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News & Comments

Agents that Induce Liver Metabolic Disorder in Broilers

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To prevent and treat infections in broiler chickens, antibiotics are frequently utilized in the poultry business. However, the improper use of antibiotics has resulted in delayed broiler growth, antibiotic residues, bacterial drug resistance, deteriorating meat quality, and other issues in chicken farming. As a result, a focus area for research began the hunt for secure medications that might lessen the harmful and adverse effects of veterinary antibiotics. FFC has been widely utilized as cattle and poultry breeding have continued to expand. However, numerous research has demonstrated that FFC consumption has negative effects on animals and results in excessive drug residues. FFC not only hurts the animals themselves but also pollutes the surrounding ecosystem. According to studies, animals exposed to FFC can directly affect soil microbial composition and cause drug resistance.

This article was originally published in Science Direct where the authors were Wei Liu, Ying Liu, Siyuan Fang, and others. A study revealed that the levels of the drug metabolism enzyme CYP3A in hepatocytes were elevated by ethanol and isoamyl alcohol. The elevated CYP3A could enhance the risk of hepatotoxicity by catalysing the demethylation of cocaine to produce harmful metabolites. UGTIA1, GSTT1, MGST1, GSTA3, and HPGDS are liver enzymes that are involved in phase II metabolism.

According to the author, UGTIA1 is crucial in the metabolism of medicines and bilirubin. Antibiotics can alter GST's expression and activity levels, according to several studies. The findings demonstrated that FFC abnormally increased phase II metabolism by inducing the upregulation of GSTT1, GSTA3, and MGSTT1 expression levels in the livers of chicks.ALAS2 is a crucial enzyme in heme production and, by boosting haemoglobin synthesis, encourages hematopoietic cell differentiation. According to observations in the literature, cells can suffer oxidative damage from an overabundance of heme. FFC boosted ALAS2 expression and encouraged overproduction of heme, both of which could harm chick liver histocytes through oxidative stress. But using SMPs and FFC simultaneously decreased ALAS2 expression and lessened oxidative damage. “Early application of the approved amount of FFC disrupted the metabolic balance in chick livers by overly stimulating phase I and phase II drug metabolism, increasing glycine and serine production while reducing their breakdown,” said the researchers. Authors proclaimed; that it was challenging to sustain the regular metabolic process in chick livers.

KEYWORDS

Florfenicol, *Salvia miltiorrhiza,* polysaccharide, metabolic disorder, high throughput sequencing, chick