

Abstract

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Field trial demonstrating the beneficial effect of dietary *Bacillus subtilis* C-3102 spores (CALSPORIN®) on brown shell color scores of eggs from hens on litter in three U.S. commercial flocks producing for the free-range egg market versus pre-trial color fan scores.

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Three U.S. commercial Bovans Brown flocks each consisting of about 14,500 laying hens producing brown eggs were utilized to compare pre-trial brown egg color fan scores (Ghen Corp., Japan, 1 lightest to 10 darkest) versus scores during supplementation of *Bacillus subtilis* C-3102 (Bs C-3102; CALSPORIN®; Calpis Co. Ltd, Tokyo, Japan) at 300,000 cfu/g feed (egg sampling after about 2 to 3 weeks). Brown egg shell color typically declines with age and may vary due to strain of hens or certain diseases. The flocks were at one company and were around 50 to 60 weeks of age when the direct-fed microbial began to be added to feeds. In each flock, the pre-trial, random egg sampling involved 3 sampling dates over about 2 1/2 wk and 100 eggs collected per sampling. During supplementation, in 2 flocks there were 2 and in 1 flock there were 3 egg sampling dates (100 eggs were taken at random per sampling during supplementation). Brown eggs were color fan scored by the same person each time under fluorescent light and natural daylight (near a large window permitting sunlight to enter) in an egg processing plant. Pre-trial vs Bs C-3102 supplementation period egg scores for youngest to oldest flocks were: 1) pre-trial 8.26, 7.11, 6.74 (avg 7.37a; however, avg 6.93 with very high initial value removed) vs during Bs C-3102 feeding 7.64, 6.60, and 6.99 (avg 7.08b, P=0.022); 2) pre-trial 7.87, 6.38, and 6.31 (avg 6.85b) vs 7.90 and 7.66 (avg 7.78a, P=0.000); and 3) pre-trial 6.63, 5.63, and 6.70 (avg 6.32b) vs during Bs C-3102 feeding 6.72 and 7.99 (avg 7.36a, P=0.000). Nonsignificant differences were found in % scores less than 5 ("too light") between pre-trial and Bs C-3102 feeding periods for the 3 flocks (4.33 vs 5.33%; 8.33 vs 1.00%; and 12.67 vs 5.50%, respectively). Dietary Bs C-3102 significantly increased brown egg shell color fan scores (+0.93 and +1.04 units) in 2 of 3 flocks in spite of age progression.

Key Words: brown egg color, Calsporin, color fan score, direct-fed microbial, laying hens

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