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Review on Composition, Nutritional and Medicinal Value of Camel

Feyera Gemeda*, Zerihun Nigussie.

School of Veterinary Medicine, College of Agriculture and Veterinary Medicine, Jimma University, Jimma, Ethiopia

***Corresponding Author**: Feyera Gemeda, Jimma University, and Addis Ababa University, Ethiopia.

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Abstract

The camels are the most dominant and widely distributed animal in tropical and subtropical continents of Africa and Asia. They make an important contribution to human survival and utilization of these dry and arid lands. The objective of this review is to describe the general compositions of camel milk and its nutritive and medicinal values. Camels are an important source of milk, meat, hides, wool and serve as a source of prestige for their owners. Camel's products like milk, meat and urine have nutritional value as well as therapeutic for different human diseases especially in the pastoral communities. Milk is the lacteal secretion of mammary gland of mammals. As it is well known, milk is the first natural food of young mammals during the period immediately after birth. Camel milk is one of the most valuable food resources in the nomadic society and has high nutritive and therapeutic values, due to its essential elements like minerals, vitamins, fatty acids, carbohydrates and protective proteins such as, lactoferrin, lacto peroxidase, lysozme, peptidoglycan recognition protein and immunoglobulins. Camel milk contains disease-fighting immunoglobulins, which are small in size, allowing penetration of antigens and boosting the effectiveness of the immune system. Camel milk has a medicinal property suggesting that, this milk contains protective proteins, which may have a possible role for enhancing immune defense mechanism. Due to its protective proteins and other components, camel's milk is important for the treatment of diseases like, dropsy, jaundice, spleen ailment, tuberculosis, asthma, anemia, autoimmune diseases (autism), constipation, Crohn's diseases, and liver cirrhosis also serve as beauty products. Pastoralists have indigenous knowledge in treating their animals and themselves using milk. Because they are living at periphery and remote area where social services are in scarce or even absence and therefore, they depend on traditional medicines. Camel milk is among the items used as traditional medicine in pastoral communities. Generally, Camel milk is extremely nutritious and safe for consumption and has a high therapeutic value, so experimental researches should be conducted specially on the medicinal value of camel milk.

Keywords: *camel milk; composition; nutrition; medicinal value*

Introduction

Camelids were probable among the last major domestic species domesticated by man. The most likely time of domestication is about 4000 years before or slightly earlier. The presumed area of domestication is the Southern Arabian Peninsula, probably the area of Yemen and Oman. Arabian camels (Camelusdromedarius) are vital domestic animal species that are best adapted to harsh environments and fluctuating nutritional conditions of arid, semi-arid and extreme arid zones. These animals are endowed with extra-ordinary features that enable them to survive and perform in such harsh environmental conditions (Takele, 2001).

Dromedaries are versatile living assets that ensure food security even during the dry periods and also serve as means of transportation in most inhospitable areas of the world, so called as "ship of the desert", represent an important security for movement and draught power (Yagil, 2004; Higgins et al.,2002).

Environmental, social and cultural factor have great influence on the distribution of camels. Arid and semi-arid zones of tropical and subtropical countries of Africa and Asiaare found to be the convenient ecology. Eastern Africa is known to be the heartland for camel population, as 80% and 63% of the Africa and world population, respectively produced in the region. In these regions Somalia, Kenya, Ethiopia and

Djibouti are the leading countries by camel production (Wilson, 2008).

In Ethiopia, camels are found in southeastern and northeastern arid and semi-arid areas of the country. The major ethnic groups owning camels in Ethiopia are the Beja, Afar, Borana and Somali (Workneh, 2002).

Camels are an important source of milk, meat, hides, wool and their dung's is used for fertilizer and as a fuel. They are also used for riding, draught power and transportation as a means of investment and long-term savings as a source of prestige for their owner and there is a large market for trade in live camels. Camel products like milk, meat and even urine has therapeutic values for different human diseases. Camel meat is used to improve resistance to disease, to strengthen the muscles and bones, to moisten the skin, and to relieve internal pain. The fat extracted from the camel's hump is used to effectively relieve pain and swelling (Encyclopedia, 2000).

The camel has been used for milk production in Africa for hundreds of years ago. There has recently been significant interest in camel dairy products in South East Asian countries. As a result of many reports, camel milk is a good source of protein and vitamin C, and is much more nutritious and has more therapeutic value than the milk of any other animal (Camel milk stays fresh much longer than cow's milk. In times of drought, camels continue to lactate long after goats, sheep, and cows have stopped (Inayat et al., 2005).

Milk is the lacteal secretion of mammary gland of mammals. As it is well known, milk is the first natural food of young mammals during the period immediately after birth. Man has consumed milk and milk products even before drown of civilization. Camel milk is gaining more popularity nowadays because of its high nutritional qualities and therapeutic value (Strasser et al., 2006). Camel milk is one of the most valuable food resources in the nomadic society and it contains all essential elements. It is important source of protein, vitamins, minerals, and is particularly rich in calcium, which is essential for healthy bones and teeth. The taste of camel's milk is slightly salty than cow's milk, but it contains lower saturated fat and about three times of vitamin C and up to ten times more iron than cow's milk (Yagil and Etzion, 2000).

Camels' milk is generally opaque white and has a sweet and sharp taste, but sometimes it can be salty. The type of fodder and availability of drinking water cause the changes in taste. It has a low PH due to its high amount of vitamin C concentration. A wide range of products are made from camel's milk such as various sour milks, cheese, khoa, butter and ghee, etc (Farah, 2016). One peculiar characteristics of camel milk is its therapeutic value against a number of human disease and pastoralist claim that milk of camel used to treat a number of diseases in human beings. The camel milk is believed to be valuable for sick individuals, very old and very young person because of the belief that it is not only make healthy, but also well in bone formation (Alemayehu, 2001).

Camel milk has been used to cure diseases caused by chronic imbalance of the liver, such as jaundice, oedema, and swelling of the belly. Some research reveals that raw camel milk contains insulin-like proteins that can bypass the stomach and be absorbed intact. This characteristic of camel milk could be exploited to help control diabetes (Agrawal et al., 2005).

Therefore, the Objectives of this paper are:

To describe the general compositions of camel milk and its nutritive values.

To review on the therapeutic value of camel milk in treating diseases using camel milk.

Literature Review

Composition of Camel Milk

The prime importance of camel milk for the young camel, and especially for man, who drinks camel milk, is its composition varieties. This can be partly attributed to the inherited capabilities of the animals; but the stage of lactation, age, and the number of calvings also plays a role. Most camel milk is drunk fresh and also consumed when slightly sour or strongly soured (Yagil and Etziion, 2000). What is exceptional about the quality of camel milk is a change that occurs in the quality of milk when the camel is severally dehydrated in the middle of hot summer. When drinking water is scarce, the cow, ewe, and nanny goat all secretes concentrated milk, but the camel secretes highly diluted milk with a low-fat content (Singh, 2001). The PH of camel milk ranges from 6.5 to 6.7 with an average value of 6.56, and the density from 1.025 to 1.032 with an average value of 1.029. This is similar to the pH of sheep's milk. When camel milk is left to stand, the acidity rapidly increases. The lactic acid content increases from 0.03 percent after staying 2 hours to 0.14 percent after 6 hours. The first milk, the colostrum, is white and slightly diluted as compared with the colostrum of cow (Yagil and Etzion, 2000).

It was found that 3 hours post-partum total solid averaged 30.4%. The T.S. declined to 18.4 % during the first 2 days of lactation. This decline in T.S. is not caused by a variation in fat content, as initially the fat

percentage was low, which is 0.2 %, and then greatly increased to 5.8 %; rather the decline in total proteins and minerals are responsible for the reduction of T.S. The specific gravity of camel milk is less than that of cow, sheep or buffalo milk (Shalash, 2019).

Moisture and protein have been found to be higher in camel milk compared to cow milk. Comparative low percentages of total solids and fat in camel milk have definite positive benefits of drinking camel milk over cow milk. Post-partum changes in gross chemical composition of camel milk showed an increase in fat from 0.10 to 3.78, while protein decreased from 17.62 to 2.66

Conclusion And Recommendations

Generally, camel milk is the main source of nutrition for pastoralists, neonate calves and provides all essential nutrients for growth and development like, carbohydrate, fatty acid, vitamins, minerals, growth factor, immune modulators, serum albumin, lacto albumin, lactophorin, protective proteins such aslysozyme, lactoferrin, immunoglobins, Lactoperoxidase and PGRP and also it contains high moisture content. The nutritive value of camel milk is estimated from its components. Camel milk is extremely nutritious and absolutely safe for consumption and also has a high therapeutic value. Compared to bovine milk, a camel milk whey protein contains a higher content of antimicrobial factors. It is believed that people who drink camel milk on a regular basis are less prone to suffering from body ailments and diseases like diabetes, TB, autism, crohn's diseases, immune disorder, hepatitis B and C, tumor, constipation and different autoimmune diseases. Traditionally camel milk has been used for the treatment of disease like tuberculosis, diabetes mellitus, jaundice, asthma, hepatitis, constipation, snake venom, dropsy, anemia etic by pastoral communities due to its antimicrobial and other properties. Scientifically, camel milk has medicinal properties that contains protective proteins, which may have a possible role for enhancing immune defense mechanism and has insulin like activity, regulatory and immunomodulatory functions on β cells as well as used to treat different ailments such as multiple sclerosis, psoriasis, lupus, allergies-asthma.

Therefore, based on the above conclusions the following recommendations are suggested:

Camel health should be protected in order to get healthy milk from this animal.

Due consideration should be given to nutrition and management of camel to get high amount and quality milk.

Standardized researches should be done objectively to assess the medicinal value of camel milk.

Conflict Of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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