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动物营养专题

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中国农业科学院农业信息研究所
联系人：熊本海;郑姗姗;顾亮亮
联系电话： 010-62816017
邮箱：agri@ckcest.cn
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前沿资讯

1．兰州新区生猪生态种养循环产业化 助农牧业可持续发展

简介：8月21日，兰州新区200万头生猪生态种养循环全产业链项目举行签约开工仪式。兰州新区党工委副书记、新区管委会主任李东新表示，该项目建成后将推动新区生猪产业实现规模化、标准化、产业化、生态化发展，带动农民增收致富，促进农村三产融合发展，推动乡村振兴和农业农村现代化具有十分重要的意义。据了解，此次签约的兰州新区200万头生猪生态种养循环全产业链项目，由新希望六和股份有限公司下属西藏新好科技有限公司投资建设。项目选址位于兰州新区中川镇平岘村生态循环养殖园和西岔镇大斜沟生态循环养殖园内，占地3万亩，总投资32亿元。8月21日，项目正式开工建设，建设内容包括专业化猪饲料加工厂及年出栏200万头生猪养殖场、年屠宰加工200万头食品加工厂、冷链物流、研发及展览中心、生物安全检测中心及食品安全追溯体系等，项目建设周期2年。据了解，上述项目建成后，年总产值可达60亿元，直接提供物流运输、建材、冷链、仓储等配套产业就业岗位3000人。项目将通过种养结合、循环利用及产业链运营的发展理念，提供优质有机肥，改善土壤结构，增强土质肥力，有利于农牧业的可持续发展。

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2．猪肉富硒与硒形态分析研究取得重要进展

简介：近日，中国农业科学院北京畜牧兽医研究所优质功能畜产品创新团队在猪肉富硒与硒形态分析方面取得重要进展，研究结果已在食品科技TOP期刊《Food Chemistry》（IF: 5.399）在线发表。硒是人体必需的微量元素，摄入不足容易导致机体免疫低下、死亡风险增加、肌肉功能障碍等问题。我国2/3地区缺硒，居民平均硒摄入量44.6 μg/d，低于中国营养学会推荐的摄入量60 μg/d。同时，硒的功能与其存在形态密切相关，与无机硒相比，有机硒更易被人体吸收，效率更高。猪肉是我国居民膳食中重要的优质蛋白质来源，也是硒富集的理想载体。因此，开展富硒猪肉及猪肉中硒形态研究工作，对于改善我国居民膳食硒营养水平具有重要意义。该研究比较了日粮中添加不同硒源（亚硒酸钠、甲基硒代半胱氨酸、硒代蛋氨酸）对育肥猪肌肉中硒的富集效率及沉积形态的影响。结果发现，日粮中不同硒源在猪肉中富集效率为：硒代蛋氨酸>甲基硒代半胱氨酸>亚硒酸钠。研究开发出了基于高效液相色谱—电感耦合等离子体质谱同时检测猪肉中7种形态硒的方法，并在猪肉中鉴定到硒代胱氨酸、甲基硒代半胱氨酸、硒代蛋氨酸、硒脲共4种形态硒，猪肉中的硒主要以硒代蛋氨酸（>70%）和硒代胱氨酸（>11%）为主，甲基硒代半胱氨酸和硒脲含量相对较少（<10%）。该研究表明，日粮中添加不同硒源显著能够影响肌肉中硒沉积量和形态，采用优质硒源，生产的富硒猪肉中硒含量可达54 μg/100 g，且80%以上为硒代蛋氨酸；利用硒代蛋氨酸作为优质硒源生产的富硒猪肉，可以作为改善我国居民硒营养状况的良好膳食来源。该研究得到国家重点研发计划（2018YFD050040001-02/03）、中央级科研院所基本科研业务费（2018-YWF-YB-5）、中国农业科学院科技创新工程（ASTIP-IAS12）等项目支持。博士生张凯为该论文的第一作者，张军民研究员为通讯作者。

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3．USDA：预计美第三季度猪肉出口量增加

简介：美国农业部预测，第三季度商业猪肉产量将近68亿磅，比一年前增长7%以上。由于分割猪肉的月度库存增加，2019年和2020年年末猪肉冷库存预估均走高。上半年猪肉出口量比一年前下降近2%。总的来说，除了中国/中国香港之外，对墨西哥和亚洲的出口疲弱。除了多米尼加共和国以外，对加拿大和澳大利亚以及拉丁美洲的出口都很强劲。预计第三季度出口量将比一年前增长19%以上。2019年美国上半年进口猪少于2018年同期：美国是加拿大活猪的重要进口国。几乎所有美国的育肥猪进口都来自加拿大。在2018年和2019年的上半年，大约85%的进口猪都是用于加工；也就是，在加拿大喂养至屠宰重量，然后在美国加工。在2019年的前6个月，美国从加拿大进口的育肥猪减少了4.2%。然而，美国上半年进口的即时屠宰生猪增加了2%，这可能是由于最近在靠近加拿大边境的地区开设了屠宰厂。
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学术文献

1．Effect of fosfomycin, Cynara scolymus extract, deoxynivalenol and their combinations on intestinal health of weaned piglets(磷霉素、苏铁提取物、脱氧雪腐镰刀菌醇及其组合对断奶仔猪肠道健康的影响)

简介：Weaning is a challenging stage of pig farming. Animals undergo environmental, social and dietary changes leading to weaning stress syndrome. In order to compensate for the detrimental effects of weaning stress, antibiotics and natural extracts are used as feed additives, sometimes without fully understanding the interactions between them or even with low concentrations of mycotoxins that are frequently present in feed. The aim of this study was to evaluate the effect of fosfomycin (FOS), Cynara scolymus extract (CSE), deoxynivalenol (DON) and their combined administration on intestinal health of weaned piglets. The experiment was designed as a 2 × 2 × 2 factorial arrangement with 3 factors (FOS, CSE and DON treatments), 2 levels each (presence and absence) and 3 repeats. Weaned piglets (n = 24) were randomly divided in groups to receive the different treatments, namely DON administered in diet (50 μg/kg BW), FOS administered into the drinking water (30 mg/kg BW), CSE administered in diet (15 mg/kg BW) and all their combinations. After 15 d, the animals were euthanized and gastrointestinal tract samples were immediately taken to evaluate gastrointestinal pH, Enterobacteriaceae to lactic acid bacteria (E:L) ratio, volatile

fatty acid (VFA) concentrations, disaccharidase (lactase, sucrase and maltase) activity, histology (intestinal absorptive area [IAA] and goblet cells count) and mucus ability to adhere pathogenic Escherichia coli . From our results, FOS and CSE treatments, individually or combined, produced a lower E:L ratio, an enhanced production of butyrate, increased disaccharidase activity (particularly maltase), and a greater IAA and goblet cells count along with an increase in pathogenic bacteria adherence to intestinal mucus. Deoxynivalenol did not show interactions with the other factors and its administration produced decreases on VFA, disaccharidase activity and goblet cells count. In conclusion, weaning piglets receiving diets containing FOS, CSE or both exhibited evident beneficial intestinal effects compared to animals receiving diets free from these compounds. On the contrary, the presence of DON at sub-toxic concentrations produced detrimental effects on intestinal health. The knowledge of the physiological and pathological gut changes produced by these compounds contributes to understand their potential productive consequences.

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2．Dietary supplementation of weaned piglets with a yeast-derived mannan-rich fraction modulates cecal microbial profiles, jejunal morphology and gene expression(断奶仔猪日粮中添加富含酵母的甘露聚糖组分，可调节盲肠微生物形态、空肠形态和基因表达)

简介：The development of nutritional strategies to improve microbial homeostasis and gut health of piglets post-weaning is required to mitigate the high prevalence of post-weaning diarrhea and subsequent growth checks typically observed during the weaning transition. Therefore the objective of this study was to determine the effect of supplementing piglet creep and nursery feed with a yeast-derived mannan-rich fraction (MRF) on piglet growth performance, cecal microbial profiles, and jejunal morphology and gene expression. Ten litters of piglets (n=106) were selected on postnatal day (PND) 7 and assigned to diets with or without MRF (800 mg/kg) until weaning (n=5 litters/treatment; initial weight 3.0±0.1 kg). On PND 21, 4 piglets per litter (n=40) were selected and weaned into the nursery where they remained on their respective diets until PND 42. A two-phase feeding program was used to meet nutrient requirements, and pigs were switched from phase 1 to phase 2 on PND 28. Feed intake and piglet weights were recorded on PND 7, 14, 21, 28, 35 and 42. On PND 28 and 42, ten piglets per treatment were euthanized to collect intestinal tissue and digesta. Piglets supplemented with MRF had 21.5% greater (P<0.05) average daily feed intake between PND 14-21. However, MRF supplementation did not affect piglet growth performance compared to control. On PND 28, jejunal villus height was 16.8% greater (P<0.05) in piglets consuming MRF supplemented diets. Overall microbial community structure in cecal digesta on PND 28 tended to differ in pigs supplemented with MRF (P=0.076; analysis of similarities (ANOSIM)) with increased (P<0.05) relative abundance of Paraprevotellaceae genera YRC22 and CF231, and reduced (P<0.05) relative abundance of Sutterella and

Prevotella. Campylobacter also tended to reduce (P<0.10) in MRF supplemented piglets. On PND 28 differential gene expression in jejunal tissue signified an overall effect of supplementing MRF to piglets. Downstream analysis of gene expression data revealed piglets supplemented with MRF had enriched biological pathways involved in intestinal development, function and immunity, supporting the observed improvement in jejunal villus architecture on PND 28. On PND 42 there was no effect of MRF supplementation on jejunal morphology or overall cecal microbial community structure. In conclusion, supplementing Actigen™, a MRF, to piglets altered cecal microbial community structure and improved jejunal morphology early post-weaning on PND 28, which is supported by enrichment of intestinal development pathways.

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