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C. VAN EENAEME, L. ISTASSE, A. GABRIEL, P. BALDWIN and J.M. BIENFAIT  
Dept. Animal Nutrition, Veterinary Faculty, University of Liege,  
45, rue des vétérinaires, 1070, Brussels. Belgium.

#### MEASUREMENT OF MUSCLE PROTEIN SYNTHESIS AND TURNOVER AT THE CELLULAR LEVEL IN YOUNG BULLS

Meat production can be defined as protein deposition in carcass muscle. This growth process is the net result of synthesis and degradation reactions ("turnover"). Measurements of muscle protein (MP) synthesis and degradation rates in the whole animal are hampered by the difficulty of evaluating correctly the relative contributions of skeletal muscle and gastro intestinal tract muscle to the whole process. Therefore, determination of MP turnover at the cellular level should be a better estimate of the molecular process of meat production. In the present communication preliminary results of a first experiment to estimate MP turnover at the cellular level are presented.

Muscle tissue samples were obtained by needle biopsy in longissimus dorsi in twelve young bulls of two breeds with extremely different beef production capacities e.g. Friesian Holstein (H) and Belgian White Blue (BBB). Biopsy samples (50 to 100 mg) were aliquoted and either incubated directly in oxygenated Krebs Ringer Buffer containing appropriate nutrients and additives in order to estimate in vitro protein synthesis (incorporation of tritiated tyrosine) and degradation (tyrosine release) rates, or frozen in liquid nitrogen and stored subsequently at  $-60^{\circ}\text{C}$  for chemical analysis of moisture, total protein, fat, nucleic acids and free intracellular 3-methylhistidine (f3MH). In vitro MP synthesis and degradation rates were slightly higher in the H-group although differences were statistically not significant:  $K_s$  : 3.4 vs 2.9% ,  $K_d$  : 5.3 vs 4.1% . Intracellular f3MH concentrations were around 20 nmoles per g tissue. The free to total intracellular 3MH ratio can be considered as another estimate of the fractional degradation rate. The results are lower than those obtained from the in vitro incubations but more in line with in vivo measurements. No differences were observed in nucleic acid content. In contrast, intracellular protein was significantly higher and fat lower in the BBB bulls : 83 and 11 vs 90 and 7% in dry matter for H and BBB respectively.