



The Solution to Weight Loss Is to Stop Trying to Lose Weight

JJ Virgin, CNS, CHFS



Less than 7 percent of the U.S. adult population has good cardiometabolic health.

Friedman School of Nutrition Science and Policy at Tufts University

Journal of the American College of Cardiology, July 12, 2022

Metabolic Health Markers

- Blood Pressure 120/80
- Waist Circumference >34.6 female, >40 males
- Triglycerides <150
- Hdl ≥ 40 male, ≥ 50 female
- Fasting Blood Sugar >70 and < 100

2017–2018 Data from the National Health and Nutrition Examination Survey (NHANES)

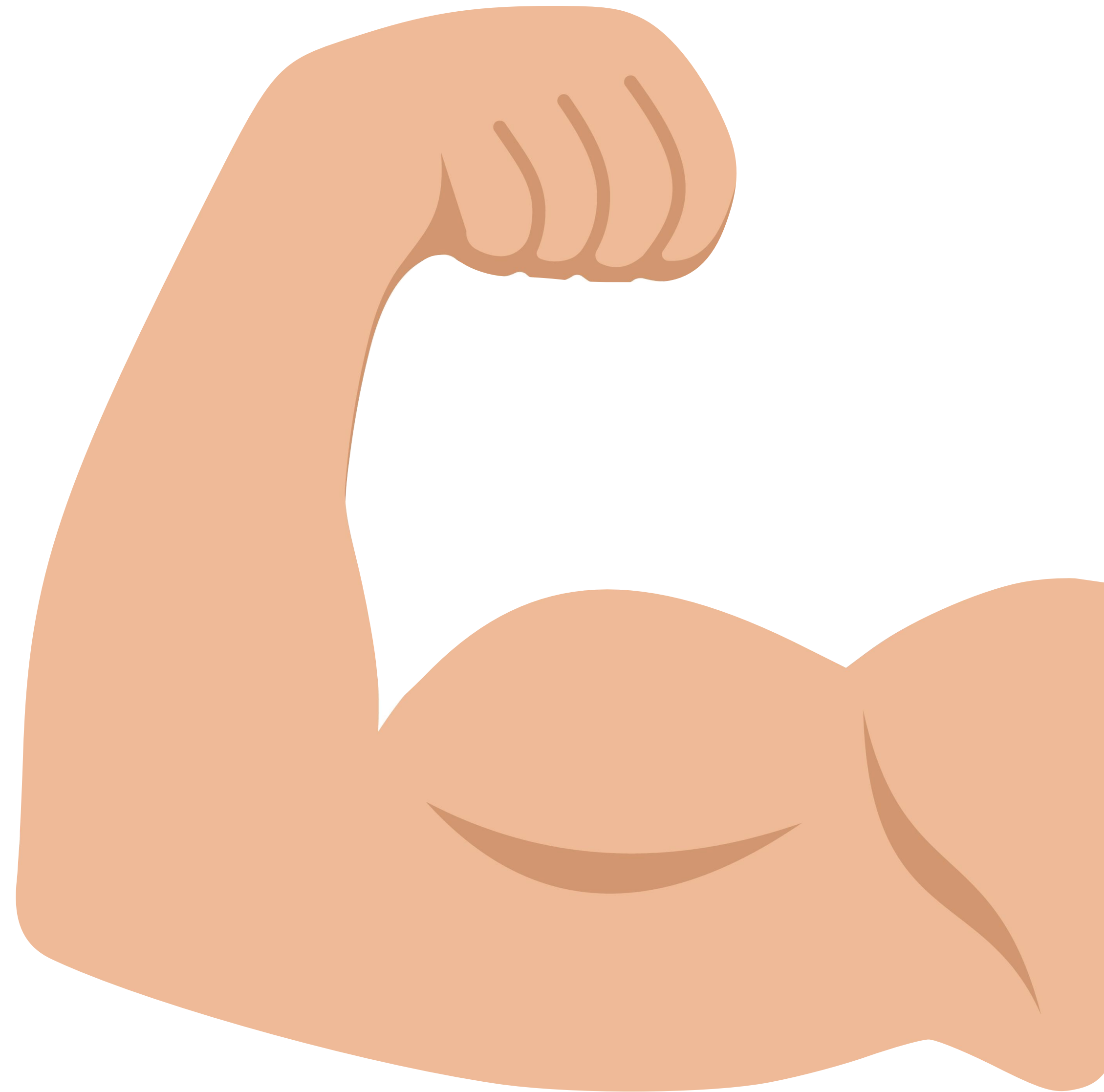
- Nearly 1 in 3 adults (30.7%) are overweight
- More than 2 in 5 adults (42.4%) have obesity
- About 1 in 11 adults (9.2%) have severe obesity





You don't lose weight to get healthy....you get healthy
by building muscle to improve metabolic function &
support fat loss

- Metabolic Spanx
- Sugar Sponge





Use it or lose it!

- Starting after age 30
- Up to 1% muscle loss annually
- Up to 2-4% strength loss annually
- Up to 6%+ power loss

The Loss of Skeletal Muscle Strength, Mass, and Quality in Older Adults: The Health, Aging and Body Composition Study



Bret H. Goodpaster, Seok Won Park, Tamara B. Harris, Steven B. Kritchevsky, Michael Nevitt, Ann V. Schwartz, Eleanor M. Simonsick, Frances A. Tylavsky, Marjolein Visser, Anne B. Newman for the Health ABC Study

The Journals of Gerontology: Series A, Volume 61, Issue 10, October 2006, Pages 1059–1064, <https://doi.org/10.1093/gerona/61.10.1059>

Methods

Three-year changes in muscle mass and strength were determined in 1880 older adults. Knee extensor strength was measured by isokinetic dynamometry. Whole body and appendicular lean and fat mass were assessed by dual-energy x-ray absorptiometry and computed tomography.

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The Journals of Gerontology: Series A, Volume 61, Issue 10, October 2006, Pages 1059–1064, <https://doi.org/10.1093/gerona/61.10.1059>

Results

Both men and women lost strength, with men losing almost twice as much strength as women. Blacks lost about 28% more strength than did whites. Annualized rates of leg strength decline (3.4% in white men, 4.1% in black men, 2.6% in white women, and 3.0% in black women) were about three times greater than the rates of loss of leg lean mass ($\sim 1\%$ per year). The loss of lean mass, as well as higher baseline strength, lower baseline leg lean mass, and older age, was independently associated with strength decline in both men and women. However, gain of lean mass was not accompanied by strength maintenance or gain (β coefficients; men, -0.48 ± 4.61 , $p = .92$, women, -1.68 ± 3.57 , $p = .64$).

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The Journals of Gerontology: Series A, Volume 61, Issue 10, October 2006, Pages 1059–1064, <https://doi.org/10.1093/gerona/61.10.1059>

Conclusions

Although the loss of muscle mass is associated with the decline in strength in older adults, this strength decline is much more rapid than the concomitant loss of muscle mass, suggesting a decline in muscle quality. Moreover, maintaining or gaining muscle mass does not prevent aging-associated declines in muscle strength.

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The Journals of Gerontology: Series A, Volume 61, Issue 10, October 2006, Pages 1059–1064, <https://doi.org/10.1093/gerona/61.10.1059>

Skeletal Muscle Quality: A Biomarker for Assessing Physical Performance Capabilities in Young Populations

Muscle quality (MQ), defined as **the amount of strength and/or power per unit of muscle mass**, is a novel index of functional capacity that is increasingly relied upon as a critical biomarker of muscle health in low functioning aging and pathophysiological adult populations.

[Front Physiol.](#) 2021; 12: 706699.

Published online 2021 Aug 5.

Strength

A meta-analysis with 2,000,000 participants found higher levels of handgrip strength to be associated with lower risk of all-cause mortality, irrespective of age and length of follow-up. Studies also show **consistent associations of lower handgrip strength with cardiovascular mortality**. The association is linear age 65 and up.







Preserving Healthy Muscle During Weight Loss

Weight loss, achieved through a calorie-reduced diet, decreases both fat and fat-free (or lean body) mass.

In persons with normal weight, **the contribution of fat-free mass loss often exceeds 35% of total weight loss and weight regain promotes relatively more fat gain.** In persons who are overweight or obese, fat-free mass contributes only ~20–30% to total weight loss and weight regain does not prevent fat-free mass regain. Men tend to lose more fat-free mass than women, especially shortly after the initiation of weight loss, probably because they are leaner than women.



Two-Year Changes in Body Composition and Future Cardiovascular Events: A Longitudinal Community-Based Study



Background

The risk of cardiovascular diseases has rapidly increased among middle-aged and elderly. However, little is known about the relationship of body composition changes with the risk of cardiovascular events among this population in China. We explored the associations of 2-year changes in fat percentage (fat%) and fat-free mass percentage (FFM%) with subsequent cardiovascular events in a middle-aged and elderly community-based cohort.

Nutr Metab (Lond)

2023 Jan 31;20(1):4. doi: 10.1186/s12986-023-00727-2

Tingting Hu, Yun Shen, Weijie Cao, Yiting Xu, Yufei Wang, Xiaojing Ma, Yuqian Bao



Methods

This study included 1048 participants (456 men [43.51%], aged 50-80 years) without overt cardiovascular disease, who underwent two examinations during 2013-2014 and 2015-2016. All participants were followed up until 2022 for cardiovascular events. A bioelectrical impedance analyzer was used to calculate fat% and FFM% change.

Results

At baseline, the median body mass index (BMI), fat%, and FFM% were 23.9 (22.1-25.9) kg/m², 27.2 (20.8-33.6)%, and 72.8 (66.4-79.2)%, respectively. Two-year changes in fat% and FFM% were 0.31 (- 5.53 to 6.87)% and - 0.12 (- 2.36 to 2.06)%. During an average follow-up of 5.5 years, 86 cardiovascular events (8.21%) occurred. Cox regression models showed that hazard ratios (HRs) of every 2% change in fat% and FFM% for cardiovascular events were 1.04 (95% confidence interval [CI] 1.01-1.07) and 0.84 (95% CI 0.74-0.95), respectively. Compared with participants with stable fat% ($-2\% \leq \text{fat\%} < 2\%$), those with fat% gain $\geq 2\%$ had an increased risk of cardiovascular events (HR 2.07, 95% CI 1.08-3.97). FFM% loss $> 8\%$ was associated with a higher risk of cardiovascular events (HR 3.83, 95% CI 1.29-11.4).



Conclusions

In a middle-aged and elderly community-based Chinese population, fat% gain or FFM% loss was associated with an increased risk of cardiovascular events.

Nutr Metab (Lond)

2023 Jan 31;20(1):4. doi: 10.1186/s12986-023-00727-2

Tingting Hu, Yun Shen, Weijie Cao, Yiting Xu, Yufei Wang, Xiaojing Ma, Yuqian Bao



What to Monitor

- Body Fat %
- VAT-visceral adipose tissue
 - Less than 10% of your overall body fat - and as low as possible
- Skeletal Muscle = ALMI or ASMI
 - Upper 25th percentile for your age




Recent research has suggested that older adults should aim for a muscle mass index (MMI) of at least 20 kg/m² for men and 15 kg/m² for women to maintain optimal health and function. The MMI is a measure of skeletal muscle mass that takes into account a person's height and weight.

A study published in the American Journal of Clinical Nutrition in 2021 found that older adults with an MMI below these thresholds had a higher risk of functional limitations, such as difficulty with activities of daily living, compared to those with higher MMI. Other studies have suggested that maintaining muscle mass and strength can also reduce the risk of chronic diseases such as diabetes and cardiovascular disease.



It's the Inches You Can't Pinch That Are the Problem



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CITY _____ STATE _____ ZIP _____

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Weight Training, Aerobic Physical Activities, and Long-Term Waist Circumference Change in Men

This study examined prospectively whether weight training, moderate to vigorous aerobic activity (MVAA), and replacement of one activity for another were associated with favorable changes in WC and body weight (BW).

Obesity (Silver Spring)

2015 Feb;23(2):461-7. doi: 10.1002/oby.20949. Epub 2014 Dec 19

Rania A Mekary 1, Anders Grøntved, Jean-Pierre Despres, Leandro Pereira De Moura, Morteza Asgarzadeh, Walter C Willett, Eric B Rimm, Edward Giovannucci, Frank B Hu



Methods

Physical activity, WC, and BW were reported in 1996 and 2008 in a cohort of 10,500 healthy U.S. men in the Health Professionals Follow-up Study. Multiple linear regression models (partition/substitution) to assess these associations were used.

Obesity (Silver Spring)

2015 Feb;23(2):461-7. doi: 10.1002/oby.20949. Epub 2014 Dec 19

Rania A Mekary 1, Anders Grøntved, Jean-Pierre Despres, Leandro Pereira De Moura, Morteza Asgarzadeh, Walter C Willett, Eric B Rimm, Edward Giovannucci, Frank B Hu



Results

A significant inverse dose-response relationship between weight training and WC change (P-trend <0.001) was observed. Less age-associated WC increase was seen with a 20-min/day activity increase; this benefit was significantly stronger for weight training (-0.67 cm, 95% CI -0.93, -0.41) than for MVAA (-0.33 cm, 95% CI -0.40, -0.27), other activities (-0.16 cm, 95% CI -0.28, -0.03), or TV watching (0.08 cm, 95% CI 0.05, 0.12).

Substituting 20 min/day of weight training for any other discretionary activity had the strongest inverse association with WC change.

Obesity (Silver Spring)

2015 Feb;23(2):461-7. doi: 10.1002/oby.20949. Epub 2014 Dec 19

Rania A Mekary 1, Anders Grøntved, Jean-Pierre Despres, Leandro Pereira De Moura, Morteza Asgarzadeh, Walter C Willett, Eric B Rimm, Edward Giovannucci, Frank B Hu





- Anabolic Resistance: a blunted stimulation of muscle protein synthesis rates (MPS) to common anabolic stimuli in skeletal muscle tissue such as dietary protein and exercise
- Eat protein first
- Lift heavy things to overcome anabolic resistance

Timing and Distribution of Protein Ingestion During Prolonged Recovery From Resistance Exercise Alters Myofibrillar Protein Synthesis

Regular physical activity, especially resistance-type exercise training, and high protein intake (1.25–1.5 times the RDA for sedentary persons and >1.5 times the RDA for those who exercise) are recommended for persons with obesity who undergo weight-loss therapy to limit the loss of muscle mass because dietary amino acids, insulin, and contractile activity are the major regulators of muscle protein synthesis and breakdown. **Amino acids and dietary protein stimulate muscle protein synthesis in a dose-dependent manner $\leq \sim 20$ g protein/meal.** Insulin is a potent inhibitor of muscle protein breakdown and maximally suppresses muscle protein breakdown at plasma insulin concentrations of 15–30 $\mu\text{U/mL}$. **Exercise (both resistance and endurance type) improves insulin sensitivity and stimulates muscle protein synthesis.**

J Physiol. 2013 May 1; 591(Pt 9): 2319–2331.

Published online 2013 Mar 4. doi: 10.1113/jphysiol.2012.244897

José L Areta, Louise M Burke, Megan L Ross, Donny M Camera, Daniel W D West, Elizabeth M Broad, Nikki A Jeacocke, Daniel R Moore, Trent Stellingwerff, Stuart M Phillips, John A Hawley, and Vernon G Coffey



Exercise Attenuates the Weight-Loss-Induced Reduction in Muscle Mass in Frail Obese Older Adults



Purpose

To evaluate the effect of adding exercise to a hypocaloric diet on changes in appendicular lean mass and strength in frail obese older adults undergoing voluntary weight loss.



Methods

Thirty frail older (age, 70 ± 5 yr) obese (body mass index, 37 ± 5 kg·m⁻²) adults were randomly assigned to 6 months of diet/behavioral therapy (diet group, $n = 15$) or diet or behavioral therapy plus exercise that incorporated progressive resistance training (PRT; diet + exercise group; $n = 15$). Body composition was assessed using dual-energy x-ray absorptiometry, and muscle strength was assessed using one-repetition maximum. The volume of upper extremity (UE) and lower extremity (LE) exercise training was determined by multiplying the average number of repetitions performed by the average weight lifted during the first three exercise sessions and during the last three exercise sessions of the study.

Results

The diet and the diet + exercise groups had similar ($P > 0.05$) decreases in weight (10.7 ± 4.5 vs 9.7 ± 4.0 kg) and fat mass (6.8 ± 3.7 vs 7.7 ± 2.9 kg). **However, the diet + exercise group lost less fat-free mass** (FFM; 1.8 ± 1.5 vs 3.5 ± 2.1 kg), LE lean mass (0.9 ± 0.8 vs 2.0 ± 0.9 kg), and UE lean mass (0.1 ± 0.2 vs 0.2 ± 0.2 kg) than the diet group ($P < 0.05$). The diet + exercise group had greater increases in percent of weight as FFM (FFM/weight $\times 100$) than the diet group (7.9 ± 3.3 vs $5.4 \pm 3.7\%$; $P < 0.05$). **Despite lean mass losses, the diet + exercise group increased UE and LE strength in response to exercise (17–43%),** whereas the diet group maintained strength. The volume of UE and LE exercises correlated with the amount of UE and LE lean mass ($r = 0.64$ – 0.84 ; $P < 0.05$).



Conclusion

Exercise added to diet reduces muscle mass loss during voluntary weight loss and increases muscle strength in frail obese older adults. Regular exercise that incorporates PRT should be used to attenuate muscle mass loss in frail obese older adults on weight-loss therapy.

Eat Protein First

- More thermic 20-30%
- More satiating
- Sparing of muscle protein loss
- Helps support blood sugar balance - better glycemic control
- Overcome anabolic resistance due to aging
- Better food choices overall

My Protein Recommendations

- 0.7-1 gram per # of Target Body Weight
- 30-60 grams at your first and last meals
- 100 grams or more overall

Is Leucine Content in Dietary Protein the Key to Muscle Preservation in Older Women?

Loss of muscle mass and strength with aging is a serious problem that threatens physical function and independence in seniors. An adequate dietary protein intake is fundamental for muscle health because it provides the essential amino acids needed to replace those lost from catabolism and stimulates muscle protein synthesis and growth. Low protein intake is associated with accelerated muscle loss in older adults. Yet, a significant proportion of older adults, particularly women, do not meet the Recommended Daily Allowance for protein. Previous studies also suggest that the muscle protein anabolic sensitivity to dietary amino acids may be reduced with aging but can be restored by increasing the proportion of dietary leucine.

Am J Clin Nutr. 2018 Feb; 107(2): 143–144.

Published online 2018 Feb 26.

Elena Volpi

Is Leucine Content in Dietary Protein the Key to Muscle Preservation in Older Women?

Leucine is the essential amino acid that can directly activate the mechanistic target of rapamycin complex 1 (mTORC1) signaling pathway in skeletal muscle, thereby stimulating translation initiation and protein synthesis. On the basis of several acute studies, **the dose of leucine necessary to achieve the maximal stimulation of muscle protein synthesis in older persons has been estimated to be ~3–4 g/meal, which would correspond to ~25–30 g protein/meal.** NHANES data show that older adults achieve such an amount of protein intake only in one of the daily meals, dinner, when they tend to consume most of their daily protein intake. The other 2 meals contain suboptimal doses of protein (~15 g) and leucine (<2 g), which, over time, may negatively affect skeletal muscle mass.

Preserving Healthy Muscle During Weight Loss

Quantity and timing of protein ingestion are major factors regulating myofibrillar protein synthesis (MPS). However, the effect of specific ingestion patterns on MPS throughout a 12 h period is unknown. We determined how different distributions of protein feeding during 12 h recovery after resistance exercise affects anabolic responses in skeletal muscle. Twenty-four healthy trained males were assigned to three groups (n= 8/group) and undertook a bout of resistance exercise followed by ingestion of 80 g of whey protein throughout 12 h recovery in one of the following protocols: 8 × 10 g every 1.5 h (PULSE); 4 × 20 g every 3 h (intermediate: INT); or 2 × 40 g every 6 h (BOLUS).

Adv Nutr. 2017 May; 8(3): 511–519.

Published online 2017 May 5.

Edda Cava, Nai Chien Yeat, and Bettina Mittendorfer

Preserving Healthy Muscle During Weight Loss

Muscle biopsies were obtained at rest and after 1, 4, 6, 7 and 12 h post exercise. Resting and post-exercise MPS (l-[ring- $^{13}\text{C}_6$] phenylalanine), and muscle mRNA abundance and cell signalling were assessed. All ingestion protocols increased MPS above rest throughout 1–12 h recovery (88–148%, $P < 0.02$), but INT elicited greater MPS than PULSE and BOLUS (31–48%, $P < 0.02$). In general signalling showed a BOLUS>INT>PULSE hierarchy in magnitude of phosphorylation. MuRF-1 and SLC38A2 mRNA were differentially expressed with BOLUS.

In conclusion, 20 g of whey protein consumed every 3 h was superior to either PULSE or BOLUS feeding patterns for stimulating MPS throughout the day.

Adv Nutr. 2017 May; 8(3): 511–519.

Published online 2017 May 5.

Edda Cava, Nai Chien Yeat, and Bettina Mittendorfer



Supplementation of Protein at Breakfast Rather Than at Dinner and Lunch Is Effective on Skeletal Muscle Mass in Older Adults

Front Nutr. 2021; 8: 797004.

Published online 2021 Dec 21

Hyeon-Ki Kim, Hanako Chijiki, Mayuko Fukazawa, Jin Okubo, Mamiho Ozaki, Takuya Nanba, Seiichirou Higashi, Miho Shioyama, Masaki Takahashi, Takashi Nakaoka, and Shigenobu Shibata



Background

The effects of different intake patterns of meal protein on muscle mass have not been clarified. We cross-sectionally and longitudinally examined the effect of different timing of protein intake on sarcopenia-related factors in older adults.

Front Nutr. 2021; 8: 797004.

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Hyeon-Ki Kim, Hanako Chijiki, Mayuko Fukazawa, Jin Okubo, Mamiho Ozaki, Takuya Nanba, Seiichirou Higashi, Miho Shioyama, Masaki Takahashi, Takashi Nakaoka, and Shigenobu Shibata



Methods

This cross-sectional study 1 included 219 (male, $n = 69$, female, $n = 150$) elderly subjects aged ≥ 65 years. Subjects who consumed more protein at breakfast than at dinner were grouped into the morning group (MG, $n = 76$; male, $n = 26$; female, $n = 50$), and those who consumed more protein at dinner than at breakfast were grouped into the evening group (EG, $n = 143$; male, $n = 43$; female, $n = 100$). In cross-sectional study 2-1 (female, $n = 125$), the subjects were classified into four groups according to the number of meals with sufficient protein intake. In cross-sectional studies 2-2 (female, $n = 125$) and 2-3 (female, $n = 27$), the subjects were classified into eight groups and three groups according to whether they had consumed sufficient protein at three meals; sarcopenia-related factors were compared.

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Methods *cont.*

The intervention study was a placebo-controlled, double-blind, randomized controlled trial that included 40 elderly women with low daily breakfast protein intake. The subjects were divided into four groups: morning protein and placebo intake groups and evening protein and placebo intake groups. Each group consumed the test food (containing 10 g milk protein) or placebo in the morning or evening for 12 weeks. Blood indices and physical function were assessed before and after the intervention.

Front Nutr. 2021; 8: 797004.

Published online 2021 Dec 21

Hyeon-Ki Kim, Hanako Chijiki, Mayuko Fukazawa, Jin Okubo, Mamiho Ozaki, Takuya Nanba, Seiichirou Higashi, Miho Shioyama, Masaki Takahashi, Takashi Nakaoka, and Shigenobu Shibata



Results

Comparing all subjects, MG showed significantly higher handgrip strength than did EG ($P < 0.05$). The higher ratio of morning protein intake relative to the total protein intake, the better the muscle mass ($r = 0.452$, $P < 0.05$) and handgrip strength ($r = 0.383$, $P < 0.05$). The intervention study showed an increase in muscle mass with the intake of milk protein in the morning rather than in the evening ($P < 0.05$).

Front Nutr. 2021; 8: 797004.

Published online 2021 Dec 21

Hyeon-Ki Kim, Hanako Chijiki, Mayuko Fukazawa, Jin Okubo, Mamiho Ozaki, Takuya Nanba, Seiichirou Higashi, Miho Shioyama, Masaki Takahashi, Takashi Nakaoka, and Shigenobu Shibata



Conclusions

Protein intake at breakfast might have relatively stronger effects on skeletal muscle mass than at lunch and dinner.

Front Nutr. 2021; 8: 797004.

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Hyeon-Ki Kim, Hanako Chijiki, Mayuko Fukazawa, Jin Okubo, Mamiho Ozaki, Takuya Nanba, Seiichirou Higashi, Miho Shioyama, Masaki Takahashi, Takashi Nakaoka, and Shigenobu Shibata

The Effect of Adherence to Dietary Tracking on Weight Loss: Using HLM to Model Weight Loss over Time

The role of dietary tracking on weight loss remains unexplored despite being part of multiple diabetes and weight management programs. Hence, participants of the Diabetes Prevention and Management (DPM) program (12 months, 22 sessions) tracked their food intake for the duration of the study. A scatterplot of days tracked versus total weight loss revealed a nonlinear relationship. Hence, the number of possible tracking days was divided to create the 3 groups of participants: rare trackers (<33% total days tracked), inconsistent trackers (33–66% total days tracked), and consistent trackers (>66% total days tracked).

J Diabetes Res. 2017; 2017: 6951495.

Published online 2017 Aug 9.

John Spencer Ingels, Ranjita Misra, Jonathan Stewart, Brandon Lucke-Wold, and Samantha Shawley-Brzoska

The Effect of Adherence to Dietary Tracking on Weight Loss: Using HLM to Model Weight Loss over Time

After controlling for initial body mass index, hemoglobin A1c, and gender, **only consistent trackers had significant weight loss (–9.99 pounds), following a linear relationship with consistent loss throughout the year.** In addition, the weight loss trend for the rare and inconsistent trackers followed a nonlinear path, with the holidays slowing weight loss and the onset of summer increasing weight loss. **These results show the importance of frequent dietary tracking for consistent long-term weight loss success.**

J Diabetes Res. 2017; 2017: 6951495.

Published online 2017 Aug 9.

John Spencer Ingels, Ranjita Misra, Jonathan Stewart, Brandon Lucke-Wold, and Samantha Shawley-Brzoska

Effectiveness of Creatine Supplementation on Aging Muscle and Bone: Focus on Falls Prevention and Inflammation

Sarcopenia, defined as the age-related decrease in muscle mass, strength and physical performance, is associated with reduced bone mass and elevated low-grade inflammation. From a healthy aging perspective, interventions which overcome sarcopenia are clinically relevant.

Accumulating evidence suggests that exogenous creatine supplementation has the potential to increase aging muscle mass, muscle performance, and decrease the risk of falls and possibly attenuate inflammation and loss of bone mineral.

J Clin Med. 2019 Apr; 8(4): 488.

Published online 2019 Apr 11.

Darren G. Candow, Scott C. Forbes, Philip D. Chilibeck, Stephen M. Cornish, Jose Antonio, and Richard B. Kreider

Lift Heavy Things



Your Resistance Rx - Train to Get Better at Life

- Focus on Compound Movements
- Train to 85%+ of failure
- Train each major body part 2x per week for maintenance
- Train each major body part 3x per week for hypertrophy

The 3-3-3 formula

- 3 exercises, 3 sets, 3 times a week
- 6-30 reps, 1-2 min break



Upper Body Pushing	Upper Body Pulling	Hip & Thigh Hinging
pushup/chest press	pull up/pulldown	squat
overhead press	bent over row/seated row	deadlift
dip	upright row	step up

Resistance Training Formula

- Hypertrophy - time under tension
 - 6-30 reps, 2-4 sets, 1-2 min rest
- Strength - 1 RM max
 - 1-5 reps, 3-6 sets, 3-5 min rest
- Power - Explosive Speed
 - 40% of 1RM AMRAP



Stuart Phillips, Ph.D., McMaster University, Ontario, Canada, says he expects the average subject to gain 4 to 7 pounds of muscle in three months. No matter how good the program or supplements are, he never sees average gains exceeding about a half-pound a week.



Eat Protein First Lift Heavy Things



Thursday 2:45pm – 3:45pm

The Solution to Weight Loss Is to Stop Trying to Lose Weight

Please scan this QR code on you mobile
or tablet device to access the session feedback survey



The Solution to Weight Loss Is to Stop
Trying to Lose Weight