**O.201**

**Reduced muscle growth in pigs sub-clinically affected with proliferative enteropathy**

Alison M. Collins¹ Shayne Fell¹ Jolien van Straaten² Nadine Bolsius²

1. Elizabeth Macarthur Agricultural Institute, Narellan, NSW, Australia; 2. University of Utrecht, Utrecht, Netherlands

**Introduction**

Pigs clinically affected with proliferative enteropathy (PE) suffer diarrhea, reduced growth and poor feed efficiency, which can cost Australian producers as much as A$7 per pig¹. These costs do not include changes to body composition such as muscle growth. The impact of sub-clinical PE is difficult to estimate because many producers are unaware of the problem. In this study we examined the impact of sub-clinical PE in real time on body composition, muscle growth and P2 backfat depth.

**Materials and Methods**

Thirty six male hybrid weaner pigs (Large White x Landrace) were randomly allocated at 13.8 ± 1.0kg into 2 treatments: pigs infected with *L. intracellularis*, and a cohort of uninfected pigs. Pigs were housed in individual pens, with strict quarantine between treatments (separate rooms). Serology and faecal PCR monitoring of pigs prior to challenge indicated that all pigs were naïve to *L. intracellularis*. At 9 weeks of age, one group of 18 pigs was orally challenged with 5.9 x 10⁹ viable *L. intracellularis* extracted from a PE-affected mucosa, and the control group was inoculated with phosphate buffered saline. The consistency of pig's faeces was scored daily as either normal or diarrhoeic. Blood collected at 0, 28 and 38 days post inoculation (pi) was tested for *L. intracellularis*- specific IgG using an indirect fluorescent antibody test (IFAT). Faeces collected twice per week from 0 to 35 days pi was tested for *L. intracellularis* DNA by a conventional PCR. The body composition of pigs was determined at 14 days pre-inoculation and 21 and 42 days pi, using a Picker spiral CT scanner (Model PQ2000). Pigs were anaesthetized and cross-sectional images of the whole pig in 10mm sections (re-constructed in 3 dimensions) were analysed to calculate tissue volumes of bone, muscle, fat, skin and water using described CT densities². Muscle growth was defined as the difference in muscle volume divided by the number of days between CT scans. Tissue volumes were converted into a mass, using described tissue densities and calculated as a proportion of the total mass of the pig³. The P2 backfat was measured from the 42 days pi CT image².

**Results**

*L. intracellularis* infection was demonstrated by faecal PCR and IFAT between 14 and 42 days pi in all pigs challenged with *L. intracellularis*. The majority of infected pigs (>80%) were sub-clinically affected, but pigs inoculated with *L. intracellularis* had a significantly higher probability of diarrhea than control pigs between day 22 and 26 pi. *L. intracellularis* infection did not significantly alter the mean tissue weights or proportion of tissue types. However, *L. intracellularis* infection did significantly reduce the muscle growth in the late infection period.

The totals of CT tissue weights were accurate compared with the actual body weights of the pigs (±1%). Muscle growth was highly correlated with feed intake and weight gains of pigs (r>0.80) and with the absence of diarrhoea (r>0.72) throughout the trial. *L. intracellularis* infection did not significantly alter the P2 backfat depth.

**Discussion**

While sub-clinical PE did not affect body composition or P2 backfat depth, it did reduce muscle growth in experimentally challenged pigs. Animal genetics, gender, diet and pig weight all play a significant role in muscle growth. However, *L. intracellularis*-specific changes to the digestive and absorptive capacity of the intestine may also explain changes in muscle growth. Reduced amino acid absorption³ and reduced digestive enzyme activity⁴ have been described in pigs with PE.

**Acknowledgments**

Financial and academic support was provided by the Australian Research Council, Boehringer Ingelheim, the University of Sydney and NSW Department of Industry and Investment.

**References**