



## 饲料添加25-羟基维生素D3对轮状病毒攻毒和未攻毒断奶仔猪血清和肠内容物抗体和细胞因子水平的影响

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### Effects of Dietary Supplementation with 25-OH-D3 on Antibody and Cytokine Levels in Serum and Intestinal Contents of Weanling Pigs with or without Rotavirus Challenge

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**摘要** 本试验旨在研究饲料中添加25羟基维生素D3 (25-OH-D3) 对轮状病毒攻毒和未攻毒断奶仔猪血清和肠内容物抗体和细胞因子水平的影响。选取48头28日龄断奶的平均体重为 (7.35±0.75) kg的杜长大三元杂交仔猪, 按体重随机分配到4个组, 每组12个重复, 每个重复1头猪, 试验期21 d。C-、C+分别为未攻毒和攻毒对照组, 饲料添加25-OH-D3 220 IU/kg; T-、T+分别为未攻毒和攻毒试验组, 饲料添加25-OH-D3 2 200 IU/kg。C+、T+组仔猪试验开始时灌服人轮状病毒1 mL (轮状病毒浓度为1×10<sup>6</sup> TCID50/mL)。结果表明, 饲料添加2 200 IU/kg 25-OH-D3提高了攻毒仔猪试验第5、21天血清和肠内容物轮状病毒抗体 (RV-Ab) 水平 (P<0.05); 降低了未攻毒仔猪第5天血清免疫球蛋白G (IgG)、免疫球蛋白M (IgM)、免疫球蛋白A (IgA) 含量 (P<0.05) 以及攻毒仔猪第5、15天血清IgA含量和第15天血清IgM含量 (P<0.01); 对未攻毒和攻毒仔猪血清和肠内容物白介素2 (IL-2)、白介素6 (IL-6) 水平以及肠内容物干扰素γ (IFN-γ) 水平有降低趋势 (P>0.05); 提高了未攻毒仔猪血清和肠内容物白介素4 (IL-4) 水平 (P>0.05) 以及攻毒仔猪第5天血清IL-4水平和第15天肠内容物IL-4水平 (P<0.01)。由结果可知, 饲料添加2 200 IU/kg的25-OH-D3可以提高轮状病毒攻毒和未攻毒断奶仔猪血清及肠内容物RV-Ab水平, 降低促炎症细胞因子的分泌及其参与的炎症反应, 促进炎症细胞因子的生成及其参与的免疫应答, 进而表现出提高断奶仔猪抗病力的作用。

**关键词:** 断奶仔猪; 25-OH-D3; 轮状病毒; 抗体; 细胞因子

**Abstract:** This experiment was conducted to study the effects of dietary supplementation with 25-OH-D3 on the antibody and cytokines in serum and intestinal contents of weanling pigs with or without rotavirus challenge. Forty-eight 28-day-old three-way cross (Duroc×Landrace×Yorkshire) weanling pigs with an average body weight of 7.35 kg were randomly assigned into 4 treatments with 12 replicates and 1 pig in each replicate. The experimental period lasted for 21 d. The pigs of control groups with or without rotavirus challenge (C+ or C-) and experimental groups with or without rotavirus challenge (T+ or T-) were fed diets with 220 and 2 200 IU/kg 25-OH-D3, respectively. The C+ and T+ groups were challenged orally with 1 mL human rotavirus (1×10<sup>6</sup> TCID50/mL). The results showed that dietary supplementation with 2 200 IU/kg 25-OH-D3 had elevated the level of rotavirus antibody in serum and intestinal contents of pigs with rotavirus challenge at d 5 and 21 (P<0.05), had decreased the serum immunoglobulin G (IgG), immunoglobulin M (IgM) and immunoglobulin A (IgA) contents of pigs without rotavirus challenge at d 5 (P<0.05), and had reduced the serum IgA content at d 5 and 15 (P<0.05) and serum IgM content at d 15 (P<0.01) of pigs with rotavirus challenge. Dietary supplementation with 2 200 IU/kg 25-OH-D3 had a decreasing trend of interleukin-2 (IL-2) and interleukin-6 (IL-6) levels in serum and intestinal contents and interferon-γ (IFN-γ) level in intestinal contents of pigs with or without rotavirus challenge (P>0.05), had enhanced the interleukin-4 (IL-4) level in serum and intestinal contents of pigs without rotavirus challenge (P>0.05), and had increased the serum IL-4 level at d 5 (P<0.01) and IL-4 level in intestinal contents at d 15 (P<0.01) of pigs with rotavirus challenge. These results indicate that dietary supplementation with 2 200 IU/kg 25-OH-D3 can increase the rotavirus antibody level in serum and intestinal contents with or without rotavirus challenge, reduce the secretion of proinflammatory cytokines and the inflammatory responses concerned with them, promote the production of anti-inflammatory cytokines and the anti-inflammatory responses concerned with them, and enhance the ability of disease resistance

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