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动物营养专题

本期导读

► 学术文献

1. 葡萄籽原花青素改善动物生长性能和肠道健康的研究进展
2. 畜禽微生物-肠-脑轴调节机制研究进展
3. 基于铁蛋白显示抗原纳米颗粒和纳米体辣根过氧化物酶融合的竞争ELISA快速灵敏检测非洲猪瘟病毒抗体
4. 断奶过渡期间猪的肠内分泌肽、生长和微生物组
5. 政产学研视角下的数字乡村赋能生猪产业振兴——以重庆荣昌为例

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学术文献

1. 葡萄籽原花青素改善动物生长性能和肠道健康的研究进展

简介: 原花青素 (PCs) 是一类广泛存在于植物皮、壳、籽、核、花、叶中的多酚类化合物的总称, 在葡萄籽中原花青素含量最高。其主要有效成分为低聚原花青素 (OPCs), 具有抗炎、抗氧化、抗应激、调节免疫力、抑菌等生理作用。本文对葡萄籽原花青素的理化性质及其改善动物生长性能和肠道健康的作用机理进行综述, 以为葡萄籽原花青素在动物养殖领域的应用提供理论依据。

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2. 畜禽微生物-肠-脑轴调节机制研究进展

简介: 微生物-肠-脑轴 (microbiota-gut-brain axis, MGBA) 是动物机体最主要的生理代谢调节机制之一。肠道菌群在肠道与大脑通过神经和内分泌等物质介导的双向应答系统中发挥着关键作用。目前, MGBA在畜禽营养代谢方面的研究已有不少报道, 但在畜禽生产应用和功能性疾病方面研究较少。本文从微生物及其代谢物与宿主肠道、神经内分泌系统、免疫系统之间的联系入手, 综述了畜禽MGBA调节机制的研究进展, 以为畜禽MGBA的研究应用提供新思路, 达到科学高效养殖的目的, 从而提高畜禽经济效益与动物福利, 促进畜禽养殖业高效健康发展。

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3. Ferritin-displayed antigen nanoparticles and nanobody-horseradish peroxidase fusions based-competitive ELISA for the rapid and sensitive detection of antibody against African swine fever virus (基于铁蛋白显示抗原纳米颗粒和纳米体辣根过氧化物酶融合的竞争ELISA快速灵敏检测非洲猪瘟病毒抗体)

简介: African swine fever (ASF) is a highly contagious and lethal hemorrhagic disease, which has brought great distress and economic losses to the world pig industry. For lack of approved vaccines and effective treatment, accurate early detection, both ASF virus (ASFV) antigen and antibody detection in the field, is one of the most important aspects for preventing the outbreak and spread of ASFV. Here we screened the specific nanobodies against the ASFV-P30 protein from the library of immunized Bactrian camel and fused them with horseradish peroxidase (HRP) for expression in HEK293T cells. Moreover, the P30 protein was designed and displayed on the surface of ferritin, the fusion nanocages. Then we developed a novel competitive ELISA (cELISA) based on ferritin-displayed P30 nanoparticles protein (P30-Fn) and nanobody-horseradish peroxidase fusions (P30Nb71-vHRP) for rapid detection of ASFV

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antibody in serum sample with high sensitivity and specificity. The cELISA can detect as far as 1:200 diluted clinically positive serums and show no cross-reactivity with positive serums against others porcine viruses, such as PRRSV, PPV, CSFV, TGEV, PEDV, PCV and SIV. The agreement rate is 98.1% with the test results of the commercial ELISA kit for the detection of a total of 267 clinical samples, and the kappa value is 0.96. Furthermore, the cELISA exhibits a good repeatability and the intra- and inter-assay coefficient of variation are less than 10%. In summary, the newly developed cELISA is a simple, rapid, sensitive and low-cost immunoassay, which has a great potential for ASFV antibody detection in clinical samples.

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4 . Enteroendocrine peptides, growth, and the microbiome during the porcine weaning transition (断奶过渡期间猪的肠内分泌肽、生长和微生物组)

简介: Background: Growth rate in pigs can be affected by numerous factors that also affect feeding behavior and the microbiome. Recent studies report some communication between the microbiome and the enteroendocrine system. The present study examined if changes in the piglet microbiome between birth and during the weaning transition can be correlated either positively or negatively with growth rate and plasma concentrations of enteroendocrine peptides. Results: During the post-weaning transition, a 49% reduction in average daily gain was observed at day 24 ($P < 0.05$) relative to day 21. Pigs recovered by day 28 with body weight and average daily gain increases of 17% and 175%, respectively relative to day 24 and the highest rate of gain was measured at day 35 (462 g/day). The time interval between day 21–24 had the highest number of correlations ($n = 25$) between the relative abundance differences in taxa over time and corresponding percent weight gain. Amplicon sequence variants with the greatest correlation with percent weight gain between day 21–24 belonged to families Prevotellaceae NK3B31 ($\rho = 0.65$, $P < 0.001$), Veillonellaceae ($\rho = 0.63$, $P < 0.001$) and Rikenellaceae RC9 ($\rho = 0.62$, $P < 0.001$). Seven taxa were positively correlated with percent weight gain between day 24–28. Eight taxa were positively correlated with percent weight gain between day 28–35, of which four were Clostridia. Only *Lactobacillus reuteri* was positively correlated across both day 24–28 and day 28–35 analyses. Insulin-like growth factor 1 (IGF-1; $R_2 = 0.61$, $P < 0.001$), glucose-dependent insulintropic polypeptide (GIP; $R_2 = 0.20$, $P < 0.001$), glucagon-like peptide 1 (GLP-1; $R_2 = 0.51$, $P < 0.001$), and glucagon-like peptide 2 (GLP-2; $R_2 = 0.21$, $P < 0.001$) were significantly associated with the piglet fecal community NMDS, while serotonin showed no significant association ($R_2 = 0.03$, $P = 0.15$). Higher concentrations of GLP-1 and GLP-2 characterized day 1 fecal communities, while GIP levels had the strongest relationship primarily with samples ordinated with the day 21 cluster. Conclusions: Demonstration of an association of certain taxa with individual gut peptides at specific ages suggests the potential for the microbiome to elicit changes in the gut enteroendocrine system during early postnatal development in the pig.

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5. 政产学研视角下的数字乡村赋能生猪产业振兴——以重庆荣昌为例

简介:对重庆市荣昌区通过数字乡村赋能的形式所打造的大数据监管生猪养殖模式进行了分析,并将之总结为“科研机构+政府+企业”的政产学研模式,其主要成功经验是:畜牧业与大数据技术相结合,实现了养殖过程中的数字监管,造就了精准培育的模式,提高了生猪的产量和质量;借助“大数据”“云计算”等技术,对生猪全产业链数字资源进行调动,实时把控供应端和消费端的平衡,助推生猪产业数字化发展;利用国家级重庆(荣昌)生猪大数据中心等创新平台,通过区块链技术来实现猪肉产品的全程溯源,确保生猪产前产中产后的实时监管,针对性克服生猪交易链条太长、信息壁垒高企、质量问题难保证、生产交易成本难降等一系列问题。

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