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Zahraa HK AL-Moosawi
College of Veterinary Medicine,
Alqasim Green University, Iraq

Mozhir KK Almahdawi
College of Agriculture and
Forestry, University of Mosul,
Iraq

Areej GH Al-Charak
College of Veterinary Medicine,
Alqasim Green University, Iraq

Camel milk as an integrated food and its physical and chemical properties with therapeutic characteristics

Zahraa HK AL-Moosawi, Mozhir KK Almahdawi and Areej GH Al-Charak

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Abstract

A staple food in many regions of the world, especially in the arid and semi-arid regions, is camel's milk. Health-promoting ingredients found in camel's milk include lactoferrin, zinc, lactoactive peptides, and mono- and polyunsaturated fatty acids. Some significant human ailments, such as asthma, gastrointestinal issues, jaundice, tuberculosis, and asthma, may be treated with the use of these drugs. Compared to cow's milk, camel's milk has a more varied composition. In camels, nutrition, breed, age, and lactation stage have a greater impact on milk composition. The ratio of components in camel's milk varies greatly depending on the region and season. Along with having a large number of soluble proteins, camel's whey protein contains native proteases such as chymotrypsin A and cathepsin D. These whey proteins have distinctive qualities, such as the technical, physiological, chemical, physical, and biological traits that are advantageous in the food application, in addition to their high nutritional value. Camel's milk proteins are hydrolyzed to create bioactive peptides, which have an impact on the body's primary organ systems and give them physiological activities. The angiotensin-I-converting enzyme (ACE) inhibitory peptides, antidiabetic, antibacterial, antioxidant, and anticholesterol properties of camel milk.

Keywords: Integrated food, chemical properties, physical properties, therapeutic characteristics

Introduction

The family Camelidae of the order Artiodactyl includes camels, which are characterized as pseudo-rumen chorionic mammals with double digits and lined feet (Franklin, 2011) [28]. The Arabian or dromedary one-humped camel and the Bactrian two-humped camel (*Camelus bactrianus*) (*Camelus dromedarius*) respectively, are the two varieties of camels (El-Agamy *et al.*, 1992) [18]. Many people heavily rely on camels for their way of life, particularly those in the dry areas of the Middle East and Arabian Peninsula. Camels have the ability to adapt to many environmental situations. They are used for transportation, recreation, and as sources of meat and milk, boosting the economy and ensuring that people have access to food (Swelum *et al.*, 2020) [64]. According to the most recent data from According to the Food and Agriculture Organization (FAO), there are around 29 million camels worldwide. With over 95% of them being dromedary (one humped) camels (Sikkema *et al.*, 2019) [60]. The time a camel spends nursing can range from 9 to 18 months. The amount of milk produced is influenced by a variety of variables, including breed, animal health, lactation stage, and living conditions (Swelum *et al.*, 2020) [64]. Even though camel udders are similar to cow udders in structure, camel milk yield is smaller and more unstable than cow milk yield. However, improved nutrition, water, and veterinary practices may raise camel milk yield (Park & Haenlein, 2013) [53]. Milk is a crucial food for kids. Middle Eastern, Asian, and African societies have used camel milk as a therapeutic beverage for millennia (Nikkha, 2014) [52]. Due to rising demand, camel milk products are well-liked worldwide and frequently seen in pharmacies (El-Agamy, 2006) [68]. The nutrients in camel milk are sufficient to keep a human alive all day. Camel milk is frequently given to infants who are malnourished in many nations. Camel milk contains a lot of vitamins, minerals, and immunoglobulin (Shabo *et al.*, 2005) [58]. Camel milk, also known as the "white gold of the desert," resembles human milk the most of any milk (Kumar *et al.*, 2015) [43].

Corresponding Author:
Mozhir KK Almahdawi
College of Agriculture and
Forestry, University of Mosul,
Iraq

It also differs from other ruminant milk in that it has higher protective proteins such as Immunoglobulins, lysozyme, lactoperoxidase, and lactoferrin, lower levels of cholesterol, sugar, minerals and vitamin C. (Jilo, 2016) ^[33]. Customers value camel milk for its therapeutic qualities. According to legend, it has anti-infectious, anti-cancer, and anti-diabetic properties. It is recognized as a product that provides energy for recovering patients. Camel milk is used in some countries as an addition to chemotherapy for some types of tumors, including those of the digestive tract. It also aids in the treatment of infectious diseases like tuberculosis in humans. Patients with diabetes now require less insulin, and their glycemic levels are more evenly distributed. According to Kurtu (2004) ^[44], the Somali people believe that camel milk has a curative effect for at least 13 different disorders, including hyperacidity, hypertension, pneumonia, respiratory diseases, as well as being an aphrodisiac. High levels of insulin, up to 52 to 59 U/L, are present in camel milk, along with a protein that performs similar activities to human insulin (Abdalla, 2015) ^[2]. According to reports, camel milk has minimal levels of casein and little to no lactoglobulin, both of which might make lactose intolerant people react negatively (Konuspayeva *et al.*, 2009) ^[40]. Nevertheless, it contains an anti-tumor protein with insulin-like capabilities that is protective and used to treat a variety of illnesses like diabetes, autism, and diarrhea (Gul *et al.*, 2015) ^[30]. Further, camel milk has been shown to have a very robust immune system (Abdel Galil *et al.*, 2016) ^[3], treat peptic ulcers, and have anti-malignant, anti-platelet, and anti-thrombotic capabilities (Musaad *et al.*, 2013) ^[48]. In more recent investigations, it was shown that camel's milk has distinct anti-oxidative, anti-bacterial, antiviral, antifungal, anti-hepatitis, treatment for para-tuberculosis, hypoglycemic activity, anticancer, anti-aging, treatment for autoimmune illnesses, cosmetic, and detergent properties (Simeneh, 2015) ^[69]. This systemic review's objective is to identify camel milk as a complete food for humans and to show how it can be utilized to treat a variety of illnesses.

Literature review

1. Camel's milk

The taste of camel milk varies depending on the feed and the availability of drinking water for the camels. Camel milk is white and opaque, with a mildly salty flavor. When the milk is slightly churned, a layer of froth or butter forms, and due to the scent of the camel's milk, many people were unable to taste it (Sisay and Awoke, 2015) ^[61]. Compared to cow's milk, which has a pH range of 6.5-6.7, camel's milk has a pH range of 6.2-6.5. (El-Hatmi *et al.*, 2015) ^[22]. It contains very little fat, 96% triglycerides, and about 30 mg of cholesterol per 100 grams of dry matter (Ereifej *et al.*, 2011) ^[24]. (Salwa & Lina, 2010). Compared to cow's milk, it has less short chain fatty acids in its fat (Ereifej *et al.*, 2011) ^[24]. Additionally, the fat globules are smaller on average than those seen in milk from cows, buffalo, and goats (Khalesi *et al.*, 2017) ^[37-38]. Due to the high digestibility of camel's milk (Meena *et al.*, 2014). It can be problematic in technological applications (Khalesi *et al.*, 2017) ^[37-38]. Camel's milk is a good source of vitamins B1, B2 and C. (Ereifej *et al.*, 2011) ^[24]. In desert regions where access to green crops is scarce, vitamin C which is three to five times more than in cow's milk, is crucial for diet (Kamal & Karoui, 2017) ^[34]. Researchers have found that camel's milk possesses anti-diabetic, antibacterial and hepatitis-hosting properties (Agrawal *et al.*, 2009) ^[8]. Due to its unique inhibitory structures, such as lactoferrins, lysozyme,

thiocyanate, hydrogen peroxide framework, immunoglobulins, and free greasy acids. It resists contamination with bacteria to varying degrees (ELFakharany *et al.*, 2012) ^[21]. Camel milk has an opaque white color, a typical odor, and a salty flavor. Due to the fats being finely homogenized throughout the milk, the hues are opaque white. Long-chain poly unsaturated fatty acids (PUFA) make up the majority of the milk fat (Abu-Lehiya, 1987) ^[5]. The proportion of proteins varies between 2.30% and 3.95%. However there is no allergic lactoglobulin present, and the casein is different and "fresh." Because of vitamin C in camel milk has strong antioxidant properties during the early stages of lactation. The breast tissue exhibits higher levels of synthetic activity which decreases as lactation progresses. Its relatively low pH is likely a result of the significant amount of ascorbic acid present (vitamin C). The milk is stabilized by the low pH caused by the vitamin C content and can be kept for a comparatively longer time. (Farah, 2011) ^[25].

Advantages of camel milk

There is no question that all varieties of milk from cows, goats, camels, horses, or other animals are good for human health and provide the body with nutrients like proteins, fats, minerals, and vitamins in addition to water. This differentiation is based on science rather than individual human preferences or tastes. The advantages of camel milk and goat milk over the widely consumed cow milk around the world make them superior.

1. As for camel milk, it contains 90% water from the components of camel milk compared to cow's milk.
2. The second thing is low cholesterol content of camel milk as it contains 40% less amount of saturated fatty acids and it contains healthy and light types of unsaturated fatty acids, cholesterol, fat, obesity, and cancer.
3. Camel milk contains the most vitamin C and a group of B vitamins, compared to other types of animal milk.
4. Among the minerals, camel milk contains higher amounts of iron, calcium, potassium and selenium, compared to cow's milk. Specifically amount of iron in camel milk is about ten times that in cow's milk.
5. Camel milk is less likely to cause allergies that some suffer from as a result of eating cow's milk proteins. Due to its light content, camel milk is less likely to cause cases of (lactose intolerance) which in some people lead to flatulence increased intestinal gas and indigestion compared to cow's milk.

The amount of casein proteins is lower in camel milk compared to cow's milk which makes it easier to digest and easier on the stomach to form milk curd.

2. Camel milk production

Due to the camel's inconsistent frequency of milking, it is difficult to assess the camel's daily milk output in climatic conditions. The amount of milk produced and its composition are influenced by the presence of calves, the method of milking (hand or machine), animal health, heat stress, reproductive status (estrus, gestation), lactation stage, breed, age, season of calving, feeding, management conditions (milking frequency), parity, and water accessibility (Farah, 2011, Alhadrami and Faye, 2022 and El-Agamy, 2017) ^[25, 10, 19]. Heat stress caused a decrease in milk production (Al-Jassim and Sejian, 2015) ^[12]. Between 8 and 18 months of lactation, various camels produced between 1000 and 12000 L of milk, varying between geographic regions (Africa vs. Asia) (Nagy and Juhasz, 2016) ^[50]. For instance, under ideal

circumstances, the milk production of female Maghrebi camels increased up to 6-12 L/day (Ayadi *et al.*, 2009) [13], leading to the establishment of a dairy camel farm in Dubai. For the 390 days of the camels' (Neggas) lactation season in Tunisia, the mean daily and overall milk production of one-humped camels was 6.0 0.12 kg and 3314 98.5 kg respectively (Nagy *et al.*, 2013) [51]. (Bekele *et al.*, 2002) [70] report that the average daily milk production of camels in eastern Ethiopia ranged from 224 to 567 days and was 1422 74 kg on average. According to other research, one-humped camels in Pakistan's Punjab area were able to produce up to 30 kg of milk per day after calving for more than a 10-month period (Alhadrami and Faye, 2016) [11]. Al-Majahim camels (Saudian ancestry) may generate up to 18 L of milk per day using Saudi Arabia's intensive farming techniques (Alhadrami and Faye, 2016) [11]. On the other hand, during the lactation period, it has been calculated that the milk output of Somali camels was an average of 10 L per day during the rainy season (Alhadrami and Faye, 2016) [11]. In accordance with a study by Nagy and Juhasz (Nagy and Juhasz, 2016) [50], camel milk production peaked immediately after parturition (8.9 0.04 kg) and subsequently decreased until it reached 50% of its maximum since the 16th month postpartum (4.3 0.06 kg). The greatest milk yield of camels was discovered by Abdalla *et al.* (2015) [2] between the fifth and sixth parities, which is later than that of dairy cows whose maximum milk yield is typically noted at the third parity.

In general, two herdsmen milk both udder halves at the same time, although Before the camels are milked, the calf is allowed to nurse until the milk starts to flow (Farah, 2011, Seifu, 2009) [25]. It is challenging, if not impossible, to milk the dam without this stimulus. If milking is not induced, the dam dries up if the calf dies.

3. Physical properties of camel milk

Camel milk is opaque white, which may be because it contains less -carotene (Patel *et al.*, 2016; Vincenzetti *et al.*, 2012) [54, 65]. (Alhadrami and Faye, 2016, Smits, *et al.*, 2011 and Muthukumaran, *et al.*, 2022) [11, 62, 49]. Additionally, camel milk has a sweet, astringent flavor that can occasionally be salty (Alhadrami and Faye, 2016, Swelum *et al.*, 2021, Patel *et al.*, 2016, Vincenzetti *et al.*, 2022) [11, 63, 65]. Acidity levels of camel's milk range from 6.2 to 6.5 (Farah, 2011, Swelum, *et al.*, 2021) [25, 63], and its density values range from 1.026 to 1.035 (Farah, 2011) [25], with an average value of about 1.029. Generally, the palatability and favor of camel milk depend on the type of fodder and drinking water availability to compared to cow milk (Patel, *et al.*, 2016, Swelum, *et al.*, 2021, Vincenzetti, *et al.*, 2022, Mehta, *et al.*, 2015 and Kumar, *et al.*, 2016) [54, 63, 42, 65]. The camel milk has a lower density and pH. (Farah, 2011) [25]. Camel milk has a higher content of vitamin C than cattle milk, which may be the reason for the milk's acidic pH. (El-Hatmi *et al.*, 2015) [22]. Camel's milk sour extremely slowly, thus it can be kept longer without refrigeration (Farah, 2011) [25]. Camel milk has a viscosity of 1.72 mPas at 20 °C, while content cows milk has a viscosity of 2.04 mPas at the same temperature and dry matter (Kherouatou, *et al.*, 2003). One-humped camel milk has a freezing point that ranges from 0.57 to 0.61 degrees Celsius (Muthukumaran, *et al.*, 2022) [49]. One-humped camel milk has a lower freezing point (0.51 to 0.56 °C) than cow milk. Additionally, compared to milk from other species, camel milk has a higher alcohol stability number 20.8,10.3,12.5 and 14.1 (Mehta *et al.*, 2015; Chabeda, 2002; El-Agamy, 2006) [46, 16, 68]. The maximum observed buffering capacity for skim

camel milk was at pH 4.95, while cow skim milk displayed a higher buffering capacity at pH 5.65 (Mehta, *et al.*, 2015) [46] compared to cow milk. The camel milk has an energy content per liter of 665 k_{cal} (Kumar, *et al.*, 2016) [42]. camel milk's has an electrical conductivity was 6.08 milliohms and its stated acidity was 0.144% lactic acid (Vincenzetti, *et al.*, 2022) [65].

4. Chemical milk of Camel

Camel milk is often a whitish liquid with a salts-like scent and flavor. It mostly depends on the type of nutrients and plants available in grazing meadows (Khalesi *et al.*, 2017; Abbas *et al.*, 2014) [37-38, 1]. Additionally, because milk's homogenized fats White in color, camel milk differs in flavor depending on the type of feed or plant found in the pastures and drinking water (Kumar *et al.*, 2015) [43]. Furthermore, the pH of camel milk ranged from 6.2 to 6.5 and its thickness varied from 1.026 to 1.035. They both fall short of cow milk, and skim milk has its best buffering potential at a pH of 4.95. (Gul, *et al.*, 2015) [30]. There are several Camel milk is often a whitish liquid with a salts-like scent and flavor. It mostly depends on the type of nutrients and plants available in grazing meadows (Khalesi *et al.*, 2017; Abbas *et al.*, 2014) [37-38, 1]. Additionally, because milk's homogenized fats White in color, camel milk differs in flavor depending on the type of feed or plant found in the pastures and drinking water (Kumar *et al.*, 2015) [43]. Furthermore, the pH of camel milk ranged from 6.2 to 6.5 and its thickness varied from 1.026 to 1.035. They both fall short of cow milk, and skim milk has its best buffering potential at a pH of 4.95. (Gul *et al.*, 2015) [30]. There are many factors that affect the quality of camel milk, including feeding conditions, physiological stages, physiological and seasonal variations, camel intrinsic characteristics, and health issues (Konuspayeva *et al.*, 2009) [40]. As shown in table 1, camel milk typically contains the following components: ash 0.79%, water 87%, lactose 4.4%, fat 3.5%, and protein 3.4%. (Al-Haj and Al-Kanhal, 2010) [9]. The factors that affect camel milk quality include feeding conditions, physiological stages, physiological and seasonal variations, camel intrinsic characteristics, and camel health (Konuspayeva *et al.*, 2009) [40]. As shown in table 1, camel milk typically contains the following components: ash 0.79%, water 87%, lactose 4.4%, fat 3.5%, and protein 3.4%. (Al-Haj and Al-Kanhal, 2010) [9].

Table 1: Composition of camel milk and other species of milk (Fox, 2003)

Animal species	Water (%)	Fat (%)	Protein (%)	Lactose (%)	Ash (%)
Cow	86.00	4.05	5.60	4.85	0.75
Buffalo	83.00	9.25	3.45	4.75	0.85
Sheep	80.50	7.75	6.15	4.55	0.95
Goat	87.50	4.25	3.30	3.90	0.85
Human	88.50	4.00	1.20	6.90	0.25

5. Health benefits of Camel's milk

Milk is the most crucial source of nourishment for newborn mammals. Milk contains biologically active elements and chemicals that are essential for a healthy immune system and growth. Camel's milk offers a variety of healthy nutritional and medicinal qualities, including antibacterial, anticancer, antioxidant, hypotensive, and anti-diabetic (Ayoub *et al.*, 2018) [14]. Because it contains natural bioactive components, camel's milk has historically been used to cure conditions like tuberculosis, asthma, dropsy, and jaundice (Abdelgadir *et al.*, 1998) [4]. Additionally, camel's milk is one of the substitute sources for human consumption because it is more easily

digestible and has higher nutritional value than cow's milk (Salami *et al.*, 2009) ^[56]. The probiotic bacteria can manufacture these beneficial components from milk proteins during the fermentation process (Devendra *et al.*, 2016) ^[17]. Additional uses for camel's milk include the treatment of digestive issues. Due to its high content of anti-inflammatory proteins, polyunsaturated fatty acids, and vitamins that speed up carbohydrate metabolism. It has a positive impact on stomach and intestinal illnesses. Hepatitis C and B viruses can be inhibited and their multiplication in cells prevented by the lactoferrin and IgG found in camel's milk. When human IgG cannot detect the presence of the virus. The IgG can recognize hepatitis C viral peptides in quantities. Additionally, The camel's milk can treat hepatitis B because it boosts the immune system and prevents the virus' DNA from replicating of camel's milk which has a therapeutic impact on drug-resistant tuberculosis due to the amount of antibacterial components in it. Therefore, symptoms like a cough, shortness of breath and fever may be relieved by camel's milk (Devendra *et al.*, 2016) ^[17]. Due to the tiny size of the immunoglobulins and the presence of insulin and insulin-like compounds, camel's milk can be utilized to treat both type 1 and type 2 diabetes (Devendra *et al.*, 2016) ^[17]. There are 52 units of insulin per liter in camel milk, which is a high concentration (Ayoub *et al.*, 2018) ^[14]. Additionally, these substances have an impact on the liver and pancreas, improving insulin output and lowering the amount of insulin needed. Additionally to its use in the treatment of diabetes, camel's milk lowers blood sugar, lessens insulin resistance, and enhances lipid profiles (Ayoub *et al.*, 2018) ^[14]. Salami and colleagues (Merin, *et al.*, 2001) ^[47] investigated the anti-aging properties of camel milk and proposed that once camel milk is drank and digested, peptides are created that begin to function as natural antioxidants and ACE inhibitors. The high quantities of vitamin C in camel milk maintain collagen, making it beneficial for anti-aging. Camel milk contains vitamin C which has antioxidant and tissue-protective properties. An important water soluble vitamin that supports the immune system is vitamin C. Vitamin C is required by the body for the synthesis of collagen, a protein that helps with the development of cells and blood vessels and provides skin its firmness and strength, according to Natural Standard Research. By boosting collagen production, collagen is found in the skin, joints, and cartilage. Vitamin C improves the resilience and structural support of skin, which aids in skin restoration. The vitamin C has lowers the pace of free radical damage which results in wrinkles and dry skin (Shabo, *et al.*, 2005) ^[58]. Furthermore, Lactoferrin is a protein that chelates iron, is present in higher concentrations in camel milk. This protein heals arthritic patients' joints by removing free iron from their joints (Muthukumaran, *et al.*, 2022) ^[49].

6. Therapeutic uses of camel's milk

6.1 Camel milk as a therapy for autoimmune disease

It has been widely observed over the years that drinking camel milk can either regulate or even cure autoimmune illnesses. Camel milk's ability to effectively control autoimmune disorders is based on the qualities listed below.

- According to Hoelzer *et al.* (1998) ^[32] and El-Agamy (2000) ^[20], Compared to humans, camels have a stronger immune system, and small immunoglobulins can travel from camel milk into human blood. Drinking milk will help fight autoimmune illnesses by repairing the immune systems rather than depression because camel milk contains immunoglobulins at all times during

breastfeeding.

- According to Hamers (1998) ^[31], camel immunoglobulins are tiny enough to penetrate into milk, where they can be used to treat autoimmune illnesses.
- The extraordinary camel immune system, which is unique from that of all other mammals, was described by Riechmann and Muyldermans in 1999 ^[55]. Human antibodies fall into 5 categories: IgG, IgM, IgA, IgD, and IgE. The simplest antibodies, including IgG, IgD, and IgE are monomers which are "Y"-shaped macromolecules. IgA is a dimer and IgM is a pentamer. Two identical heavy chains make up each of the four glycoprotein chains. and two identical light chains make up a monomer. Because they are macromolecules, immunoglobulins have a hard time interacting with and penetrating antigens. However, camel immunoglobulins are small and do not contain any short chains, making them effective against antigen.

6.2 Camel milk as a therapy for Milk allergies

Children with severe food allergies improved quickly with camel milk, according to Shabo *et al.* (2005) ^[58]. Because camel milk has the following qualities, its proteins are essential for avoiding and treating food allergies.

- Beta-lactoglobulin is absent from camel milk.
- Different beta-caseins are present in camel milk.
- Another important aspect is that immunoglobulins in camel milk are the same as those in mother's milk reducing allergic reactions in youngsters and enhancing their ability to react to food in the future.

6.3 Camel's milk and diarrhea

According to a study, fermented camel's milk has higher levels of salt and potassium, which helped to lessen rat diarrhea and ameliorate the condition's symptoms in people with autism and Crohn's disease (Zibae, 2015) ^[67]. Bioactive peptides found in camel's milk include immunoglobulin, peptidoglycan, lysozyme, lactoferrin, and lactoperoxidase (El-Agamy *et al.*, 1992; Kappeler, 1998) ^[18, 35].

6.4. Camel milk as a therapy for diabetes

According to numerous research, camel's milk can treat diabetes or lactose intolerance (Agrawal *et al.*, 2007; Al-Haj and Al-Kanhal, 2010; Malik *et al.*, 2012) ^[7, 9, 45]. Camel's milk is useful in managing diabetes, according to research on humans and animals. In India, where camel breeders drink a lot of camel's milk, the prevalence of diabetes is zero percent, as opposed to 5.5% in other civilizations (Agrawal *et al.*, 2011) ^[7]. Patients with type one diabetes who utilize camel's milk had reduced daily insulin requirements of 30-35% because it contains insulin, insulin-like proteins, immunoglobulins and trace components with anti-inflammatory characteristics. with low blood sugar levels and albumin protein in their urine (Shori, 2015; Agrawal *et al.*, 2011; El-Sayed *et al.*, 2011; Gader and Haider 2016) ^[59, 7, 23, 29]. Agarwal *et al.* (2011) ^[7] reported that in India this study comparing young people with diabetes who received standard care to those who additionally drank camel milk found that the latter group had significantly lower blood sugar and HbA1C values. Significantly less insulin was injected as a result. Because camel milk has the following qualities.

- Camel milk contains a regulatory, immunomodulatory, and activity similar to that of insulin in cells (Breitling, 2002) ^[15].
- 150 U/ml of insulin is found in significant concentrations

in camel milk (Zagorski *et al.*, 1998) ^[66].

- c) Although insulin is present in cow, goat, and human milk, it is broken down in the stomach's acidic environment. Camel milk does not experience this since it does not react to acid and does not produce coagulum (Abu-Lehiya, 1987) ^[8].

Other benefits of camel milk: The benefits of camel milk abound, and we also mention

Camel milk has anti-aging properties: Camel milk is a great source of numerous nutrients that are good for the body, including hydroxyl acid, which fights wrinkles and other indications of age in the skin.

1. Antioxidant: Antioxidants included in camel milk shield the body from substances that cause skin pigmentation and the growth of malignant cells.
2. Helps children's physical development: Because camel milk contains animal proteins, it aids in appropriate bone and body growth. It was applied to malnourished children, greatly enhancing their growth and wellbeing.
3. Camel milk includes immunoglobulins comparable to those present in breast milk, which is used to treat food allergies. It was discovered that consuming camel milk helps reduce food allergies, particularly in kids.
4. Stimulating blood circulation: Camel milk is a rich source of iron, and iron plays a crucial role in the production of hemoglobin, which carries oxygen to the body's numerous organs. As a result, consuming camel milk improves blood circulation and preserves overall bodily health.
5. Protects the heart: It was discovered that camel milk is rich in healthy fats that lower harmful cholesterol levels in the body, safeguarding the body and avoiding ailments of the heart and arteries like high blood pressure.
6. Prevents cancer: It was discovered that camel milk benefits for cancer patients lie in the lactoferrin molecule in it, which, in addition to its antioxidant capabilities, is able to impede the growth of cancer cells by destroying the genetic material in them.
7. Treatment for skin conditions: Camel milk contains a variety of vitamins and minerals, including vitamin B and C. Acne, eczema, and skin infections are all treated with it.

Conclusions

1. People who reside in dry regions of the world depend heavily on camel milk as a source of protein.
2. Camels milk has special qualities, including the highest level of vitamin C and lower fat than cow's milk.
3. A crucial food for kids is camel milk.
4. Medicinal beverages containing camel milk have been consumed for generations. It contains insulin and proteins that resemble insulin, making it effective in treating diabetes mellitus.
5. High iron and vitamin C levels were present in the camel milk.
6. Greater nutritional value than that of milk from cows and good digestion.
7. Its role in the management and control of diabetes as a result of its hypoglycemic impact.

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