The influence of red meat intake upon the response to a resistance exercise-training program in older Australians

PL McLennan¹,², LC Tapsell¹, AJ Owen¹, IF Gutteridge²

¹Smart Foods Centre & ²Dept of Biomedical Science, University of Wollongong, NSW, 2522

Background - In older adults muscle performance declines with age, and in the elderly this can have a major impact on daily living by impairing the ability to undertake routine activities, increasing risk of falls and hindering recovery from injury. A recent study has suggested that the protein intake of older adults may be insufficient to maintain optimum muscle capacity (1).

Objective – To examine the effects of a 12-week diet and exercise program upon skeletal muscle performance and body composition in older Australians.

Design – Subjects (n=28, mean age=67yr, range 63-76yr) undertook a lower limb resistance-training program while consuming a diet with 20% energy as protein delivered through two levels of red meat intake (either moderate = 800g/week, or low = 400g/week in combination with other sources of dietary protein). Muscle performance was assessed at weeks 0, 6 & 12. At week 0 and week 12, body composition was assessed using anthropometry, BIA and thigh X-sectional CT, and dietary intake assessed by diet history.

Outcomes - Exercise training significantly increased leg muscle strength by more than 50% (P<0.01) and muscle endurance ~30% (P<0.01), and reduced thigh skin folds ~15% (P<0.01). Subjects on the moderate red meat diet had greater improvements in muscle strength at week 6 than those on the low red meat diet (P<0.01), but this difference was abolished at the study endpoint. The red meat was incorporated into both diets with no change in overall energy intake.

Conclusions - In older Australians, a resistance-training program markedly increased muscle strength. Consuming a diet with a moderate red meat content compared to a low red meat content in part enhanced the benefits upon muscle performance.