

## Completion Report for BSAS Scholarships

**Name and affiliation:**

Stafford Vigors  
University College Dublin, Ireland

**Award Name and value of the award:**

Murray Black Award, £1,000

**Was any additional funding secured to support the activity?**

(If yes, please state the value and source of funding):

**Start/end date of the award:**

July 20<sup>th</sup>, 2014-July 24<sup>th</sup> 2014

**Summary of the award (Briefly describe the objectives and how was it undertaken):**

(approximately 300 words)

The objectives upon receiving this award were to attend the 2014 Joint Annual Meeting of the American Dairy Science Association, American Society of Animal Science and the Canadian Society of Animal Science in Kansas City in the United States of America. I attended this conference to present my work in the form of two oral presentations entitled:

- 1) Residual feed intake in pigs is associated with organ weight, nutrient digestibility and intestinal nutrient transporter gene expression
- 2) The effect of divergent selection for residual feed intake on cytokine gene expression in pigs following an ex vivo lipopolysaccharide challenge

I also presented two poster presentations entitled:

- 1) Divergent selection for residual feed intake may be impacted by differences in feeding behavior
- 2) The improvements in growth, bone mineral status and nutrient digestibility in pigs following the addition of phytase is accompanied by modifications in ileal nutrient transporters

The presentations both oral and poster were well received and generated important opportunities for discussion. The feedback I received in these situations will be highly beneficial in my thinking in my future research. While I benefited hugely from these interactions I also received a number of requests for further information in my phytase poster from both academics and industrial based conference attendees, which will hopefully be of benefit to these people in their research areas.

While the main aim of attending this conference was to present my own work to a global audience attending other presentations was also very important. The conference had a huge range of

presentations across multiple species and scientific disciplines, which provided an amazing opportunity to broaden my knowledge base that I can then use in my future Phd work.

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### **Benefits of the Award:**

This is the main part of the report and the two sections below should be approximately 1000 words in total. You may focus on benefits to yourself, to the animal science community, or both – depending on the nature of the activity undertaken.

### **Benefit of the award to you (e.g. new knowledge or skills, new contacts and collaborations):**

This award was beneficial as it allowed me to present my work to a large scientific audience. This is important as it allowed me to improve my skills in creating a presentation, presenting to a large audience and also fielding a diverse range of questions. This is also applicable to the poster presentation as it really makes you focus on what is important to convey to the audience. These are skills that will be very important in the remainder of my research.

The Murray-Black award allowed me to attend one of the largest animal science conferences in the world, which gave me the opportunity to attend presentations, which will be very helpful in my future research. On the opening day of the conference there was a very interesting session, which had multiple presentations on the importance and functionality of the gut microbiome. This is an area that I will be focusing on so to see the views of academic experts was very interesting.

In regards to my research into the enzyme phytase and phosphorus in the Monday morning session there was an interesting poster looking at the transport of phosphorus in the small intestine, which is similar to work, I have conducted in my research. Comparing data from different research projects and different experimental conditions is vital in the understanding the diverse range of metabolic processes that are involved in the digestion and transport of nutrients in the small intestine.

Whole genome sequencing is a technology that is becoming much more widely utilized. This technology is one I am going to be undertaking as part of my future research. Seeing the benefits and wide range of uses compared to the candidate gene approach was very interesting. Also as this conference was made up many different areas it was interesting to see the uses of this technology in the different species such as dairy cows. A talk entitled: The relationship between digestibility and residual feed intake in lactating Holstein cows fed high and low starch diets I found to be very interesting. The question of whether the increased efficiency in low RFI (LRFI) more efficient animal is similar across different diets is a very pertinent and important one. While this research was conducted in dairy cows and my work is with pigs it is very interesting that differences in feed efficiency were consistent across diet types. This study raises the question of whether these differences are consistent across species and also whether when RFI animals are restricted do differences in feed efficiency still apply? These questions raise the possibility of conducting future research in this area.

As this was such a large conference there was an extremely diverse range of topics in the species that I am working with. Sessions such as meat science and muscle biology, nutrient requirements of monogastrics and amino acid digestibility of feedstuffs were areas I had very little

knowledge of and I think it is very important to have a basic knowledge in a wide range of research areas.

The session I found most interesting and beneficial was a session entitled comparative gut physiology. One of main areas of work I have undertaken is examining the role of intestinal nutrient transporters in feed efficiency and in pig diets following supplementation. The talks in this session were directly related to this research. John Furness from the University of Melbourne gave excellent talks on the role of gut hormones in the control of nutrient transporters. He discussed the importance of sweet taste receptors and gut hormones such glucagon-like peptide 1 and peptide tyrosine tyrosine in the regulation of nutrient transporters. I found this very interesting as it provides an interesting area that I could pursue in my research studies. Another talk in this session delivered by Hannah Cunningham from the University of Wyoming was very relevant to my research as she was examining the role of intestinal nutrient transporters in the differences in efficiency in RFI cows. Interestingly which is in contrast to results I have found in my research the gene expression of the nutrient transporters were that the nutrient transporters were up regulated in the high RFI inefficient animals, which the author attributed to the fact that the inefficient steers were eating more. Attending conferences like the 2014 JAM are an excellent way to see what are the latest advances in research and this is a prime example where this was very important to me. Similarly a poster presented by Stephanie Perkins presented interesting data was similar to the results that I have found in my research. Following the discussions at the poster session I was able to set up a correspondence where I received further information, which will be of great benefit to my future research.

**Benefit of the award to the animal science community, academic and industrial:**

My research into feed efficiency is pertinent at this time with problems of increasing global population, reduced land area and the added pressure of global climate change. The future incorporation of phytase enzymes and the ability to easily select for more feed efficient pigs will be very important in the future of pig production. In my research I have identified a number of genes that are differentially expressed in animals, which differ in feed efficiency. These genes will become important in the future with the increased viability of selecting for animals through the use of whole genome sequencing technology. From my poster presentations it is clear that there is interest in my research area from industry and the Murray Black award has helped me to disseminate my research to members of the scientific and industrial community

**Other supporting information:**

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