

Issue 95

In a nutshell

Milk consumption is a risk factor for iron deficiency in children, in part because it supplies energy at the expense of other more iron-rich sources in the diet.

These two studies suggest that eating of iron-rich foods along with dairy foods can counter any such effects in children.

Iron deficiency, food and dairy

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NUTRITION RESEARCH REVIEW

Study one: other foods affect impact of milk

Overdependence on milk as a food source increases the risk of iron deficiency, but not when the diet has plenty of foods which increase iron status (such as meat and fruit). This is the conclusion of recent analysis from a national dietary survey in England.

Subjects: 1,003 children from the National Diet and Nutrition Survey

Method: A weighed dietary record was made and blood taken for measurement of haemoglobin (Hb) and serum ferritin.

Results: Iron status - both Hb and serum ferritin - was significantly lower in the younger age group (1.5 - 2.5 years) compared with the older children (3.5 - 4.5 years). Surprisingly boys had significantly lower ferritin levels than girls.

Iron status was directly associated with consumption of meat and fruit, and inversely associated with milk dairy consumption. This last association remained true after adjusting for various factors, including socioeconomic status.

An explanation for this association may lie in the fact that the children consuming >400 gm/day of milk and cream were less likely to consume foods in other groups. The highest risk of iron deficiency was in those who ate little meat, fish, fruit or nuts (but there was no association with vegetarian diet).

Reference: Thane C et al. Risk factors for poor iron status in British toddlers: further analysis of data from the National Diet and Nutrition Survey of children aged 1.5-4.5 years. *Public Health Nutrition*, 2000;3:433-440

Study two : pureed meat protects against low iron

Infants fed iron-fortified infant cereal and pureed meat are protected from any extra risk of iron deficiency, even if they are on a whole cow's milk diet as their primary food source, according to recent Canadian research.

Subjects: 97 six month old infants.

Method: Randomised controlled trial in which the infants were either given no dietary intervention or active intervention. This consisted of being placed on a diet where whole cow's milk diet was the primary milk source, but where the diet also included iron-fortified infant cereal (10.2 mg iron) and pureed meat (0.75-1.7 mg iron). Hb and serum ferritin were measured every two months for 6 months.

Results: There was no more anaemia in the active than the control groups.

Reference: Yeung GS, Zlotkin SH. Efficacy of meat and iron-fortified commercial cereal to prevent iron depletion in cow milk-fed infants 6 to 12 months of age: a randomized controlled trial. *Can J Public Health* 2000;91:263-7

Comments

These two studies are important because iron deficiency is a major problem in young children. It is both common (particularly amongst children from poorer families) and from being a cause of anaemia, iron deficiency can lead to developmental and cognitive delays, particularly during a vulnerable period of growth from 6 to 24 months of age.

It is known that over reliance on milk as a food source in this age range is a risk factor for iron deficiency. This is because milk is a poor source of bioavailable iron, and possibly also because whole milk in the first year of life can cause GI bleeding.

For this reason, many paediatricians and child health nurses recommend avoiding dairy products as a main source of nutrition in that first year. However, for some mothers it may not be so easy to find substitute milks (such as formula or non-cow milks) to replace cow's milk.

The first of these two studies confirms that milk consumption is a risk factor for iron deficiency. However, it has a positive message as well. It suggests that the main reason for this problem is not anything in the milk itself, but the fact that it displaces other iron-rich foods in the diet as a source of energy.

By eating adequate amounts of meat (a rich source of bioavailable iron - particularly red meat) and fruit (a source of vitamin C which increases bioavailability of non-meat iron) this problem can be overcome.

The second study from Canada is even more specific in showing that dairy products do not necessarily have to be limited, provided the diet contains plenty of iron-rich foods. Provided the infant consumes pureed meat and iron-fortified cereal, their randomised, controlled trial demonstrated that whole cow's milk does not increase the risk of iron deficiency.

These findings can increase the range of options available to health professionals in advising mothers as to the source of milk.

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