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## 动物营养专题

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## 学术文献

### 1. 全基因组SNP分型技术在畜禽遗传育种研究中的应用

**简介:** 随着畜禽资源分子鉴定、物种进化、全基因组育种等热点领域的逐渐兴起,准确的全基因组SNP分型成为了畜禽基因组研究的关键。基因芯片、重测序、简化基因组测序及靶向捕获测序等全基因组SNP分型技术已广泛应用于畜禽基因组研究中。本文概述了全基因组SNP分型技术的原理及其在全基因组关联分析、选择信号分析和畜禽遗传资源背景分析等方面的应用, 以为畜禽基因组研究和育种应用提供借鉴和参考。

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[http://agri.ckcest.cn/file1/M00/10/11/Csgk0GMySTqAcM-oAA5FHUO\\_BPI746.pdf](http://agri.ckcest.cn/file1/M00/10/11/Csgk0GMySTqAcM-oAA5FHUO_BPI746.pdf)

### 2 . Agrobacterium sp. ZX09 $\beta$ -Glucan Attenuates Enterotoxigenic Escherichia coli-Induced Disruption of Intestinal Epithelium in Weaned Pigs (Agrobacterium sp . Zx09 $\beta$ -葡聚糖减弱产肠毒素大肠杆菌诱导的断奶仔猪肠道上皮损伤)

**简介:** To explore the protective effect of dietary  $\beta$ -glucan (BGL) supplementation on intestinal epithelium exposure to enterotoxigenic Escherichia coli (ETEC), thirty-two weaned pigs were assigned to four groups. Pigs were fed with a basal diet or basal diet containing 500 mg/kg BGL, and were orally infused with ETEC or culture medium. Results showed BGL supplementation had no influence on growth performance in weaned pigs. However, BGL supplementation increased the absorption of D-xylose, and significantly decreased the serum concentrations of D-lactate and diamine oxidase (DAO) in the ETEC-challenged pigs ( $p < 0.05$ ). Interestingly, BGL significantly increased the abundance of the zonula occludens-1-(ZO-1) in the jejunal epithelium upon ETEC challenge ( $p < 0.05$ ). BGL supplementation also increased the number of S-phase cells and the number of slgA-positive cells, but significantly decreased the number of total apoptotic cells in the jejunal epithelium upon ETEC challenge ( $p < 0.05$ ). Moreover, BGL significantly increased the duodenal catalase (CAT) activity and the ileal total superoxide dismutase (T-SOD) activity in the ETEC-challenged pigs ( $p < 0.05$ ). Importantly, BGL significantly decreased the expression levels of critical inflammation related proteins such as the tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), interleukin-6 (IL-6), myeloid differentiation factor 88 (MyD88), and nuclear factor- $\kappa$ B (NF- $\kappa$ B) in the jejunal and ileal mucosa upon ETEC challenge ( $p < 0.05$ ). BGL also elevated the propanoic acid content and the abundance of Lactobacillus and Bacillus in the colon upon ETEC challenge ( $p < 0.05$ ). These results suggested BGL could alleviate the ETEC-induced intestinal epithelium injury, which may be associated with suppressed inflammation and improved intestinal immunity and antioxidant capacity, as well as the improved intestinal macrobiotic.

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### 3 . Rhodotorula benthica culture as an alternative to antibiotics improves growth performance by improving nutrients digestibility and intestinal morphology, and modulating gut microbiota of weaned piglets (海洋红酵母培养物作为抗生素的替代品, 通过改善营养物质消化率和肠道形态, 以及调节断奶仔猪的肠道微生物群来提高生长性能)

**简介:** The effects of *Rhodotorula benthica* culture (RBC) and antibiotics (AB) on the growth performance, nutrients digestibility, morphological indicators, and colonic microbiota of weaning piglets were explored. Ninety-six (Duroc × Landrace × Large) weaned piglets (21-day-old) weighing 7.7 ± 0.83 kg, were randomly allocated to 4 dietary treatments. They were fed with basal diet (CON), basal diet + 25 mg/kg bacitracin zinc + 5 mg/kg colistin sulfate (AB), 5 g/kg reduction in soybean meal of basal diet + 5 g/kg RBC (RBC1), or 10 g/kg reduction in soybean meal of basal diet + 10 g/kg RBC (RBC2). The results showed that dietary RBC1 improved the body gain/feed intake (G/F) of weaned piglets than the CON diet, and the RBC2 diet improved the average daily gain and G/F than CON and AB diets from days 15 to 28 ( $P < 0.05$ ). Supplementation of RBC2 improved the apparent total tract digestibility of dry matter, nitrogen, and gross energy in weaned piglets compared to controls from days 15 to 28 ( $P < 0.05$ ). Dietary AB, RBC1, and RBC2 enhanced the ileal villus height (VH) and VH/crypt depth (CD), and these two indicators were greater in the RBC2-treated piglets than in the AB- and RBC1-treated piglets ( $P < 0.05$ ). The activity of serum superoxide dismutase (SOD) was enhanced by dietary AB, RBC1, and RBC2 ( $P < 0.05$ ). Serum glutathione (GSH) concentration was elevated by dietary RBC1 and RBC2 ( $P < 0.05$ ). According to 16S rRNA sequence analysis, AB- and RBC2-treated piglets had a higher relative abundance of Firmicutes and Lachnospiraceae in the colon digesta, and more abundant *Lactobacillus* was found in RBC1-treated piglets, as compared to the CON group. Additionally, RBC2 supplementation increased the  $\alpha$  diversity [Chao1, PD-whole-tree, and observed operational taxonomic units (OTUs)] compared to the CON group. Taken together, the dietary RBC improved the growth performance of weaned piglets. In addition, 10 g/kg of RBC2 in the diet achieved better effects on higher ADG, ileal villi morphology, and stronger antioxidant capacity than dietary AB and RBC1 in weaning piglets.

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### 4. 楼房养猪智能化设备应用

**简介:** 关于楼房养猪1. 1楼房养猪的发展养殖业一直是我国农业的支柱产业, 集约化、智能化是现代养殖业发展的方向, 而随着规模化养殖业的发展, 对于土地的需求也越来越多, 养殖业的发展也是从传统的平房养殖转移到立体楼房养殖, 而在楼房养殖的发展过程中也是经历了平层叠加的探索以及集中通风楼房的创新, 目前楼房养殖还处于不断

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探索不断创新的发展过程中。养猪的模式发展过程如图1所示。

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<http://agri.ckcest.cn/file1/M00/03/3F/Csgk0YeI9ZiAXTRGACH3h27IMos211.pdf>

## 5. 北美生猪养殖产业近10年的创新研究进展

简介：本文综述了过去10年来北美生猪产业最重要的创新技术，包括分子基因组学与基因编辑技术、子宫颈后人工授精技术、精准营养创新技术、饲料原料优选技术、快速传染病检测与信息通讯整合对疾病控制的技术，对控制猪繁殖与呼吸综合征（PRRS）、控制氧化应激以及调节肠道健康等方面的创新技术也做了总结。

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