PSVIII-B-1 Biological Pathways Affecting Fertility in Dairy Cattle. Haley M. Konoval¹, Ashley Waymire¹, Fernando Campos¹, Daniel Peterson¹, David B. Vagnoni¹, Mehdi Sargolzaei², Paul Stothard¹, Paul Anderson¹, Mohammed Abo-Ismail¹, ¹Animal Science Department, California Polytechnic State University, ²Select Sires, ³Department of Computer Science and Software Engineering, California Polytechnic State University

Abstract: Infertility is one of the most economically important traits for the dairy cattle industry, accounting for 22.1 % of culled cows in 2017. Therefore, the objectives of this study were to identify genomic regions via genome-wide association studies (GWAS) and to retrieve the biological pathways that are associated with variation in fertility traits in the dairy cow. Fertility records including days open (DO), Times Bred to Conception (TBRD), Calving Ease (CE), and Days in Milk (DIM) from the Cal Poly Dairy were collected from the DairyComp management system. After quality control, 345 individuals and about 782,000 SNPs were used in the GWAS analyses. Significant SNPs were mapped to the corresponding genes that were used for in-silico functional analyses using DAVID Software. A total of 3, 3, 8, 3, and 7 SNPs were significantly associated with chloride transmembrane transport, neutrophil chemotaxis, cell adhesion, starvation response and nervous system development. The functional analyses suggested potential molecular mechanisms such as chloride transmembrane transport (P = 0.017) and neutrophil chemotaxis (P = 0.02) as significant enriched biological pathways involved with variations seen for DO. Cell adhesion was found as a significant (P = 0.004) biological pathway for TBRD whereas the analysis revealed the starvation response mechanism as significant (P = 0.005) for CE. Nervous system development was significantly (P = 0.0003) associated with DIM. These results from the current study will be validated in a larger population with higher density panel and sequence data.

Keywords: fertility traits, dairy cattle, genome wide association analysis

PSVIII-B-10 Feeding Senior Labrador Retrievers Hydrolyzed Whey Protein Isolate to Prevent Sarcopenia. Jessica L. Varney¹, Heather A. Adams¹, Jason W. Fowler¹, Craig N. Coon¹, ¹Four Rivers Kennel, LLC

Abstract: Conditions which affect humans are often closely followed by our companion animals, especially in aging populations. Canines often present with muscle wasting diseases such as sarcopenia and cachexia as a result of aging or chronic disease. In this 26wk study, our goal was to evaluate the effects of feeding 1.5x AAFCO CP from whey protein isolate and a pea isolate compared to feeding senior dogs a standard AAFCO CP diet (45g CP/1000 kcal DM) on body composition in exercised senior Labrador Retrievers. Thirty-six (36) Labrador Retrievers (18m/18f; 8-12yrs) were sorted into three equal groups and fed basal AAFCO diet plus hydrolyzed whey isolate, pea isolate, or added fat and sugar (control). All dogs ran 1.6km run twice weekly throughout the trial. Body composition was determined by dual-energy x-ray absorptiometry (DXA) at Weeks 0, 12, 20, and 26. All dogs were weighed weekly and feed intake measured daily. Body weights and feed intake were similar between groups. Whey group gained 1.69% fat and 0.6kg fat mass compared to control group gaining 7.97% fat and 3.05kg fat mass (p=0.045; p=0.005). From Wk0 to Wk26, whey group lost only 0.38kg lean/fat ratio compared to control group’s -1.75kg loss (p=0.021). From Wk12 to Wk26 and Wk18 to Wk26, whey group maintained a higher lean:fat ratio compared to pea and control group (p=0.101; p=0.049). Based on these results, senior Labrador Retrievers fed 1.5x AAFCO CP from basal plus hydrolyzed whey protein isolate during an exercise regimen maintained higher lean:fat ratio compared to seniors fed basal plus pea protein and seniors fed only basal. Senior dogs fed hydrolyzed whey protein isolate also had increased fat loss vs seniors consuming only the basal diet.

Keywords: body composition, senior dog nutrition, whey protein