



## Composition and Therapeutic Properties of Camel Colostrum

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### Introduction

Colostrum is an essential source of nutrients and immunosuppressants for newborns. Camel colostrum contains less lactose and fat and more proteins, peptides, vitamins, and minerals than other animal colostrum. Camel colostrum is produced in the first week for five days; the change phase lasts two days, then from the seventh day, the secretion is considered mature milk [1]. The major proteins in camel colostrum are immunoglobulins (IgG1, IgG2, IgG3), camel serum albumin, lactoferrin, and  $\alpha$ -lactalbumin. Camel colostrum contains antimicrobial agents which actively stimulate the camel calf's immune system [2]. Colostrum is characterized by very high levels of immunoglobulin, transmitted immediately after delivery from the mother's colostrum to the infant, born without immunoglobulin in the blood, thus creating passive immunity.

### Composition of camel colostrum

Proteins, especially immunoglobulins G (IgG), are the main components of colostrum. The IgG content must be high enough to insure adequate immunization. The mean lactoferrin in two hump camels' colostrum was more than three times that of whole milk samples [3]. The highest insulin concentration was at 0 hours after calving. It was the highest, then reached  $367.5 \pm 286.1 \mu\text{mol/mL}$  in 24 hours, 20% of the initial rate [4]. Camel colostrum is rich in fatty acids with potential health benefits such as oleic acid, vaccenic acid and CLA. Camel colostrum can be used instead of cow's milk in the production of human infant formula because cow's milk is poor in oligosaccharides [5].

### Therapeutic properties of camel colostrum

One hump colostrum has been shown to have vigorous antimicrobial activity against pathogenic bacteria such as *Escherichia coli* and *Listeria monocytogenes*. The high lactoferrin content can explain this in one hump colostrum [6]. In addition to antimicrobial activity, one hump camel colostrum has shown antihypertensive and antioxidant activity. These activities are improved after digestion in the gastrointestinal tract and intestines. Bioactive peptides derived from colostrum proteins of one hump camel have various biological functions such as antioxidant, anti-cancer activity, anti-hypotension, opioid activity, mineral binding, stimulating growth, and anti-inflammatory activities. Camel colostrum is the best diet compared to other species because it contains the highest healthy fatty acids such as oleic acid, vaccenic acid, and ruminic acid [7].

Camel lactoferrin has antimicrobial activity on various infectious agents such as bacteria, molds, and viruses, anti-cancer, and antioxidant activities [8].  $\alpha$ -lactalbumin is involved in the apoptosis of tumor cells and the trapping of free radicals. Nutritionally, this protein contains essential amino acids and exceptional amounts of tryptophan, cystine, and lysine [9].

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