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磷来源与水平对蛋鸡生产性能和蛋壳质量的影响

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摘要
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摘要 本试验采用2×7因子完全随机区组试验设计，旨在研究磷源[磷酸一二钙（MDCP）和磷酸氢钙（DCP）]及非植酸磷（NPP）添加水平（0、0.05%、0.10%、0.15%、0.20%、0.25%和0.30%）对蛋鸡生产性能和蛋壳质量的影响，试验共13个处理，每个处理6个重复，每个重复15只鸡。选取1 170只25周龄罗曼粉壳蛋鸡，随机分配到各处理，饲喂玉米-豆粕型基础饲粮（NPP 0.12%），所有处理的钙水平都是3.5%，试验期为24周。结果表明，磷源与磷水平在蛋鸡生产性能和蛋壳质量上未表现出显著的互作效应（P>0.05）。从全期来看，基础饲粮组蛋鸡平均日产蛋率、平均日产蛋量、平均日采食量和平均蛋重显著低于无机磷添加组（P<0.05），料蛋比、破蛋率和畸形蛋率显著高于无机磷添加组（P<0.05）。磷源和磷水平对蛋壳厚度均无显著影响（P>0.05）。0.05%~0.30% NPP组蛋鸡的平均日产蛋率、料蛋比（除1~4周外）、死亡率、破蛋率、软壳蛋率和畸形蛋率无显著差异（P>0.05）；0.10%~0.30% NPP组蛋鸡的平均日产蛋量无显著差异（P>0.05）；平均蛋重和平均日采食量随NPP水平的提高，呈先升高后降低的趋势。结果提示，MDCP可以替代DCP作为蛋鸡饲粮的磷源；蛋鸡（25~49周龄）玉米-豆粕型饲粮中适宜的NPP水平为0.22%，适宜的MDCP添加量为0.48%。

关键词： MDCP DCP 磷水平 生产性能 蛋壳质量

Abstract： The experiment was conducted to investigate the effects of different phosphorus levels from mono-dicalcium phosphate (MDCP) or dicalcium phosphate (DCP) on performance and eggshell quality of laying hens. A completely randomized design involving a 2×7 factorial arrangement of treatments was used in this study. Two phosphorus sources were MDCP and DCP, and seven phosphorus supplemental levels were 0, 0.05%, 0.10%, 0.15%, 0.20%, 0.25% and 0.30%, respectively. A total of 1 170 commercial Lohmann pink-shell laying hens aged 25 weeks were randomly assigned to 13 treatments with 6 replicates each and 15 hens in each replicate. The corn-soybean meal based diet contained 0.12% non-phytate phosphate (NPP) and calcium level of all diets was 3.5%. The experiment lasted for 24 weeks. The results showed as follows: there were no significant interactions between phosphorus source and phosphorus level in the laying performance and eggshell quality (P>0.05). During the whole experimental period, hens fed the basal diet had the lowest average daily egg production, average daily egg mass, average daily feed intake (ADFI) and average egg weight, and the highest feed to egg ratio, cracked or broken, and malformation egg percentage (P<0.05). Phosphorus source and level had no significant effects on eggshell thickness (P>0.05). When hens were fed the diets with NPP supplemental level between 0.05% and 0.30%, there were no significant differences in average daily egg production, feed to egg ratio (except for 1 to 4 weeks), mortality, cracked or broken, soft, and malformation egg percentage (P>0.05). When hens were fed the diets with NPP supplemental level between 0.10% and 0.30%, there were no significant differences in average daily egg mass (P>0.05). With dietary NPP level increasing, average egg weight and ADFI increased firstly, and then decreased. The results indicate that MDCP can completely replace DCP in the diet of laying hens. The suitable NPP level in the corn-soybean meal based diet is 0.22%, and MDCP supplemental level is 0.48% for laying hens aged from 25 to 49 weeks. [Chinese Journal of Animal Nutrition, 2011, 23 (10) : 1684 -1696]

Keywords： MDCP, DCP, phosphorus level, performance, eggshell quality

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