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Effect of Surfeit Concentrations of Vitamin D₃ on Performance, Bone Mineralization and Mineral Retention in Commercial Broiler Chicks

[Savaram V. Rama Rao](#)¹⁾, [Mantena V.L.N. Raju](#)¹⁾, [Arun K. Panda](#)¹⁾, [Poonum N. Saharai](#)¹⁾, [Maddula R. Reddy](#)¹⁾, [Gajula Shyam Sunder](#)¹⁾ and [Ramashriya P. Sharma](#)¹⁾

1) Project Directorate on Poultry, Indian Council of Agricultural Research, India

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An experiment was conducted to see the effect of higher concentrations of vitamin D₃ in diets containing sub optimal levels of calcium (Ca) and non-phytate phosphorus (NPP) in broiler chickens. Maize-soybean meal based starter and finisher reference diets (RD) prepared to contain 1.0% and 0.9% Ca, 0.45 and 0.35% NPP, respectively. The RD contained 1200ICU D₃/kg. Another basal diet (BD) was prepared to contain 0.4% Ca and 0.2% NPP. The BD was supplemented with D₃ at 4 different concentrations such as 1200, 2400, 4800 and 9600ICU/kg. Each diet was fed to 11 replicates of 5 chicks each during experimental period of 0 to 6 weeks of age. The body weight gain decreased significantly with reduction in levels of Ca and NPP in diet compared to those fed RD. Supplementation of vitamin D₃ to the low Ca and NPP diet, though improved the weight gain significantly but not at par with RD. The feed efficiency was not affected by concentrations of Ca, NPP and D₃ in diet at 36d of age. The relative weight of tibia, tibia breaking strength and tibia ash content decreased significantly with reduction in Ca and NPP levels in diet. Supplemental D₃ replenished the tibia ash content and enhanced tibia weight and strength. Supplemental D₃ non-linearly increased the serum Ca, P, acid and alkaline phosphatase contents in serum. Concentrations of Ca, P, Fe, Zn, Mn and Cu in excreta decrease non-linearly with increase vitamin D₃ concentration in BD. It is concluded that higher levels of D₃ supplementation to

low Ca and NPP diet improved the performance partially but not at per with diet containing the recommended concentrations of Ca and NPP in broiler diet.

Keywords: [bone mineralization](#), [broiler chicks](#), [calcium](#), [growth](#), [phosphorus](#), [vitamin D₃](#)

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