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**THE USE OF SEMI-ANAEMIC PIGLETS TO INVESTIGATE
THE EFFECT OF MEAT AND LSF DIETS ON
IRON BIOAVAILABILITY**

A thesis presented in partial fulfilment of the requirements
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ABSTRACT

Anaemia, which is caused by iron deficiency, is a global nutritional disorder of utmost concern. It has been assumed that meat, which contains haem as well as non-haem iron, enhances non-haem iron absorption due to the presence of the “meat factor”. In the experiment reported here, 24 semi-anaemic, 3-week-old piglets were utilised as human nutrition models to assess the effects of dietary lactoferrin, meat and LSF (Low Molecular Weight Sarcoplasmic Fraction) on iron bioavailability during a 4-week feeding period. The parameters that were used as measurements of iron bioavailability were changes in haematological indices, haemoglobin iron repletion efficiency, intestinal morphology and mineral balances. Non-significant ($p > 0.05$) dietary effects were observed for growth performance and for all the haematological and some histological parameters (small intestine villi height, crypt depth and mucosal thickness). Haemoglobin iron repletion efficiency was highest for the control group and was not significantly different between the other 3 diets. The superiority of the control diet in this respect was not consistent with previous trials and can not be explained. Results suggested that increased retention of calcium, magnesium, phosphorous and manganese tended to inhibit iron absorption. However, the LSF and meat diets significantly ($p = 0.003$) increased the number of goblet cells/100 μm suggesting that mucin secretion was favoured by these two diets. Additionally, all immunological parameters were significantly ($p < 0.05$) improved by the LSF diet. As such, the LSF diet can be a potential immunobooster feed ingredient for weanling piglets. Overall, the level of LSF in the LSF diet was insufficient to exert a desirable enhancement of iron bioavailability and betterment of

iron status of the semi-anaemic piglets relative to the control group. However, the diet containing LSF was as effective as the meat diet with respect to these characteristics.

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