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Effects of glyphosate, antibiotics, and an anticoccidial drug on pancreatic gene expression and blood physiology in broilers

Key words: Glyphosate, Antibiotics, Anticoccidial drug, Pancreas, broilers, Gene expression, Blood parameter

Research Summary

Drugs and pesticide residues in broiler feed can compromise the therapeutic and production benefits of antibiotic application and affect gene expression.

In this study, we analyzed the expression of 13 key pancreatic genes and blood physiology parameters after administering the following: one maximum residue limit of herbicide glyphosate (GLY), two antibiotics (ANT), and one anticoccidial drug (AD).

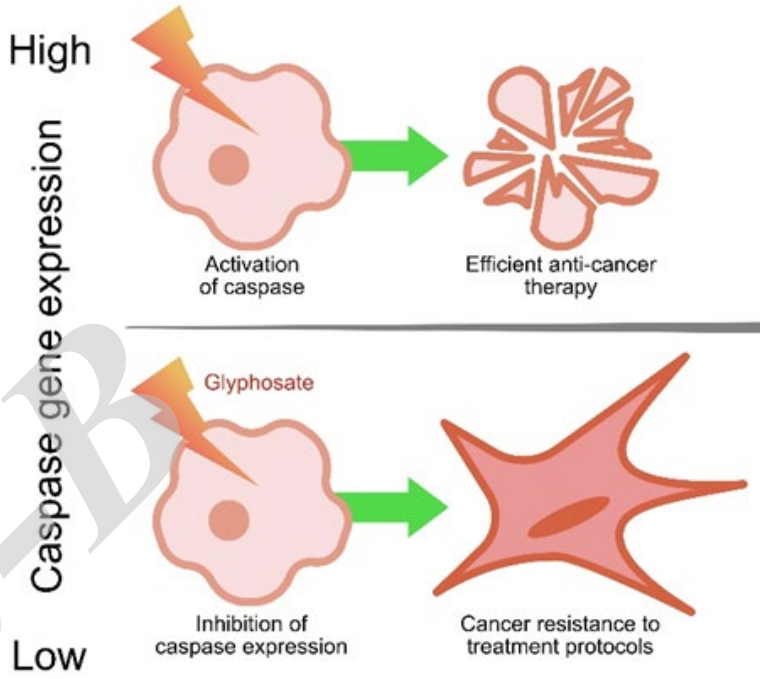
A total of 260 Ross 308 broilers aged 1 to 40 days were divided into the following four groups of 65 birds each:

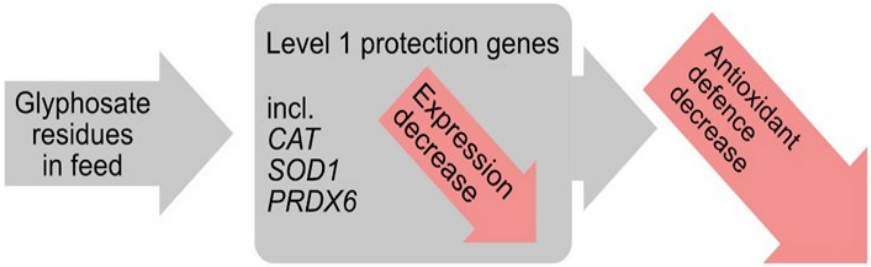
- ✓(1) control group fed the main diet (MD), and three experimental groups fed MD supplemented with
- ✓(2) GLY,
- ✓(3) GLY+ANT (enrofloxacin and colistin methanesulfonate) and
- ✓(4) GLY+AD (ammonium maduramycin).

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Innovation points

The results showed that the addition of GLY, GLY+ANT and GLY+AD caused significant changes in the expression of several genes of physiological and economic importance.
In particular, genes related to inflammation and apoptosis (*IL6, PTGS2* and *CASP6*) were downregulated by up to 115.4 times, and those related to antioxidant protection (*CAT, SOD1* and *PRDX6*) by up to 69.4 times, compared to controls.
There was also a significant decline in the values of immunological characteristics in the blood serum observed in the experimental groups and certain changes in gene expression were concordant with changes in the functioning of the pancreas and blood.





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