



2022年第22期总345期

## 动物营养专题

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## ▶ 前沿资讯

### 1. 欧盟食品安全局发布欧盟非洲猪瘟流行病学分析报告（2020.9月-2021.8月）

**简介：**2022年5月4日，欧盟食品安全局发布了欧盟非洲猪瘟流行病学分析报告（2020年9月至2021年8月）。据了解，报告对2020年9月1日至2021年8月31日欧盟受影响成员国和两个邻国的非洲猪瘟基因型II疫情进行了描述性分析。部分原文报道如下：This report provides a descriptive analysis of the African swine fever (ASF) Genotype II epidemic in the affected Member States in the EU and two neighbouring countries for the period from 1 September 2020 to 31 August 2021. ASF continued to spread in wild boar in the EU, it entered Germany in September 2020, while Belgium became free from ASF in October 2020. No ASF outbreaks in domestic pigs nor cases in wild boar have been reported in Greece since February 2020. In the Baltic States, overall, there has been a declining trend in proportions of polymerase chain reaction (PCR)-positive samples from wild boar carcasses in the last few years. In the other countries, the proportions of PCR-positive wild boar carcasses remained high, indicating continuing spread of the disease. A systematic literature review revealed that the risk factors most frequently significantly associated with ASF in domestic pigs were pig density, low levels of biosecurity and socio-economic factors. For wild boar, most significant risk factors were related to habitat, socio-economic factors and wild boar management. The effectiveness of different control options in the so-named white zones, areas where wild boar densities have been drastically reduced to avoid further spread of ASF after a new introduction, was assessed with a stochastic model. important findings were that establishing a white zone is much more challenging when the area of ASF incursion is adjacent to an area where limited control measures are in place. Very stringent wild boar population reduction measures in the white zone are key to success. The white zone needs to be far enough away from the affected core area so that the population can be reduced in time before the disease arrives and the timing of this will depend on the wild boar density and the required population reduction target in the white zone. Finally, establishing a proactive white zone along the demarcation line of an affected area requires higher culling efforts, but has a higher chance of success to stop the spread of the disease than establishing reactive white zones after the disease has already entered in the area.

**来源：**食品伙伴网

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<http://agri.ckcest.cn/file1/M00/10/04/Csgk0GKJ3TmATk-IAA4YK2NgM5Y380.pdf>

## 学术文献

### 1. 益生菌对断奶仔猪肠道黏膜屏障功能的调控作用及可能机制

**简介:** 早期断奶仔猪, 由于饮食、环境的改变以及自身消化系统、免疫系统的不完善, 易引发断奶应激综合征, 造成肠道屏障功能紊乱。有效修复因断奶应激引发的肠道屏障功能紊乱, 提高仔猪肠道消化吸收及免疫机能对促进仔猪生长、防治腹泻具有重要意义。益生菌是一类安全、绿色、高效的新型饲料添加剂, 具有抗菌、抑炎、免疫调节等作用。研究表明, 益生菌能够维护断奶仔猪肠道屏障功能, 缓解断奶应激。本文综述了益生菌对断奶仔猪肠道健康影响的研究进展, 总结了其调控断奶仔猪肠道屏障功能的可能机制, 以期对断奶仔猪肠道健康的营养调控提供理论依据。

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### 2. 金华猪肌肉和血清氨基酸谱的发育性变化及其与肌肉生长的相关性

**简介:** 选择同批次的60头金华猪仔猪进行饲养, 在45、90、150、270日龄分别选择4头金华猪进行屠宰, 测定眼肌面积, 并采集背最长肌和血清样品, 分别用于水解氨基酸和游离氨基酸及其衍生物的测定。试验结果显示: 随着日龄增加, 金华猪眼肌面积显著 ( $P < 0.05$ ) 增大。肌肉水解氨基酸中: 必需氨基酸含量和总氨基酸含量在45日龄至270日龄间先显著 ( $P < 0.05$ ) 升高, 再显著 ( $P < 0.05$ ) 下降, 之后基本保持稳定; 非必需氨基酸含量先显著 ( $P < 0.05$ ) 升高, 再显著 ( $P < 0.05$ ) 下降, 后又显著 ( $P < 0.05$ ) 升高。血清游离氨基酸中: 必需氨基酸含量在45日龄至270日龄间先保持稳定, 最后显著 ( $P < 0.05$ ) 升高; 非必需氨基酸含量先显著 ( $P < 0.05$ ) 降低, 再显著 ( $P < 0.05$ ) 升高, 后保持稳定; 总氨基酸含量先显著 ( $P < 0.05$ ) 下降, 之后显著 ( $P < 0.05$ ) 升高。肌肉和血清中的大部分氨基酸含量均与眼肌面积呈正相关, 其中, 精氨酸、缬氨酸、异亮氨酸和亮氨酸含量与眼肌面积呈较强的正相关, 但甘氨酸含量与眼肌面积呈负相关。综上, 金华猪肌肉和血清中的氨基酸谱呈现发育性动态变化, 精氨酸、缬氨酸、异亮氨酸和亮氨酸含量变化与肌肉生长存在较强相关性。

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[http://agri.ckcest.cn/file1/M00/10/04/Csgk0GKJ3\\_WAFV\\_-ABuY\\_GSxI-Q220.pdf](http://agri.ckcest.cn/file1/M00/10/04/Csgk0GKJ3_WAFV_-ABuY_GSxI-Q220.pdf)

### 3 . Oxidation of amino acids, glucose, and fatty acids as metabolic fuels in enterocytes of developing pigs (肥育猪红细胞中氨基酸、葡萄糖和脂肪酸作为代谢燃料的氧化)

**简介:** Enterocytes of young pigs are known to use glutamine, glutamate, and glucose as major

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metabolic fuels. However, little is known about the roles of aspartate, alanine, and fatty acids as energy sources for these cells. Therefore, this study simultaneously determined the oxidation of the amino acids and glucose as well as short- and long-chain fatty acids in enterocytes of developing pigs. Jejunal enterocytes were isolated from 0-, 7-, 14- and 21-day-old piglets, and incubated at 37 °C for 30 min in Krebs-Henseleit bicarbonate buffer (pH 7.4) containing 5 mM d-glucose and one of the following: d-[U-14C]glucose, 0.55 mM l-[U-14C]glutamate, 0.55 mM l-[U-14C]glutamine, 0.55 mM l-[U-14C]aspartate, 0.55 mM l-[U-14C]alanine, 0.52 mM l-[U-14C]palmitate, 0.55 mM [U-14C]propionate, and 0.55 mM [1-14C]butyrate. At the end of the incubation, <sup>14</sup>CO<sub>2</sub> produced from each <sup>14</sup>C-labeled substrate was collected. Rates of oxidation of each substrate by enterocytes from all age groups of piglets increased (P < 0.05) gradually with increasing its extracellular concentrations. The rates of oxidation of glutamate, glutamine, aspartate, and glucose by enterocytes from 0- to 21-day-old pigs and of alanine from newborn pigs were much greater (P < 0.05) than those for the same concentrations of palmitate, propionate, and butyrate. Compared with 0-day-old pigs, the rates of oxidation of glutamate, aspartate, glutamine, alanine, and glucose by enterocytes from 21-day-old pigs decreased (P < 0.05) markedly, without changes in palmitate oxidation. Oxidation of alanine, propionate, butyrate and palmitate by enterocytes of pigs was limited during their postnatal growth. At each postnatal age, the oxidation of glutamate, glutamine, aspartate, and glucose produced much more ATP than alanine, propionate, butyrate and palmitate. The degradation of glutamate was initiated primarily by glutamate-pyruvate and glutamate-oxaloacetate transaminases. Our results indicated that amino acids (glutamate plus glutamine plus aspartate) are the major metabolic fuels in enterocytes of 0- to 21-day-old pigs.

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<http://agri.ckcest.cn/file1/M00/03/32/Csgk0Ybg1GSAZUH5AAtS4xVYGR4871.pdf>

#### **4 . The Effect of Reduced CP, Synthetic Amino Acid Supplemented Diets on Growth Performance and Nutrient Excretion in Wean to Finish Swine (日粮中降低粗蛋白、合成氨基酸对断奶仔猪生长性能和养分排泄的影响)**

简介: Mixed sex pigs (n = 720) were placed in 12 rooms (Purdue Swine Environmental Research Building) to measure the effect of reduced crude protein (CP), amino acid (AA)-supplemented diets on growth and the carcass. Pigs were blocked by body weight (BW) and gender and allotted to room and pen (10 mixed-sex pigs/pen). Pigs were fed a 9-phase, wean-finish program. Control pigs consumed corn-soybean meal-distiller's dried grains with solubles (DDGS) diets containing no to minimal (Met) synthetic AA. The 2X diet was formulated to meet the seventh most-limiting AA, and balanced using synthetic AAs to meet all AA needs. The 1X diet was formulated to meet a CP value halfway between the control and 2X diet, and also balanced using synthetic AAs to meet all AA needs. Diets were formulated to identical net energy concentrations and balanced to meet standard ileal

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digestible NRC 2012 AA requirements.. Pit vacuum samples were collected at the end of each growth phase for analyses of nitrogen, C and dry matter (DM). Pigs fed the Control and 1X diet grew faster ( $P < 0.005$ ), had greater gain:feed ( $P < 0.001$ ), and were heavier at market ( $P < 0.001$ ) than animals fed the 2X diet. No consistent effects of diet were observed on average daily feed intake. Carcass data were analyzed for sex, diet and sex\*diet effects. Reductions in dietary CP resulted in a linear reduction in ammonium nitrogen excretion per kg of BW gain in Nursery ( $P < 0.001$ ) and Grow-Finish ( $P < 0.001$ ) phases. Reductions in dietary CP, with synthetic AA supplementation resulted in a linear reduction in total nitrogen excreted per kg BW gain in the Grow-Finish phase ( $P < 0.001$ ) and overall ( $P < 0.001$ ). Total mineral excretion per kg gain was reduced in pigs fed 1X and 2X diets compared with control-fed pigs ( $P < 0.005$ ). Reductions in dietary CP of ~3 and 5%-units from wean-finish result in reductions of total N excretion of 11.7 and 24.4%, respectively. Reduced performance and carcass characteristics observed in pigs fed the 2X diets indicates an inaccurate estimate of NRC 2012AA requirements or ratios to lysine in a low CP diet.

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