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Accumulation of ^{15}N in Yolks and Albumen of Hens Fed Diets Containing ^{15}N -CCC During Egg Development

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Abstract

An experiment was conducted to evaluate the accumulation of dietary ^{15}N -CCC in yolks and albumen of hens fed diets containing ^{15}N -CCC during egg development. Twenty 280 days old Brown breed layer hens were fed a ^{15}N -CCC free balanced diet with 16.37 % crude protein and 11.48 MJ ME/kg. In completely randomised design, the hens were divided into 4 groups (A, B, C and D) and given on one of the 4 treatments: 0 mg ^{15}N -CCC / kg feed (control diet / group A), 5 mg ^{15}N -CCC / kg feed (group B), 50 mg ^{15}N -CCC / kg feed (group C) and 100 ppm mg ^{15}N -CCC / kg feed (group D) for 11 days. During the 7 days followed, ^{15}N -CCC treatments were withdrawn and all chickens restored to feeding on the control diet. Eggs were collected daily during both periods and egg yolks and albumen were separated. The ^{15}N content was measured using a coupled Elemental Analyser-Continuous Flow II Interface-Isotope Ratio Mass Spectrometer (EA-ConFloII Interface-IRMS) and the $\delta^{15}\text{N}$ excess ($\delta^{15}\text{N}$ -ex) and atom percentage ^{15}N (At%) calculated. There was no significant ($p > 0.05$) difference in $\delta^{15}\text{N}$ -ex and At% of egg yolks and albumen of group B both during 11 days of feeding on ^{15}N -CCC containing diets and during the 7 days ^{15}N CCC diets withdrawal. Feeding with ^{15}N CCC affected ($p < 0.05$) $\delta^{15}\text{N}$ -ex and At% in egg yolks and albumen of group C and D from 8 and 3 days respectively after the beginning of feeding ^{15}N -CCC diets, and up to 2 and 4 days after ^{15}N CCC diets were withdrawn, respectively. The $\delta^{15}\text{N}$ -ex and At% in egg yolks tended to be higher than in albumen during the treatment period. The ^{15}N concentrations reduced after ^{15}N -CCC diets were withdrawn. These results suggest that hens might transfer excess dietary ^{15}N -CCC or its metabolites into eggs and ^{15}N accumulates during egg development. However, by this method it is not possible to determine if ^{15}N is still bound in CCC or in its metabolite products.

Keywords: Atom percentage ^{15}N , chlorocholine chloride, $\delta^{15}\text{N}$, egg