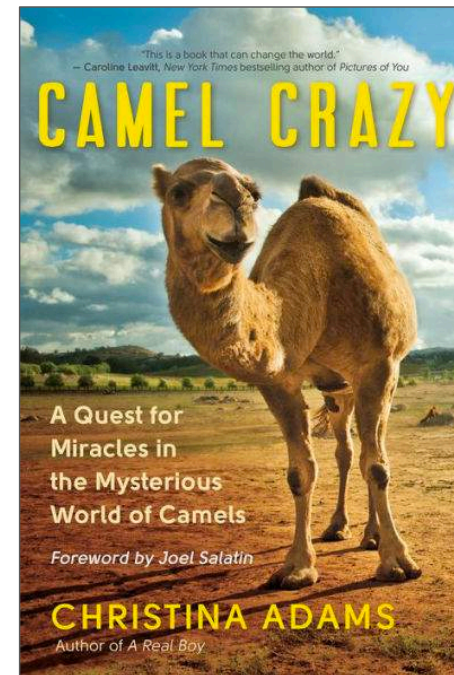


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## Camel Crazy Shares the Global Camel Story

- It is now sold around the world
- Helps camel milk farmers, sellers and pastoralists
- Helps families—explains CM, how to use, health benefits for diabetes, autism, food/gut, etc
- Contains list of global milk sellers
- Helps connect pastoralists, consumers, producers, and vets/science researchers
- Goal was to share the value of pastoralists/nomads
- Won a Nautilus Book Award





## Let's Keep Pastoralist Awareness Going

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