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## ▶ 前沿资讯

### 1. 中国饲料工业协会发布低蛋白配合饲料团体标准

**简介:** 据中国乡村之声消息,10月26日,中国饲料工业协会批准发布《仔猪、生长育肥猪配合饲料》《蛋鸡、肉鸡配合饲料》两项团体标准,这是我国饲料和养殖业贯彻落实绿色发展理念,立足国情大力推进节本降耗和源头减排所采取的重要举措,也是进一步提升产业竞争力的有效措施。团体标准聚焦降低配合饲料蛋白含量,倡导高效低蛋白日粮体系应用,具有前瞻性和指导性,在我国饲料行业内有里程碑式意义,并将对绿色发展产生深远影响。我国工业饲料以及肉、蛋产量连续多年位居全球第一,但饲料资源长期短缺,特别是蛋白饲料原料的进口依存度接近80%,成为制约我国饲料工业和养殖业发展的瓶颈。同时,饲料利用效率不高不仅增加养殖动物代谢负担,而且导致养分大量过腹排放,带来了比较突出的环境影响,长此以往将成为农村环境治理的一大难题。随着科学研究不断深入,特别是低蛋白日粮配制技术发展,在合理添加合成氨基酸和酶制剂的前提下,配合饲料中粗蛋白和磷的水平可以显著降低。为切实减少饲料原料特别是蛋白质饲料原料的消耗,有效破解养殖业的环境约束,建立可持续发展的产业体系,中国饲料工业协会联合国内动物营养领域专家及大型饲料企业,共同起草了《仔猪、生长育肥猪配合饲料》《蛋鸡、肉鸡配合饲料》两项团体标准。与现行的2008年版《仔猪、生长育肥猪配合饲料》《产蛋后备鸡、产蛋鸡、肉用仔鸡配合饲料》国家标准相比,两项团体标准增设了粗蛋白质、总磷上限值,下调了部分指标的下限值,增加了限制性氨基酸品种,重新划分了动物生长阶段,增加了我国特色养殖品种黄羽肉鸡的相关指标。针对低蛋白日粮对养殖动物的营养保障问题,专家研究结果及国内相关养殖企业应用实践表明,该标准的指标设置完全可以满足养殖动物生长需求,不会降低生产性能和产品质量,也不会影响畜产品的生产周期。两项标准的出台将有效减少豆粕等蛋白饲料原料用量。据测算,猪配合饲料平均蛋白水平下调1.5个百分点,有望将生产1公斤猪肉的蛋白质消耗从0.45公斤降至0.39公斤,降幅达13%;蛋鸡、肉鸡配合饲料蛋白水平也将降低约1个百分点。新标准在全行业全面推行后,养殖业豆粕年消耗量有望降低约1100万吨,带动减少大豆需求约1400万吨,对于保障我国饲料和养殖业蛋白原料供给和提高利用效率,将发挥积极作用,有利于提升我国饲料工业水平,促进高质量发展。

**来源:** 中国畜牧网

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**全文链接:**

<http://www.chinafarming.com/axfwnh/2018/10/29/2323697850.shtml>

### 2. 4056起! 非洲猪瘟全球蔓延, 13个国家已根除!

**简介:** 截至10月22日,全球有37个国家和地区向OIE报告发生非洲猪瘟疫情,其中13个国家已经根除。2018年新发生疫情的国家包括匈牙利(4月)、保加利亚(8月)、中国(8月)、比利时(9月)。2018年以来,全球有波兰、俄罗斯、拉脱维亚、捷克、罗马尼亚、摩尔多瓦、乌克兰、匈牙利、保加利亚、比利时、科特迪瓦、南非、乍得、赞比亚和中国等15个国家发生4056起非洲猪瘟疫情。

**来源:** 中国饲料行业信息网

**发布日期:**2018-10-23

**全文链接:**

## 学术文献

### 1. 日粮添加褐藻糖胶对断奶仔猪抗炎能力和肠道微生物多样性的影响

**简介:** 目的】本试验旨在研究日粮添加海带提取物褐藻糖胶对断奶仔猪生长性能、营养物质消化率、机体免疫力和肠道微生物多样性的影响。【方法】试验选用36头初始体重为(7.43±0.12)kg的健康仔猪,按照随机区组设计分为3组,每组12头。日粮处理组分别为不含抗生素的基础日粮组、抗生素组和褐藻糖胶组;试验期为28天。评价褐藻糖胶对仔猪生长性能和营养物质消化率的影响;通过比色法和酶联免疫吸附法检测血清中与免疫相关的指标;通过16S rRNA扩增子高通量测序检测试验第0、14和28天肠道微生物多样性。【结果】日粮添加褐藻糖胶可降低试验0-14天仔猪耗料增重比( $P < 0.05$ ),但对试验全期仔猪平均日增重和平均日采量无显著影响( $P > 0.05$ )。与对照组相比,饲喂褐藻糖胶日粮后,仔猪的中性洗涤纤维和酸性洗涤纤维表观消化率显著提高( $P < 0.05$ );仔猪饲喂抗生素和褐藻糖胶日粮后,血清IL-22含量显著降低。试验第14天,抗生素组和褐藻糖胶处理组中Bacteroidetes数量呈上升趋势( $P = 0.07$ );试验第28天,抗生素组和褐藻糖胶处理组Actinobacteria丰度显著高于对照组( $P < 0.05$ ),且褐藻糖胶处理组Bacteroides属的菌群丰度显著高于对照组和抗生素组。【结论】日粮添加褐藻糖胶提高了断奶仔猪纤维养分消化率和拟杆菌属的丰富度和多样性,并且降低了促炎性细胞因子IL-22含量,这有助于缓解仔猪的断奶应激反应,建立稳定健康肠道菌群。

来源:微生物学报

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全文链接:

<http://agri.ckcest.cn/ass/48fb84e9-c5b8-4e1c-93a1-d3390e2ee7cd.pdf>

### 2. Supplemental effect of xylanase and mannanase on nutrient digestibility and gut health of nursery pigs studied using both in vivo and in vitro models (使用体内和体外模型研究木聚糖酶和甘露聚糖酶对育苗猪养分消化率和肠道健康的补充作用)

**简介:** Non-starch polysaccharides (NSP; arabinoxylan, mannans) are present in high concentration in distiller's dried grain with solubles (DDGS). These NSP are not degraded by endogenous digestive enzymes of pigs. The purpose of this study was to determine if supplemental enzymes could increase the apparent ileal digestibility (AID) of nutrients in nursery pigs fed corn DDGS, alter short chain fatty acid (SCFA) production, and affect gut health. Two independent studies were carried out using an in vitro porcine model and in vivo model. For the in vitro study, enzymatically digested residue of DDGS was used in a 2 × 2 factorial arrangement of treatments: supplemental xylanase (0 or 1500 endo-pentosanase unit of xylanase/kg of the diet) and supplemental mannanase (0 or 400 unit of mannanase/kg of diet). For the in vivo study, corn-soybean meal based diets with 15% corn DDGS were formulated using thirty-two newly weaned pigs in a randomized complete block design for 4

treatments in the similar fashion as in vitro study. Plasma and mucosa were collected for tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and malondialdehyde (MDA) measurements. Digesta samples from jejunum and ileum were collected to measure viscosity, pH, and AID of nutrients including NSP components. Supplemental xylanase increased ( $P < 0.05$ ) concentration of SCFA, acetate, and propionate, and AID of total NSP, arabinoxylan, and GE. Supplemental xylanase also increased ( $P < 0.05$ ) villus height in the duodenum, proliferation rate in the crypt of jejunum, and the concentrations of claudin, occludin, and ZO-1 in jejunum, whereas reduced ( $P < 0.05$ ) the viscosity of jejunal digesta. Supplemental Mannanase increased ( $P < 0.05$ ) production of butyrate and AID of mannan and occludin concentration, whereas tended to decrease ( $P = 0.057$ ) MDA level in the jejunum. An interaction effect ( $P < 0.05$ ) was found between xylanase and mannanase for digestibility coefficient of arabinoxylan and ZO-1 concentration. In conclusion, the use of supplemental xylanase and mannanase were able to improve digestibility of targeted NSP and improve gut health. Hence, these enzymes can be used separately or together depending upon the type of ingredients used in the feed and amount of substrate (xylan or mannan) available for enzymes to degrade in diets for nursery pigs to enhance utilization of different fibrous coproducts and improve gut health.

来源: Animal Feed Science and Technology

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全文链接:

<http://agri.ckcest.cn/ass/355c6a0c-cd28-4453-b17f-33cc05825ef3.pdf>

### **3 . High removal efficiency of antibiotic resistance genes in swine wastewater via nanofiltration and reverse osmosis processes (通过纳滤和反渗透工艺高效去除猪场废水中抗生素抗性基因)**

简介: Swine wastewater treatment plant has become one of the main sources of antibiotic resistance genes (ARGs). Membrane treatment processes are promising solutions for removal of the emerging contaminants. However, limited studies have investigated the effects of nanofiltration and reverse osmosis treatment in removing ARGs in swine wastewater. In this study, the presence and the fate of common ARGs including *sul1*, *sul2*, *tetA*, *tetM* and *tetW*, as well as *intI1* and 16S rRNA gene, were investigated in a medium-sized (6500) pig farm wastewater treatment plant (WWTP) equipped with conventional biological treatment and advanced membrane processing system. All of the genes were detected with highly abundance in the raw sewage. The biological treatments of the swine wastewater treatment plant did not reduce the quantity of the ARGs. As expected, nanofiltration and reverse osmosis treatment reduced the absolute gene copy number of ARGs efficiently (4.989.52 logs removal compared to raw sewage). Compared to the reverse osmosis effluent, however, the absolute abundance of ARGs in the artificial wetland increased by 1.002.06 logs. Meanwhile, the relative abundance of sulfonamide resistant genes were basically unchanged, while tetracycline resistance genes (*tetA*, *tetM* and *tetW*) decreased by 0.88, 3.47, 2.51 log, respectively. The results demonstrated that advanced membrane treatments are capable of removing various kinds of ARGs efficiently, as well as some common nitrogen and phosphorus contaminants. This study suggested a mature alternative method for the removal of ARGs from livestock

wastewater.

来源: Journal of Environmental Management

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全文链接:

<http://agri.ckcest.cn/ass/8e79817d-b718-4c5c-abb0-3f3ecee92f2b.pdf>