

A better understanding of phosphorus: stronger, healthier pigs?

Harper Adams University

Current Postgraduate Research Briefing



Why phosphorus?

Pigs and humans have fairly similar digestive systems. Research to improve pig digestive health could also benefit human health.

Weaning is a particularly critical time for young pigs so the stronger they are, and the more robust their immune systems, the better. The mineral, **phosphorus**, is essential for strong and healthy bones. But, because it can be poorly digested, an **enzyme** has commonly been added in standard amounts to pig diets to help digestion.

Recently, research has identified that pigs have grown better when fed extra large doses of this enzyme, known as **phytase**. However, we don't yet understand the reasons for this.

Study aim

This study aims to feed larger than normal amounts of phytase to weaned pigs and evaluate the effects on **mineral digestibility** and **immunity**.



Use of The Princess Margaret Laboratories

Weaned pigs, in a farm situation, were fed diets containing different levels (including super and mega amounts) of the enzyme, phytase. After three weeks, feed and faecal samples were analysed for mineral content using the **mass spectrometry equipment** (see panel) in **the Princess Margaret Laboratories**.

RT-qPCR equipment (see panel) is being used as part of investigations into the immune response and mineral transport from the feed into the body.



harper.ac.uk/labs

What next?

So far, the results have indicated that super doses of phytase, in a diet already adequate in phosphorus, could boost growth rates in weaned pigs, especially in the first two weeks after weaning.

The next step is to find out why there is this unexpected boost in pig growth. In the long-term this will help nutritionists to formulate healthier pig diets and provide an insight into possible benefits for human health.

PhD programme

This briefing outlines the second-year work of a three-year PhD research programme by **Stephen Mansbridge**, a graduate of Harper Adams University, and now Postgraduate Researcher.

Director of Studies :

Alan Stewart, *Senior Lecturer in Animal Production,*
Harper Adams University

Mass spectrometry

The inductively coupled plasma mass spectrometer (ICP-MS) measures most minerals to a sensitivity of 1 part per trillion. This is equivalent to one drop of water diluted into 20 Olympic-size swimming pools.

RT-qPCR equipment

The reverse transcription quantitative polymerase chain reaction (RT-qPCR) equipment in the Molecular Diagnostics Laboratory is being used to extract nucleic acids and quantify the extent to which the genes are turned on or off.

Acknowledgements

The external funding from AB Vista, Primary Diets and the Silcock Fellowship for Livestock Research, is gratefully acknowledged.



harper.ac.uk/research



Harper Adams
University