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**Iron bioavailability for piglets:
The effects of iron status, vitamin C and cooked or uncooked meat**

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Patricia J. Clayton 2002

Abstract

Worldwide, iron deficiency affects more than 1 billion people. People with iron deficiency have symptoms of fatigue, intolerance to the cold and poor behaviour and psychomotor development problems. This is partly because the amount of iron present in food is not the amount that is available to the body.

The bioavailability of iron is a key component in understanding the complexities of iron deficiency.

Using an animal model involving 4-week old anaemic piglets, this study investigated several aspects of iron bioavailability. These were:

The relationship between iron status and iron absorption, the difference in bioavailability of meat iron and non-haem iron and whether supplementary vitamin C can aid in the absorption of dietary iron, and the effect of temperature and cooking of meat on iron bioavailability.

Dietary iron bioavailability was measured both in iron deficient and non-iron deficient piglets, by measuring changes to the composition of the red cell mass, serum iron concentrations and the binding capacity of iron transport proteins over a period of 28-days.

Experiment 1 showed that meat iron was more bioavailable than the inorganic iron in a vegetable based diet. Also, in the anaemic piglet, 500 ppm of vitamin C in the diet was able to enhance the availability of the non-haem iron from a diet consisting of food choices from a typical human diet. Experiment 2 showed that a diet containing meat iron was able to return iron deficient piglets to haematologic normality more readily than a diet consisting of milk protein and inorganic iron. Also, cooking meat in a steam-heated circulating water bath was beneficial in increasing the digestibility of the diet and also increasing the availability of the meat iron.

The findings of this study reflect the conclusions drawn from similar human studies, thereby providing further evidence of the suitability of the piglet as a model for the human in future studies of iron bioavailability.

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The Animal Ethics Committee at Massey University, Palmerston North, approved the experimental protocols of the studies described herein.

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