

Egg Shell and Broiler Quality: A Variety of Studies

Author: Steve Johnson

Dietary CALSPORIN® for Improving Broiler Breeder Performance

One of the challenges breeder flock managers face is how to maintain egg shell quality.

Hens' age, genetic disposition, and disease can all contribute to poor egg shell quality. Thin egg shells frequently mean lost moisture in the eggs during incubation which can lead to dead embryos, or dehydrated chicks at placement. Either way it can result in a lost profit opportunity.

One way to improve egg shell quality in broiler breeder flocks is by supplementing breeder hen diets with CALSPORIN® direct fed microbial. CALSPORIN® contains the unique proprietary *Bacillus subtilis* strain C-3102 available only from QTI Animal Health and Calpis Co. CALSPORIN® is the only direct fed microbial with a patent for improving egg shell quality and is being used by broiler and laying hen producers around the world.

Research conducted in a variety of commercial settings has demonstrated that, when fed at the recommended inclusion rate of 300,000 CFU per gram of feed, CALSPORIN® can improve egg production, egg shell quality, brown egg color, chicks per hen, and reduce intestinal and litter pathogen loads.

Egg Production

One of the top broiler integrators in Brazil ran an evaluation trial comparing three breeder flocks treated with CALSPORIN® versus three flocks on their usual antibiotic additive in pelleted feeds. Over the 65 week life of each of the flocks, the CALSPORIN® treated hens produced on average 3.89 additional eggs per hen versus the untreated hens.

Egg Shell Thickness

A 5.2% improvement in egg shell thickness of Dekalb caged laying hens was reported in the patent application for improving egg shell quality with CALSPORIN® (U.S. patent 6,660,294; December 9, 2003.) Follow up field evaluation trials in the US have reported egg shell thickness improvements of 2-3%. One trial conducted with a large Midwest egg producer shows just how beneficial CALSPORIN® can be when fed to older hens. After a pretrial baseline was established, Hy-Line W-36 hens 58 weeks of age were fed CALSPORIN® at 300,000 CFU/g of complete diet up to molt (76 weeks). During the trial, product was inadvertently left out of the diet for two weeks during which time shell thickness fell to projected baseline. Upon re-introduction of CALSPORIN®, egg shell thickness improved and persisted above the projection line despite age progression in the hens.



Brown Egg Shell Color

A slight but significant positive correlation has been reported between brown egg shell color and egg shell quality in broiler breeders. CALSPORIN® has been demonstrated to improve brown egg shell color which is based on protoporphyrin, a breakdown product of hemoglobin in blood. Trials in US and China have reported improved egg shell color in hens treated with CALSPORIN®.

Chicks Per Hen

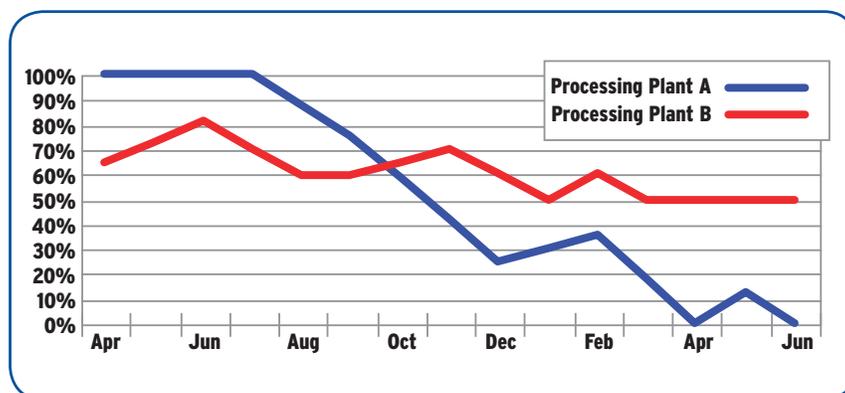
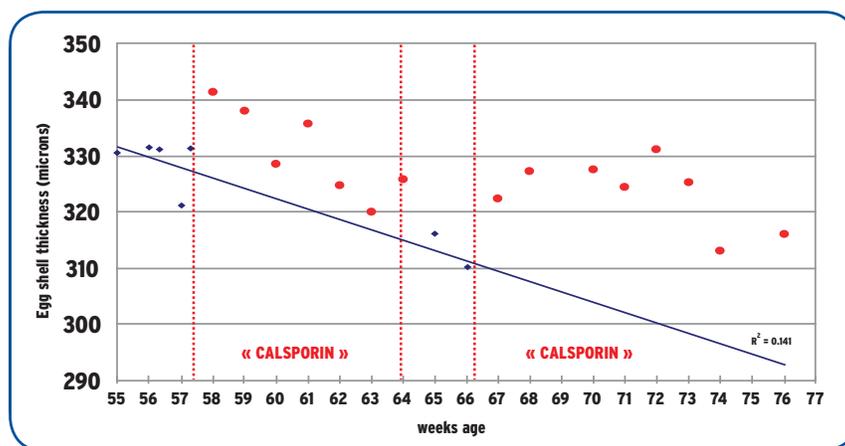
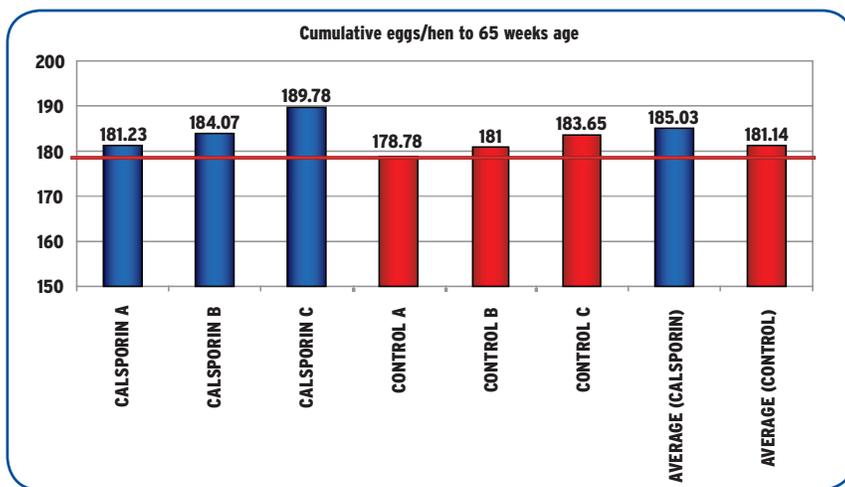
Results of a broiler breeder trial with another large broiler integrator in Brazil reported reduced number of cull eggs for CALSPORIN® treated hens versus control hens. This study reported an increased number of eggs set, and more chicks hatched and marketed, for the CALSPORIN® treated hens.

Salmonella Positive Chickens

A public health center in Japan worked in cooperation with two processing plants for a period of one year, one plant received only broilers treated with CALSPORIN® while the other plant's broilers were not treated with CALSPORIN®. The incidence of *Salmonella* positive broilers was reduced to around 0-10% after 1 year in flocks receiving diets supplemented with CALSPORIN® compared to 50% for untreated controls.

Conclusion

Managers responsible for performance, health and safety of broiler breeder flocks should consider supplementing their flocks' diets with CALSPORIN®. When used at the recommended dose of 300,000 CFU/gram of feed, CALSPORIN® direct fed microbial may improve egg production, shell quality, brown egg color, chicks per hen, and may reduce pathogen load in and on the chickens.



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