

# Research in pigs benefits human health



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Awareness of the benefits of using large animal models in human nutrition and health related research has increased. In fact, it has been estimated that as little as 40% of research results obtained from rodent models result in successful human clinical trials; the species are just too different for example in physiology and structure. It is becoming increasingly important that health science researchers identify more appropriate animal models; the pig is one of those more appropriate models. Due to physiological, anatomical, and developmental similarities to humans, researchers have been increasingly identifying the pig as a model of choice for research designed to benefit humans. One of the main benefits of research in pigs is that, unlike with the more traditional rodent models, utilizing a species of agricultural importance has the potential to apply the knowledge gained from the research to both human health sciences and agricultural industry applications.

Those research initiatives that simultaneously advance both agricultural and medical science are referred to as agrimedical research. The dual application of research in humans and agricultural species is not a new concept and research in both fields has historically been advanced through discoveries made in the other. For

example, human nutritionists have gained valuable information on nutrient interactions, bioavailability and requirements through work carried out in animals. Research in neonatal pigs has increased our knowledge of interaction between nutrients and muscle growth and development which could lead to nutritional interventions to improve growth and survival of both low-birth weight pigs and human infants.

Recent work performed at the Prairie Swine Centre in collaboration with researchers in the College of Kinesiology to examine the adequacy of dietary calcium recommendations in sows has furthered our understanding of bone development and remodeling which can be used to develop therapies to treat osteoporosis in humans. In the Colleges of Pharmacy and Nutrition, and Medicine, the piglet model has been used to examine the toxicity of intravenous solutions being provided to sick infants. Dr. Gordon Zello, Professor of Nutrition, points out that without animal model studies, advances in human health could not be achieved as there are additional ethical issues when conducting studies in vulnerable groups, such as the premature infant. These are just a few examples of how agrimedical research can have a direct benefit to both the pork industry and health sciences.

The Prairie Swine Centre currently works with 14 different groups utilizing the pig as a model from dentistry reconstruction to vaccine development, and toxicology to specialized suture validation. There is a further benefit beyond the intended outcomes of improvement of quality of life in humans, and improved productivity and cost in pork production. That benefit is the improved communication and exposure to diversity of ideas and concepts through collaboration between human and animal scientists. This may someday be seen as a renaissance of bringing diverse sciences back together which have grown apart through technical specialization; it reminds me of a quote "The Best way to predict the Future is to Design it" (source: Buckminster Fuller, architect,

author, designer and inventor). The future will be brighter when diverse talents are brought together to solve problems.

By necessity, agrimedical research requires a multidisciplinary collaborative approach. In order to foster collaborations between researchers at Prairie Swine Centre and the University of Saskatchewan Health Sciences, we recently held a symposium on the use of agrimedical models in research. This symposium, organized in collaboration with the College of Pharmacy and Nutrition, included presentations from both animal and health science researchers to highlight the importance of pigs for human health research and the benefits of agrimedical models. In response to the symposium, Dr. Kishor Wasan, Professor and Dean of the College of Pharmacy and Nutrition, states "The Prairie Swine Centre provides expertise and relevant large animal models for our health science researchers and the ability to access unique facilities, expertise and of course the pigs. This collaboration helps our scientists move their research forward and makes it more cost competitive. In particular we see significant strength in collaborating with Prairie Swine Centre on disease and nutrition research."

Research is a significant investment for both industry and government; therefore, it is increasingly important that research demonstrate benefit to multiple clients, and through that way ensure funding agencies see benefit in continuing to grow their research commitment. Our Mission speaks to our ability to take this trust and support and create value for our stakeholders.

**Our Mission:**  
We are a source of  
innovation - providing  
solutions through knowledge,  
helping to build a profitable  
and sustainable pork industry. 