The immediate postweaning period represents a critical time point in the health and development of the young pig. Often a lag in growth is observed, which can be compounded by enteric pathogen challenges. The importance of adequately meeting the nutritional needs of the newly weaned pig has been the focus of numerous papers. Postweaning changes in diet often result in decreased intake and reductions in overall absorptive area as a result of decreased villus height and crypt depth. Therefore, much research has focused on enhancing intake and improving nutrient absorption in an attempt to reduce the negative impacts of weaning on gastrointestinal health and development. As advancements have been made in molecular techniques, it is now possible to better elucidate the mechanisms involved in enhancing feed intake and nutrient absorption.

Researchers have reported increased absorption of carbohydrates when increased monosaccharides or their analogs or both are included in the diets of newly weaned pigs. On July 15, 2010, a symposium was held at the annual meeting of the American Society of Animal Science highlighting recent findings regarding “Nutrient and Non-nutrient Sensing and Signaling in the Gastrointestinal Tract.” Shirazi-Beechey et al. (2011) highlighted the role of sweet taste receptors in the enhancement of glucose absorption in newly weaned pigs. The paper details the complex interplay of a heterodimeric sugar sensing protein composed of 2 subunits, T1R2 + T1R3, coupled to a G-protein secondary messenger cascade. Evidence is provided demonstrating the role of this sweet taste receptor in upregulation of Na+/glucose cotransporter 1 (SGLT-1) expression in response to luminal glucose, monosaccharides, or their analogs. The authors propose that this sweet taste receptor, in response to increased monosaccharide concentrations, causes the secretion of a gastrointestinal hormone. They further hypothesize that this gastrointestinal signaling hormone is glucagon-like peptide 2, and that it acts through its receptor on enteric neurons stimulating SGLT-1 expression through a neuroendocrine mechanism.

The newly weaned pig is faced with a radically changed diet, environmental and social stressors, and an immune system that is in the early stages of development. To minimize the effects of these stressors, it is important that nutrients are rapidly supplied to and efficiently absorbed by the gastrointestinal tract. As advancements have been made in molecular techniques, it is now possible to better elucidate the mechanisms involved in nutrient absorption. Based on the review by Shirazi-Beechey et al. (2011), the sweet taste receptor appears to be integral in the regulation of SGLT-1 expression in the gastrointestinal tract of newly weaned pigs.

LITERATURE CITED