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### TITLE

USE OF ANTIBIOTICS AT EARLY AGE CAN AFFECT THE GUT MICROBIOTA COMPOSITION AND DIVERSITY IN ONE-WEEK OLD PIGLETS

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### CONTENT

In modern pig production, large litters are often affected by neonatal diarrhea and piglets get antibiotic treatment at their very early stage of life. Widespread resistance to antibiotic is a current issue of high relevance. Therefore, we studied the effect of two common antibiotics (amoxicillin and florfenicol) on gut microbiota composition of neonatal piglets. The study was conducted in a commercial piggery. Piglets were marked if they received antibiotic treatment within first three days of their life (n=34; 6 litters) and equal number of piglets were selected from non-treated nearest litters as control (n=34; 6 litters). Fecal samples collected at one week of age were assessed to check microbial composition by 16S rRNA gene sequencing. Intestinal microbiota population Diversity (Shannon index) and Richness were significantly lower in antibiotic treated piglets (P=0.023, P=0.003; 2.5 Vs 2.2; 55 Vs 60 respectively). Overall, the antibiotic treatment at an early age not only decreased the relative abundance of some opportunistic pathogenic bacteria (Campylobacter, Pasteurella; P < 0.01), but it also reduced some beneficial bacteria like Prevotella and Butyrimonas (P < 0.01). Moreover, individual assessment of each of the antibiotic revealed that treatment at an early age in piglets significantly decreased the relative abundance of Colostridium sensu stricto, Butyricimonas, Flavonifractor, Romboutsia, Bacteroides and Roseburia (P < 0.01).

In conclusion, this study found that early age antibiotic treatment in neonatal piglets can affect not only pathogenic bacteria in the gut, but it can also have an impact on beneficial bacterial colonization, significantly reducing the diversity of the gut microbiota. Reduced intestinal microbiota diversity has been connected with favorable growth conditions for opportunistic pathogenic bacteria.