

## Camel Production Profile and Role in Food Security

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Received: Oct 22, 2022

Accepted: Dec 16, 2022

### INTRODUCTION

Emerging goals and a growing focus on the camel have modified the belief of “supply of the barren region” to “a food safety animal” in lots of semi-arid as well as arid zones of the world. Pakistan isn't an exemption to this – wherein the camel goes to take part in a pinnacle characteristic that may fulfill all requirements of milk and meat of the rural population. The saying of the Almighty in the Quran “Do they not have a look at the camel, in what way they may be made”; nicely extolled the virtues of the camel (Al-Ghashiyah, 88). It is thought that after the barren area residents proceeded to God and complained about the difficult climatical situations of the desert, God heard their pleas and sent them the female camel, they drank its milk, and their characteristics grow well (Khan et al. 2003). The exploding population will increase the priority of food safety around the globe wherein Pakistan isn't an exception as well, as the country is 5<sup>th</sup> largest regarding population and is challenged with food safety (Faraz et al. 2019a). In the investigation of the latest property, a future need is the camel as its far vital count in the proper food chain system (Faraz et al. 2019b).

Food protection has originated to be excessive trouble worldwide because of the increase in the population of humans. To contest this condition, the investigation of novel

worldwide properties is a dire need of the current situation. The camel looks quite a central count to the proper food chain because it gives meat, milk, and important way of financial significance (Faraz 2020a). It is a key supply of subsistence and earnings for pastoral human beings (Faraz et al. 2019c). Commonly, there are two types of camels i.e., “*Camelus dromedarius*” called one-humped camel or may be called Arabian camel, and “*Camelus bactrianus*” called two-humped or may be called Bactrian camels (Faraz and Waheed 2019). There is a 35 million worldwide camel population and at the same time Pakistan ranks eighth in the globe with 1.1 million camels after Somalia, Sudan, Kenya, Niger, Chad, Mauritania, and Ethiopia (FAOSTAT 2018; GOP 2021-2022).

### Camels Distribution

One-humped camels are 95% of the total camel population. There are near about 50% of the dromedary camel population belongs to Somalia and Sudan and 70% of the Asian dromedary camels belong to Pakistan and India. Baluchistan consists of about 40% of the camel population in Pakistan; about 30% in Sindh, almost 023% in Punjab, and about 07% in KPK province (ACO 2006). Dromedary camels have dominated the camel population in Pakistan as some herds of Bactrian camels are inhabitant at Suleiman mountainous region (Raziq et al. 2010).

### Current Status

There are 4 environmental regions of camel production in Pakistan. Thal and Cholistan (sandy barren vicinity) in Punjab, Costal areas of Sindh province (Badin, Karachi, and Thatta districts), Thar in Sindh and Hilly zones (Dera Ismail Khan, Dera Ghazi Khan, of Punjab and many areas of KPK, and Balochistan). There is camel production in different watered districts of Sindh and Punjab provinces as well (Faraz et al. 2013). Camelids can be multi-purpose organisms whose female animals are used generally for milk production, the males are raised for meat purpose, draught, or transportation cause, and all over again each animal either male or female provide meat as a tertiary product (Faraz 2019a).

Camel has been considered a very important animal in many countries which is used as a food animal now-a-days because of the growing recognition of meal nutrients and dietetics. Its functionality to use roughs of rangeland in borderline zones and to live on and bring properly underneath warmth and cruel surroundings have been diagnosed considerably over the years. Globally, camel attains a completely specific socioeconomic and ecological reputation (Faraz et al. 2019d).

## Camel Production Profile

Its important feature is to provide benefit to the poor people though multiple ways and can survive severe climatic conditions since historic times (Faraz 2019 a, b, c). The camel has several unique qualities, including the ability to cruise, be milked, carry loads of goods, eaten, be secured, plowing, traded for goods, and employed aimed at unusual agronomic tasks, as well as being displayed in zoos (Iqbal 1999).

### Camel Peculiarities

There is a significant role of camel in the subsistence pastoral economic system in a number of ecozones ranging from India and the Desert Gobi in first-world Somalia to Asia and up to Ethiopia in the base of African continent (Kohler-Rollefson 2005). The ability of camels to survive in difficult, dry environments and to withstand a variety of pressures, such as heat, a lack of water or water with excessive salinity, and a lack of food, has made it a special candidate pillar of marginal ecosystems (Faraz 2020b). It can digest dry roughages and depends further to consume all cheap and rough nutrients especially crude fiber greater than one in each of the ruminant types. The extreme digestibility of fiber might be recognized as the lengthier maintenance period of enormous debris in its front belly as well as a sole measure of the fore-stomach of the camels. The camel (dromedary) is the maximum crucial element of domestic animals within temperate, semi-arid, and dry areas because it has the ability to deliver outstanding food like milk and meat in severe climates at decreased prices. It has a great tolerance to the higher temperature, solar radiation, and water shortage. It is capable to thrive nicely on sandy deserts with terrible flora and especially consumes the feed material that is unutilized with the useful reserve of many precise domestic animals (Faraz 2022).

In Pakistan, Camels are very well adapted to their close surroundings and may preserve their life cycle in warmth and severe deserts. The camel (dromedary) is an excellent supply of milk and meat, particularly for the regions wherever the production system is advanced and it can bear harsh ecological conditions of the weather. This reason is its sole physiological predisposition which allows bearing higher temperatures, water scarcity, solar radiations, dreadful flowers, and challenging geography. These animals have no antagonism with local species concerning feed and are well known for extensive performance. They may be browsers as their loosened lips with strong papillae and buds in addition to prolonged legs and neck permit the animals to browse proficiently. As concerning their detailed characteristics, the animals shall browse that feedstuff cloth and this can be an outside technique of many farm animal species (Faraz 2020 a, b).

A substantial portion of camel's milk is there in cardinal provisions of rural community which pays for about 30% of the yearly energetic diet. On an average, the everyday milk production of she-camel is normally 3-10 liters in subsistence systems and a longer lactation length of 12-18 months (Farah

and Fisher 2004; Ahmad et al. 2010). At standards, on average camel milk retains 3.7% protein, 4.9% fat, 5.1% lactose, 14.4 % total solids, and 0.70 % ash (Khan et al. 2005). Definitely, the milk of camel is enjoyed now, due to its richness with nutrients and medicinal worth. Now society starts using it as therapy for certain conditions like diabetes, liver dysfunction, tuberculosis, long bone pain, asthma, spleen ailments, piles, arthritis, food allergies, and sometimes as an aphrodisiacal. Furthermore, the milk of camel has high level of Phosphorus and vitamin C contents (Konuspayeva et al. 2011), therefore it has an advantage over other domestic species for milk comparison (Saini et al. 2007; Mohamed et al. 2005).

### Camel Accredits

The camels haven't any opposition with other home species about feed and continuous production. The grazing and browsing compartment of camel consists of actions pattern which is linked to the searching, choosing, ingestion, and absorption of feed (Faraz et al. 2018a). According to some experts, the camel has the ability to graze on high, more beginning, and moist grasses but usually, it's miles a browser and their feed includes timber, shrubs, and wood (Faraz et al. 2018b). Camels are browsers by nature as it is tall in addition to prolonged neck and legs allow them to browse effectively. Because of those specific qualities they will be proficient in browsing that feeds fabric that is away from the method of diverse livestock species. They shall browse on sensitive flora, and salty and prickly timber because of the specific shape of their mouth. It has robust prehensile lips, papillae, and a thin muzzle which allows it to browse appropriately on thorny foliage (McDowell 1986).

Camels like browsing as compared to grazing and it is declared as a browser with the beneficial resource of nature (Yagil 1990). Camels spend more time in rumination that is why they select surfing overgrazing (El-Badawi 1996). In the absence of marvelous forages, camels can make usage of terrible bizarre forages with greater effectiveness to keep fibers in their fore-stomach for a longer time of about 70 hours. Even described by Schwartz et al. (1992) in the assessment to one-of-a-kind ruminants, the feed of camel is consisting of forage with low protein as the camel has an ability and overall performance of reusage of the urea for synthesis of microbial/stomach protein far better. As one of its attributes, the camel is in consideration because of the authenticity of the animal with unfathomed volume to meet the purpose of dietary and medical requirements of people resident in the marginal areas (Faye and Esenov, 2005). But, in regardless of a selection of these traits, it has been continued to be an unobserved animal.

In arid regions, the camel signifies the maximum vital meat supply line (Knoess 1977; Farah et al. 1992). Camel is usually raised up at conservative control structures as pastoralists are moving continuously for handsome water and

meals over enormous zones for the camel (Abbas and Omer 2005; Omer et al. 2008; Ali and Majid 2013). Camel inherited native beneficial aids for easy management and conserved nicely. Camel achieves an indispensable purpose in rural biology. Good research spotlight its sole propensities, particularly under pressure situations. In order to satisfy, the emerging needs of the explosion population, the planned knowledge is needed to lessen the need for exterior provender.

### Performance Outline

Camels play an indispensable position in the community survival and economic device of human beings in semi-arid and arid zones in numerous areas. No matter the situation great input to the income of the rural community, camel is the maximum abandoned species and just rare effort had been required to represent its performance ability and interrelated limits under natural situations. At the same time as in predictable control tools the camel well-organized inclinations are short, and the old-style farming of camel has no forthcoming (Bakheit et al. 2012).

The farming of camel structure is in flux position because pastoralists are shifting from their outdated complex to intensive and semi-large arrangements. The abruptly converting situation desires popular assessment and a pressing wants to embrace multi-disciplinary kinds of research (Khan et al. 2003). Basically, the studied artwork on the industrial capacities of the camel is accomplished below conventional manage structures without notice of producing structures in Pakistan (Iqbal et al. 2001). Research artwork finished so far is totally on ever-changing herds and a lot of paintings have been based totally on survey studies below traditional control structures. The studies about the role of camel in the massive famine are positive and the basic facts on Pakistani camels and their developing functionality exploitation are critical to carry together with a rustic records base for destiny studies and to search for export potentials. Presently, Faraz along with his coworkers has completed large research concerning production capability of camels, in particular, in the manipulation systems in Pakistan, at the manner to pave a way for further investigations in this hassle and concluded that the camel appears to have a very vital chair for the food safety in the country and it is the precept pillar of the monetary device in marginal compass (Faraz 2019a).

Camel is a source of milk, wool, meat, hair, and conveyance. Camel assists hundreds and thousands of human beings in semi-arid, mountainous, arid, and particularly barren regions of our country. It has specific functional tendencies. The camel has one specific full of fat-rich parts of the body called humps on its upper part which have the ability to store calories for the camel inside different directions of the dearth of the water source. Camel's hump does no longer consist of water; in fact, its miles save of fat on which the animal can live at the equal time as food is scarce (Faraz et al. 2013).

Many types of camel breeds are determined in Pakistan. Mountainous camels regionally known as Pahari, are inhabitants of Northern Punjab as well as in Balochistan. The riverine type of camels may be placed in the barren area and irrigated grasslands of Sindh and Punjab provinces. Twenty different camel breeds are determined in Pakistan that includes 7 breeds of Balochistan (Lassi, Brahvi, Pishin, Makrani, kharani, Rodbari, and Kachhi), 4 of province Sindh (Sindhi or Larri, Kharai, Dhatti, and Sakrai), 4 of the KPK (Gaddi, Ghulmani, Khader and Maya) and 5 of Punjab (Booja or Bagri, Cambelpuri or Mountainous, Marecha or Mahra, Kalachitta, and Thalochi or Brella) (Faraz et al. 2013).

Three important production systems of camel are present in Pakistan; transhumant, sedentary and nomadic. Those performance systems in truth represent the socioeconomic significance of camel as those are associated with climatically situations, flora phonology, topography, and availability of water. In nomadic systems, raising camels is frequently compared to human social lifestyles. Nomads travel from their homeland to different areas and the principal motive for their roving is the absence of fodder for grazing and water scarcity troubles. Camels, about 26% of the herder areas in Pakistan, have a test of this type of production tool. These tools have been characterized through 3 primary capabilities: 1) Herds of camel are numerous with the useful resource of goat, sheep, and donkeys, 2) Seasonal and catastrophe movements are obvious, with survival being the most important factor, 3) Same traditional activities adopted by the nomads who lend and share the camel herds (Faraz et al. 2019 b).

The transhumant system may be changed cultivation processes inside the rainy area at a few unspecified times. The migration is also based totally upon the important purpose of accessibility of feed and water. In Pakistan, 23% of farmers are concerned about transhumant technology. Nearly 50% of the population is employed in the sedentary activity of camel rearing, which accounts for a significant portion of family income. Women play a fantastic role in this tool. Now they may not be best involved within the rearing of camel however involved in converting the byproducts into beneficial merchandise and market them (Faraz et al. 2019 a).

### Camel Benefits

Pakistani camels are widely known and renowned for their ability to produce milk. Lactation period of 270-540 days and well-known milk production tiers ranging from 1300-4200 liters, Marecha is likely the world's best milk yielder with a mean milk yield of 4179 liters per month. In parts of terrible fodder/feed and in barren region situations, reports showed that the regular production is about 4 liters/day and most heavy camel breeds can also produce 35 liters constant with the day. Unlike other domestic species, the camel can keep an average yield for a long term (at a minimum for 365 days) by providing sufficient water and feed requirements (Faraz 2020 a).

## Camel Production Profile

The milk of camel is superior to the milk of several domestic species because it is richer in minerals, fat, and vitamins, particularly vitamin C, and protein. It is far wealthier in mineral phosphorus and contains numerous additives (Konuspayeva et al. 2009; Konuspayeva et al. 2011). The self-life of camel milk is better because it has better contents of protein that accomplish a repressive movement in opposition to pathogenic bacteria. So, milk is directly sold in vital disinfected situations even at high temperatures (Faraz et al. 2018 a).

Up-to-date farming techniques allow for commercial dairy husbandry of camels, particularly in areas of the Thal and Thar deserts and Cholistan rangelands. The milk from camels is consumed raw or made into yogurt. Camel milk has particular special preferences, and Pakistani camels in particular possess all of the outstanding dairy abilities that make them fantastic dairy animals (Faraz et al. 2019a). With the day-to-day farming practices of camel, it can deliver for forthcoming food production systems, particularly in semi-arid, arid, mountainous, and barren regions (Faraz et al. 2017). Normally for Pakistani camels, the milk production is 2920 kg with an average daily yield of 8 kg which is far better than countries like India, Somalia, Tunisia, Algeria, and Ethiopia where it is about 4-6 kg on an average (Faraz et al. 2013).

Like many unique breeds of cattle, camel calves have wonderful growth (Faraz et al. 2017; Faraz et al. 2018b). In Pakistan, the ancient use of camels is typically for slaughtering purpose while only a few castrated camels are employed for fattening purposes. During Eid-ul-Ezha, Muslims joyfully slaughter camels because they are a valuable resource and they can sell them for a very high price. Opportunities exist for export to Egypt, Saudi Arabia, Libya, the Gulf, and particular Arab states. In Pakistan, specific slaughterhouses slaughter between 100 and 150 camels every day. The meat of camel is eating up as sparkling, in minced shape, and furthermore in sausages and barbecues. The taste is much like meat/beef from cattle. The quantity of protein, minerals, and ash is equal to that of cattle meat; however, the meat of camel contains very lesser amount of lipids and extra water contents. The dressing percentage may go up to 60% with a lot of healthy meat (Khan et al. 2003).

An adult camel typically produces 1-3 kg of hair per year and these hairs are used to make ropes, carpets, luggage, mats, and blankets. Additionally, it produces exceptional wool, particularly the first fibers sheared from newborn calves, is used to make blankets. Saddles and shoes are made from their hides at the same time. The usual fee for its coverage is PKR 3000-4000, but occasionally it can be as high as PKR 5000-7000 (Khan et al. 2003; Faraz et al. 2013).

### Mantle Role as Food Resource

The camel has ended up nicely to be referred as a great animal in barren land conditions. Now the animal is playing a vital feature in several atmospheres. Camel gives valuable food

and has a weird feature inside the food chain. It has the supply of meals to the people living in the harsh weather especially to the deep abandoned population of marginal areas wherein there's immoderate competition for feed among animals. It has the capability to carry out and thrive well within one's climates wherein even the survival of numerous cattle species is difficult as the production is involved. Those virtues have given the animal an eager significance that it could be the future need to bridge the triumphing food scarcity for the population. Pakistan is not an exception to the exchange, in which the notion "deliver of the barren place" has been shifted to "food protection animal" on behalf of camel. Camel is of top importance and has a fantastic supply of meals and socioeconomics in deserts and mountainous areas. Camels meet the keen requirements of milk and meat of human beings and because of this it serves as a meal's safety agency within the region (Faraz et al. 2013).

### Conclusion

In conclusion, the camel has an extreme significance and contributes a key part in the people's social livelihood as well as in the environment of arid region. It can satisfy the milk and meat needs of pastoralists, nomads, and rural inhabitants. Therefore, it is by far the best candidate for food protection in changing climates in the environment of the desert as well as in many Eco zones.

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