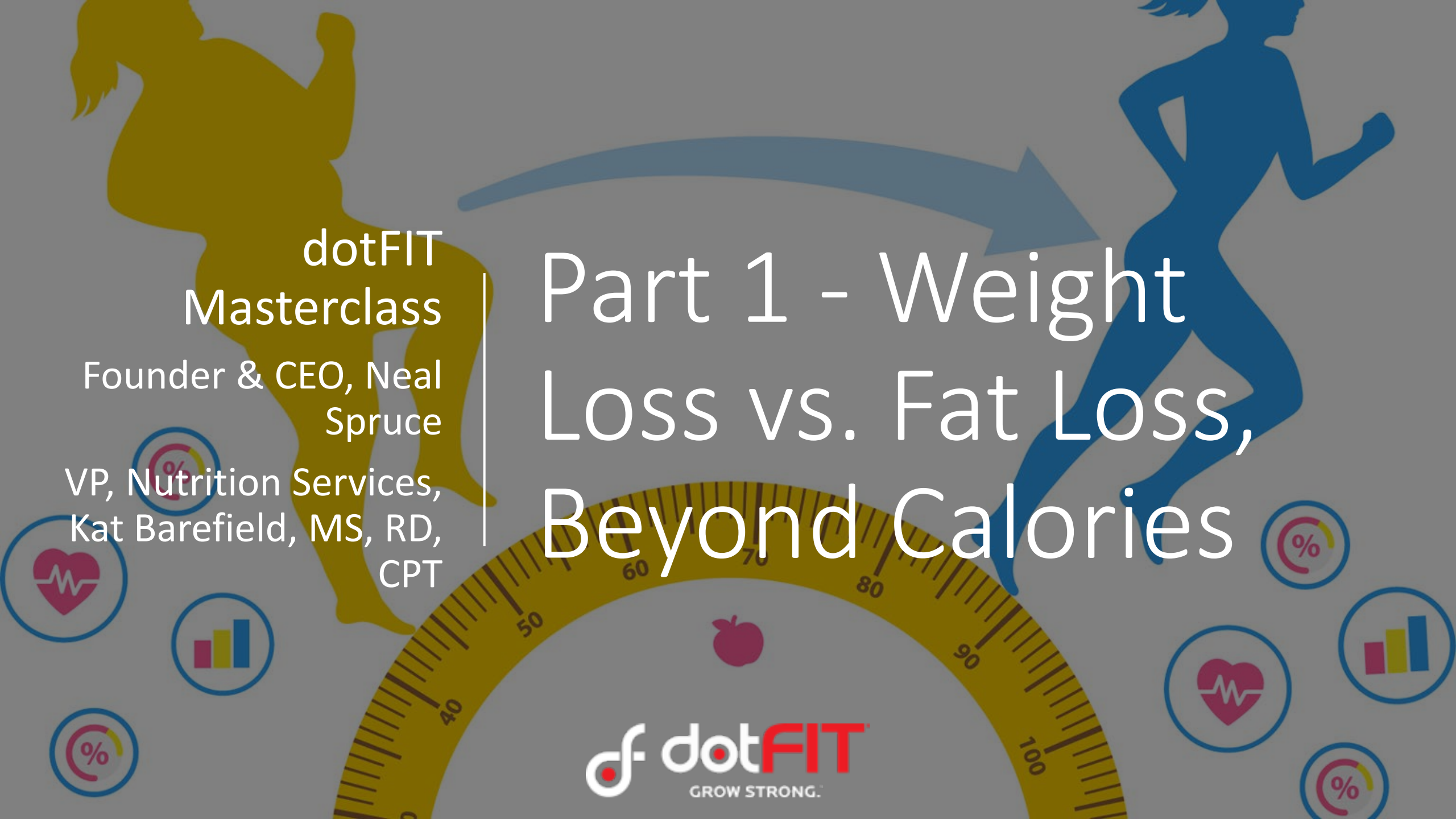


dotFIT Masterclass

Founder & CEO, Neal Spruce

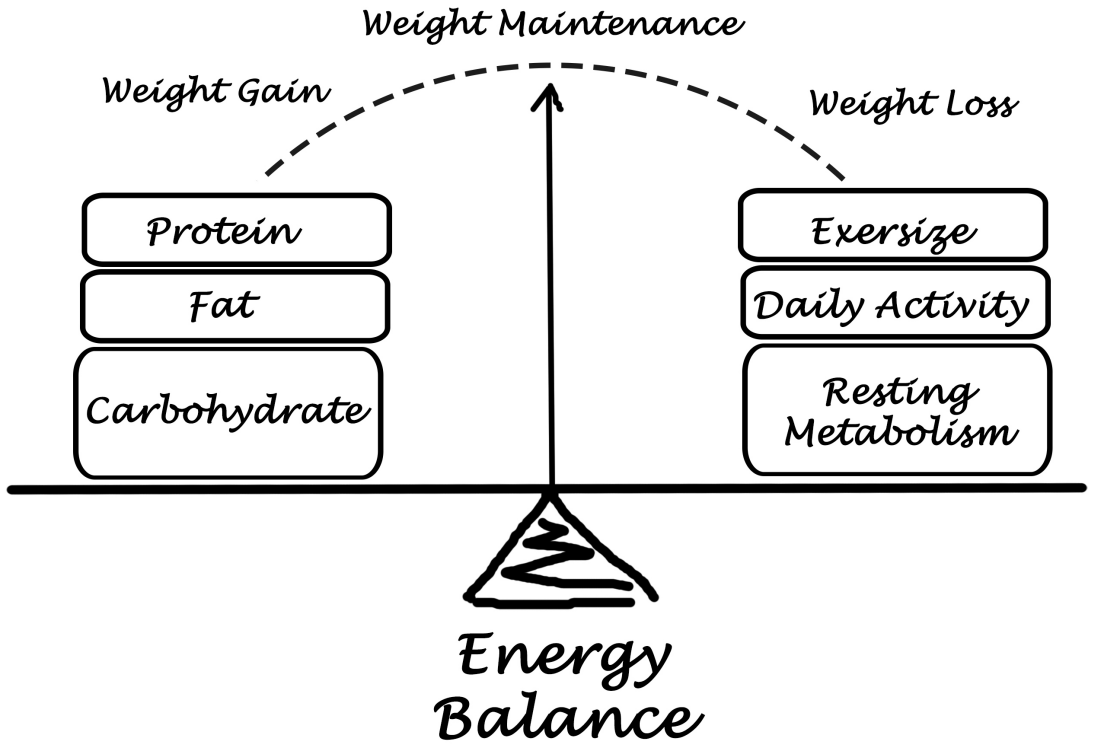
VP, Nutrition Services, Kat Barefield, MS, RD, CPT

Part 1 - Weight Loss vs. Fat Loss, Beyond Calories

dotFIT GROW STRONG.

Content to be Presented

- Energy Balance – Beyond CICO
- Impact of Diet Quality
- Popular Diets and Composition of Weight Loss
- The Factors That Influence How Much Muscle is Lost or Gained
- Research Look: Losing Fat and Gaining Muscle Simultaneously
- How to Set Up Your Program to Prioritize Fat Loss



Definition of Terms

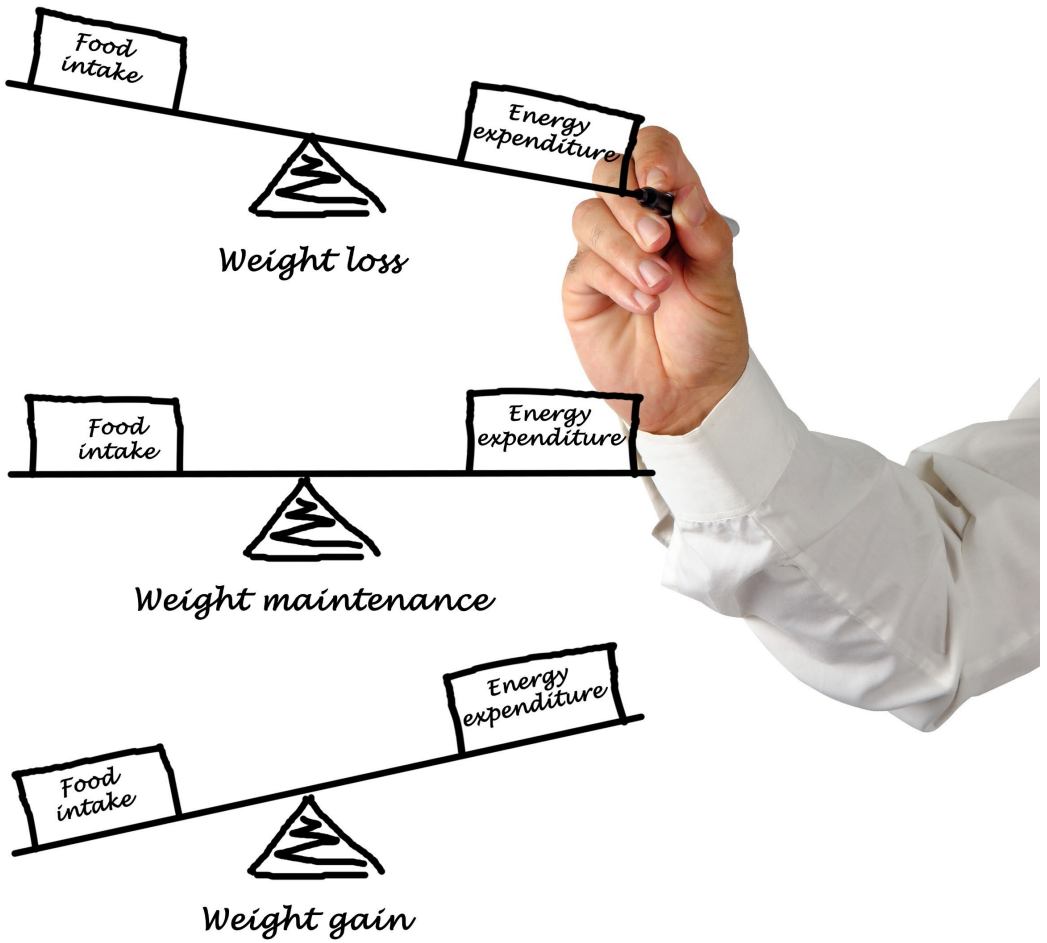
- **Maintenance** – calories required to maintain current weight
  - BMR + TEF + Exercise + NEAT
- **BMR** – Basal Metabolic Rate
  - Calories needed to sustain life
  - ~60% of daily energy expenditure/burn
- **TEF** – Thermic Effect of Feeding
  - Calories required to digest and absorb food
  - ~10% of total calories
- **NEAT** – Non-Exercise Activity Thermogenesis
  - All movement besides planned exercise
  - ~15–50+% varies greatly with occupation + lifestyle
  - Most flexible aspect of daily burn

Definition of Terms

- **Caloric Restriction** – reducing calories below maintenance level to create a calorie deficit
- **Dieting vs. Diet**
  - Dieting - restricting calories for weight loss
  - Diet – refers to the type of food pattern one follows (keto, Mediterranean, balanced)
- **LBM** – lean body mass. Fat free mass: all fat free tissue including muscle, bone, fluid, connective tissue

Background – Energy Balance & Calories

- Energy Balance - also referred to as Calories In, Calories Out (CICO)
- Describes the physiological state the body is in
  - Balance = maintenance
  - Deficit = weight loss
  - Surplus = weight gain



Energy Balance & Calories In, Calories Out

- NOT Synonymous with “All Calories are Equal”
- The Quality of Your Diet Matters. It Impacts:
  - Muscle loss/gain
  - Daily energy expenditure
  - Total calorie intake
  - Micronutrient intakes
  - Risk of health issues
  - Immune function
  - Satiety/hunger levels
  - Energy levels
  - Recovery
  - Quality of workout sessions

KEY POINTS

- ***Weight loss*** *occurs when there's a* ***calorie deficit****, regardless of where the calories come from*

- ***Weight gain*** *occurs when there's a* ***calorie surplus****, even if it's a high quality "healthy" diet*

Impact of Diet Quality on Calorie Intake & Body Weight

20 inpatient adults assigned to two different diets for two weeks at a time, ad libitum.

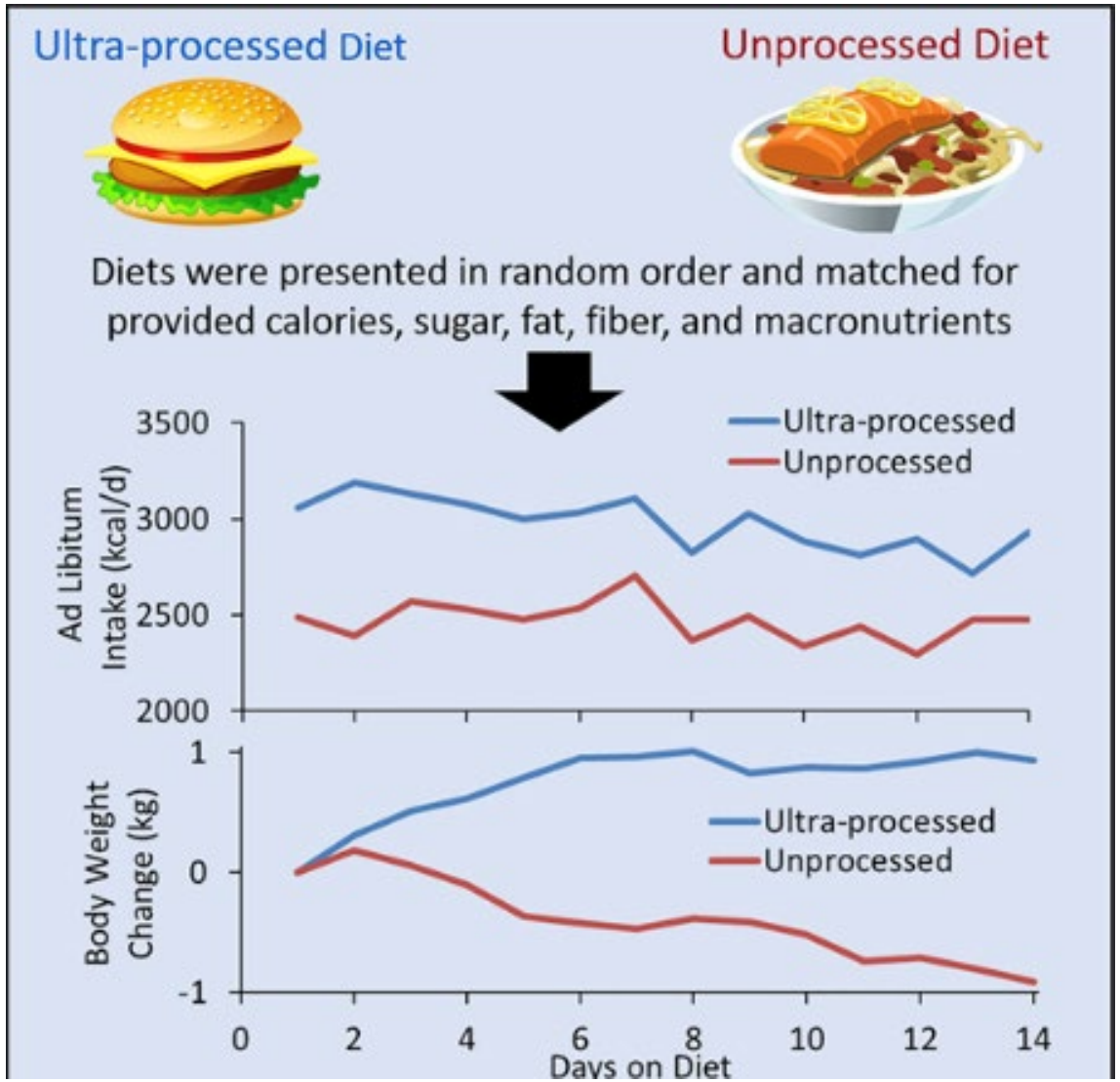
- Ultra-processed or unprocessed

Ultra-processed diet resulted in:

- 500 more calories consumed/day
- 2 lb. weight gain

Unprocessed diet resulted in 2 lb. weight loss

Takeaway: Ultra-processed diets lead to overeating and weight gain. Unprocessed diets lead to consuming fewer calories and weight loss



Hall et al., 2019

Energy Balance & Calories In, Calories Out

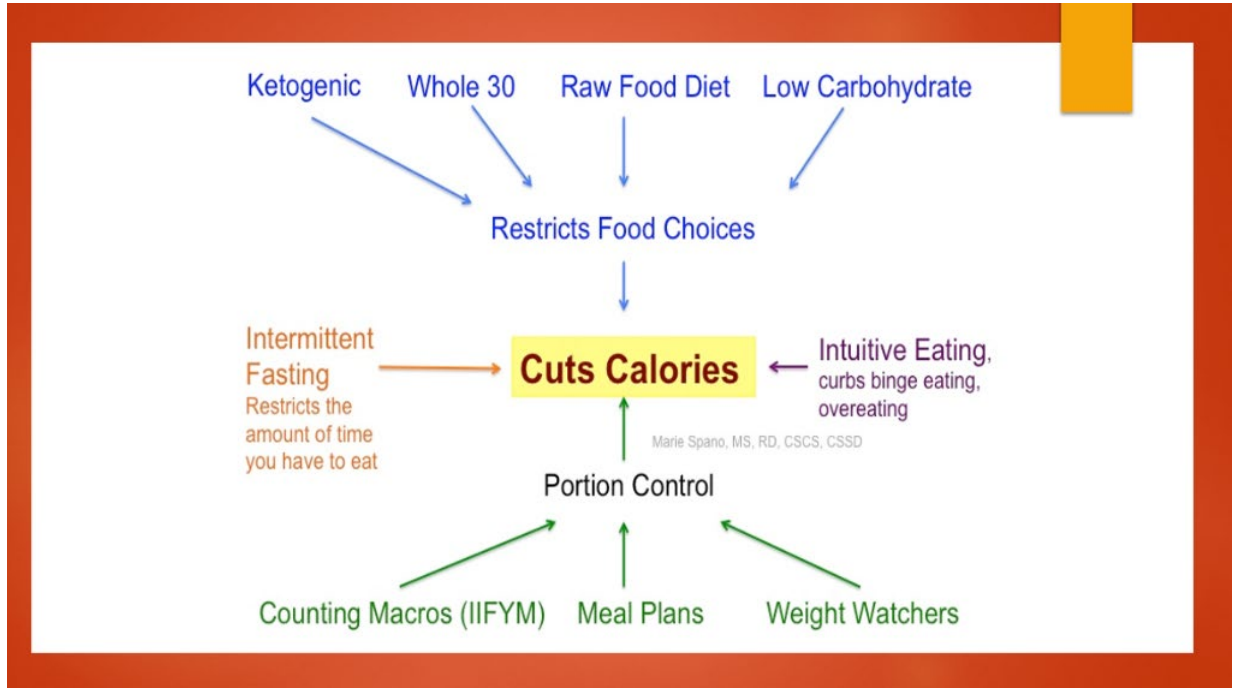
- NOT synonymous with counting calories
- Counting calories is NOT required for weight loss
- Counting calories/macros or tracking food are useful tools for many, especially initially
  - Increases awareness
  - Builds food knowledge
  - Adds accountability

KEY POINTS

- ***Yes, diet quality matters***
- ***No, you don't have to count calories (but all calories count)***

Which Diet is BEST for Weight Loss?

- Among popular diets, there is no SINGLE superior diet for weight loss
- The ability to **adhere** to a diet is the biggest determinant of success
  - A calorie deficit must be sustained for continuous progress
- Watch previous Masterclass on Popular Diets
  - https://www.dotfit.com/dotfittools/masterclass



Popular Diets Result in Micronutrient Shortages

- Menus of 4 Popular Diets Were Analyzed for 27 Vitamins + Minerals
  - Low Carb
  - Mediterranean
  - Low Fat
  - Medically Based
- Each one failed to provide 12-21 essential micronutrients
- An average intake of 27,575 calories needed to meet daily needs for all 27 micronutrients

Calton *Journal of the International Society of Sports Nutrition* 2010, **7**:24
http://www.jissn.com/content/7/1/24

jissn
journal of the international society of sports nutrition

RESEARCH ARTICLE Open Access

Prevalence of micronutrient deficiency in popular diet plans

Jayson B Calton

Popular Diets & Micronutrient Shortages

Diet	Summary/Macronutrient Breakdown	Missing Nutrients	Recommended Supplements
Paleo	NO dairy, grains and grain products, legumes, processed foods, alcohol	Calcium Vitamin D B vitamins Magnesium Fiber	Multivitamin & Mineral Calcium with Magnesium Vitamin D3
Keto	5-10% Carbs (50 g/d max) 10-20% Protein 70-80% Fat	B vitamins Magnesium Fiber Vitamin E & C Zinc Iron	Multivitamin & Mineral Calcium with Magnesium Probiotic Essential Amino Acids
Vegan	No animal meats or products (eggs, milk, cheese, yogurt)	Vitamin D Calcium Protein Zinc Omega-3 Fats B12 Iron Iodine	Vegan MV Calcium with Magnesium Plant Protein
Gluten Free	All forms of wheat and wheat products. Rye, barley, bulger, some condiments, sauces and dressings	B vitamins Vitamin D Iron Fiber Zinc Magnesium Calcium Phosphorus	Multivitamin & Mineral Calcium with Magnesium Vitamin D3 Probiotic
Intermittent Fasting	No food restrictions – no eating for a specific time period	Commonly under-consumed nutrients: Potassium, choline, magnesium Vitamins A, D, E, C Calcium, potassium, fiber Iron (for certain age/gender groups)	Multivitamin & Mineral Omega-3 Fish Oils (as needed) Calcium (as needed) Essential Amino Acids Protein
If It Fits Your Macros (IIFYM)	Varies based on individual needs, goals, preferences and training status	Commonly under-consumed nutrients (same as above)	Multivitamin & Mineral Omega-3 Fish Oils (as needed) Calcium (as needed)

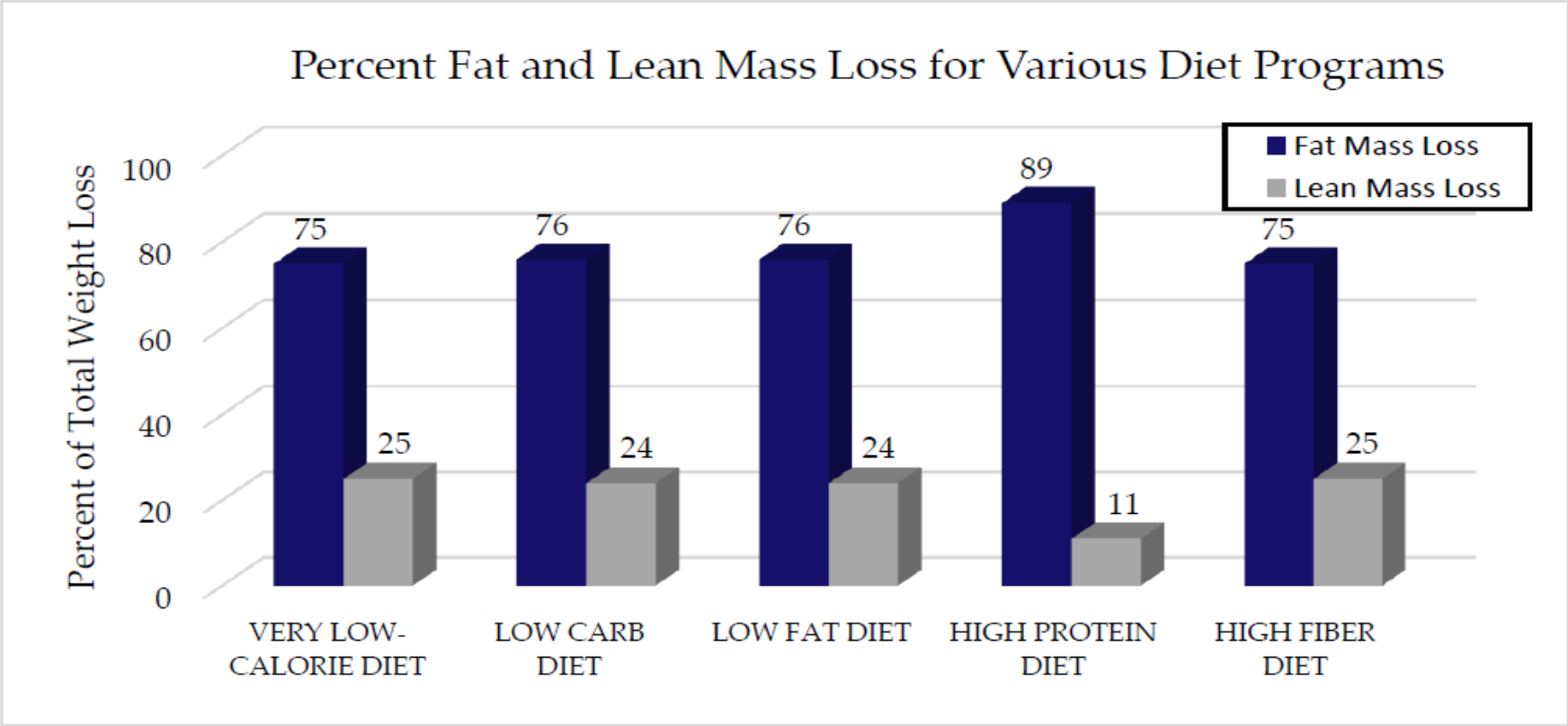


Figure 1. An overview of various weight loss clinical trials to examine the changes in body composition that occur from using popular diet programs. It should be emphasized that each diet program is distinct and contains unique and different exercise programs and diets that are thought to be helpful for weight loss but are not always evaluated by change in body composition. Results showed that all the popular diet programs examined lead to weight loss, though a large percent of the weight lost during these diet programs comes from a loss in LBM [14,16–18].

Popular Diets: Comparison of Changes in Fat Mass and Lean Mass

Willoughby, 2018. PMID 30513859

Consequences of Calorie Restriction

- Loss of fat and muscle to fuel metabolism to prolong survival
  - Muscle protein synthesis (MPS) decreases, making it harder to build muscle
  - Muscle protein breakdown (MPB) increases, leading to loss of muscle
- Hunger – increase in ghrelin
- Decrease in NEAT to preserve energy
- Invokes survival mechanisms - BMR reduces to close the deficit
  - Metabolic adaption, adaptive thermogenesis
- Prolonged or severe restriction may make fat/weight gain easier
  - Fat overshooting

Weight Loss vs. Fat Loss

Weight Loss

- Focus is on changes in scale weight, regardless of composition of weight lost
  - May lead to obsessive/disordered behaviors
- Often occurs more rapidly due to lose of lean body mass
- Consequences of dieting are more severe in most cases i.e., metabolic adaptation
  - May be medically necessary in obese
- Exacerbates micronutrients shortages
- Often leads to weight rebound
- May or may not include exercise

Weight Loss vs. Fat Loss

Fat Loss

- Focus is on maximizing fat loss while preserving or building muscle
- Diet quality is prioritized
- Slower changes on the scale
- More sustainable
- Consequences of dieting are less severe
- Results in favorable changes in body composition and toned/fit/muscular appearance
- Includes resistance training
- Supports functional independence with age

Factors That Influence LBM Changes During Weight Loss

- Rate of Weight Loss = Size of Daily Deficit
- Resistance Training
- Protein Intake
- Micronutrient Intake
- Meal Frequency
- Age
- Training Status

Evidence Based Strategies to Optimize Body Composition

Maximize Fat Loss, Preserve or Build Muscle, and Support Health and Longevity

Key Strategy #1: Choose Appropriate Rate of Weight Loss

- Benefits to Slower Rate
  - Mitigates loss of muscle mass
  - Less severe metabolic adaptations – slowing of BMR
  - Less severe hunger/cravings
  - Allows time for development of healthy habits
  - Lower likelihood of regain
- Aim for 0.5% to 1.0% per week of body weight
  - Faster rates for obese

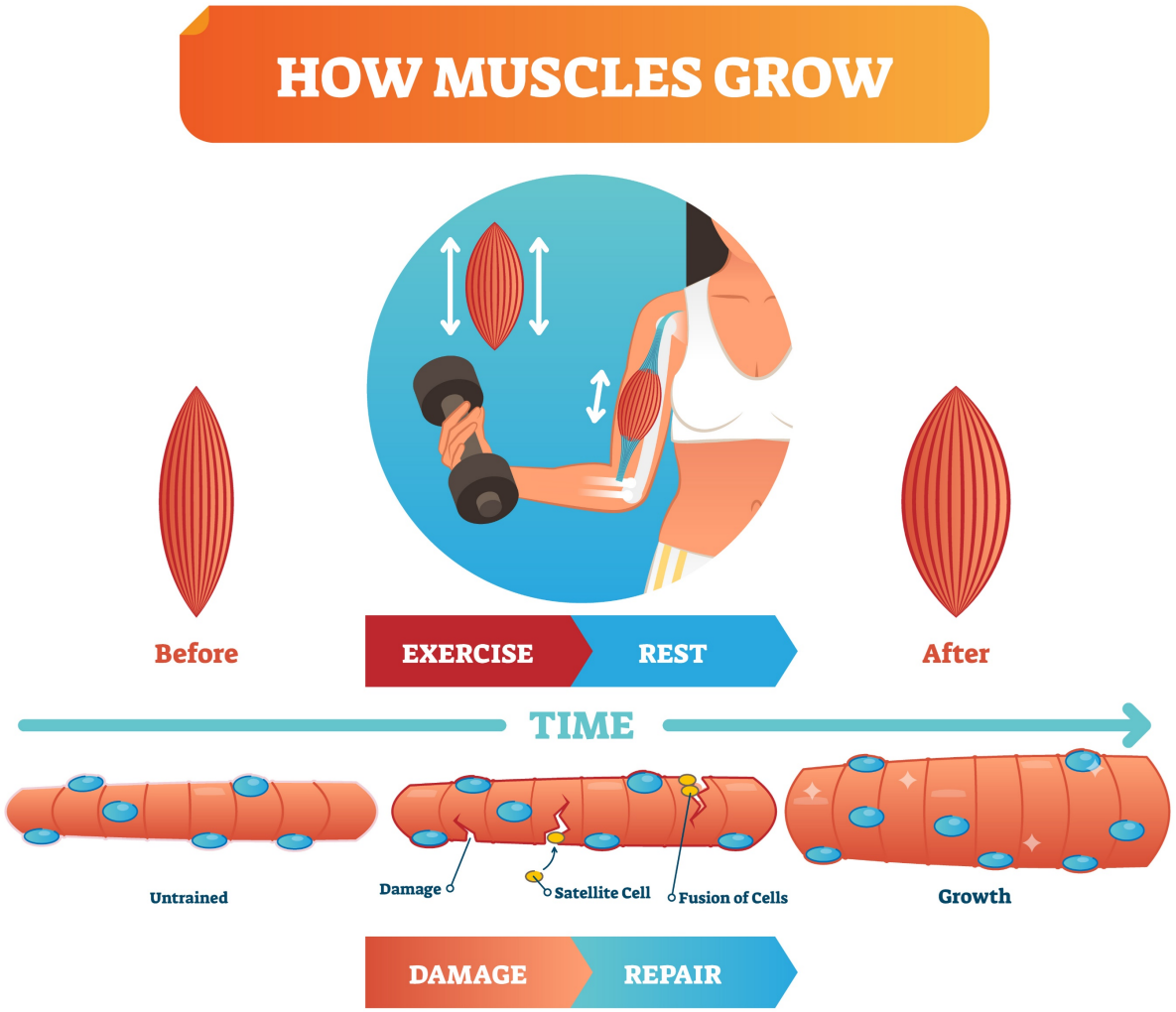
Comparison of Different Rates of Weight Loss

155 lb. female, age 34, sedentary job, exercises 2-3 times a week. Wants to lose 15 lbs

- Scenario 1:
  - 0.5% weekly weight loss rate = 0.7 lbs per week
  - Daily Calorie Burn = 1,983
  - **Daily Calorie Budget = 1,633**
    - **Daily Deficit 350 calories (18%)**
- Scenario 2
  - 1% weekly weight loss rate = 1.4 lbs per week
  - Daily Calorie Burn = 1,983
  - **Daily Calorie Budget = 1,283**
    - **Daily Deficit 700 calories (35%)**
- dotFIT Program allows you to set the weekly weight loss rate. Inputting weight/body fat weekly adjusts calories

KEY POINT

In general, slower rates of weight loss are more effective at preserving muscle mass and metabolism



Key Strategy #2: Resistance Train Consistently

- Progressive resistance training is a potent stimulus for increasing muscle protein synthesis (MPS)
  - MPS decreases in a calorie deficit
- Sensitizes muscle to nutrient intake
- May help prevent metabolic adaptations and weight regain
- Aim for a minimum of 3 sessions per week
  - Work with a fit pro to get tailored recommendations

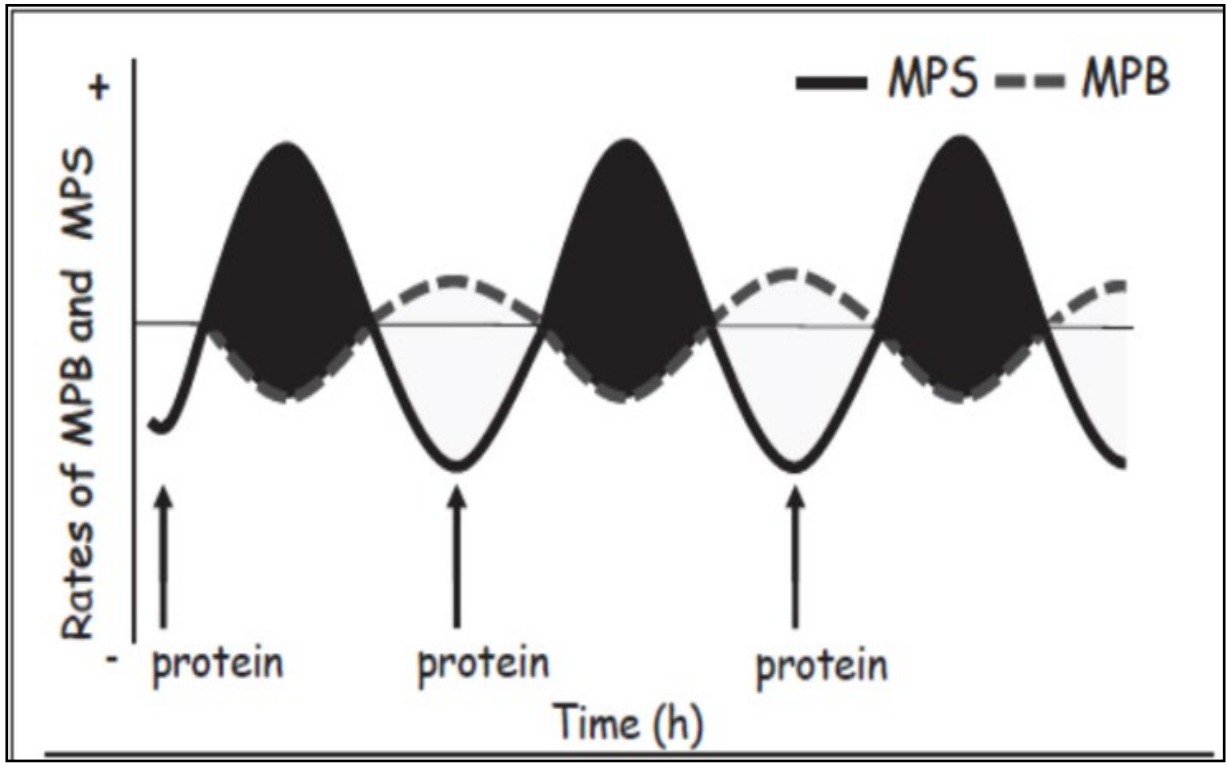
Key Strategy #3: Prioritize Protein

- RDA (0.36 g/lb. of body weight) is based on sedentary individuals
- Provides essential amino acids (EAAs) - building blocks of muscle tissue
- Adequate leucine is needed to start muscle building machinery
  - At least 2-3 grams; more for older individuals
- Other EAAs are needed to keep muscle protein synthesis turned on
- Highest TEF compared to carbs and fat
  - ~30% of calories are used to digest/metabolize
- Satiating effect
- Aim for 0.7 to 1.0 grams per pound of body weight OR 1 g/lb. of LBM across ~4 meals a day

Jäger et al., JISSN 2017

Key Strategy #3: Prioritize Protein

- Protein intake with resistance training magnifies increase in muscle protein synthesis (MPS)
- Regular protein rich meals keep muscle protein synthesis on throughout the day
- Consuming 30 g protein after resistance exercise while an energy deficit resulted in a greater stimulation of muscle protein synthesis than did consumption of 15 g protein
  - (Areta et al., 2014. PMID: 24595305)



High protein group gained ~2 lbs of lean body mass; low protein control group maintained

High protein group lost more body fat than low protein control group

Similar changes in body mass between groups

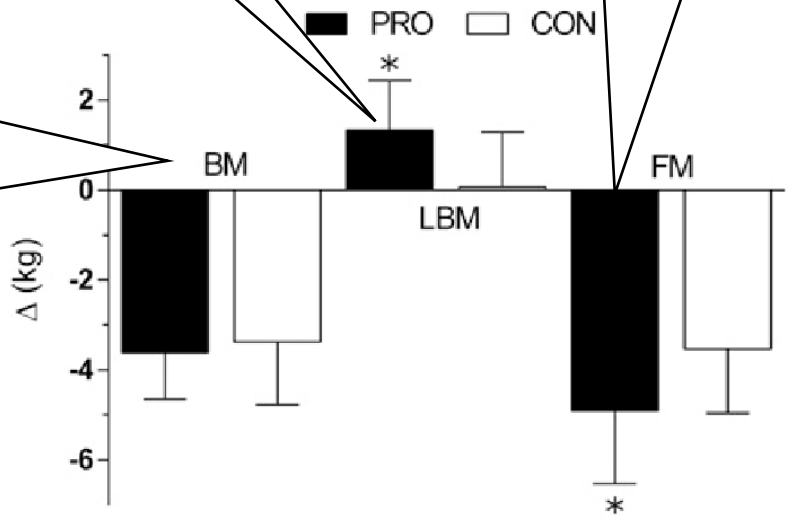


FIGURE 2 Four-compartment model-derived changes in BM, LBM, and FM during the intervention in both PRO and CON groups; data were analyzed with the use of an unpaired *t* test. Values are means ± SDs; $n = 40$ (20/group). *Significantly different from CON ($P < 0.05$). BM, body mass; CON, lower-protein (1.2 g · kg^{-1} · d^{-1}) control diet; FM, fat mass; LBM, lean body mass; PRO, higher-protein (2.4 g · kg^{-1} · d^{-1}) diet.

Longland, AJCN 2016 PMID 26817506

Losing Fat & Gaining LBM – Research

AKA Body Recomposition

Study Details:

- 40 overweight young active men
  - 40% calorie deficit
  - Full body circuit training + plyometrics 6 days a week
  - 4 weeks
  - Randomized to one of two groups:
    - Protein: 1.1 g/ lb of body weight (35% of calories)
    - Control: 0.54 g/lb of body weight (15% of calories)
  - Both groups: 50% of calories from carbs
  - Protein group used whey protein to reach daily target within total calories
  - Both groups ate more protein than the RDA (0.36 g/lb)
  - Same total weight loss – different composition

Body Recomposition Research

Study Details:

- 17 young, female novice physique competitors
- 8 weeks of supervised resistance training, 4 days a week (2 days upper, 2 days lower body)
- Randomly assigned to low or high protein intake
  - High: 1.1 g/lb/bw/d
  - Low: 0.4 g/lb/bw/d
- All macros were tracked

Results:

- High protein group experienced body recomposition
- Both groups increased LBM
  - High protein: 4.6 lbs
  - Low protein: 1.3 lbs
    - 3 of 9 lost LBM
- Only the high protein group lost a significant amount of fat
  - 2.4 lbs
- High protein group consumed more total calories from protein
  - 1,839 vs. 1,416

Campbell et al., 2018 PMID: 29405780

Body Recomposition – Research

Antonio *et al. Journal of the International Society of Sports Nutrition* (2015) 12:39
DOI 10.1186/s12970-015-0100-0

jissn
journal of the international society of sports nutrition

RESEARCH ARTICLE Open Access

CrossMark

A high protein diet (3.4 g/kg/d) combined with a heavy resistance training program improves body composition in healthy trained men and women – a follow-up investigation

Jose Antonio*, Anya Ellerbroek, Tobin Silver, Steve Orris, Max Scheiner, Adriana Gonzalez and Corey A Peacock

Study Details:

- 48 young, resistance trained individuals
- Randomly assigned to two groups:
  - Normal protein: 1 g/lb of body weight per day
  - High protein: > 1.5 g/lb of body weight per day
- Both groups performed heavy resistance training under supervision

Antonio et al, JISSN 2015

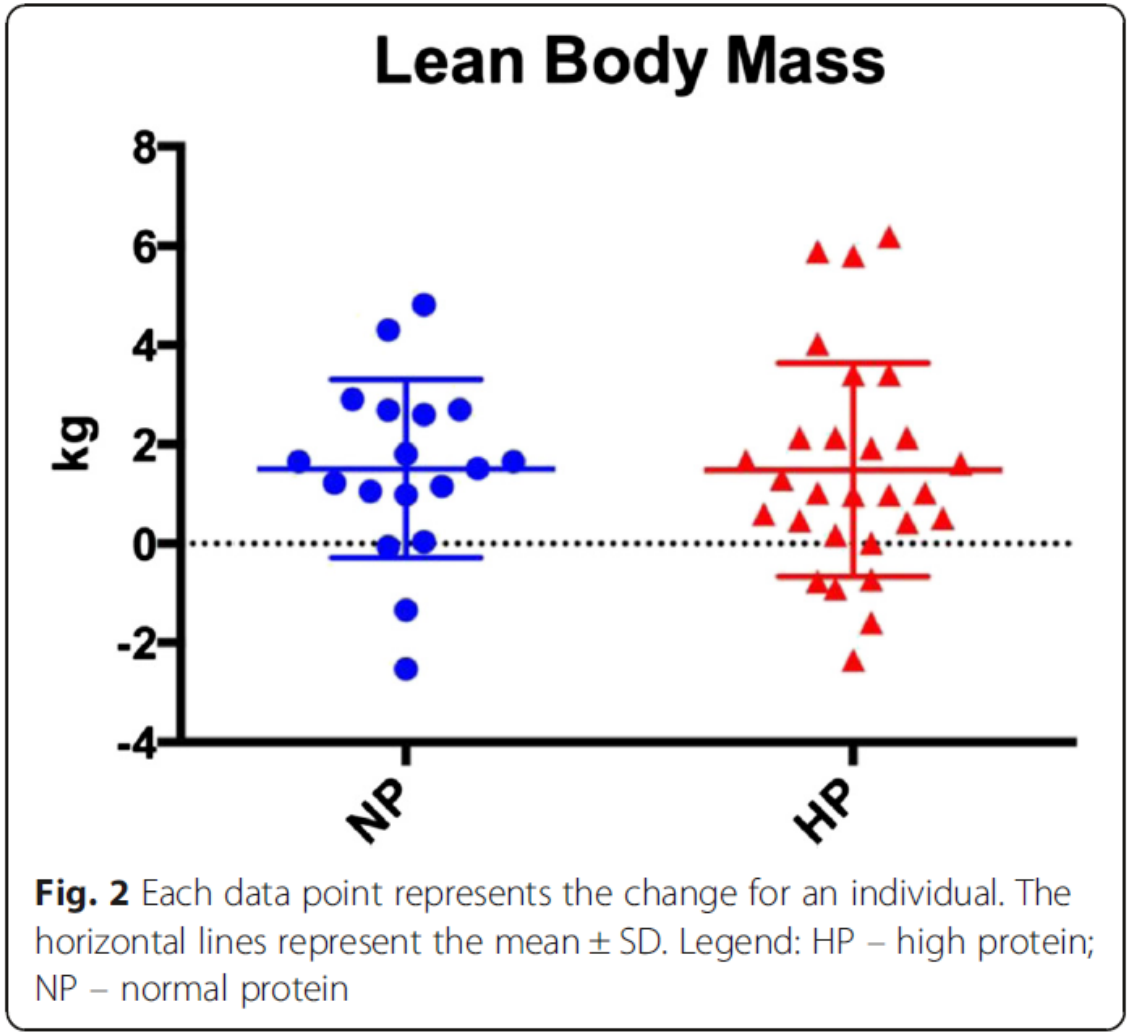


Fig. 2 Each data point represents the change for an individual. The horizontal lines represent the mean ± SD. Legend: HP – high protein; NP – normal protein

Body Recomposition – Research Results

- Both Groups Gained an Average of 3.3 lbs of LBM

- NP: Normal Protein Group - 1.0 g/lb/bw/d
- HP: High Protein Group - 1.5 g/lb/bw/d

Antonio et al, JISSN 2015

Body Recomposition – Research Results

- Both Groups Lost Fat
- High Protein Group Lost Significantly More
  - Averages: 3.5 lbs vs 0.66 lbs
- Key Takeaways:
  - Protein intakes greater than 1 g/lb of body weight per day did not result in greater gains in LBM but did promote additional fat loss in trained individuals
  - Body recomposition occurs in ~70% of trained individuals

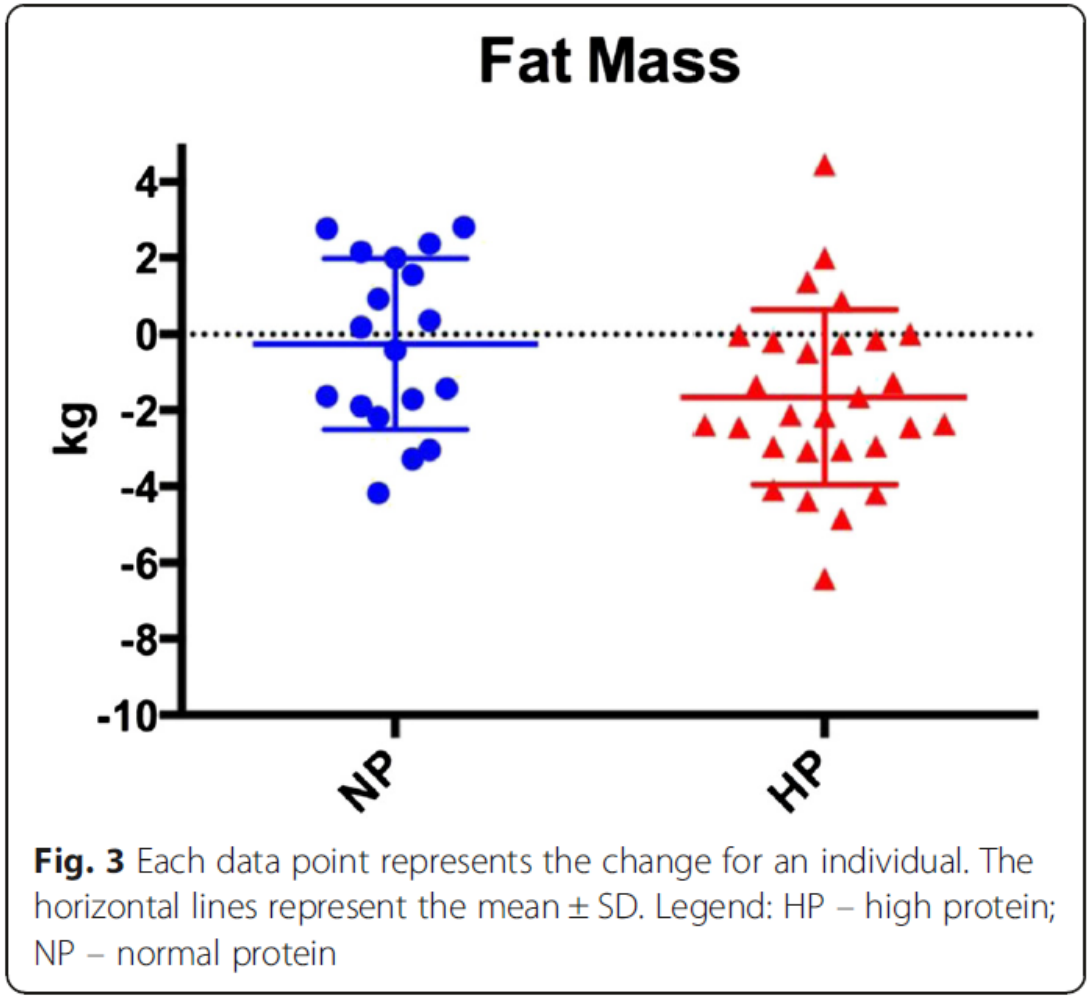


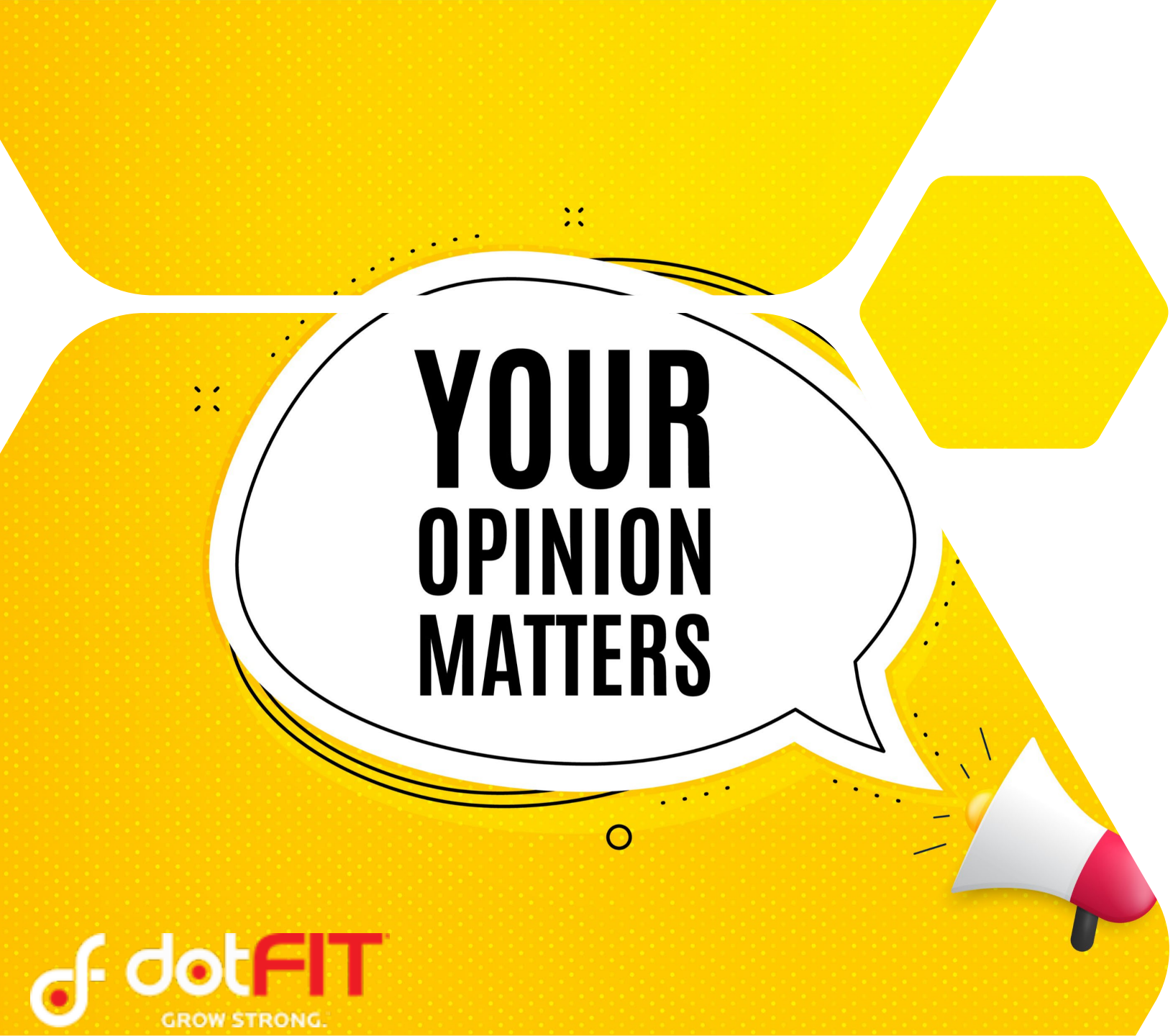
Fig. 3 Each data point represents the change for an individual. The horizontal lines represent the mean ± SD. Legend: HP – high protein; NP – normal protein

Antonio et al, JISSN 2015

Summary

- Choose a slower rate of weight loss 0.5% to 1.0% per week
  - Higher end for more overweight or those with a deadline
- Include progressive resistance training at least three times a week
- Prioritize protein – aim for at least 0.7 grams per pound of body weight Or 1.0 g per lb. of LBM
- Yes – it's possible to lose fat and gain muscle at the same time
  - Requires higher protein intake

dotFIT
GROW STRONG.



Tell Us What Topics You're Interested In!

Part 2 Next Month:

- Diet breaks
- Intermittent calorie restriction
- Maximizing muscle gain and minimizing fat gain
- ???

dotFIT
GROW STRONG.