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P-15. Whole-body protein synthesis and degradation in sheep using two isotope dilution methods

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A number of isotope dilution techniques using radioactive and stable isotopes are frequently being used to estimate whole-body protein metabolism in humans and animals. Although [²H₅]phenylalanine method doesn't need open circuit calorimetry to determine protein metabolism, until now, it has not been applying to ruminants. In this experiment, the [²H₅] phenylalanine method was compared with the [1-¹³C]leucine method, the most common method, to determine whole-body protein synthesis and degradation in four sheep. Dietary intake levels were 100% and 150% of the maintenance requirement (M and H diets, respectively). The experiment was conducted in a cross-over design for each 3 week period. Two isotope dilution methods were simultaneously conducted as a primed-continuous infusion on the last day of each period. Isotope enrichments of plasma [²H₅]phenylalanine, [²H₄]tyrosine, [²H₂]tyrosine, α-[1-¹³C]ketoisocaproic acid and exhaled ¹³CO₂ were determined by GC/MS and GC/IRMS. Nitrogen intake, N balance, and turnover rates of plasma phenylalanine, tyrosine and leucine were higher for the H diet than for the M diet. Protein synthesis and degradation were similar in the [²H₅]phenylalanine and [1-¹³C]leucine methods for both diets. Protein synthesis was slightly higher for the H diet than for the M diet, whereas protein degradation did not differ between the diets. Therefore, [²H₅]phenylalanine method is simpler and less tedious than [1-¹³C]leucine method to estimate protein synthesis and degradation in sheep. It could be concluded that, [²H₅]phenylalanine model is an alternative to [1-¹³C]leucine method.

P-16. Effects of feeding and cholecystokinin-octapeptide (CCK-8) administration on the somatotropic axis of goats around weaningKobayashi¹, Y., Onodera¹, M., Yoshida¹, M., Guilloteau², P., Katoh¹, K. and Obara¹, Y.
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Post-prandial plasma GH concentrations significantly increased prior to weaning but did not change or decreased after weaning in goats as well as other ruminants. We hypothesized that this phenomenon was induced by changes in the digestive function or in gastrointestinal hormone secretion at weaning. We, therefore, gave intravenous administrations of CCK-8 in order to establish whether or not it stimulates GH secretion. The administration in pre-weaned animals increased the GH level, but not ghrelin levels, which were significantly greater than in post-weaned animals. These results suggest the possibility that the regulation of somatotropic axis after feeding may be stimulated by peripherally secreted CCK in pre-weaned goats.