

**Aflatoxin B1 exposure causes alterations in lipid oxidation, and
carbohydrate and amino acid metabolisms in dairy goats using
metabolomic analysis**

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Short title: Metabolomic study of dairy goats exposed to aflatoxin B1

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Summary

The purposes of this study were to investigate the systemic and characteristic metabolites in the serum of dairy goats induced by aflatoxin B1 (AFB1) exposure and to further understand the endogenous metabolic alterations induced by it. A nuclear magnetic resonance (NMR)-based metabonomic approach was used to analyze the metabolic alterations in dairy goats that were induced by low doses of AFB1 (50 µg/kg DM). We found that AFB1 exposure caused significant elevations of glucose, citrate, acetate, acetoacetate, betaine, and glycine yet caused reductions of lactate, ketone bodies (acetate, β-hydroxybutyrate), amino acids (citrulline, leucine/iso-leucine, valine, creatine) and cell membrane structures (choline, lipoprotein, N-acetyl glycoproteins) in the serum. These data indicated that AFB1 caused endogenous metabolic changes in various metabolic pathways, including cell membrane metabolisms, the tricarboxylic acid cycle, glycolysis, lipids, and amino acid metabolism. These findings provide both a comprehensive insight into the metabolic aspects of AFB1-induced adverse effects on dairy goats and a method for monitoring dairy animals exposed to low doses of AFB1.