P55  Retention of major minerals and some trace elements in the newly hatched broiler chick
V Ravindran, DV Thomas
Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand

Background – The first week after hatch is the most critical period in the life of a broiler chicken. Several recent studies have examined the utilisation of energy and protein in the newly hatched chick, but corresponding data on mineral utilisation is scanty.

Objective – To determine the retention of major minerals (Ca, P, Mg, K and Na) and some trace minerals (Fe, Mn, Zn and Cu) of diets based on wheat, sorghum and maize during the first two weeks post-hatch of broilers.

Design – Three diets containing wheat, sorghum and maize as the cereal base were formulated. All three diets were formulated to contain similar levels of energy, amino acids and major minerals. Each diet was fed ad libitum to six replicate groups (8 birds/replicate) from days 1 to 14 post-hatching. On days 3, 5, 7, 9 and 14, total excreta collection method was employed to determine the mineral retention.

Outcomes – For all minerals, the retention values were higher at day 3 and then declined during 5 to 9 days, before increasing at day 14 post-hatching. Among minerals analysed, the retention of Na was the highest and those of Zn and Cu were the lowest. Cereal effects were significant only for Ca and P, with sorghum-based diets having high retention values.

Conclusion – The capacity to absorb and retain minerals appears to be limiting during the first week of life in modern fast-growing broilers.

P56  Influence of diet on iron status in the Tasmanian population with and without the haemochromatosis genes
IK Robertson, MJ Ball
School of Human Life Sciences, University of Tasmania, Launceston TAS 7250

Background – Hereditary haemochromatosis is one of the commonest genetic disorders in Australia. There is considerable variability in the rate of end-organ disease in people with susceptible HFE genotypes for hereditary haemochromatosis, possibly due to variability in the rate of iron accumulation.

Objectives – To estimate the association between dietary iron and other nutrients, and iron status.

Design – A community cross-sectional survey of 114 men and 119 women with different HFE genotypes conducted in northern Tasmania. Macro- and micro-nutrient intake was assessed by food-frequency questionnaire.

Outcomes – 67% of men and 71% of women with C282Y homozygous genotype had elevated transferrin saturation. The median ferritin in C282Y homozygous men under age 35 was 151 µg/dL and 809 µg/dL over age 35. Only 33% of C282Y homozygous women (all over age 50) had ferritin levels over 350 µg/dL. Serum transferrin saturation and ferritin levels were strongly associated with dietary fat intake in C282Y homozygotes, but not in heterozygous and normal genotypes. Serum ferritin levels were strongly associated with dietary haem iron in homozygotes with ferritin > 350 µg/dL but not below this. When the two factors were analysed together in this group, 1 SD increase in haem iron increased serum ferritin by 470 µg/dL (CI95% 82 to 857; P=0.03) and 1 SD total fat increased serum ferritin by 310 µg/dL (CI95% 31 to 589; P=0.036). There was no association between dietary non-haem iron and iron status.

Conclusions – There is a strong association between haem iron intake and ferritin in C282Y homozygotes with elevated ferritin levels. Total fat intake had an independent strong association. In these people dietary change may slow iron accumulation and may delay the need for venesection.