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Nutritional and therapeutic value of camel milk

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***Abstract*:** Compared to other milk animals housed in similar severe conditions, camels yield more milk over a longer length of time. Humans have used this multipurpose mammal, which has enormous potential for productivity, for transportation, milk, meat, and skin. The staple food of the pastoral community includes camel milk, which can make up as much as 30% of the total number of calories consumed annually. Protein is the primary component of milk that significantly influences both its nutritional content and technological appropriateness. The diverse collection of molecules known as milk proteins has varying compositions and characteristics. Since camel milk doesn't contain β-lacto globulin, it makes a good alternative to human milk. Beneficial vitamins and minerals abound in it, with B vitamins, C, and iron being particularly abundant. Furthermore having antibacterial, antiviral, and antitumor qualities is the lactoferrin found in camel milk. Small immunoglobulins that fight disease are present in it, which facilitate the entry of antigens and strengthen the immune system.

Key words: Camel milk, Medicinal, Nutritional Value

Introduction

Camel has a great deal of potential for productivity and is multipurpose. Humans have used it for transportation, milk, meat, and skin. Compared to other milk animals kept in similar demanding conditions, camels produce more milk and do so for longer. Over a lactation period of 12 to 18 months, daily yields ranging from 3 to 10 kg are typical. In addition to making up up to 30% of the annual calorie intake, camel milk is a staple of the basic diet of the pastoral population and a significant source of vitamin C and other necessary nutrients. Considering that camel's milk is utilised in several recipes, the milk's numerous qualities make it an excellent option.

On β cells, camel milk has immunomodulatory, regulatory, and insulin-like properties. When provided as an adjuvant therapy, camel milk has a hypoglycemic impact. This effect may be attributed to the presence of insulin or insulin-like protein in the milk, which is advantageous for the treatment of diabetes patients. Autism, Crohn's illness, and food allergies have all been treated using camel milk.

Nutritional value of camel milk

Protein

Milk's primary constituent, protein, has a significant influence on both its nutritional content and technological appropriateness. Heterogeneous in both composition and properties, milk proteins are a diverse set of molecules. Casein complexes and whey protein fractions are the two categories into which they fall. Milk has a relatively small amount of whey proteins, making casein the most significant protein. At the moment, four primary casein fractions are identified: αs1-, αs2-, and β-. Their distribution is varied, and the majority of animals have been shown to have these proteins' polymorphism.

Another important anti-allergenic element is that camel milk's functional ingredients include immunoglobulin, which is comparable to that in human milk and is known to lessen allergic reactions in youngsters and enhance their subsequent responsiveness to food.

Milk lipids

Milk fat globules have an average diameter of less than 0.1 µm to approximately 18 µm. Goat milk (3.19 µm) and camel milk (2.99 µm) contain the smallest average fat globules, while buffalo milk (8.7 µm) has the largest. Lipolytic enzymes'

ability to reach small fat globules (SFGs) is positively impacted by a high degree of milk fat dispersion. Consequently, goat or camel milk is more easily absorbed by human. Camel milk contain CLA, which has numerous functional properties. Triglycerides and total cholesterol, including LDL, are reduced by CLA, improving the LDL/HDL ratio in plasma. This is important because it lowers the risk of coronary heart disease and arteriosclerosis. Additionally, CLA prevent osteoporosis as well as enhance lipid metabolism to lower blood glucose levels.

Minerals

Calcium, phosphorus, salt, potassium, chloride, iodine, magnesium, and trace levels of iron are among the minerals found in milk that are considered essential. The principal mineral components of milk are calcium and phosphorus, both of which are essential for the healthy development of babies' bones and their growth. One factor influencing milk's distinct nutritional value is the high bioavailability of certain elements. Where these minerals are most abundant is in camel milk. Comparing camel milk to bovine milk, the amounts of trace minerals such as Fe, Zn, and Cu were considerably greater in the formr.

Vitamins

Due to the high quantity of vitamin C in camel milk, it is somewhat of an exception. Compared to cow's milk and human milk, camel milk has thirty times and six times the amount of vitamin C, respectively. In arid regions where fruits and vegetables are in short supply, this is quite significant. For this reason, residents of such areas frequently solely consume camel milk as a source of vitamin C. The levels of vitamin A, E and B1 are low in camel milk compared to the cow milk. From a nutritional standpoint, the fact that raw camel milk has a comparatively higher concentration of vitamin C is important because this vitamin has potent antioxidant properties.

Therapeutic (medicinal) properties of camel milk

Anti-diabetic property

The unique characteristics of camel milk's insulin allow it to be absorbed into the bloodstream more quickly than insulin from other sources or to resist proteolysis; camel milk's insulin is encapsulated in lipid vesicles, which allow it to pass through the stomach and enter the bloodstream; camel milk contains additional components that contribute to its anti-diabetic effects. A study conducted in India comparing juvenile diabetes patients receiving standard treatment with those who additionally drank camel milk revealed that the milk-drinking group had far lower Hb and blood sugar levels.

Anti-bacterial and Immunological properties

Camel immune system: IgM, IgG, IgA and even IgD have been detected in camel sera on the basis of cross-reactivity with human immunoglobulins. As the tetanus toxin penetrates the ezymes complex, camel IgG has complete neutralising effect against it. There is a greater variety of antigen binding sites in camel hypervariable areas. Milk from camels is rich in immunoglobulins, which can be used as a weapon against autoimmune illnesses by strengthening the immune system instead of treating depression.

Antibacterial activity

Many protective proteins, primarily enzymes with antimicrobial and immunological effects, are found in camel milk. These proteins' existence contributes to the explanation of some natural healing properties The immunological actions of the following protective proteins in camel milk: The main immune system, which targets structures shared by invasive pathogens, is aided by lysozymes. immunoglobulins; these provide the body's immune system with defence against infections; Iron-saturated lactoferrin, which is produced starting in the second week of lactation, inhibits the growth of microorganisms in the gut and plays a role in the first immune system. Lactoperoxidase is present in milk, tears, and saliva; it appears that camel milk has a significantly higher lactoferrin content than ruminant (cow, sheep, and goat) milk. By exercising bactericidal action, it strengthens the non-immune host defence mechanism.

Allergic therapy

Children with milk allergies find camel milk appealing since it doesn't include two potent allergens found in cow milk: β-lactoglobulin and a "new" β—casein (Makinen-kijunen and Palosne, 1992). The inability of circulating IgEs and monoclonal antibodies to recognise camel proteins may be due to variations in phylogeny. With camel milk, kids with severe food allergies made quick

progress. Camel milk seems to benefit kids with serious food allergies.

Conclusions

High amounts of insulin or proteins similar to insulin found in camel milk can pass past the stomach undamaged. The ingredient in camel milk that helps build protection against infection is called immunoglobulin. Children's immune systems are strengthened by camel's milk, which also treats severe food allergies. So, camel milk is better option for allergic and diabetic patients.

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