Acute challenge with a DON-contaminated diet induce transient changes on microbiota composition in finishing pigs

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Abstract

The present study aimed at describing the impact of a deoxynivalenol (DON) - contaminated diet on microbiota composition.

A total of 147 (Large White x Landrace) x Piétrain pigs from two replicates were affected to four different experimental treatments. Pigs in the control group (CC) received a control diet from 99 to 154 days of age. Groups DC, CD, and DD were given the DON-contaminated diet (3.02 mg DON/kg feed) for 7 days at 113, at 134, and at 113 and 134 days of age, respectively. The DON-contaminated diet was formulated with a naturally contaminated corn. The body weight gain and the feed intake were daily recorded from day 99 to 154. Fecal samples were collected at the beginning of the experiment (d99), immediately after the end of the 7-days DON challenges (d119 and 140), and at the end of the experiment (d154) for further 16S rRNA sequencing. During challenge periods, ADFI was decreased by 26% to 32% ($P < 0.05$) and ADG by 40% to 60% ($P < 0.05$). Short-term DON challenges induced transient changes in microbiota composition. Two weeks after the end of the DON challenges, this composition went back to control state. Whatever the age, DON challenged pigs could be discriminated from controls in a sparse PLS discriminant analysis based on 88 operational taxonomic units or 27 functional pathways with 16% error-rate. The main predictors raised by this discrimination belonged to *Streptococcaceae*, *Lachnospiraceae* and *Clostridiaceae* families. In our experimental conditions, changes in microbiota composition observed during DON challenges were poorly correlated to changes in ADG and ADFI. This experiment revealed a transient modification of the microbiota composition following the exposition to DON-contaminated diet, with no long-term impact on pigs' performance.

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