

Estimation of the protein upper limit for one meal with urinary urea nitrogen excretion in male adult athletes

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Purpose: The protein upper limit for one meal remains to be elucidated. This study assumed that a flexion point of urinary urea nitrogen excretion (UUNE) exists at the point of the upper limit.

Methods: In study 1, adult males completed a 3-day dietary record and urine collection. In study 2, adult males received 3 dietary treatments; consumed 1.8 g protein/kg BW/day (N, Normal), and 0.5 g/kg BW protein was added to N over 3 meals (Sp, Spread) or to one meal (Ps, Pulse). Each treatment lasted for 9 days and dietary record and whole urine were collected during the last 3 days.

Results: Study 1; the protein intake was 1.4 (SD 0.5) g/kg BW/day, 0.7 (0.3) g/kg BW with the meal containing the largest amount of protein (MLP) and the proportion of protein with MLP (PPMLP) was 52.8 (11.8)%, whereas no flexion point of UUNE was observed. Study 2; the protein intake was 1.8 (0.2) g/kg BW/day for N, 2.3 (0.4) g/kg BW/day for Sp, and 2.3 (0.4) g/kg BW/day for Ps ($N < Sp = Ps$, $P < 0.05$); with MLP it was 0.8 (0.4) g/kg BW for N, 1.0 (0.2) g/kg BW for S, and 1.3 (0.3) g/kg BW for Ps ($N = Sp < Ps$, $P < 0.05$). The PPMLP was 46.3 (7.3)% for N, 42.0 (3.3)% for Sp, and 55.6 (8.0)% for Ps ($N = Sp < Ps$, $P < 0.05$). No flexion point of UUNE was observed in all treatments.

Conclusion: Since no UUNE flexion point was observed in the current study, the protein upper limit for one meal could not be estimated.

Keyword protein, upper limit intake, intake with one meal, urea nitrogen excretion