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矿物元素理想模式研究——从理论到实践

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Mineral Element Ideal Pattern—From Theory to Practice

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摘要 矿物元素在动物的生长发育、机能维持、产品质量、免疫功能等方面发挥重要的作用。因为矿物元素之间复杂的互作和拮抗关系,单一提高某种矿物元素在动物饲料中的配比,会导致饲料利用率下降、成本上升、环境污染等问题。在此研究背景下,本文提出了矿物元素理想模式这一全新概念,即在动物的不同生长发育阶段,不同种类矿物元素之间最佳的比例关系,以确保动物能够以经济适宜的添加量获得最佳的生产效益。本文以仔猪为例,进行了矿物元素理想模式的研究与实践,并分析了动物矿物元素理想模式的理论基础和研究意义,指出了确定矿物元素理想模式存在的困难和需要注意的问题。

关键词: 矿物元素 理想模式 理论基础 猪

Abstract: Mineral elements play an important role in the animals' growth and development, functional sustains, quality of the product, immune function and so on. Because of the delicate interaction and antagonism existing in mineral elements, a single increase of some mineral element in animal feed ratio will lead to the decline of feed utilization, wasted cost and environmental pollution. Under this background, a new concept 'mineral element ideal pattern' was set up in this review, based on the analysis and research for piglets' mineral nutrition. This pattern meant that different kinds of mineral elements were the best quantity proportion relationship, ensuring the best production efficiency acquired from an economic trace minerals adding in the animals' different growth stages. Furthermore, the theory foundation and application prospect of the pattern were discussed, as well as some problems of the pattern were pointed out and solutions were given in this review.

Keywords: mineral elements, ideal pattern, theory foundation, pig

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[1] 杨凤. 动物营养学[M]. 北京: 中国农业出版社, 2004: 44.

[2] COLE D J A. Amino acid nutrition of the pig[M]//HARESIGN W, LEWIS D. Recent advances in animal nutrition. London: Butterworths, 1978: 59-72.


[3] FULLER M F, LIVINGSTONE R M, BAIRD B A, et al. The optimal amino acid supplementation of barley for the growing pig. 1. Response of nitrogen

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- [4] FULLER M F, MCWILLIAM R, WANG T C, et al. The optimum dietary amino acid pattern for growing pigs. 2. Requirements for maintenance and for tissue protein accretion[J]. The British Journal of Nutrition, 1989, 62: 255-261.
- [5] WANG T C, FULLER M F. The optimum dietary amino acid pattern for growing pigs. 1. Experiments by amino acid deletion[J]. The British Journal of Nutrition, 1989, 62: 17-89.
- [6] REES E L, CAMPBELL J. Patterns of trace minerals in the hair and relationship to clinical states[J]. Orthomolecular Psychiatry, 1975, 4(1): 53-60.
- [7] LAWRENCE W. The four lows pattern[EB/OL]. [2012-11-12]. <http://drlwilson.com/Articles/four%20lows.htm>.
- [8] JOSEPH E, NASIRUL R, AHMED Y A. Trace elements pattern in some Nigerian commercial infant milk and infant cereal formulas[J]. Annals of Biological Research, 2011, 2(2): 351-360.
- [9] FUCHS B, SZUBA-TRZNADEL A, KUBIZNA J. The rearing of pigs after weaning using diets containing mineral and organic sources of microelements Cu, Zn, Mn and Fe[J]. Zeszyty Naukowe Uniwersytetu Przyrodniczego we Wrocławiu: Biologia i Hodowla Zwierząt, 2009, 575: 101-120.
- [10] 杨永生. 湖南省饲料微量元素盈缺规律及猪日粮中不同添加模式的研究[D]. 硕士学位论文. 长沙: 湖南农业大学, 2009.
- [11] 倪可德, 阎素梅, 郝俊玺, 等. 农畜矿物质营养[M]. 上海: 上海科学技术文献出版社, 1995: 74.
- [12] SUTTLE N F. Mineral nutrition of livestock[M]. 4th ed. London: British Library, 2010.
- [13] CUI L, TAKAGI Y, WASA M, et al. Nitric oxide synthase inhibitor attenuates intestinal damage induced by zinc deficiency in rats[J]. The Journal of Nutrition, 1999, 129: 792-798.
- [14] DIBNER J J, ATWELL C A, KITCHELL M L, et al. Feeding of oxidized fats to broilers and swine: effects on enterocyte turnover, hepatocyte proliferation and the gut associated lymphoid tissue[J]. Animal Feed Science Technology, 1996, 62: 1-13.
- [15] FERKET P R, OVIEDO-RONDON E O, MENTE P L, et al. Organic trace minerals and 25-hydroxycholecalciferol affect performance characteristics, leg abnormalities and biomechanical properties of leg bones of turkeys[J]. Poultry Science, 2009, 88: 118-131.
- [16] MANANGI M K, HAMPTON T, FISHER P, et al. Impact of feeding lower levels of chelated trace minerals versus industry levels of inorganic trace minerals on broiler performance, yield, footpad health, and litter mineral concentration[J]. The Journal of Applied Poultry Research, 2012, 21: 881-890.
- [17] HUANGY L, LU L, LI S F, et al. Relative bioavailabilities of organic zinc sources with different chelation strengths for broilers fed a conventional corn soybean meal diet[J]. Journal of Animal Science, 2009, 87: 2038-2046.
- [18] DEVRIM S A, TAYLAN A, BULENT O, et al. The effects of replacing inorganic with a lower level of organically complexed minerals (Cu, Zn and Mn) in broiler diets on lipid peroxidation and antioxidant defense systems[J]. Asian-Australian Journal of Animal Science, 2010, 23: 1066-1072.
- [19] SAHIN K, SMITH M O, ONDERCI M, et al. Supplementation of zinc from organic or inorganic source improves performance and antioxidant status of heat-distressed quail[J]. Poultry Science, 2005, 84: 882-887.
- [20] JAMES D R, JUNMEI Z, ROBERT J H, et al. Trace mineral nutrition in poultry and swine[J]. Asian-Australian Journal of Animal Science, 2010, 23: 1527-1534.
- [21] SUFEN L, YUOXIA L, LIN L, et al. An estimation of the manganese requirement for broilers from 1 to 21 days of age[J]. Biology Trace Element Research, 2011, 143: 939-948.
- [22] LÓPEZ-ALONSO M. Trace minerals and livestock: not too much not too little[J]. ISRN Veterinary Science, 2012. doi: 10.5402/2012/704825.
- [23] 方热军, 王康宁, 范明哲, 等. 不同方法测定生长猪内源磷排泄量及磷真消化率的比较研究[J]. 畜牧兽医学报, 2005, 36(2): 137-143.
- [24] COZZOLINO D, MORON A. Exploring the use of near infrared reflectance spectroscopy (NIRS) to predict trace minerals in legumes[J]. Animal Feed Science and Technology, 2004, 111: 161-173.
- [25] BAXTER I, HERMANS C, LAHNER B, et al. Biodiversity of mineral nutrient and trace element accumulation in *Arabidopsis thaliana*[J]. PLoS One, 2012, 7(4): e35121.
- [26] JANNINE K, PATTERSON, LEI X G, et al. The pig as an experimental model for elucidating the mechanisms governing dietary influence on mineral absorption[J]. Exploring Biology Medicine, 2008, 233: 651-664.
- [27] PERKS S M, MILLER D D. Adding ascorbic acid to iron-fortified cows milk does not enhance iron bioavailability to piglets[J]. Nutrition Research, 1996, 16(6): 969-975. 
- [28] CLOSE W H. Trace mineral nutrition of pigs: meeting production and environmental objectives[C]//The 57th annual meeting of EAAP. Antalya: [s.n.], 2006.

- [1] 李东卫, 卢庆萍, 张宏福, 庄晓峰, 陈亮. 仿生消化法中消化酶与消化时间对评定生长猪常用植物性饲料磷体外消化率的影响[J]. 动物营养学报, 2013, 25(9): 2051-2058
- [2] 陈明洪, 段杰林, 尹杰, 刘金艳, 李铁军, 方俊. 谷氨酸和精氨酸对饲喂霉变饲料育肥猪所受损伤的缓解作用[J]. 动物营养学报, 2013, 25(9): 2101-2110
- [3] 杨鹏, 吴德, 车炼强, 王军, 方正锋, 林燕, 徐盛玉. 妊娠期营养水平对初产母猪繁殖性能和乳成分的影响[J]. 动物营养学报, 2013, 25(9): 1954-1962
- [4] 安清聪, 张春勇, 李美荃, 陈克嶙, 郭荣富. 谷氧还蛋白1和硫氧还蛋白1基因在高黎贡山猪不同组织中表达规律及维生素E对其在氧化应激细胞中表达的影响[J]. 动物营养学报, 2013, 25(8): 1825-1835
- [5] 常启发, 白会新, 石宝明, 单安山, 魏传玉, 于长青, 仝宝生. 黄腐酸对生长猪生长性能、血清生化指标、血常规参数和免疫功能的影响[J]. 动物营养学报, 2013, 25(8): 1836-1842

- [6] 贺淼, 周安国, 王之盛, 陈中平, 张海波, 邹华围, 申俊华. 复合酵母的营养价值评定[J]. 动物营养学报, 2013,25(8): 1904-1910
- [7] 耿梅, 姜建阳, 韩先杰, 宋春阳. 纤维素组合酶在不同品种生长猪饲料中的适宜添加量[J]. 动物营养学报, 2013,25(7): 1541-1550
- [8] 吴苗苗, 肖昊, 印遇龙, 李丽立, 李铁军. 谷氨酸对脱氧雪腐镰刀菌烯醇刺激下的断奶仔猪生长性能、血常规及血清生化指标变化的干预作用[J]. 动物营养学报, 2013,25(7): 1587-1594
- [9] 聂昌林, 姜建阳, 韩先杰, 宋春阳. 杜洛克与鲁烟白杂交断奶仔猪对可消化赖氨酸的需要量[J]. 动物营养学报, 2013,25(7): 1617-1623
- [10] 董晓丽, 张乃锋, 周盟, 屠焰, 刁其玉. 复合菌制剂对断奶仔猪生长性能、粪便微生物和血清指标的影响[J]. 动物营养学报, 2013,25(6): 1285-1292
- [11] 徐露蓉, 栾兆双, 胡彩虹, 石波. 饲料中添加纤维寡糖对生长猪生长性能、结肠菌群和肠黏膜通透性的影响[J]. 动物营养学报, 2013,25(6): 1293-1298
- [12] 王凤利, 刘岭, 臧建军, 赖长华. 生长猪对国产双低菜籽粕与进口普通菜籽粕营养价值的比较[J]. 动物营养学报, 2013,25(6): 1324-1331
- [13] 彭瑛, 杨焕胜, 吴信, 李丽立, 印遇龙. N-氨甲酰谷氨酸在猪营养中应用的研究进展[J]. 动物营养学报, 2013,25(6): 1131-1136
- [14] 王军, 赵迎飞, 方正锋, 林燕, 车炼强, 杨敏, 吴德. 饲料中添加苏氨酸和色氨酸对接种猪繁殖与呼吸综合征弱毒苗生长猪免疫反应的影响[J]. 动物营养学报, 2013,25(6): 1189-1198
- [15] 石秋锋, 桑静超, 辛小召, 杨富宇, 李振田. 不同蛋白质源组合饲料对断奶仔猪生长性能和血清生化指标的影响[J]. 动物营养学报, 2013,25(6): 1199-1206