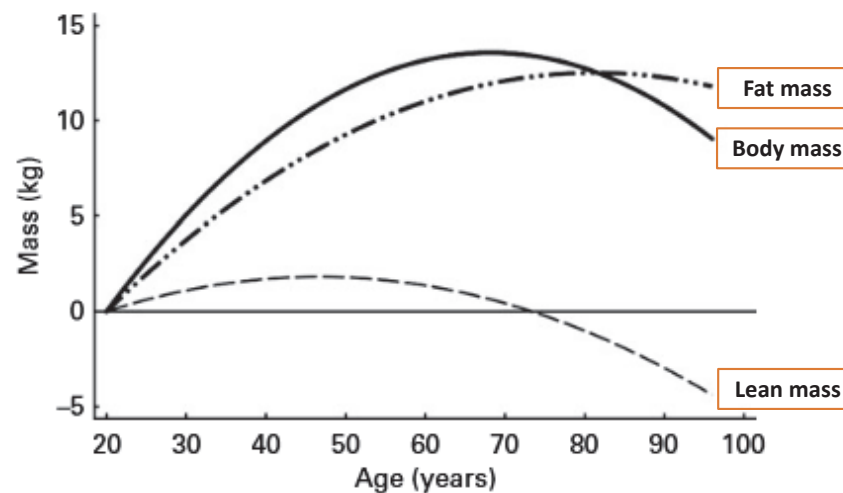


# Dietary Protein Intake on Body Composition Changes in Healthy Aging

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Mini-Symposium: The Role of Nutrition in Healthy Aging  
7<sup>th</sup> Nov, 2017

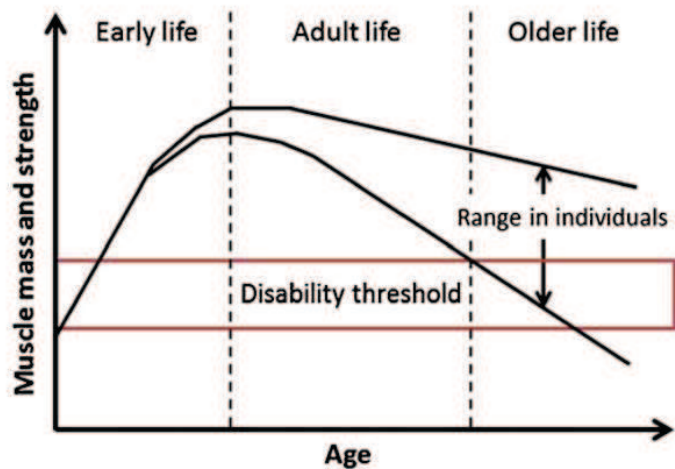
## Longitudinal changes in body composition associated with aging



Jackson AS et al. Br J Nutr, 2012

## Sarcopenia

- The loss of muscle mass, strength and function related to aging



<http://www.iofbonehealth.org/what-sarcopenia>  
Adopted from Mithal A et al. Osteoporos Int, 2013

## Impact of body composition changes on mortality risk

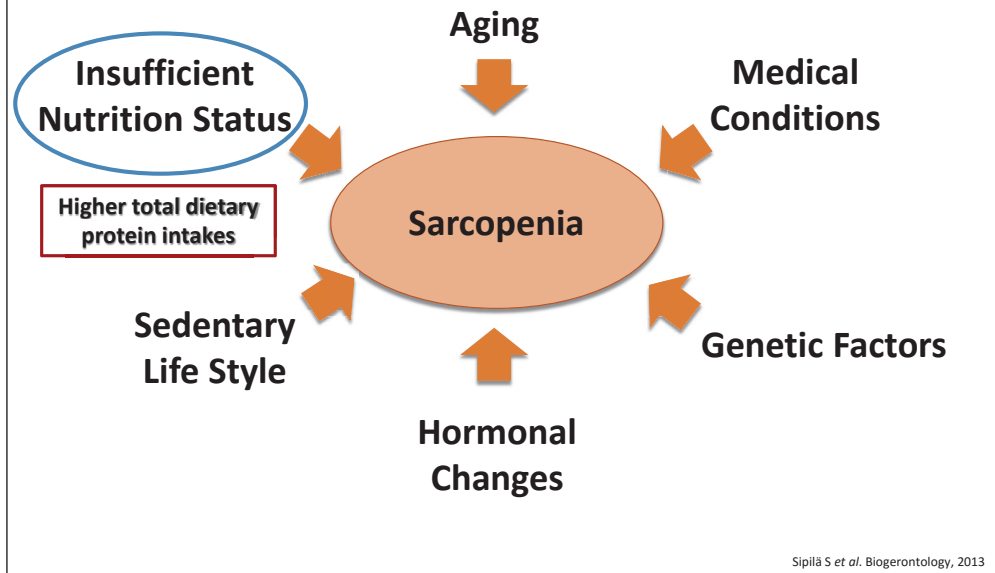
- 791 older adults (75 ± 9 yr, BMI: 25 ± 6 kg/m<sup>2</sup>; mean ± SD)
- Cohort study (1999 – 2011)

	HR	95% CI	P-value
<b>BMI change (kg/m<sup>2</sup>/year)</b>			
Maintenance	Reference (1.00)		
Gain	0.89	0.59-1.36	0.612
Loss	1.12	0.76-1.64	0.562
<b>FMI change (kg/m<sup>2</sup>/year)</b>			
Maintenance	Reference (1.00)		
Gain	1.05	0.70-1.58	0.805
Loss	0.87	0.57-1.34	0.536
<b>FFMI change (kg/m<sup>2</sup>/year)</b>			
Maintenance	Reference (1.00)		
Gain	1.17	0.79-1.75	0.438
Loss	2.02	1.28-3.19	0.002

BMI: Body mass index; FMI: Fat mass index; FFMI: Fat free mass index  
HR: Hazard ratio; 95% CI: 95% confidence interval

Adopted from Graf CE et al. Clin Nutr, 2016.

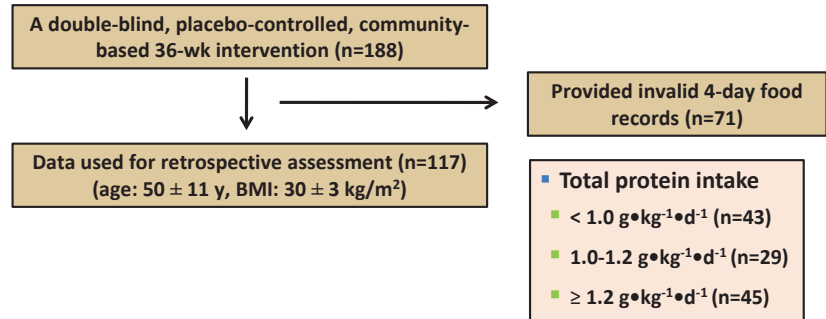
## How to improve/retain body composition for healthy aging ?



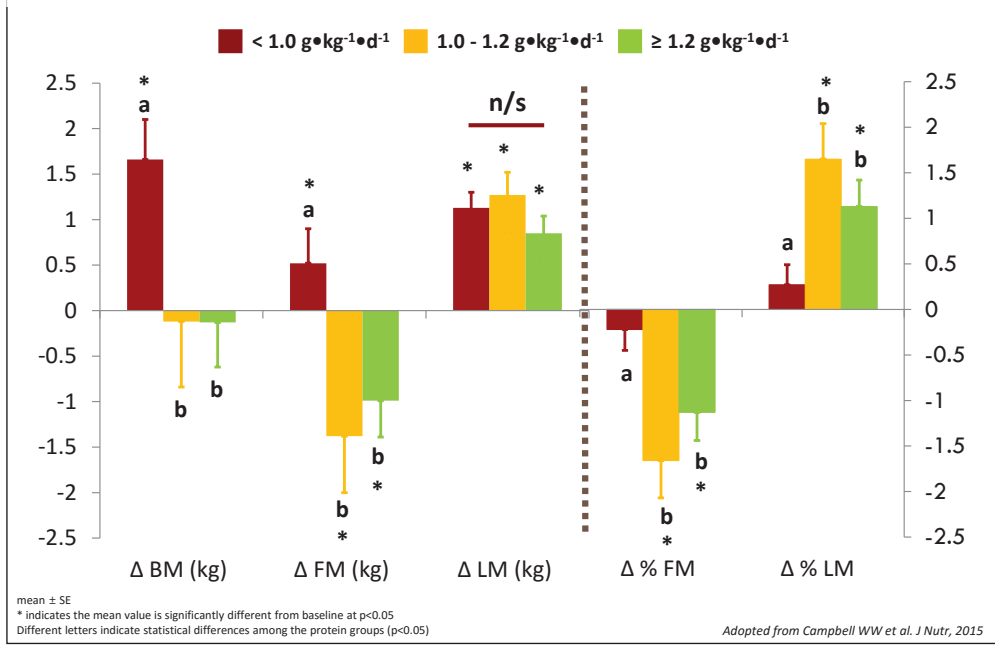
## Impact of higher dietary protein intake on exercise-induced body composition changes in middle-aged and older US adults

### Purpose

To assess the impact of total protein intake on changes in body composition in overweight and obese, middle-aged adults who participated in a resistance and aerobic exercise training program

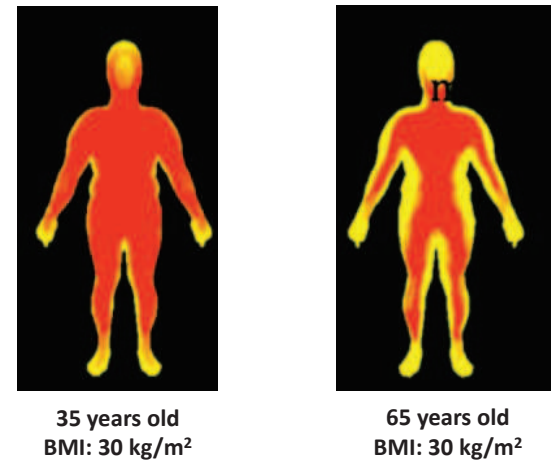


## Impact of total protein intake on the changes in body composition

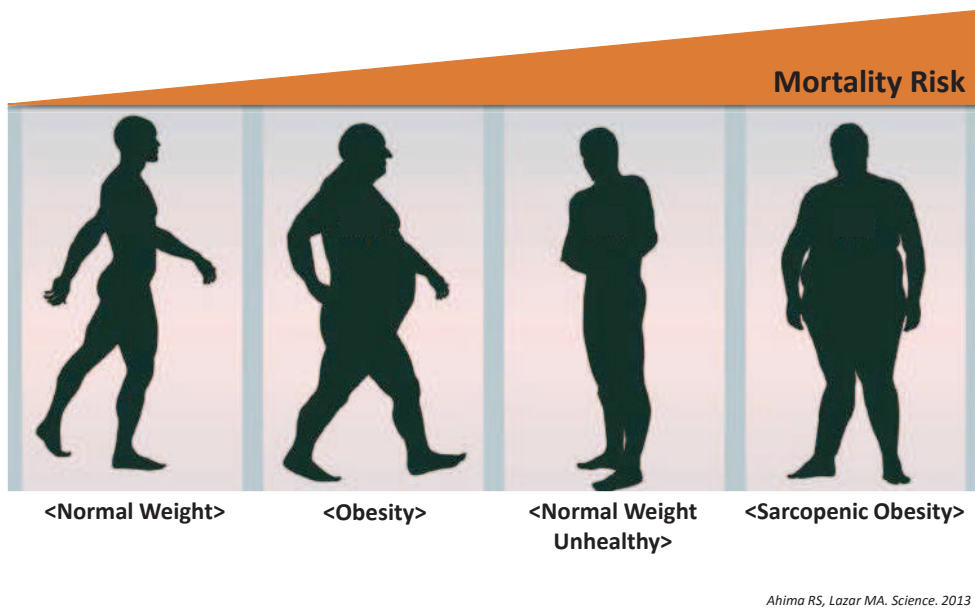


## Sarcopenic obesity

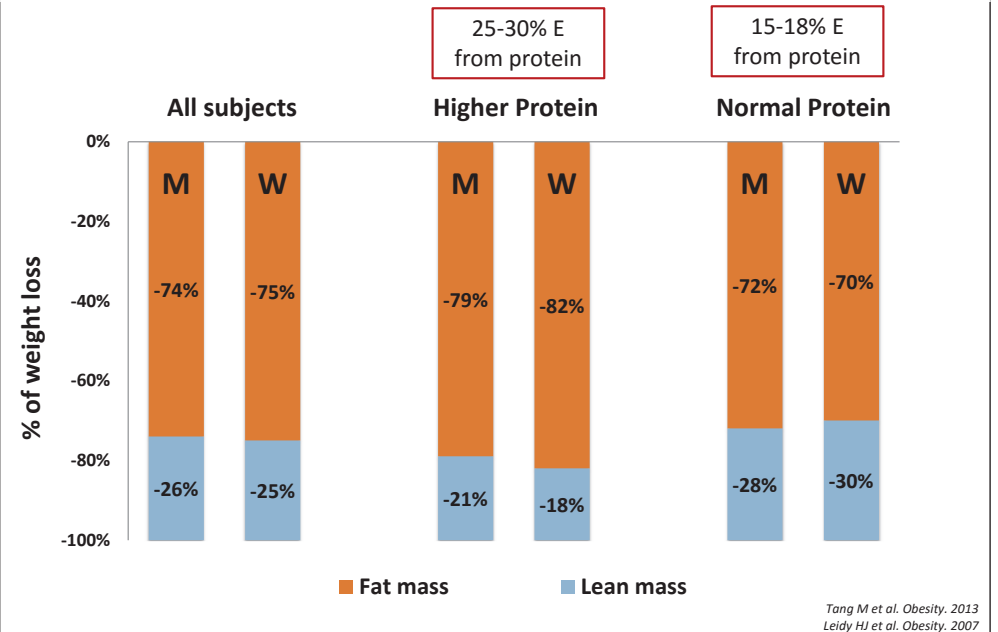
- Age-related progress loss of skeletal muscle mass and strength with gain in fat mass



## Mortality risk for sarcopenic obesity



## Effect of dietary protein on % changes of body mass as fat mass and lean mass



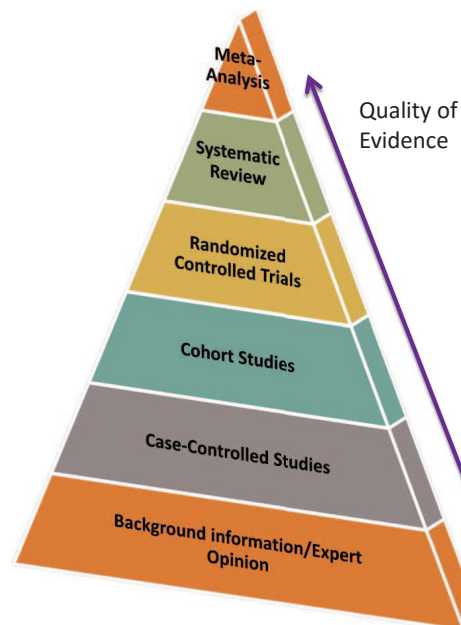
## Systematic Review and Meta-Analysis

### Systematic Review

- More “objective” literature review.
- Thorough search to find all relevant studies associated with a particular research question.

### Meta-Analysis

- The use of statistical methods to combine results of different individual studies and identify patterns among study results.
- Allows making the best use of all the information gathered in systematic review by increasing the power of the analysis.



Adopted from EBM Pyramid and EBM Page Generator, copyright 2006 Trustees of Dartmouth College and Yale University

## Impact of higher dietary protein intake on body composition changes after weight loss in older adults

### PICOS criteria

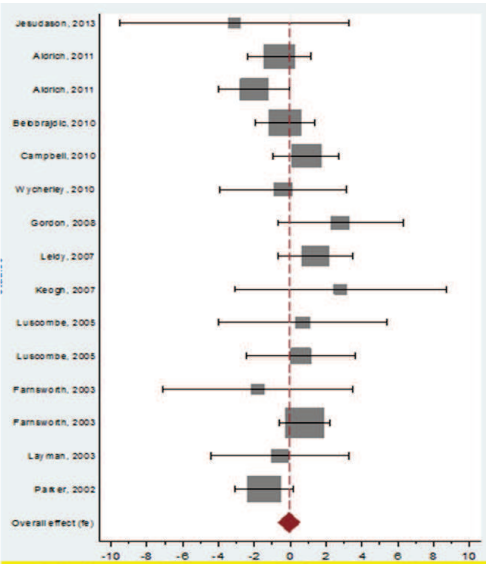
Parameter	Description
<b>P</b> opulation	Adults mean age $\geq 50$ y
<b>I</b> ntervention	Consumed energy-restricted diet with $\geq 1.0 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ of dietary protein during weight loss
<b>C</b> omparison	Consumed energy-restricted diet with $< 1.0 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ of dietary protein during weight loss
<b>O</b> utcome	Changes in whole-body composition, body mass, lean mass, and fat mass
<b>S</b> etting	Randomized controlled trials
<b>Research Question</b>	What is the effect of higher dietary protein intake on whole-body composition changes after weight loss in older adults?

### Mean protein intakes

- Higher protein intake:  $1.31 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$  ( $1.01 - 1.57 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ )
- Normal protein intake:  $0.79 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$  ( $0.58 - 0.97 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ )

Kim JE et al. Nutr Rev. 2016

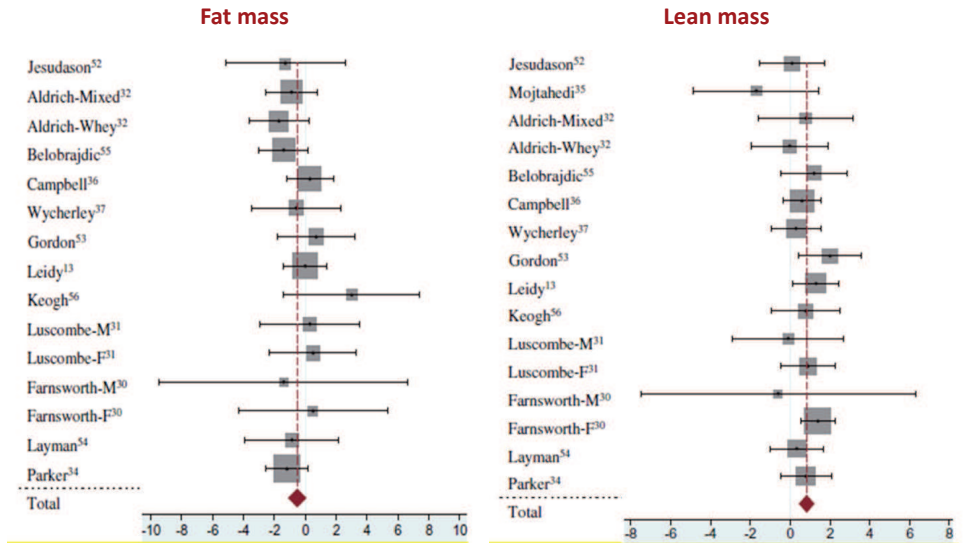
### Impact of higher protein intake on body mass change during weight loss



**Weighted mean difference in body mass and 95% CI: -0.06kg (-0.66, 0.53)**

Kim JE et al. Nutr Rev. 2016

### Impact of higher protein intake on fat and lean mass change during weight loss



**Weighted mean difference in fat mass and 95% CI: -0.57kg (-0.98, -0.15)**

**Weighted mean difference in lean mass and 95% CI: 0.83kg (0.47, 1.19)**

Kim JE et al. Nutr Rev. 2016

### Conclusion



**By Improving Age-Related Body Composition changes**