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Quercetin Loaded Oil in Water Microemulsion. Characterization and Evaluation of the Antiviral Activity against *Bovine alphaherpesvirus 1*. †

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Abstract: *Bovine alphaherpesvirus 1* (BoHV-1) is a virus known to cause several diseases in cattle, including rhinotracheitis, and abortion, among others. Quercetin is a flavonoid with therapeutic properties such as antioxidant, antibacterial and antiviral properties. However, the use of quercetin is limited due to its poor water solubility and its limited bioavailability. This work proposes an oil-in-water microemulsion based on the use of biocompatible materials as a vehicle to load quercetin. The microemulsion was composed of isopropyl myristate (2.50%), tween 80-ethanol (42.0%), and water (55.5%) and was loaded with quercetin at concentrations that ranged from 50-200 mg L^{-1}. Particle size (Z) and polydispersity index (PdI) were measured by dynamic light scattering, and antiviral activity studies were performed using MDBK (Madin-Darby bovine kidney) cells and BoHV-1Cooper strain (Titer: 106$TCID_{50}mL^{-1}$). A significant reduction ($p<0.05$) of viral titers after pretreatment of cell monolayers (70.7±1.9)% and in the binding assay (56.8±0.7)%, concerning the control sample, was achieved when the concentration of quercetin loaded was 100 mgL^{-1}. The Z and PdI values for this microemulsion were 10.65 nm and 0.137, respectively.
Finally, a new carrier system for quercetin was successfully obtained, and preliminary antiviral assays showed promissory results for potential use against BoHV-1.

Keywords: oil in water microemulsion; quercetin; antiviral; BoHV-1.

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Conflicts of Interest

The authors declare no conflict of interest.