

Abstract

The effects of feeding diets based on soybean meal, low phytate hulless barley (Lphybarley) and low phytate pea (Lphypea) with inorganic phosphorus (iP) reduced by 50 or 100% to broiler chickens on performance, P digestibility and bone characteristics were investigated. Two hundred and ten day-old (Ross 308 strain) broiler chicks (5 birds per cage; 6 cages per diet) were randomly allocated to 7 dietary treatments for a 21-day study. Diets were formulated based on soybean meal-normal phytate hulless barley (SBM-normbarley) with added inorganic P (iP) to meet NRC (1994) P requirements (SBM-normbarley100) or with 50% less iP (SBM-normbarley50), soybean meal-Lphybarley-Lphypea with added iP (Lphybarley-Lphypea100) or iP reduced by 50% (Lphybarley-Lphypea50) or 100% (Lphybarley-Lphypea0), and soybean meal-normbarley normal phytate pea (normpea) with added iP (normbarley-normpea100) or iP reduced by 50% (normbarley-normpea50). Birds fed the Lphybarley-Lphypea0 diet had the lowest (P<0.10). Reducing iP content reduced P retention in the SBM-normbarley-based diet but not in the normbarley-normpea-based diet but tibia ash and length were reduced in birds fed both diets (P< 0.05). Reducing dietary iP content linearly increased (P <0.05) retention and linearly decreased (P<0.05) tibia ash and length in the Lphypea-Lphybarley-based diets. In conclusion, feeding a low phytate hulless barley-low phytate pea based diet with iP reduced by 50% supported similar performance as control and increased P retention, suggesting that utilizing a combination of low phytate ingredients can reduce the need for supplemental iP with significant cost and environmental implication.