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CALCIFICATION STUDIES WITH LAYING HENS

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The aim of the present study is to determine whether certain metabolites of vitamin D₃ (1,25-dihydroxycholecalciferol or 24,25-dihydroxycholecalciferol) added to the diet will affect shell quality in aged laying hens. This will be further evaluated by measurements of the carbonic anhydrase activity of the shell gland, blood serum calcium levels and calcium binding protein activity of the duodenum and shell gland.

One hundred twenty-seven 18-month old hens were placed on a diet containing no supplemental vitamin D₃. Egg shell breaking strength and thickness were measured once a week. After 6 weeks, seven of the hens were sacrificed to establish baseline values for serum calcium, carbonic anhydrase and calcium binding protein levels. The remaining hens were divided into six treatment groups and placed on a diet containing one of the following vitamin supplements: (1) 24 µg D₃/kg diet, (2) 48 µg D₃/kg diet, (3) 6 µg 1,25-(OH)₂-D₃/kg diet, (4) 12 µg 1,25-(OH)₂-D₃/kg diet, (5) 6 µg 24,25-(OH)₂-D₃/kg diet, (6) 12 µg 24,25-(OH)₂-D₃/kg diet.

These treatments will be maintained for 10 to 12 weeks. One egg per hen per week will be tested for breaking strength and the shell thickness measured. For the last 6 weeks of the study, every egg will be subjected to these measurements. At the end of the 10 to 12 weeks, a representative group of hens from each diet will be sacrificed and the blood serum calcium levels, carbonic anhydrase levels and calcium binding protein levels measured as before.

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