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The Prevention of Fatal Salmonellosis in Guinea Fowl Keet by Supplementing Organic Acids in Togo

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Abstract

Togo's guinea fowl producers face high keet mortality rates. The disease responsible is called “porte la boubou” locally, recently identified as a *salmonella* septicemia. Organic acids in drinking water have shown to reduce salmonellosis incidence in poultry systems hence a randomised controlled field trial to test its influence on rearing losses was arranged. The study was conducted over a duration of 8 weeks in cooperation with nine local farmers. The drinking water in the treatment groups was supplemented with 1.5 ml/l organic acids composed of formic acid, sodium formiat, lactic acid and propionic acid.

The observed mortality rate of all keets in a trial period of 5–8 weeks was $57.32 \pm 49.62\%$ ($n=157$) and was significantly reduced to $10.37 \pm 30.58\%$ ($n=164$) in the treatment ($p=5.35E-22^{***}$). In the nine farmers' groups the mean mortality rates were $56.40 \pm 33.28\%$ and $9.51 \pm 8.98\%$ respectively. A F-test showed no significant influence of the farmer but of the group ($p = 0.0036^{**}$), confirmed by a Welch's test ($p = 0.0027^{**}$). The effect size was large for both, ranging from 0.99 to 1.92.

The study additionally highlights the cumulative mortality rates after 5 weeks, after 8 weeks with a reduced sample size due to drop-outs, and a version of the dataset extrapolated to 8 weeks including all farmers' flocks. The weekly mortality rates peaked five weeks after hatching. In general, the mortality rate increased over time and the 5–8 weeks results underestimate the total losses.

The prevalence of fatal *salmonella* septicemia in guinea fowl keets over a 5–8 weeks period is estimated at $46.28 \pm 4.77\%$ while around 10% die due to other factors not affected by organic acid supplementation. The incidence rate per week during rearing is $8.70\% \pm 9.44\%$ and varies due to environmental factors like management.

It can be concluded that Togolese farmers face keet mortalities on a massive scale which can be mitigated by supplementation of organic acids in the drinking water. The suggested intervention could almost double farmers production, but further research is needed to quantify the economic impact in more detail. Additionally, serological studies to determine the zoological impact of the disease are needed.

Keywords: Guinea fowl, mortality rates, organic acids, salmonellosis