

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
- 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 (autism)
- 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
- 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
- I wrote an article that went viral and kicked off new interest in camel milk across the
- Nomadic-inspired treatment recorded in scientific journal
- Wrote a journal article describing the case study
- Now has been cited 14 times
- Example: kids with autism before and after camel milk
- Autism Rising Globally, So Need for CM Will Increase
- “It feels like some kind of science fiction,” said Walter Zahorodny, an associate professor of pediatrics at Rutgers New Jersey Medical School. “To say that 7% of 8-year-olds in one school district — and 5% of 8-year-old boys statewide — have autism is shocking,” he added, “but in reality, this is true. And it can’t be explained.”
- Natural therapies are more attractive to such parents than medications
- Other inflammation-related disorders also rising, ie. Diabetes Type One and Two, ADD, etc.
- Food allergies, gastrointestinal issues, etc.
- I list these issues and more in my Camel Crazy book
- 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
- Camels Led Me to Greater Biodiverse Awareness
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- A Global Community Recognizes the Value of Camel Milk
- I write & advise scientists, vets, doctors, companies, farmers, cultural & health communities, parents
- Visit camel farms, taste milks, research science
- US/Global: all countries have autism
- The milk brings out dads, brings communities together, helps lift awareness of camels
- Female veterinarians like Dr. Ilse Kohler-Rollefsen of LPPS are in the forefront of camel milk and pastoralists (India)
- The Value of Camel Milk Created a Global Community
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- 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
- 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
- Camel Milk: A Small But Growing Health/Food Industry
- Camel milk is potential \$10.2B industry in 10 years (FAO)
- Camel are 2nd-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
 - Camels/Camelids & Other Pastoral Animals Have Scientific Value

- Camels are unique
 - Oval blood cells
 - Camel antibodies/immunoglobulins/IgGs resist pathogens (germs)
 - Only heavy chain antibodies (left), not light & heavy like most species (right)
- Ancient gene family that allows human use
 - Camel/camelid-derived nanobodies have extreme medical potential for diagnosis and therapies
 - Snakebite, cancer, platform for vaccines and immunotherapy, antiviral therapy, neutralize beta coronaviruses, etc
 - Donkey milk also has beneficial medical properties
 - Camelid Antibodies & Nanobodies
- Antibodies can bind specific pathogens, have antibacterial activity
- Nanobodies are smallest intact antigen-binding fragments
- Derived from only heavy-chain antibody creatures (camelids/ sharks).
- Work like antibodies but have high target affinity w/low toxicity
- So tiny (1-10th of normal size) they can penetrate tissue better than conventional antibodies
- COVID-19 spike blocked—nanobodies can be made into an aerosol and inhaled
- Traditional Foods May Be Functional/'Therapeutic' Foods
- Camel milk is one example
- Ancient healing remedy
- Immunoglobulins may 'kill' antigens
- Insulin, enzymes w/antibacterial & immunological properties (especially lactoferrin) plus probiotics, GABA
- Anti-oxidant, anti-inflammatory
- May positively impact gut bacteria, linked to better brain health/decreased ASD symptoms/aging well
- 80% of camel milk from India's Camel Charisma sold to parents of autistic kids (TB use also)—feed on 36 ayurvedic plants
 - 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
- Donkey Pastoralists Declining in India But Milk Listed for Sale
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 - Traditional Fabrics and Handicrafts (Soaps, Cosmetics)
- Entertainment
- Racing
- Fairs/Festivals
- Milking contests
- Tourism
- Rides/Treks
- Time with animals
- 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
- US Amish-Mennonite Farm Family
- 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
- (And Don’t Forget--Pastoralists Need Vet Care)
- Traditional medicines can be weak and less effective
- Pastoralists may not be able to afford medications
- Mange is an issue
- Herds need testing for TB, Brucellosis, especially milking herds
- Injuries need treating as pastoralists may not afford treatment
- New interest in vets treating camels in US
- 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)
- California Wildlife: A Suburban Biodiversity Example
- Loss of local habitat from buildings/highways
- Wildlife decreasing due to inbreeding-related poor health in smaller habitat

- This ‘monoculture’ creates disease spread, fertility problems, birth defects
- Human activity intimidating wildlife crossings, etc
- New project: Dark tunnel under 17-lane highway creates blockage, being modified with night lighting, logs/rocks for shelter, will connect two wildlife reservoirs
- Goal of “genetic connectivity” will create new bobcat generation every 5 years if successful
- Mountain lions will return (not seen in 20 years)
- 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
- 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
- One goal was to share the value of pastoralists and nomads
- Let’s Keep Pastoralist Awareness Going
- Orderbook from bookstores or online sites
- Hump Group UK/Aadvik Foods India
- www.ChristinaAdamsAuthor.com
- Facebook ChristinaAdams Author
- Twitter @camelmilkinfo
- Instagram @Christina_Adams_Author