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## 动物营养专题

### 本期导读

#### ▶ 前沿资讯

1. 替代豆粕，饲料降价将不再是梦？！国际顶尖学术期刊《自然》：中国科学家找到了“高蛋白”玉米！
2. 重庆研发新型饲料添加剂“腺苷七肽”获批使用
3. 猪蛋白质替代品的思考

#### ▶ 学术文献

1. CRISPR/Cas9系统在基因组编辑中的优化与发展
2. 饲喂添加酶处理酵母的断奶仔猪的胃肠动力学、免疫反应和营养消化率

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](mailto:agri@ckcest.cn)  
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## ▶ 前沿资讯

### 1. 替代豆粕，饲料降价将不再是梦?! 国际顶尖学术期刊《自然》：中国科学家找到了“高蛋白”玉米!

**简介：** 人类祖先9000多年前就开始驯化野生玉米了，从墨西哥南部的巴尔萨斯河流域将它带到世界各地，成为世界上最高产的农作物之一。然而，现代玉米却在追求产量、淀粉含量更高的育种目标中“丢失”了玉米祖先的高蛋白好“品质”。经过十年的努力，上海夫妻档科学家从野生玉米中克隆了控制玉米高蛋白品质形成和氮素高效利用的关键变异基因。相关研究成果于北京时间今天凌晨在国际顶尖学术期刊《自然》(Nature)上发表。

**来源：** 中国饲料行业信息网

**发布日期：**2022-11-21

**全文链接：**

<http://agri.ckcest.cn/file1/M00/03/44/Csgk0YfRgUmANXzoABFoL05biAU372.pdf>

### 2. 重庆研发新型饲料添加剂“腺苷七肽”获批使用

**简介：** 近日，农业农村部发布公告，国家生猪技术创新中心主体建设单位——重庆市畜牧科学院研发的“腺苷七肽”获批新饲料添加剂产品证书。据悉，“腺苷七肽”以约氏乳杆菌为菌种，经液体发酵、提取、添加载体进行喷雾干燥，再添加稀释剂制得的饲料添加剂，可助力改善肠道形态稳态，调节肠道微生物菌群等。“研制安全、绿色、环保的抗生素替代品一直是畜牧业发展的一项重大课题。”谈起研发新型饲料添加剂的初衷，国家生猪技术创新中心有关负责人说，“腺苷七肽”突破了肽类代谢物高效表达、分离纯化、标准化检测等多项核心技术，可以提高动物机体免疫力，促进动物生长，改善对饲料养分利用率，达到抗生素使用效果，特别适用于免疫力较差的断奶仔猪。该负责人表示，“腺苷七肽”是国家生猪技术创新中心建设以来第一个获农业农村部批准的新产品。“这标志着中心和重庆市畜牧科学院科技创新、成果转化迈上了新台阶。之后将以此为契机，面向国家重大战略需求，不断提高创新水平，解决更多畜牧科技发展瓶颈问题，引领畜牧产业的绿色高质量发展，为实现高水平科技自立自强贡献畜牧力量。”

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[http://agri.ckcest.cn/file1/M00/10/16/Csgk0GN60VeALmzvAAwxnP\\_MAdS793.pdf](http://agri.ckcest.cn/file1/M00/10/16/Csgk0GN60VeALmzvAAwxnP_MAdS793.pdf)

### 3 . Considerations for Protein Alternatives in Swine (猪蛋白质替代品的思考)

**简介：** Feeding pigs a balanced ration can be a challenge. Not only is feed expensive, but as monogastric animals, a pig's growth and well-being is readily influenced by the nutrient composition of its diet. Two commonly used feed ingredients in swine diets are corn and soybean meal (extruded). Corn contributes energy to the diet to support growth, maintenance, and fat deposits in the finishing phase while the soybean meal contributes protein for building tissue, predominantly muscle. In times of elevated soybean prices, you

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may want to consider replacing soybean meal with alternative protein sources to lessen the cost of the daily ration. Soybean meal is a commonly used protein source in pig diets because the amino acid content in soybean meal complements the amino acid profile in corn, which is one reason why this combination is one of the most common in the United States. A variety of protein sources can be used in pig diets and are commonly utilized in nutritionist formulated complete diets. However, when you mix your own feed, finding a replacement for soybean meal can be a bit trickier. Producers who mix their own feed need to be aware that, when replacing soybean meal, finding the right balance of amino acids in the diet is critical, otherwise you may need to accept a loss in animal performance. When selecting a protein source, consider the cost, shipping, and practicality in the current operation. Luckily, there are a variety of protein sources suitable for pigs due to their omnivorous capacity. Protein sources can be broken into two categories, plant-based protein sources, and animal-derived protein sources. In this article, you will find some information on protein sources that can be used in pig feed. You might notice that each are compared to soybean meal. As stated above, soybean meal has the superior amino acid profile that complements corn, making soybean meal the 'gold standard' in corn-based pig diets. Everything else is an 'alternative' to soy protein.

来源: The Pig Site 官网

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<http://agri.ckcest.cn/file1/M00/03/44/Csgk0YfRkMyAf8b5ACEk8dZvVmw262.pdf>

## ➤ 学术文献

### 1. CRISPR/Cas9系统在基因组编辑中的优化与发展

**简介:** CRISPR/Cas9是近年来发展起来的新兴技术,其在多种生物和组织的基因组上具有快速、高效、精准的基因编辑与调控能力,这使得该技术在基础科学和合成生物学等应用科学领域均得到了极大的发展与应用。本文首先对CRISPR的历史沿革、分类及CRISPR/Cas9技术的作用机制进行简述,并结合其原理和在基因组工程中面临的脱靶率高、PAM依赖性强等限制因素总结了近年来针对Cas9蛋白和向导RNA进行的一系列优化与改造。接下来详细叙述了CRISPR/Cas9系统结合效应蛋白实现的多种功能,包括基因表达调控、表观基因组编辑、单碱基编辑等。基于gRNA多表达策略和Cas9多路复用策略,本文还对CRISPR/Cas9技术主要的多重应用成果进行了梳理汇总。最后探讨了CRISPR/Cas9作为高精度基因组编辑工具使用的的应用前景,以及作为疗法使用时的安全性和风险控制问题。

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<http://agri.ckcest.cn/file1/M00/03/44/Csgk0YfRjSOAZQ7eABUEISYt05M255.pdf>

### 2 . Gastrointestinal dynamics, immune response, and nutrient digestibility of weanling pigs fed diets supplemented with

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## enzymatically treated yeast (饲喂添加酶处理酵母的断奶仔猪的胃肠动力学、免疫反应和营养消化率)

简介: The objective of this trial was to investigate the effect of enzymatically treated yeast (ETY) on the growth performance, nutrient digestibility, immune response, and gut health of weanling pigs. A total of 192 weanling pigs (6.0  $\pm$  1.04 kg) were allocated to 4 corn and soybean-based diets with increasing concentrations of ETY (0, 1, 2, or 4 g/kg) for a 43-d trial. There were 8 replicate pens (4 replicate pens per sex) and 6 pigs per replicate. The experiment was set up as a randomized complete block design with body weight used as a blocking factor. Pigs had ad libitum access to water and diets for the duration of the study. There was no effect of ETY supplementation on the growth performance indices of weanling pigs. At d 14, there was a quadratic decrease ( $P < 0.05$ ) in the ATTD of ADF. At d 28, there was a linear increase ( $P < 0.05$ ) in the ATTD of NDF and a quadratic decrease ( $P < 0.05$ ) in the ATTD of ADF. On d 14, there was a linear increase ( $P < 0.05$ ) in serum catalase activity with ETY supplementation. There was a linear increase ( $P < 0.01$ ) in the gene expression of GPX4 in the ileal mucosa of pigs. Increasing dietary ETY supplementation linearly decreased ( $P < 0.05$ ) the gene expression of ileal PEPT1. There was a tendency for a quadratic effect ( $P = 0.07$ ) in the ileal villus height to crypt depth ratio with ETY supplementation. Additionally, there was a tendency for a linear increase ( $P = 0.06$ ) in ileal digesta butyrate with ETY supplementation. In conclusion, the current study demonstrated that dietary enzymatically treated yeast supplementation could partly ameliorate the deleterious effects of post-weaning stress by enhancing the antioxidative status of weanling pigs. However, prolonged supplementation of ETY may be needed to see its effect on growth performance.☒

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