

Milk Lactoferrin: A Nutraceutical Agent against Viral Infections

Taherah Mohammadabadi*

Professor, Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University, Iran

***Corresponding Author:** Taherah Mohammadabadi, Professor, Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University, Iran.

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Milk lactoferrin is against the cell surfaces infections; prevents virus entry into target cells, binds to heparan sulfate receptors, and or viral particles and inhibits localization in the cells [1]. Lactoferrin is against naked and enveloped viruses like respiratory syncytial virus, HIV and herpes simplex viruses [2]. This supplement blocks virus entry into the target cells by binding receptors or viruses in the first stage of the infection [3].

According to studies, lactoferrin prevents respiratory syncytial virus and herpes simplex viruse-1 and neutralizes intracellular spread of viruses [1]. Lactoferrin inhibits the replication of human immunodeficiency virus in the target cells as well as for rotavirus and hepatitis C virus [4,5].

Milk lactoferrin stimulates proliferation and activation of the phagocytic function of immune system. It boosts the immune responses and protects host cells against bacterial and viral infections [2]. Lactoferrin is involved in differentiation and proliferation of immune cells and further regulate the modulation of lytic activity and motility of immune cells [6]. It strengthens the recruitment of neutrophils and leukocytes, induces phagocytosis, stimulates migration and cell activation, affects the expression of immune effectors (cytokines and chemokines) thus control inflammation and immunity [7].

Bovine lactoferrin blocked entry of viral ribonucleoproteins and inhibited apoptosis by the effect on the caspase 3 activity in H3N2 influenza A virus 5. The researches declared that lactoferrin prohibited the absorption of respiratory syncytial virus by stopping the entry of viruses into the target cell [4]. Antiviral effects of lactoferrin prevented virus adsorption into the cells and inhibited viral replication for human parainfluenza virus type 2 [8,9]. The using of 100-1000 mg lactoferrin/day reduced the symptoms of colds [10].

The immuno-modulatory effects of lactoferrin strengthen immune responses and inhibits infections [11]. Lactoferrin inhibited human coronavirus such as SARS-CoV; most close to SARS-CoV-2; by 50% [12]. It is confirmed that lactoferrin can be used in infant formula and clinical trials by 100 mg to 4.5g /day without toxicities [13].

Therefore, immuno-modulatory, anti-bacterial and antiviral properties of milk lactoferrin make it unique preventative agent and novel promising candidate against viral infections. But more studies should be done to prove the amount of lactoferrin as preventive and treatment supplement [14].

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