

USING PIGS AS A MODEL TO STUDY DIETARY DETERMINANTS AND MECHANISMS OF IRON NUTRITION

Xingen Lei⁽¹⁾ and Dennis Miller⁽¹⁾

⁽¹⁾Departments of Animal Science and Food Science, Cornell University, Ithaca, NY, USA, XL20@cornell.edu, ddm2@cornell.edu

Because pigs and humans share many similar anatomical and physiological features, we have exploited these similarities to study dietary factors that may enhance or inhibit the bioavailability of dietary iron and to explore mechanisms governing these effects. We have developed a hemoglobin repletion efficiency model for studying iron bioavailability from diets. Applying this model, we have revealed that supplemental dietary inulin enhances iron absorption in young pigs by affecting the expression of iron and inflammation related genes. Subsequently, we have demonstrated that inulin does not enhance iron absorption by promoting iron absorption in the colon. However, inulin alters intestinal bacterial populations. Seemingly, this may partially account for its iron bioavailability-promoting effect and possibly other health benefits. We also showed that iron biofortified black beans provide more bioavailable iron to pigs than conventional black beans.