



Effect of 6 month supplemental milk protein intake on lean tissue mass in healthy adults aged 50 to 70 years

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The RDA for protein of 0.8 g/kg/d describes the quantity that should be consumed daily to meet population needs and to prevent deficiency. However, anabolic resistance to protein feeding is prevalent in the elderly and less than adequate, or biased distribution of meal level protein intake may lead to loss of lean tissue mass in this population^(1,2). The aim of this study was designed to investigate whether a modest increase in protein intake, designed to address the biased distribution of daily meal level protein, could effect a change in lean tissue mass in healthy adults aged 50 to 70y.

With ethical approval, a convenience sample of 140 volunteers (115 women, 25 men), age 50–70y, agreed to participate. 17 (15 women, 2 men; –12%) were excluded following medical screening, the remaining 123 subjects randomly assigned to either CON (49 women, 7 men) or FORM (51 women, 16 men). Estimated food intake record (eFIR), analysed by WISP© (Tinuviel Software, Anglesey, UK), revealed adequacy with respect to mean protein intake (1.2(0.3) g/kg/d equivalent to 16(2) % of a mean total energy intake EI; 1927(365) kcal/d). Protein intake (g (SD); %intake) was distributed between breakfast (15.9(7.5); 19%) midday meal (21.9(12.7); 26%), evening meal (38.1(15.3); 45%) and snacks (8.3(4.4); 10%). Subjects, blinded to treatment allocation, were provided with a dietary supplement to be consumed twice daily, at breakfast and midday meals. The nutrient formulation (FORM) provided 0.33 g/kg/d of a milk-based protein, 0.25µg/kg/d vitamin D and 10 mg/kg/d of dairy-based calcium. The control (CON) was an isoenergetic quantity of maltodextrin. A Lunar iDXA™ scanner (GE Healthcare, Chalfont St Giles, Bucks., UK) with enCORE™ v.14.1 software was used to undertake whole body measurement of lean tissue mass (LTM).

60 of the 123 subjects (~50%) completed the study to 24 weeks, 29 CON (24 women, 5 men) and 31 FORM (22 women, 9 men). At 24 weeks the mean difference in the LTM between the FORM and CON groups was 0.61 kg (ANOVA; $P = 0.06$, $1-\beta = 0.861$).

	Group	MeanΔ	SD	Range	P^1
LTM (kg)	CON	-0.16	0.9	-1.94–1.44	0.006
	FORM	0.45	1.1	-1.23–2.52	
LTM (%)	CON	-0.3	2.1	-4.44–3.62	0.06
	FORM	0.91	2.4	-2.97–6.22	

Values are group mean changes of 29 CON and 31 FORM subjects. LTM, Lean tissue mass; CON, Control; FORM, Formulation. ¹Two-way ANOVA with group and gender as fixed factors

These data lend support to the role of dietary protein in the sarcopenia of aging. In protein sufficient, 50–70y men and women daily supplementation of the two low-protein meals of the day with a milk-based protein for a period of 24 weeks resulted a modest (~1%) mean change in whole body LTM compared to similar supplementation with an isoenergetic, non-protein control.

1. Paddon-Jones D, Short KR, Campbell WW, Volpi E, Wolfe RR. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr.* 2008 May;**87**(5):1562s–6s.
2. Mamerow MM, Mettler JA, English KL *et al.* Dietary Protein Distribution Positively Influences 24-h Muscle Protein Synthesis in Healthy Adults. *J Nutr.* 2014;**144**:876–880.

