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Farmers’ and academia’s views”

Acidifier reduce African swine fever virus in commercial pig feed under tropical conditions

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Abstract

African Swine Fever virus (ASFv) causes lethal disease in pigs with mortality up to 100%. Feed or feed materials can serve as potential vectors for the introduction and transmission of ASFv. Recent data show that organic acids, e.g. formic acid and medium-chain fatty acids, may exert an anti-viral impact against ASFv, albeit with some limitations (high dosages, *in-vitro* data). However, data on a combined approach of organic acids and medium chain fatty acids are scarce. This study investigates the impact of an agglomerate of sodium diformate and medium chain fatty acids (MCFA) on its ability to reduce the activity of ASFv in feed under tropical conditions in northern Vietnam.

The experiment was designed to evaluate the viability of ASFv (p72, genotype II) over time (0, 1, 3 and 7 days post-inoculation) in commercial swine feed containing either 0% or 0.3% of an agglomerate of sodium diformate and MCFA (Formi Alpha, ADDCON). Feed bags were incubated with a viral concentration of 10^8 HAD₅₀/mL. After the appropriate post-inoculation incubation period, surviving virus was eluted from the samples using RPMI 1640 medium with 5% fetal bovine serum. Virus titers (HAD₅₀/mL) were calculated by the Karber method. The quantity of ASFv was determined by real-time PCR to measure Ct-value. A significance level of 0.05 was used in all tests.

The ASFv titration assay on cell cultures showed that the feed acidifier had a significant reduction activity against ASFv throughout the whole period, beginning after a few hours. The 0.3% inclusion of the additive was able to inhibit the virus within less than one hour significantly, from 4.72 to 4.10 Log₁₀ HAD₅₀. From day 1 onwards, the reduction was highly significant ($p < 0.001$). On day 7, the ASFv was inhibited completely.

Addition of low dosages of Formi Alpha caused a highly significant reduction of the viral load in commercial swine feed – achieving complete inhibition of the virus after 7 days and can be consequently an economical and sustainable approach to curb disease transmission while reducing infection probability for pigs exposed to virus-contaminated feed.

Keywords: Acidifier, African Swine Fever, feed, medium chain fatty acids, sodium diformate