

## PROJECT REVIEW

<b>NAME:</b>	Selene Jarrett	Full Time	Year 2
<b>INSTITUTE:</b>	The Roslin Institute, The University of Edinburgh		
<b>TITLE:</b>	The contribution of oocytes and follicular fluid to pig fertility		

### AIMS & OBJECTIVES:

A high fibre diet fed to pigs before mating increases embryo survival and the number of live born piglets born to each pig. Additionally, the high fibre diet is associated with improved maturation of porcine oocytes (egg cells) and improved development of blastocysts (early stage embryos) following in vitro fertilisation (IVF).

The main aims of this study:

- Establish whether a high fibre diet fed to pigs alters the composition of porcine follicular fluid, which is the fluid that surrounds maturing oocytes in the ovary. The protein composition of follicular fluid from pigs fed a control diet and pigs fed a high fibre diet have been compared as well as fluids from fertile and non-fertile pigs.
- Identify nutrition dependent molecular mechanisms involved in blastocyst development. Ingenuity Pathway Analysis Software was used to identify molecular pathways associated with the differentially expressed proteins between the follicular fluid samples.
- Using this knowledge, the ultimate aim is to optimise the oocyte maturation environment both in vitro and in vivo by altering oocyte maturation medium and pig feeding regimens respectively.

### KEY MILESTONES:

	TARGET DATE:	ACHIEVED DATE:
Mass spectrometry analysis on follicular fluid for protein comparison	June 14	September 14
Pathway analysis of differentially expressed proteins	December 14	March 15
Candidate confirmation of handful of selected proteins	January 16	
Metabolic analysis on follicular fluid of control and high fibre fed pigs	September 16	
IVF trials (reciprocal and trials using abattoir derived oocytes)	December 16	
Nutritional trial	June 17	

### KEY ACHIEVEMENTS:

- I presented a poster at the Society for Reproduction and Fertility 2015 Annual Meeting in Oxford, UK.
- I have an abstract accepted for presentation at the 2016 International Embryo Transfer Society Annual Meeting in Louisville, Kentucky, which will also be published in Reproduction, Fertility and Development.
- I presented an essay on mitochondrial DNA replacement to an audience of peers and a panel of judges, which placed me as runner up for the 2015 Scotland Young Thinker Award. The essay was subsequently published in the Scottish Review.
- I have optimised the fluorescent western blotting technique for analysing specific protein concentration in porcine follicular fluid and updated IVF protocols established at the institute.

### BENEFIT TO LEVY PAYERS:

The average litter sizes of UK herds lag behind several other EU countries, indicating that the efficiency of the British pig production industry can be improved. The results of this study could provide novel approaches to assess the characteristics of a healthy and fertile pig ovary and lead to the development of management strategies to enhance pig fertility and enhance litter sizes in UK herds.

<b>SUPERVISOR(S):</b> Prof. Cheryl J. Ashworth and Dr Andrew C. Gill	<b>FUNDERS:</b> AHDB Pork	<b>DATED:</b> 06/11/15
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