Posters

Serum amino acid analysis by gas chromatography
D Zhang¹, X Li¹, MN Sillence², WL Bryden³
¹ School of Animal Studies, University of Queensland, Gatton, QLD 4343
² School of Agricultural and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2678

**Background** - Accurate amino acid analysis is crucial in defining protein function and quality. However, the diverse chemistry of amino acids makes fast, accurate quantification of all amino acids challenging. Moreover, analyses of amino acids in physiological samples are further complicated by the increased number of compounds that must be separated. Gas chromatographic techniques offer advantages in resolution, sensitivity, speed and cost reduction. However, the development of satisfactory gas chromatographic procedures has been hindered as amino acids are not sufficiently volatile to permit direct analysis and must be converted into volatile derivatives prior to gas chromatography. A gas chromatography amino acid analysis kit (EZ:Faast® amino acid testing kit, Phenomenex, USA) is a new procedure for a rapid clean-up, derivatisation and analysis of amino acids and related compounds in physiological fluids. The analysis is completed in 15 minutes.

**Objective** - To evaluate the EZ:Faast® gas chromatographic kit as a suitable procedure for serum amino acid analysis.

**Design** - Six replicates of a mixed standard amino acid solution and five replicates of horse serum samples were extracted and derivatised following the instructions in the EZ:faast® kit for accuracy and precision calculations, respectively. Five replicates of serum samples with added tryptophan standard were prepared to calculate tryptophan recovery.

**Outcomes** - The accuracy results in our study were < 9% for all amino acids determined. The precision results were < 5% for most amino acids. Tryptophan recovery was 93%.

**Conclusion** - The advantages of the EZ:faast® technology are easy sample clean-up, derivatisation and fast, cost-effective analysis. The disadvantages of the procedure are that arginine, methyl histidine, citrulline and taurine can not be analysed.

The relationship between apparent ileal digestible amino acid and crude protein content of canola meal
X Li, D Zhang, WL Bryden
School of Animal Studies, the University of Queensland, QLD 4343

**Background** - Provision of adequate levels of essential amino acids is very important in the compilation of diets, especially for monogastric animals. Numerous studies conducted by Bryden and his colleagues¹,² found that formulating diets based on digestible amino acid values was superior to those based on total amino acids. Amino acid analysis and digestible amino acid determination are too costly and time consuming for routine investigation in the feed industry and it would be helpful if the apparent ileal digestible amino acid content of a feedstuff could be deduced from its total crude protein content, which is routinely determined.

**Objective** - To investigate the relationship between the total crude protein and total amino acid content, digestible crude protein and digestible amino acid, total crude protein and apparent ileal digestible amino acid content of Australian canola meals.

**Design** - Male broilers at 35 days of age were allocated to pens with 7 birds per pen. Eleven canola meal samples with total crude protein contents ranging from 266 to 394 g/kg canola meal (air dry basis) were collected from a various sources, grown in Victoria, New South Wales, prepared by solvent extracted or expeller. Canola meals were incorporated as the sole source of dietary protein in experimental diets. The dextrose proportion varied in experimental diets so that the diet contained approximately 200g/kg crude protein. Celite, a source of acid insoluble ash, was added (20 g/kg) to all diets as an indigestible marker. Each experimental diet was fed to three pens of 6 birds per pen for 5 days. At the end of trial all birds were sacrificed and the digesta from the lower portion of the ileum was collected and pooled with the contents of the other birds from the same group. Freeze-dried digesta were analysed for crude protein, amino acids and acid insoluble ash.

**Outcomes** - There were strong and significant (P<0.01) positive correlations between total crude protein and apparent ileal amino acid contents except for HIS (P=0.016), SER (P=0.047) and LYS (P=0.133). There was no correlation between total crude protein content and apparent digestible lysine content which is probably due to the fact that lysine is the most labile to processing.

**Conclusion** - Total crude protein content of canola meal is a reasonable indicator of apparent ileal amino acid content for broiler chickens.

**References**