

PROCEEDINGS



**WORLD CAMEL DAY**

**International Symposium on  
Camel as the Animal of Future  
22<sup>nd</sup> June 2020**

**Organized by  
Virtual University of Pakistan  
(Department of Molecular Biology)**

**in Collaboration with  
Camel Association of Pakistan (CAP)  
&  
Saudi Geographical Society (SGS)  
&  
International Society of Camelid  
Research and Development (ISOCARD)**





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**Department of Molecular Biology, Virtual University of Pakistan,  
Lahore**

*in collaboration with*

**Camel Associate of Pakistan (CAP)**

**&**

**Saudi Geographical Society, Kingdom of Saudi Arabia (SGS)**

**&**

**International Society of Camelid Research and Development  
(ISOCARD)**

**Focal Person:**

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## EVENT BROCHURE

World Camel Day



22<sup>nd</sup>

June 2020, Monday

Time: 10:00 AM - 03:00 PM  
(Pakistan Std. Time)

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**The International Society  
of Camelid Research  
and Development  
(ISOCARD)**



Dr. Rafat Al Jasim  
Australia



Dr. Bernard Faye  
France



Dr. Piers Simpkin  
Kenya



Dr. Tahereh  
Mohammabadi, Iran



Dr. Abdul Raziq Kakar  
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Prof. Dr. Muhammad  
Younas, Pakistan



Prof. Dr. Masroor  
Ellahi Babar, Pakistan



Dr. Karima A. Al Salihi  
Iraq



Dr. Pamela Burger  
Austria



Prof. Dr. Mohamed Metwaly  
The Kingdom of Saudi Arabia



Prof. Han Jianlin  
China



Prof. Dr. Talal A.  
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FOR REGISTRATION

<https://bit.ly/intlcamel>

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**Editor:** Dr. Tanveer Hussain







**Co-Editors:** Dr. Midhat Salman








Mr. Syed Hassan Abbas

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<p><b>Focal Person</b></p>	
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## PROGRAM

<b>22<sup>nd</sup> June 2020 (Monday)</b> <b>Pakistan Standard Time – UTC/GMT+5 hours</b>	
<b>Inaugural Session</b>	
<b>10:00 a.m.</b>	Holy Quran Recitation
<b>10:05 a.m.</b>	Aims and Objectives of the symposium by the Focal Person, Dr. Tanveer Hussain
<b>10:10 a.m.</b>	Welcome address by the Rector, Virtual University of Pakistan, Mr. Naeem Tariq
<b>10:15 a.m.</b>	Message from the Camel Association of Pakistan by Prof. Dr. Muhammad Riaz Virk
<b>10:20 a.m.</b>	Message from the Saudi Geographical Society of Kingdom of Saudi Arabia by Dr. Ali Aldosari
<b>10:25 a.m.</b>	Message from ISOCARD by Dr. Rafat Al Jassim
<b>10:30 a.m.</b>	Address by the Chief Guest
<b>1<sup>st</sup> Technical Session</b> (Moderator: Ms. Zinnia Mansoor)	
<b>10:45 a.m.</b>	How the Camels are Made? <b>Prof. Dr. Muhammad Younas</b> , Patron, Camel Association of Pakistan
<b>11:15 a.m.</b>	The Impact of Camels on Climate and Natural Resources. <b>Dr. Rafat Al Jassim</b> , Nutrition Biochemist & Gut Microbiologist, Australian Institute for Bioengineering and Nanotechnology & Centre for Animal Science, The university of Queensland, Australia
<b>11:45 a.m.</b>	Is the Camel the Animal of the Future? One perspective from Kenya. <b>Dr Piers Simpkin</b> , Technical Consultant to Frontier Counties Development Consultant (FCDC), Nairobi, Kenya.
<b>12:15 p.m.</b>	Dromedary Camel: A Sustainable Dairy Animal in Challenging Environments. <b>Dr. Adul Raziq Kakar</b> , Technical Manager, Camel Farms, Alain Farms for Livestock Production, Alain, U.A.E.
<b>12:30 p.m.</b>	The current and future Camel studies in Saudi Arabia. <b>Prof. Dr. Mohamed Ahmed Metwaly</b> , Member of Saudi Society of Camel Studies, King Saud University, Saudi Arabia
<b>12:45 p.m.</b>	Isolation and partial characterization of pregnancy-specific protein B (PSPB) from Iraqi dromedary camels, <b>Prof. Dr. Talal A. Abdulkareem</b> , Department of Animal Production, College of Agricultural Engineering Sciences, University of Baghdad, Iraq
<b>01:00 p.m.</b>	<b>Break</b>
<b>2<sup>nd</sup> Technical Session</b> (Moderator: Dr. Midhat Salman)	
<b>01:15 p.m.</b>	The Assets of the Camel and Camel Farming for the Future. <b>Dr. Bernard Faye</b> , Chairman, ISOCARD, France
<b>01:45 p.m.</b>	Camel Milk; a Superfood as Adjunctive Therapy for Diabetes. <b>Dr Tahereh Mohammadabadi</b> , Associate Professor, Department of Animal Science. Faculty of Animal Science and Food Technology, The Agricultural Sciences and Natural Resources University of Khuzestan, Iran
<b>02:00 p.m.</b>	Zoonotic Diseases of Camel. <b>Dr. Karima Al-Salihi</b> , College of Veterinary Medicine, Al Muthanna University, Iraq
<b>02:15 p.m.</b>	Camel Genome Consortium. <b>Dr. Pamela Burger</b> , Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna, Vienna, Austria
<b>02:30 p.m.</b>	Frontiers in Genomics Research and Dairy Industry of Chinese Bactrian Camels. <b>Dr. Han</b>



International Symposium on “Camel as the Animal of Future”

Department of Molecular Biology, Virtual University of Pakistan, Lahore

	<b>Jianlin</b> , ILRI, Institute of Animal Science, Chinese Academy of Agricultural Sciences (CAAS), China
<b>02:45 p.m.</b>	Genomic Techniques to explore the Potentials of Camel. <b>Prof. Dr. Masroor Ellahi Babar</b> , Vice Chancellor, The University of Agriculture, Dera Ismail Khan, Pakistan
<b>Concluding Ceremony</b>	
<b>03:00 p.m.</b>	Vote of Thanks by the Dean, Faculty of Science & Technology, VUP, Prof. Dr. Muhammad Arif Rafiq
<b>03:05 p.m.</b>	Closing remarks by the Rector, Virtual University of Pakistan, Mr. Naeem Tariq

## **VIRTUAL UNIVERSITY OF PAKISTAN**

[www.vu.edu.pk](http://www.vu.edu.pk)

The Virtual University of Pakistan is the pioneering e-distant educational institute within Pakistan and since its inception in 2002, it has been disseminating knowledge by taking education to the doorstep of students. Using free-to-air satellite television broadcasts and the Internet, the Virtual University allows students to follow its rigorous programs regardless of their physical locations. Currently, the university has more than 200 campuses across Pakistan with an enrollment of more than 250 thousand students in over 90 degree programs. It is also the first University in Pakistan that offers degree programs in the realm of life sciences in a virtual mode. Pakistani students residing overseas in more than 50 countries are also enrolled in the

The Virtual University, Pakistan’s first University based completely on modern Information and Communication Technologies, was established by the Government as a public sector, not-for-profit institution with a clear mission: to provide extremely affordable world class education to aspiring students all over the country. Using free-to-air satellite television broadcasts and the Internet, the Virtual University allows students to follow its rigorous programs regardless of their physical locations.

VU aspires to be a leading teaching and research university, recognized nationally and globally as a hub of academic excellence, producing highly skilled empowered professionals and leaders who would contribute positively to the socio-economic development of Pakistan.

## AIMS AND OBJECTIVES

Camel is a desert animal that has been a vital source of food, wool and leather and an important means of transport since ancient times. Its ability to sustain in extremely harsh environments paired with special properties of its meat and milk has increased its importance as a livestock species under the current threats of global climate change. Rapid increase in population along with issues of food security has highlighted the need of alternative food resources that will be available even when the grazing pastures are gone and the water supply is scarce. Camel can act as a great alternative, being a source of milk and meat in such conditions, because of its varied dietary requirements compared to other livestock and the ability to withstand water scarcity for longer periods of time. Its milk has immense nutritional value and is considered as superfood. Many studies are now underway worldwide to understand camel biology specifically genetics, to explore its potential for sustainable utilization and conservation. However, ladies and gentlemen, it is important to note that raising camels as a livestock comes with challenges of its own that requires further research.

Keeping in view the importance of camels in future and the current challenges faced in their rearing, nutrition, health, reproduction, breeding and genomics, the Department of Molecular Biology, Faculty of Science & Technology, Virtual University of Pakistan has organized a one day international symposium on the World Camel Day, June 22, 2020 with a theme of “Camel as the Animal of Future” in collaboration with Camel Association of Pakistan, Saudi Geographical Society of Kingdom of Saudi Arabia and the International Society of Camelid Research and Development (ISOCARD). Scientists and researchers from different parts of the world have been invited to share their knowledge about exploring this wonderful creature and to enhance awareness about its better utilization in future.

The forum will also provide an opportunity to all for collaborating in research on various aspects of camel in the days ahead. Ladies and Gentlemen, I take this as an opportunity to thank our collaborators for their input as well as esteemed panelists for joining us today despite being in different time zones. I would also like thank you all for being a part of this event and hope that the sessions will bring us beneficial knowledge.

Dr. Tanveer Hussain  
Focal Person,  
Associate Professor, Department of Molecular Biology,  
Virtual University of Pakistan, Lahore

## MESSAGES ON THE WORLD CAMEL DAY



## CAMEL ASSOCIATE OF PAKISTAN

cappak.wordpress.com

I am pleased to welcome all camel stake holders, farmers, researchers, scientists and academicians participating in the International symposium “Camel as the Animal of Future” at the eve of Camel Day 22<sup>nd</sup> June 2020 in Pakistan. It is felt in mark of respect the whole day as Allah Subhana Wataala (ASWT) gifted the mankind such a wonderful animal. Camel has ever been helpmate of the mankind in this world. It is all in one having the answer to all of the purposes of Livestock keeping. The camel can provide food security in any of the unsecure environment and potential to the level of commercial farming. It is mountain of meat, source of stable milk, Power source (DAP), fiber field, riding conveyance, racing industry, dancing pleasure, and recreation acrobatic activities as well needed both for mental and physical wellbeing of the mankind. For a long time the camel has been ignored despite of its valuable role in providing the animal source of protein to nomadic pastoral families surviving in remote areas. It is complimentary to mention here the pioneer research endeavors done for the last two decades by the research scholars, academicians trained by the professors of Department of Livestock Management, University of Agriculture Faisalabad now actively playing their role in various national/ international organizations in the country and abroad to exploit the production potential of camels in the benefits of stakeholders and vas interest of community are witnessed by the activity. There is much to do yet to explore the benefits and to raise the camel on commercial level using all available modern tools and innovations for the interest of farmers and to make quality products available for community in urban areas. Once again on behalf of CAP I am honored to thank the all participants, organizers, members of CAP and ISOCARD for their valuable participation and dedication for the subject in this vulnerable time of Pandemic COVID- 19 situation. I pray for all the success of the symposium and good health for the people.

Prof. Dr. Muhammad Riaz Virk  
President, Camel Association of Pakistan (CAP)  
Institute of Animal & Dairy Sciences, FAH  
University of Agriculture, Faisalabad-Pakistan

## **SAUDI GEOGRAPHICAL SOCIETY, KINGDOM OF SAUDI ARABIA**

saudigs.org/en

Saudi Geographical Society (SGS) is registered as a nonprofit academic society at King Saud University, to serve and represent the geography sciences in the Kingdom of Saudi Arabia (KSA). The first meeting of the General Congress of SGS took place on 22<sup>nd</sup> December 1984. Since then the Society has led out in important activities in the region which include publications of bilingual (Arabic and English) and biennial, refereed journals such as geographical research series, geographical studies series, and the Arabian Journal of Geographical Information Systems. In addition, the SGS publishes an annual bulletin that is dedicated to writing and translating references and publications to Arabic.

Organizing local and international events is an important way to deliver the knowledge of geography and to discuss human-environment phenomena. To this end, SGS organizes local and international field trips to explore the landscape of the Earth and human cultures. The SGS is a member of the International Geographical Union (IGU), the Food and Agriculture Organization (FAO) of the United Nations. The SGS also collaborates with many other geographical societies to exchange experiences and facilitate knowledge transfer, the latest of such arrangements being the “International Symposium on Camel as the Animal of Future”, organized by the Virtual University of Pakistan (VUP), in collaboration with the SGS, Camel Association of Pakistan (CAP), and the International Society of Camelid Research and Development (ISOCARD).

The activities of SGS primarily cover the whole of KSA with its population of over 27 million inhabitants (2010), land area of approximately 2 million square kilometers, total coastline length of 3,800 km, and about 1,285 Islands. The climate of the country is mainly arid and the land is comprised of narrow plains on the shore of the Red Sea westwards, and mountain ranges (above 2000m) eastwards. Three main deserts and rocky plateaus in the center cover 90% of the total land area of KSA, creating an optimum habitat for over half a million camels in the country. Many people have taken the camel as a symbol of their lives; with the camel, they have recalled the memory of the place and revived its full characteristics. Hence, the camel has become an ever-existing heritage mate. In addition, it provides the people with food resources such as meat, milk, and leather, and it is a renewable economic resource.

The camel has always played an essential part of Saudi culture as there is an annual Camel Festival every December, which includes camel racing, camel beauty contests, cultural events and owners’ meetings. Indeed, the Saudi Vision 2030 appreciates the value of the camel as the animal of the future. Officially, the International Camel Organization (ICO) was established in

Riyadh in 2019, with representatives of 96 countries in attendance. This reaffirmed the importance of camels in human history and their association with the legacy and culture of the world. The establishment of the World Camel Polo Federation and opening of the Salam Veterinary Hospital for Camels this year in Saudi Arabia are further testaments of the commitment of the government and people to the welfare of camels and the preservation of the culture and livelihoods of camel owners throughout the country and beyond.

Dr. Ali Abdullah Aldosari  
President,  
Saudi Geographical Society,  
Kingdom of Saudi Arabia

## **INTERNATIONAL SOCIETY OF CAMELID RESEARCH AND DEVELOPMENT**

[www.isocard.net](http://www.isocard.net)

The International Society of Camelid Research and Development (ISOCARD) is delighted to join the camelid communities and celebrate the camel day. Our participation reflects our commitments to the mission of ISOCARD as an international camelid research and development society and symbolizes our acknowledgment to the significance and the role this animal played over the years, since its domestication, to serve mankind. The camel has coevolved with man and provided man with food, shelter and enabled exploration of lands that couldn't've been reached otherwise.

ISOCARD take this opportunity to thank the Virtual University of Pakistan for the great initiative of organizing a virtual conference to mark this anniversary and celebrate the day.

We emphasize our commitment to provide a platform for camelid researchers to pursue their goals in investigating the potential of this animal and provide better understanding to its biology, value and role, particularly to the most vulnerable farming communities worldwide.

Let us be united and work together to make this day a memorable day, I personally wish you success in your endeavor.

Dr. Rafat Al Jassim  
On behalf of the EC  
ISOCARD



## ABSTRACTS

### HOW THE CAMELS ARE MADE?

Muhammad Younas<sup>1\*</sup>, Abdul Raziq<sup>2</sup> and Asim Faraz<sup>3</sup>

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<sup>3</sup>Department of Livestock & Poultry Production, Faculty of Veterinary Sciences,

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#### Abstract

Camel is one of the creations that Allah Almighty has asked us to ponder on. The camel is very technical, highly engineered animal with many special attributes not found in other animals. The camel has been made in such a way that it can survive in desert condition, during difficult environments and can provide food, blanket, loading, transportation and recreation, etc. This presentation will dwell it various features that make the camel to survive in deserts and stay in high spirit even when shortage of feed and water. Survival in desert is made possible because of its feet structure, sand cruising, its selective feeding habits, knee pads, long neck giving its chance to browse above, hump being its reservoir and head, ears, eyes & nostrils protecting it from sand storms. Its defensive nature, cunning habits and water conservation through blood cells, qualities are unique. The composition of milk and meat are so marvelous in providing good, safe and healthy foods to overcome many health ailments and allergies. Riding, racing and dancing of camels provide wonderful events of recreation all over the world. Brief resume of these superb qualities will be dealt in this presentation. All these qualities are not by the way, but these have been gifted by the Creator intentionally to live, survive and produce in deserts and range conditions for its dwellers.

## IMPACTS OF CAMELS ON CLIMATE AND NATURAL RESOURCES

Rafat Al Jassim

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### Abstract

The sustainability of animal industries depends on their ability to utilise available resources efficiently, face the challenges of climate change and adapt to world market flexibility. Climate change and depletion of natural resources threaten the sustainability of intensive high input animal operations and impact on biodiversity. The increase in world human population, which currently stands at 7.8 billion and is expected to reach 9 billion in 2037, is accompanied by shortages of food and water, increasing environmental degradation and a dramatic increase in poverty, whereby 39% of the world's population are undernourished or hungry. The rise in population is mainly seen in less developing parts of the world, with Africa alone expected to increase by 1 billion by 2050 and Asia by 650 million. During the same period, advanced economies will experience population decline and move toward being an aging society. This is mainly due to increased life expectancy and a lower fertility rate. The rise in world population has also coincided with an increase in % of urban areas from 30% in 1950, to 56% in 2020 and predicted to reach 68% in 2050. The challenges leaders and decision-makers of the highly populated and less developing countries face are to provide food and shelter for the growing population and alleviate the impact of poverty on people. The production of food from plant and animal industries can be very costly and have adverse impacts on the environment. Recent analysis of a large volume of data by Oxford University in the UK and the Swiss Agricultural Research Institute, Agroscope, published in Science in 2018, showed that a large proportion of the agricultural land, about 83%, is currently used to grow forages and grains for animals. However, in return, animal products contribute only 18% of calories, while the remaining 82% comes from plant sources. In addition, animal operations are the biggest contributors to anthropogenic greenhouse gas (GHG) emission, with 15% of it coming from livestock production with cattle being the biggest emitters of GHG (~ 40% of the 15%). The study suggested a shift in agricultural practices towards more food production than feeds and less overall reliance on animal products. However, the demand for meat, milk and eggs will continue to grow as a result of population growth and increasing consumer prosperity and urbanisation. Animal industries vary in their contribution to global GHG emissions and variations could be very high for the same animals and same product. Pakistan has a large population of cattle, buffalo and small ruminants (sheep and goats) and a relatively small camel herd (1.1 million). The Pakistani camels are known for their ability to produce a good volume of milk under a range of conditions and are well adapted to the arid and semi-arid environments. In addition, the camel has lower maintenance energy requirements and emits less GHG

compared with cattle. The development of the camel industry in Pakistan offers new opportunities, supports the most vulnerable communities and creates the balance between productivity and sustainability.



## IS THE CAMEL THE ANIMAL OF THE FUTURE? ONE PERSPECTIVE FROM KENYA

S. Piers Simpkin

Technical Consultant to Frontier Counties Development Consultant (FCDC), Nairobi, Kenya  
spsimpkin@gmail.com

### Abstract

The paper draws upon hitherto unpublished data from the authors PhD research in the 1990s, documenting the historical role of the camel (*Camelus dromedaries*) in pastoral societies and how camel breed and management system influence productivity. The author looks at the camel's contribution to food production and income, and investigates the current and potential future role of the camel in Kenya. Whilst camel numbers have risen significantly in Kenya over the last three decades, due to both intrinsic population growth, likely in-migration from neighboring countries; shifts in preferences in herd species composition due to climate change and probably due to changes in method of censusing livestock. The current population in Kenya is estimated at over 3 million animals, the majority kept under traditional nomadic production system. In terms of contribution to gross national economic production camels contribute much less than other livestock species despite producing more milk per kg live weight (0.5 kg/100kgLW) than cattle (0.4 kg/100kgLW), sheep and goats (0.375 kg/100kgLW), and comparable average daily mean growth rates (0.5, 0.438 and 0.265 kg/day between 0-12 months for Somali and Turkana and Rendille breed camels respectively) as cattle (0.5 kg/day Borana cattle) when kept under similar management conditions. Because of the camel's multiple adaptations to desert and drought conditions, and its major contribution to the resilience of pastoralists, enabling them to survive and thrive in arid environments subject to huge variability in rainfall, it has some drawbacks in terms of production that limit its full integration into commercial livestock production systems, such as its late age of maturation and slow reproductive rate, largely traditional management approaches and when compared to other species the lack of breed improvement especially towards milk production. Breed effect showed significant effect on total 12 month lactational yield (1141 and 890 kg for Somali and Turkana breed respectively  $P < 0.001$ ). Twelve month lactational yields for local cattle under similar conditions range from 300-800 kg, and 24-120 kg for goats. In some management systems camels were only able to feed 8-10 hours per day and calves were separated (Turkana and Gabbra systems) whilst others grazed/browsed for up to 15 hours a day with their calves (Somali system). The paper documents the constraints to improving camel productivity in Kenya and whilst recognizing that the camel's ability to adapt to climate change in Kenya and providing high quality milk and meat, it cautions that the hypothesis of the camel being the animal of the future depends more on global human factors and perceptions than the camel

itself. The paper identifies areas requiring more research and more investment, and raises questions and tries to define the future role of the camel in Kenya and other similar countries.

## DROMEDARY CAMEL: A SUSTAINABLE DAIRY ANIMAL IN CHALLENGING ENVIRONMENTS

Abdul Raziq Kakar<sup>1\*</sup>, Nisar Ahmad Wani<sup>2</sup>, Muhammad Younas<sup>3</sup>, Tahereh  
Muhammadabadi<sup>4</sup> and Liudmila Nadtochii<sup>5</sup>

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<sup>3</sup>Pioneer of Camel Production Science in Pakistan

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<sup>5</sup>Associate Professor at ITMO University in St. Petersburg, Russia

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### Abstract

Arabian Peninsula is home to one of the driest and challenging landscapes on the face of earth. It is probably one of the earliest victims of natural climate change, which is reported to have occurred around 4000-3000 BC. During those tough times, the survival of people in the region was challenging, however, the animal they domesticated was one of their main resources for them to survive. Yes, we are referring here the Arabian or dromedary camel (*Camelus dromedarius*). The nature has blessed this animal with unique and special traits making it a highly adaptable livestock species to harsh climate of Arabian Peninsula. The Arabian camel was domesticated initially for its meat and milk to feed the drought-stricken communities in the harsh and hostile ecosystem. The skin would be used to make shoes, water containers and even some dresses. Its wool was commonly used for tent and rug-making. It evolved to be one of the main sources of transportation for people and various supplies from place to place. The invention of automobiles pushed the camel from its primary role of transportation but is still best livestock in the region for its meat and milk production.

During the last decade camel milk attained world attention for its medicinal value, which lead to the establishment of many sophisticated and mechanized dairy farms in Middle East. Camel milk is declared as a super food and is considered to be nutritious, curing most of the nutritional deficiencies. This has led to people with entrepreneurship minds to establish camel diaries, even though at smaller levels, in some of the developed and non-camel habitat countries like USA, Australia and South Africa. The threat of climate change has increased the importance of camel manifold because of its sustainability in challenging climatic conditions and its conversion of far less and inferior food to high quality milk when compared to other livestock. For example, an exotic cow needs 8-10 times more water per unit of milk, in similar conditions, when compared to the camel. Camels eat tough vegetation and almost all parts of a plant including those usually overlooked by other animals. Keeping in view these facts about

the ability of camel as a sustainable livestock species, funding agencies at both national and international levels need to prioritize the research projects on this wonderful animal in order to improve its productivity and production ability.

## THE CURRENT AND FUTURE CAMEL STUDIES IN SAUDI ARABIA

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### Abstract

Camels are celebrated as a basic symbol of the desert lifestyle of the people of the Arabian Peninsula. They are connected to Arabs' history and life throughout the successive civilizations. When the Arabs in the Arabian Peninsula relied heavily on nature, the camels were present in their daily life style routines. With modern urbanization, the Arabs did not get along without camels. In the past, camels were helpers, now; they become basic icons of Arab heritage, life and economy. Based on the long history of the Camel use in the Saudi Arabia, the Saudi Society for Camel studies lunched five years ago to highlight the importance of the Camels based on three categories; the cultural, the economics and the health. Moreover, recently the Saudi governorate held different celebrations and activities for the Camel based on its importance as Arabian heritage. The International Camel Organization (ICO), Saudi Camel Club are the most important two examples. Also, there are a great efforts are running from the medical team belongs to King Saud University (KSU) for discovering the importance of the Camel milk, meat and urine in the treating of different diseases and increase the human immunity. The studies relating to the importance of the Camel need more efforts and gathering work in the near future particularly the world are suffering from pandemic diseases and probably the Camel studies can help in the regard.

## ISOLATION AND PARTIAL CHARACTERIZATION OF PREGNANCY-SPECIFIC PROTEIN B (PSPB) FROM IRAQI DROMEDARY CAMELS

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### Abstract

This study was conducted to isolate, purify and partially characterize PSPB from a female Iraqi dromedary camel placenta. Three adult female camels of 7-8 years old, used in this study. Females were naturally mated with the fertile male, following the appearance of estrus signs. Pregnancy checked for these females using rectal palpation at days 60 and 90 PM. Caesarean section performed by a specialist veterinarian surgeon to each female at months 5.5, 6 and 7.5 of gestation period. Isolation, purification and partial characterization procedures carried out at the laboratories of Biotracking LLC, Moscow, Idaho, USA. Placental samples were gamma irradiated at Foreign Animal Disease Diagnostic Laboratory (FADDL) that belongs to Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture for samples sterilization. Twenty three consecutive trials were carried out to isolate, purify and partially characterize camel PSPB. Results suggested that a MIX-2/ MAb-45 ELISA can be used to follow camelid PSPB (cPSPB) throughout the purification procedure, and the current anti-bovine antibodies can be used to successfully monitor the location of camelid PSPB during the purification steps. The camel PSPB had isoelectric points ranged from 4.1 to 5.4 and molecular mass of 15 kDa, 25 kDa, 50 kDa, 55 kDa and 65kDa. The major band was at 55 kDa and 65 kDa. This study describes for the first time the partially production of polyclonal antisera raised against PSPB molecules isolated from female camels placenta.

## THE ASSETS OF THE CAMEL AND CAMEL FARMING FOR THE FUTURE

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### Abstract

The future world is faced to many challenges and constraints. Regarding the countries where camel rearing plays a central part of the livestock economy, the camel could play a particular and original role. For long time, regarded as “an animal of the past” with the decreasing use of camel as packing and pulling animal over the world, camel is nowadays contributing (i) to the desertification combat thanks to its feeding behaviour and its digestive physiology, (ii) to the food security and poverty alleviation thanks to its drought resistance and added-value of its products, (iii) to the biodiversity of the domestic livestock, of the commercialized products and of the farming systems in arid areas, and (iv) to the biological research, notably in medicine, thanks to the peculiarities of some of its biological molecules as immunoglobulins and lactoferrin.



## CAMEL MILK; A SUPERFOOD AS ADJUNCTIVE THERAPY FOR DIABETES

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### Abstract

Camel milk is a unique source of nutrients. The amount of vitamin C, Mg, Fe, Cu and Zn in the camel milk is more than cow milk. Camel milk is great alternative for kids with allergy to cow milk due to lack of  $\beta$ -lactoglobulin and low  $\beta$ -casein as allergic proteins. Also camel milk has high amount of mono-and polyunsaturated fatty acids that have beneficial effects on the human health. Lactose of camel milk is more digestible than cow milk for lactose intolerance cases. Protective proteins of camel milk are including; lactoferrin, lactoperoxidase, lysozymes, immunoglobulins and peptidoglycan recognition protein that have medicinal properties. Small size immunoglobulins of camel milk strengthen the immune system. Furthermore, lactic acid bacteria of camel milk are effective on the gut health. Camel milk is having anti-diabetic activity possibly because of insulin like protein (about 52 units/liter), that covered by fat micelles and not destroyed in the stomach and helps to treat type 1 and 2 and gestational diabetes. According to the studies, raw camel milk in type 1 diabetes patients caused to increase insulin secretion, reduce blood sugar; reduce required insulin and insulin resistance. Camel milk has immune-modulatory effects on the pancreas  $\beta$ -cells and reduces diabetes complications. Raw camel milk is more beneficial for treatment and heating of camel milk in high temperature may destroy its therapeutic efficacy. But without heating, storage at high temperature with low hygienic conditions may destroy raw camel milk; also it is a threat for health due to possible contamination. Therefore, camel milk should be heated and high temperature destroys vitamin C, IgG, lysozyme, lactoferrin, anti-diabetic properties and peptidoglycan recognition protein of camel milk. Although the clinical trials reported, the raw camel milk by 500 mL/day improved diabetes and its complications. But pasteurizing in high temperature, sterilization, boiling, cooling, freezing and freeze drying of camel milk may be decrease anti-diabetes effects of camel milk. Hence, more scientific studies are needed to evaluate the effectiveness of these processing's methods of camel milk on diabetes.

## ZOONOTIC DISEASES RELATED TO CAMELIDS

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### Abstract

A various diseases infect camelids. Some of these diseases can be transmitted naturally from camels to humans with or without the intermediates arthropod. Frequently, these diseases do not make the animal appear sick but can cause serious illness in humans. The people with specific medical conditions such as a chronic illness, immunodeficiency and pregnancy may be at higher risk of developing severe diseases or complications from the bacteria, protozoa, fungi, viruses, and parasites of camelid origin, and should avoid contact with these animals. Zoonotic diseases associated with camelids are divided into three groups: (i) significant diseases, such as Camelpox & Rabies (ii) diseases of which Camelids are potential pathogen carriers, like MERS-COV & Rift valley fever, and (iii) minor or non-significant diseases such as Brucellosis & Tuberculosis. Therefore, anyone working with or handling camelids should be aware of the potential zoonotic threat, and precautions must be taken to minimize their risk of becoming infected.

## GENOMIC RESOURCES FOR A SUSTAINABLE UTILIZATION OF CAMELS

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### Abstract

In view of an increasing demand for healthy and sustainably produced food and considering new emerging diseases, camels are re-gaining importance. Many milk and meat markets in Eastern countries already include camel products with increasing proportions, and Western countries detect camel milk as healthy and luxury article. The pharmaceutical industry investigates New and Old World camel antibodies, so called “nanobodies” for fighting diseases, including the current COVID-19 pandemic. Using new technologies, large parts of the three camel species’ genomes (*Camelus dromedarius*, *Camelus bactrianus*, and *Camelus ferus*) have been sequenced over the past five years and are available for the worldwide scientific community. To facilitate and foster international collaboration and exchange of genomic and phenotypic data, the International Camel Consortium for Genomic Improvement and Conservation (ICC-GIC, [www.icc-gic.weebly.com](http://www.icc-gic.weebly.com)) was founded with the aim of improving production traits in camels, while conserving their genetic diversity. To date, 92 members from 21 countries are registered to the ICC-GIC with different types of expertise. In addition, the Greater Good Initiative of the Illumina sequencing company (<https://emea.illumina.com/company/news-center/feature-articles/greater-good-initiativewinner.html>) facilitated 400 camel genomes to be sequenced over a global distribution range to investigate genome-wide diversity and to develop a camel SNPchip (PI: Elena Ciani, Univ. Bari, Italy). At the moment, a new 180K camelids SNP array for New and Old World camels is being tested in collaboration with the Animal Production and Health (APH) Laboratory of the Joint Food and Agriculture Organisation (FAO)/ International Atomic Energy Agency (IAEA) Division, Austria. In parallel, the development of systematic phenotype recording guidelines is in progress within the frame of the International Committee of Animal Recording (ICAR, [www.icar.org](http://www.icar.org)). Combining joint efforts, the understanding of functional important genomic regions, *e.g.*, related to (re)production traits, immune response and adaptation to different environments will lead our way to a sustainable utilization and conservation of the significant genomic resources in camels.

## FRONTIERS IN GENOMICS RESEARCH AND DEVELOPMENT IN DAIRY INDUSTRY OF CHINESE BACTRIAN CAMELS

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### Abstract

There are 368,700 domestic Bactrian camels in 2017 and distributed in Inner Mongolia, Xinjiang, Qinghai, Gansu and Ningxia provinces of northwest China, following a continuous reduction from 475,000 in 1987. Of which up to 88% are found in Inner Mongolia (51%) and Xinjiang (37%). Four breeds are recognized in the national list of priority conservation program of livestock genetic resources in China and they include Alashan, Sunite, Xinjiang and Qinghai Bactrian camels while the number of the last one has significantly decreased. Following the application of state-of-art genomics approaches to investigate the genomic evolution and population genomic diversity of domestic livestock and poultry genetic resources, Jirimutu et al. (2012) reported the first draft genome sequence from wild and domestic Bactrian camels. They found the genome of Bactrian camel and predicted 20,821 protein-coding genes. They also detected specific genomic regions, in which the olfactory receptors are located, showing significantly reduced heterozygosity in domestic Bactrian camel. In the current year of 2020, there are two significant articles published by the same team of Dr. Jirimutu from the Inner Mongolia Agricultural University and the Inner Mongolia Institute of Camel Research. The first study constructed the chromosome-level assembly of a wild Bactrian camel genome using high-coverage long-read sequencing and chromatin interaction mapping, to be the most contiguous camelid genome. They examined the detailed genomic DNA structures of immune-related genes, including immunoglobulin light-chain, four T-cell receptor loci and the complete classical MHC region. The second publication confirmed the deep genetic divergence between the extant wild and domestic Bactrian camels and the potential ancestral contribution from the wild Bactrian camels to the domesticated counterparts due probably to their young speciation and also shared habitats in East Asia. In their analysis, the west most Bactrian camels in Iran seemed to be the most distinct while some genetic admixture was observed between the domestic Bactrian camels and dromedaries distributed in Central Asia. Their comprehensive population genomics investigation supports the origin of domestic Bactrian camels in Central Asia, followed by the dispersal reaching to the Mongolian plateau. To effectively conserve the

marginalized Bactrian camel genetic resources due to the loss of their traditional utility such as the largest beast of draught power, new products and functions, for examples, those of fresh milk and powered milk as healthy and functional foods, have been successfully developed, prompted and commercialized with strong public and private investments, which benefit not only the genetic improvement programs of domestic Bactrian camels but also the poverty alleviation efforts in northwestern China.

## GENOMIC TECHNIQUES TO EXPLORE THE POTENTIALS OF CAMEL

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### Abstract

In the current era of genomics, every field of biological sciences is harvesting fruits of developments in latest molecular biological techniques. It has now become possible to capture single-cell genomic data for thousands of diverse cells from a single test specimen. In the last 25 years, DNA markers and associated molecular techniques have created new possibilities for genetic improvement, conservation of biodiversity, imparting disease resistance in animals, which led to better standard operating procedures for further targeted breeding. Molecular markers are indispensable tools for determining the genetic variation and biodiversity with high levels of accuracy and reproducibility. The widely used mitochondrial and nuclear markers-based techniques for camel improvement include random amplified polymorphic DNA, amplified fragment length polymorphism, microsatellites and next generation DNA sequencing. Marker assisted selection uses quantitative trait loci information for camel selection programs. For most livestock species, commercial platforms are currently available that allow the genotyping of an individual for tens of thousands of SNP across the genome at a reasonable cost. Recently, panels with over 700k SNP have become available in cattle and such higher density panels are also under development in other species especially camel. The main use of high-density SNP genotyping has been to implement genomic or whole-genome selection. Genomic selection involves estimation of the effect of each SNP on the high-density panel using models that fit all SNP simultaneously, with their effects treated as random variables. The high-density SNP genotypes can also be used to construct a so-called genomic relationship matrix among all individuals in the population. Implementation of genomic selection in camel species is still under development. In contrast to cattle, breeding programs in camel species offer fewer opportunities to increase rates of genetic improvement by reducing generation intervals, as selection is typically already at an early age. In the long term, genomic selection combined with reproductive technology that reduces the minimum age at breeding will greatly increase the rate of genetic gain. Genomic based selection will allow durable increases in efficiency of camel to meet the demands of markets and opportunities.







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