Can dietary pigments increase egg iron concentrations?

J.M. HUMPHRIES¹, D. REVELL², R.J. HUGHES³, D.R. TIVEY² and R.D. GRAHAM¹

¹The University of Adelaide, Waite Campus, Department of Plant Science, Glen Osmond, SA, 5064, Australia
²The University of Adelaide, Roseworthy Campus, Department of Animal Science, Roseworthy, SA, 5371, Australia
³South Australian Research and Development Corporation, Pig and Poultry Production Institute, Roseworthy, SA, 5371, Australia
*julia.humphries@adelaide.edu.au

Keywords: carotenoids; egg iron; dietary pigments; yolk nutrient concentration

Abstract

Iron deficiency anaemia affects 4-5 billion people world-wide, and is not a problem restricted to developing countries, with 1 in 12 Australian women and teenage girls affected, and 1/3 of Australian infants with low iron status. Reduced iron levels result in inhibited mental and physical development and reduced immune competence. One of the greatest contributing factors to iron deficiency is the relatively poor absorption by the human body of most iron sources. Iron absorption is affected by the form in which iron is ingested, with haem-iron being the most absorbable form. Unfortunately, the majority of iron from plant foods is in the least absorbable form. However, the form of iron present in eggs is one of the most readily available for absorption, and therefore represents an ideal vehicle to increase iron consumption. The presented work reports on the results of a trial to investigate whether addition of a natural plant pigment, lutein, in layer diets can increase the iron concentration of eggs. Lutein is proposed as a possible mechanism for increasing the iron concentration of eggs as it is deposited in high concentrations in the egg yolk. The aim of increased lutein content goes beyond merely increasing the amount of iron in the egg, as lutein is proposed to increase the post-consumption absorption of iron also (Humphries et al, unpublished data). Production of eggs with increased concentrations of lutein and iron represent a major breakthrough in the reduction of iron deficiency anaemia.