

Abstract

Enterovirus eibovi (EV-E), a representative of the *Picornaviridae* family, is an endemic virus within the global cattle population, usually causing asymptomatic infections, although under favourable conditions it may lead to severe diseases of the respiratory, digestive, and reproductive systems. It is also one of the pathogens involved in the bovine respiratory disease complex, a common, multifactorial disease associated with significant economic losses. The lack of specific antiviral therapy encourages the search for natural substances with protective potential. The aim of the study was to evaluate *in vitro* the antiviral and immunomodulatory effects of bovine lactoferrin (bLF) against EV-E.

In experiments conducted on a bovine kidney cell line (MDBK), high concentrations of bLF (0.125–1 mg/ml) inhibited EV-E replication both during the adsorption phase and after viral entry into the cell, reducing the extracellular virus titer by 1–1.1 log and decreasing intracellular viral RNA levels by approximately 75%.

In studies performed on bovine peripheral blood mononuclear cells (PBMC), low concentrations of bLF (1–5 µg/ml), close to physiological levels, increased the expression of the *IFNα*, *IFNβ*, *IL2*, and *NFκB* genes, indicating activation of early antiviral response mechanisms, whereas higher concentrations (10–25 µg/ml) exerted immunomodulatory effects by enhancing T lymphocyte proliferation and the expression of *IFNα*, *IL10*, and *NFκB*, while simultaneously reducing *IFNγ* expression and phagocytic activity. Regardless of concentration, bLF exerted a modulatory effect on the proportion of WC1⁺ γδ T cells.

The obtained results confirm the complex, concentration-dependent antiviral and immunomodulatory activity of bLF against EV-E-infected cells. This protein may represent a natural, biologically compatible agent supporting the prevention and therapy of bovine enteroviral infections.