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动物营养专题

本期导读

▶ 前沿资讯

1. 预计中国猪肉进口量将在下半年上升

▶ 学术文献

1. 噬菌体和抗菌肽对断奶仔猪生长性能、粪便微生物及血清免疫指标的影响
2. 非洲猪瘟病毒P72蛋白合成肽疫苗的构建及其免疫效力评估
3. 日粮复杂程度及饲料中添加鱼肽和复合酶对断奶仔猪的影响
4. 以枯草芽孢杆菌为基础的多菌株直接饲喂微生物对断奶仔猪免疫指标和肠道形态的影响

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. 预计中国猪肉进口量将在下半年上升

简介: 分析师称,过去一个月中国猪肉价格大幅上涨,预计第二季度将保持高位,这将支撑进口。中国正在出台政策来稳定价格和控制通货膨胀。荷兰合作银行对中国出口反弹的前景与美国农业局联合会(AGU)最近的预测相似,该预测称,秋季中国对美国猪肉的需求将增加。荷兰合作银行表示,由于当地价格疲软和与封锁相关的物流中断,2022年前四个月中国猪肉进口量同比下降65%。新冠疫情的政策措施导致中国上半年的餐饮服务需求显著下降。报告指出,随着新冠疫情限制的放松,贸易流量在6月开始改善。“我们预计中国的进口将在下半年显著回升,但年底仍将下降25%至35%,”荷兰合作银行表示。在其他地方,北美对猪肉的需求依然强劲,欧盟的需求正在改善。由于通胀担忧加剧、经济放缓和持续存在的新冠疫情风险,日本、韩国和其他一些亚洲国家预计下半年需求将减弱。荷兰合作银行表示,在经济放缓的情况下,大多数地区的猪肉需求往往具有弹性,因为它既不是最昂贵的蛋白质,也不是最便宜的蛋白质,因此消费水平变化缓慢。“经济放缓对猪肉消费的影响更多地与渠道有关,随着消费者进行价格价值比较,餐饮服务表现较弱而零售表现较强劲,”荷兰合作银行表示。

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▶ 学术文献

1. 噬菌体和抗菌肽对断奶仔猪生长性能、粪便微生物及血清免疫指标的影响

简介: 试验旨在研究噬菌体和抗菌肽对断奶仔猪生长性能、粪便微生物及血清免疫指标的影响。选取28日龄断奶仔猪168头,随机分为7组,每组4个重复,每个重复6头猪,空白对照组为基础日粮,试验组分别添加800 g/t噬菌体、800 g/t抗菌肽、400 g/t噬菌体+400 g/t抗菌肽、400 g/t噬菌体+200 g/t抗菌肽、200 g/t噬菌体+400 g/t抗菌肽和200 g/t噬菌体+200 g/t抗菌肽。试验期33 d。结果显示:试验组1、试验组2、试验组3、试验组4和试验组5仔猪料重比显著低于空白对照组($P<0.05$);试验组仔猪的腹泻率均显著低于空白对照组($P<0.05$)。试验组1、试验组2、试验组3、试验组4和试验组5仔猪粪便乳酸菌数量显著高于空白对照组($P<0.05$),沙门氏菌数量显著低于空白对照组($P<0.05$);试验组仔猪的粪便大肠杆菌数量均显著低于空白对照组($P<0.05$)。试验组1、试验组2、试验组3、试验组4和试验组5仔猪血清免疫球蛋白A(IgA)含量显著高于空白对照组($P<0.05$);试验组仔猪血清免疫球蛋白G(IgG)和白细胞介素-2(IL-2)含量显著低于空白对照组($P<0.05$)。研究表明,噬菌体和抗菌肽均能够降低断奶仔猪料重比、腹泻率和粪便中大肠杆菌、沙门氏菌数量,提高粪便中乳酸菌数量,提高仔猪免疫力,两者联合使用效果较好,且400 g/t噬菌体+200 g/t抗菌肽是比较合适的用量。

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2. 非洲猪瘟病毒P72蛋白合成肽疫苗的构建及其免疫效力评估

简介: 【目的】构建非洲猪瘟病毒CAS19-01/2019株 (GenBank登录号: MN172368.1) 结构蛋白P72的合成肽疫苗, 通过免疫小鼠评估合成肽疫苗的免疫效力。【方法】利用ProtParam、SOPMA等软件分析P72蛋白的理化性质与结构信息, 通过ABCpred、SVMtrip、IEDB预测P72蛋白的T细胞与B细胞抗原表位, 筛选出显著的表位多肽区域, 合成多肽辅以弗氏佐剂腹腔注射免疫小鼠, 检测免疫组小鼠产生的特异性抗体、T淋巴细胞亚群、脾脏淋巴细胞增殖、细胞因子白介素4 (IL-4)、IL-2、 γ ;干扰素 (IFN- γ ;)、免疫球蛋白 (IgG), 从体液免疫与细胞免疫角度评估合成肽的免疫效力。【结果】综合分析得出P72蛋白是稳定性亲水蛋白, 二级结构中 α -螺旋、 β -转角、延伸链、无规则卷曲分别占19.35%、5.42%、25.08%和50.15%。筛选出了P72蛋白的8个优势抗原表位, 626-634、520-528、298-306、203-211位氨基酸处为T细胞抗原表位, 587-606、232-251、110-129、39-58位氨基酸处为B细胞抗原表位。整合优势表位合成2个多肽P72-1与P72-2, 首次免疫小鼠14 d时可检测到P72-1与P72-2的特异性抗体, 首免后28 d达到最高值, 其最高抗体效价分别为1:25 600与1:12 800;免疫后小鼠T淋巴细胞亚群CD4+/CD8+显著上升 ($P < 0.05$);脾脏淋巴细胞增殖试验结果显示, 免疫组淋巴细胞数量均极显著升高 ($P < 0.01$);细胞因子IL-4、IL-2、IFN- γ ;含量均极显著增加 ($P < 0.01$)。【结论】本研究成功研制2种合成肽疫苗, 在免疫效力上P72-2高于P72-1, 二者都能产生高水平的特异性抗体, 刺激脾脏淋巴细胞增殖, 诱导产生细胞因子IL-4、IL-2、IFN- γ ; , 本研究为非洲猪瘟合成肽疫苗研制奠定技术基础。

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3 . Effect of diet complexity and dietary fish peptide and enzyme complex supplementation on weanling pigs (日粮复杂程度及饲料中添加鱼肽和复合酶对断奶仔猪的影响)

简介: Two experiments were conducted to assess the potential of replacing complex weanling pig diets with simple corn-soybean meal (SBM) diets by supplementation with a feed additive. The effort was made to determine the optimum inclusion rate of fish peptides in experiment 1 (Exp. 1), whereas the possibility of replacing complex diets with simply corn-SBM diets was investigated in Exp. 2. Ninety six (7.9 \pm 0.7 kg) and 48 (7.8 \pm 0.8 kg) pigs were used in Exp. 1 and 2, respectively, and pigs were assigned randomly to 6 (Exp. 1) and 3 (Exp. 2) dietary treatments with 4 pens per treatment and 2 gilts and 2 castrated males per pen in both experiments. The phase 1 (d 0 to 14) and 2 (d 14 to 28) complex, positive control diets (POS) were formulated in both experiments. Two simple corn-

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SBM, negative control (NEG) diets were formulated to be iso-lysine to the POS diets in Exp. 1, and the NEG diets were supplemented with 0.5, 1.0, 1.5, or 2.0% fish peptides. Similarly, the phase 1 and 2 simple corn-SBM, NEG diets were formulated to be iso-lysine to the POS diets in Exp. 2. However, the NEG diets contained 1.5% fish peptides, and those diets were supplemented with multienzyme complexes (ALL). During the wk 4, blood sample was collected and analyzed for serum metabolites and cytokines in Exp. 1 and metabolites in Exp. 2. During the last 2 wk of Exp. 1, the intake of feed, Lys, and digestible energy (DE) increased (cubic, $P < 0.026$) as fish peptides increased from 0 to 2%. Dietary treatments had no effect on gain to feed (G:F), gain to Lys (G:Lys), or gain to DE (G:DE) intake. Although there were some differences in serum total protein, urea N, and triglycerides, dietary treatments seemed to have no clear effect on serum metabolites or cytokines. Pigs seemed to respond to the diets containing 1.5% fish peptides, and it was used as the basis for the dietary treatments in Exp. 2. From wk 0 to 2 in Exp. 2, pigs fed the NEG and ALL diets had greater G:F, G:Lys intake, and G:DE intake ($P < 0.004$) than those fed the POS diet. In addition, G:F and G:Lys intake tended to be greater ($P = 0.095$) and G:DE intake was greater ($P = 0.009$) in pigs fed the ALL diet than those fed the NEG diet. Dietary treatments had no clear effect on the growth performance during the phase 2 or overall. Serum total protein and globulin were greater ($P < 0.007$) in pigs fed the NEG and ALL diets than those fed the POS diets because of the greater values in pigs fed the ALL diets, but those metabolites were not different between pigs fed the NEG and ALL diets. The results indicated that a complex diet can be replaced with a simple corn-SBM diet by supplementing the weaning pig diet with fish peptides and multienzyme complexes during the phase 1 (d 0 to 14).

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4 . Effects of a multi-strain Bacillus subtilis-based direct-fed microbial on immunity markers and intestinal morphology in diets fed to weanling pigs (以枯草芽孢杆菌为基础的多菌株直接饲喂微生物对断奶仔猪免疫指标和肠道形态的影响)

简介: The objective of this experiment was to evaluate the effects of a multi-strain Bacillus subtilis-based direct-fed microbial (DFM) on nursery pig health as indicated by intestinal mucosal and blood plasma immunological markers and intestinal morphology. Eighty pigs, of equal number of barrows and gilts (initial BW: 7.0 ± 0.60 kg), weaned at 21 ± 1 d of age were randomly allotted to sixteen pens, with five pigs per pen. Two dietary treatments were implemented, a basal control (CON) and a basal control plus DFM (CDFM). Both diets were corn, soybean meal, and distillers dried grains based and were formulated to meet or exceed all nutritional requirements (NRC, 2012) and manufactured on site. Diets were fed for 42 d. On d 21 and 42 of the experiment, one pig per pen was randomly selected and euthanized, with equal number of males and females represented. Blood samples were collected prior to euthanasia for assessment of plasma concentrations of immunoglobulin A

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(IgA) and intestinal fatty acid binding protein. Segments of the gastrointestinal tract including duodenum, jejunum, ileum, ascending and distal colon were removed for analysis of intestinal morphology, and levels of interleukin 6, interleukin 10 (IL-10), and tumor necrosis factor alpha. Jejunal villus height was greater in the CDFM pigs as compared with CON pigs ($P = 0.02$) and ascending colon crypt depth tended to be greater on d 21 ($P = 0.10$). Compared to CON, CDFM significantly increased overall plasma IgA ($P = 0.03$) (0.58 vs. 0.73 0.05 mg/mL, respectively), while it tended to increase plasma IgA ($P = 0.06$) on d 21 (0.34 vs. 0.54 ± 0.07 mg/mL, respectively) and tended to increase overall IL-10 ($P = 0.10$) in the jejunum (113 vs. 195 ± 35 pg/mL, respectively). Addition of a multi-strain Bacillus subtilis-based DFM may have an early benefit to nursery pig health status, observed through specific changes in morphology and both systemic and localized immunological markers.

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