Feeding dietary seaweed to laying hens – Evaluation of processing on egg production and intestinal microbiota at different stages of production

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Laying hen producers are interested in methods to improve bird health and product safety at a time when the use of antibiotics in animal agriculture is highly scrutinized. This could present a significant challenge for the industry as it transitions to alternatives to conventional cages while continuing to manage problematic bacteria associated with eggs and egg products. The manipulation of novel feed ingredients to improve production and product safety are not unique to the egg industry but have a wide ranging application to all poultry industries.

Researchers at Dalhousie have established that short term feeding studies of 2-3 weeks are sufficient to demonstrate the ability of this ingredient to alter the bacteria in the digestive tract of the bird, including exclusion of Salmonella enteritidis (SE). The objective of this project was to evaluate the impact of incorporating red seaweed (*Chondrus crispus*) (CC) into laying hen diets at various stages of production for longer durations to ensure the use of this product does not negatively impact production and remains an effective bacteria modulator. Additionally, this feed ingredient was extruded prior to incorporation into the diet to determine if this would improve its function and nutrient availability, thereby remaining effective at a lower dose. The parameters measured were egg numbers, feed intake, body weight, egg quality and yolk fatty acid profiles.

Two trials were conducted. Late-cycle Lohmann LSL-Lite White laying hens were fed diets including dried or extruded CC at levels up to 4% to determine doses of the extruded product for a longer term trial. At 31 weeks of age Lohmann LSL-Lite White hens and Lohmann Lite Brown hens were fed CC as either raw ground or extruded up to levels of 3% up to 43 weeks of age.

Based on the results so far, red seaweed (*Chondrus crispus*) can be included in the diet of late-cycle and early cycle laying hens up to a level of 3% without a negative impact on egg production. Body weights were lower for hens consuming 3% CC compared to 0% which were on the high side of acceptable. Extruding the CC did not improve the overall production performance of the hens. Including CC in the diet, in particular at a level of 3%, did improve the fatty acid profile of the eggs produced by the hens. Eggs from the Lohmann Brown-Lite hens fed CC had higher linolenic acid, and eggs from both strains of hens had higher EPA, DHA, total omega-3 levels and also higher omega-3 to omega-6 ratios. Samples of digestive tract contents will be analyzed to confirm this feed ingredient continues to improve the profile of bacteria found there. So far it can be concluded that diets containing CC do not negatively impact egg production and could be beneficial for maintaining a healthy body weight. Eggs from hens fed CC could also contribute to the health of humans consuming these eggs as they have an improved fatty acid profile.

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