

Effect of Source and Level of Vitamin D on the Performance of Breeder Hens and the Carryover to the Progeny¹

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Abstract :

A study was conducted to evaluate the effect of the vitamin D level and source on the performance of broiler breeders and the deposition of this vitamin in egg yolk. Pullets reaching sexual maturity were depleted of vitamin D stores by feeding a vitamin D deficient diet during an eight week period. Following depletion, an experimental design was utilized consisting of a 5 x 2 factorial arrangement with four levels of dietary cholecalciferol (0, 300, 600, 1200 and 2400 IU/kg) and two levels of 25-hydroxycholecalciferol (25-OH, supplied as HyD) (0 and 68 µg/kg) for a total of 10 treatments. Each experimental diet was fed to two pens with 10 hens and 2 roosters that each received the experimental diets. Levels of 25-OH in plasma and in egg yolk were measured right after the depletion period and during the experimental phase. Performance parameters such as body weight, hen-day production, egg-shell thickness and egg mass were measured weekly. After the depletion period the level of 25-OH in plasma and egg yolk was below the detection limit confirming the depletion status. During the experimental phase the amount of 25-OH in plasma and egg yolk was higher as the cholecalciferol increased. When HyD was fed the level of 25-OH in plasma and egg yolk was higher than obtained when cholecalciferol was fed. Increasing levels of cholecalciferol improved egg shell thickness, hen-day production and egg mass. The addition of HyD improved egg-shell thickness, heday production and egg mass. The effect of HyD on performance was more noticeable at low levels of cholecalciferol with no difference at higher levels of cholecalciferol in the diet.

Key Word :

Breeders, cholecalciferol, 25-hydroxycholecalciferol, vitamin D, carryover

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