

Concurrent Session 3: Regulation of Protein Metabolism

The optimal protein content of a western diet

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Background – Surprisingly little is known about optimal protein intake and health. Estimates of protein requirement are based on several assumptions the relevance of which can be challenged for populations consuming western diets.

Review – The most recent Nutrient Reference Values for Australia and New Zealand (1) list the RDI for men 19-70 years as 64g per day and for women as 46 g/day with 25% increases in individuals >70 years. These recommendations are based on reference body weights 76 kg and 57 kg for men and women respectively. These values rely heavily on the meta-analysis by Rand et al (2) based on 19 nitrogen balance studies in 235 individuals. This study provided estimated average requirements (EAR) and 97.5th percentile (RDI) of protein intakes for healthy adults at 0.65 and 0.83 g good-quality protein per kilogram per day, respectively. These values were not different for adult age groups, sex, or diet groups although the data was not powered to detect less than very major differences. Millward (3) argues that the adequacy of protein and amino acid intakes cannot be discussed separately from the adequacy of energy intake.

There are at least 3 issues which need to be borne in mind in applying these data to food based recommendations. Firstly, the definition of measured body nitrogen equilibrium (zero nitrogen balance) as the criterion of nutritional adequacy may be questionable. As skeletal muscle accounts for approximately 35% of the total body mass and energy expenditure, optimising accretion of lean tissue may be advantageous in minimising adiposity and enhancing insulin sensitivity. Secondly, whether the most appropriate method of expressing the protein requirement should be based on absolute body weight or lean body mass has not been determined. Thirdly, nitrogen balance data from these studies relates to energy balance not energy restriction. These are important limitations given that 60% of Australians are overweight or obese and estimating protein needs in this group in both energy balance but particularly energy restriction is needed.

Limited evidence suggests that a higher ratio of protein to carbohydrate during weight loss has several subtle metabolic advantages, most notably lean mass preservation and enhanced fat loss, triglyceride reduction, increased thermic effects, improved satiety, lower post prandial glucose and insulin responses, improved nutritional status (4-6). The mechanism of whether these effects are related to increased protein or carbohydrate restriction or an interaction between these macronutrients is not straightforward.

Epidemiological studies (7,8) also suggest that higher protein intakes may be associated with a lower risk of ischaemic heart disease and stroke. The 50th percentile of protein intakes from the National Nutrition Survey (1995) reports protein intakes at 96-115 g in men and 70-74 g in women. Protein sources in the Australian and New Zealand diet comprise meat poultry and fish 33% and dairy 16% with at least 25% from non animal sources such as cereal and cereal based foods (2). Protein foods are also sources of several micronutrients. In omnivorous western diets, obtaining the RDI for calcium, iron and zinc from wholefoods necessitates protein intakes in excess of current RDIs to achieve optimal nutrient intakes.

Conclusion – The optimal dietary pattern for a western diet requires protein in excess of current recommendations.

References

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