

**Iron status and dietary intake of 6-24 months old children in Ghana***<sup>1</sup>P E Oti-Boateng, <sup>2</sup>B Baffoe-Bonnie, <sup>1</sup>D Tivey*<sup>1</sup>Department of Animal Science, University of Adelaide, Glen Osmond, SA, 5064<sup>2</sup>Department of Paediatrics, University of Science and Technology, Kumasi, Ghana

The most common micro-nutrient deficiency in infants and young children during the period of rapid growth is iron. Chronic iron deficiency in children is associated with anaemia, alterations in small intestinal mucosal permeability predisposing the gut to malabsorption, and impaired mental and psychomotor development. In spite of these adverse effects of iron deficiency anaemia, the assessment of iron status in children is not routinely done. The aim of this study was to assess the iron status and dietary intake of 6 - 24 months old children living in metropolitan Accra and Kumasi in Ghana.

Three hundred and seventy eight healthy children (55% boys and 45% girls) aged 6-24 months were recruited from Well Baby clinics into the study. Anthropometric measurements were taken on the day of assessment. Dietary iron intake of children was estimated from semi-quantitative diet recall questionnaire administered to their parents. Blood samples for full blood count, serum ferritin (SF), serum iron (SI) and transferrin receptor (TfR) level estimations were obtained by venepuncture. Based on the laboratory test results, children were classified as *iron sufficient* (IS) if the haemoglobin (Hb) concentration was > 110 g/L, SF  $\geq$  15  $\mu$ g/L, TfR  $\leq$  8.5  $\mu$ g/ml, SI  $\geq$  8  $\mu$ mol/L and iron saturation (ISAT)  $\geq$  12 %; or *non-anaemic iron deficiency* (NAID) if the Hb concentration was > 110 g/L and SF < 15  $\mu$ g/L or SI < 8  $\mu$ mol/L, TfR > 8.5  $\mu$ g/ml, and ISAT < 12 %; or as *iron deficiency anaemia* (IDA) if the Hb concentration was < 110 g/L in association with SF < 15  $\mu$ g/L or with SI < 8  $\mu$ mol/L, TfR > 8.5  $\mu$ g/ml and ISAT < 12 %.

Eighty seven percent of all children were within 3 standard deviations for growth. Thirty five percent of children were classified IS, 12 % as NAID and 53 % were IDA. There was a significant difference in the iron status of children in 6-12, >12-18 and >18-24 months age groups (Chi-square = 12, P < 0.01). The prevalence of IDA was more common in 6-18 than > 18 - 24 month olds (P < 0.01). The recommended daily dietary iron intake was low in all age groups with older children consuming only  $6.7 \pm 4$  mg of iron a day (P < 0.001). There was an association between dietary iron intake and Hb concentration ( $r = 0.4$ , P < 0.01). Ninety seven percent of all children were exclusively breastfed for five months, with 40 % still being breastfed at 9 months. Multivariate analysis indicated that prolonged breast feeding was a risk factor for depletion of body iron stores ( $r^2 = 2.8$ , P < 0.01). As breastfeeding decreased or ceased maize, cowpeas and soya bean-based diets became the main weaning foods while fish and fish products were consumed in smaller amounts by older children.

Results indicate that iron deficiency anaemia and inadequate dietary iron intake are common in young children in Ghana. This can be attributed to the intakes of low iron diets both in content and availability at a period when the child has a high iron requirement for increased erythropoiesis and growth. The prevalence of IDA in Ghanaian infants and toddlers is much higher than those in a previous study conducted in Adelaide, Australia where IDA was only 7 % and NAID 23 % (1). These results suggest that iron deficiency and anaemia are still prevalent in both industrialised and developing countries. Measures to improve the bioavailability of iron in weaning diets are recommended especially as iron deficiency anaemia has been associated with impaired cognitive functions and behaviour.

1. Oti-Boateng P, Shesadri R, Gibson R, Simmer K. Iron status and dietary intake of young children in Adelaide. *J Paediatr Child Health* 1994; 30: A63.