

# *Functional Role of Nutrition in Addressing NCDs*



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# Learning Objectives:

- Precision nutrition has the goal of individualized, actionable dietary recommendations that help people decide what, when, why, and how to eat to optimize their health and quality of life
- Dietary quality beyond calorie intake is essential for health.



[Home](#) / [News](#) / [Detail](#) / Cardiovascular diseases, diabetes and cancer cost nearly RM 9 billion productivity losses annually to Malaysian economy



# Over half of Malaysia's adults overweight or obese, says Health Ministry

By MARTIN CARVALHO, ASHLEY TANG and FATIMAH ZAINAL



## NATION

Thursday, 03 Mar 2022

11:18 AM MYT

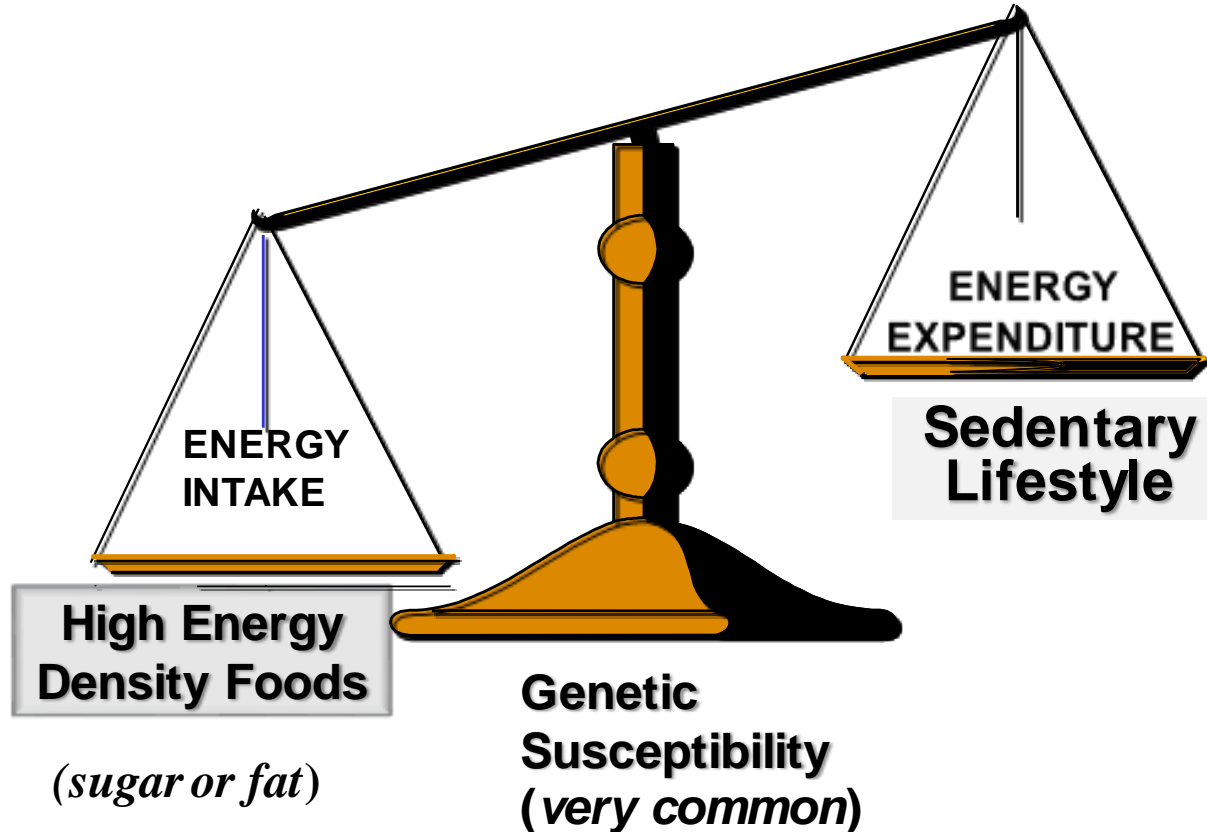
KUALA LUMPUR: Half of Malaysian adults are either overweight or obese, with obesity rates increasing every year, says the Health Ministry.

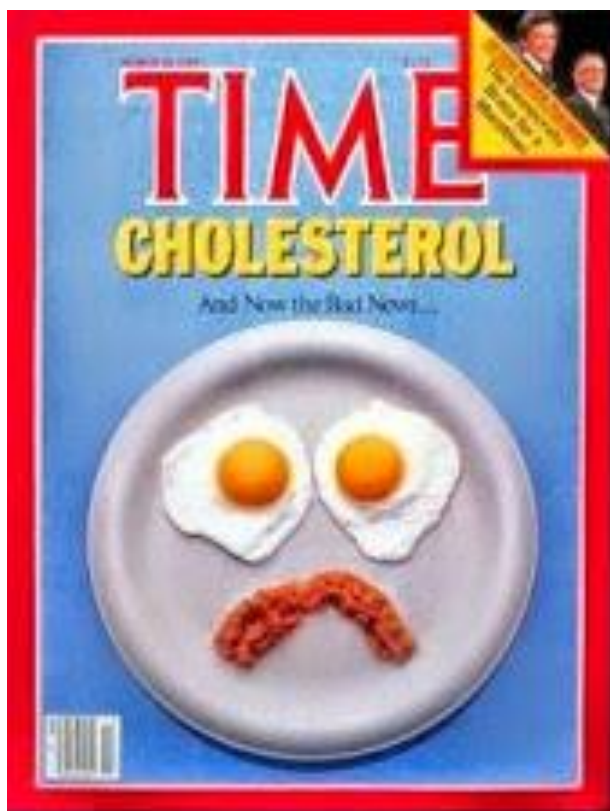
Out of 50.1% of Malaysian adults, 30.4% were overweight and 19.7% were obese according to the National Health and Morbidity Survey (NHMS) 2019.

Obesity rates are also rising each year, as this stood at 17.7% in 2015, 15.1% in 2011, and 14% in 2006 according to the NHMS studies held in those years, said the ministry.

The next NHMS will be held in 2024.

# Etiology of Obesity



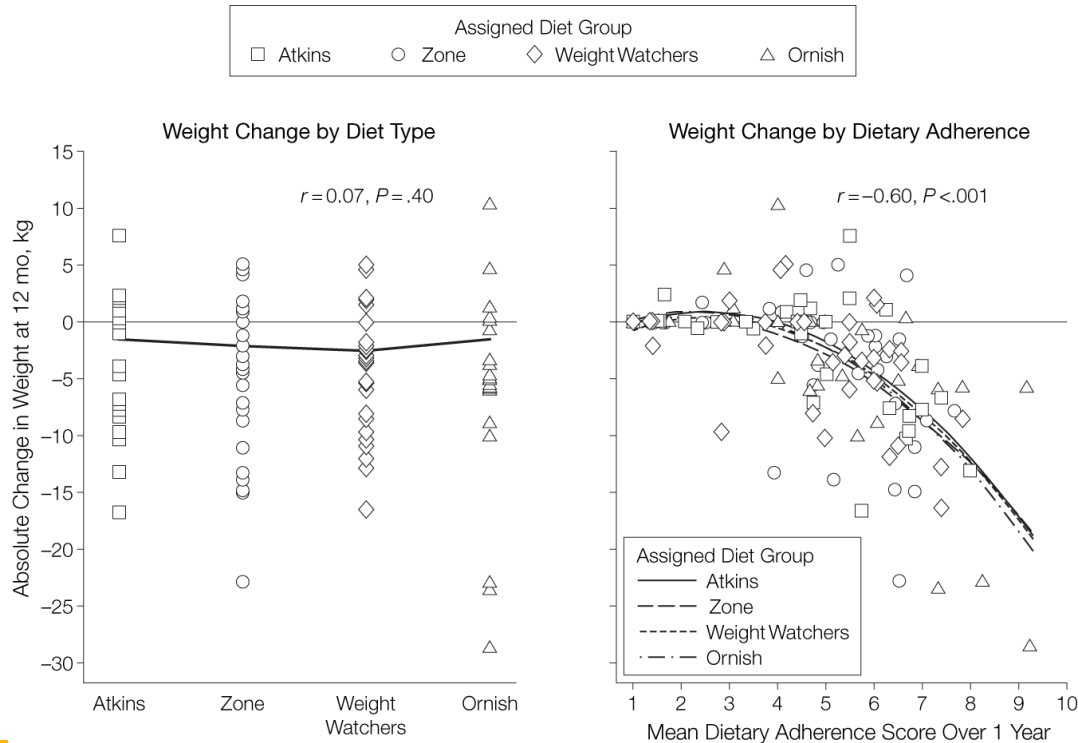


1984



2014

# What diet is the best?



JAMA. 2005 Jan 5;293(1):43-53.

# We are 99.9% the same as the person next to us

The genetic similarity  
between a human  
and a human is:

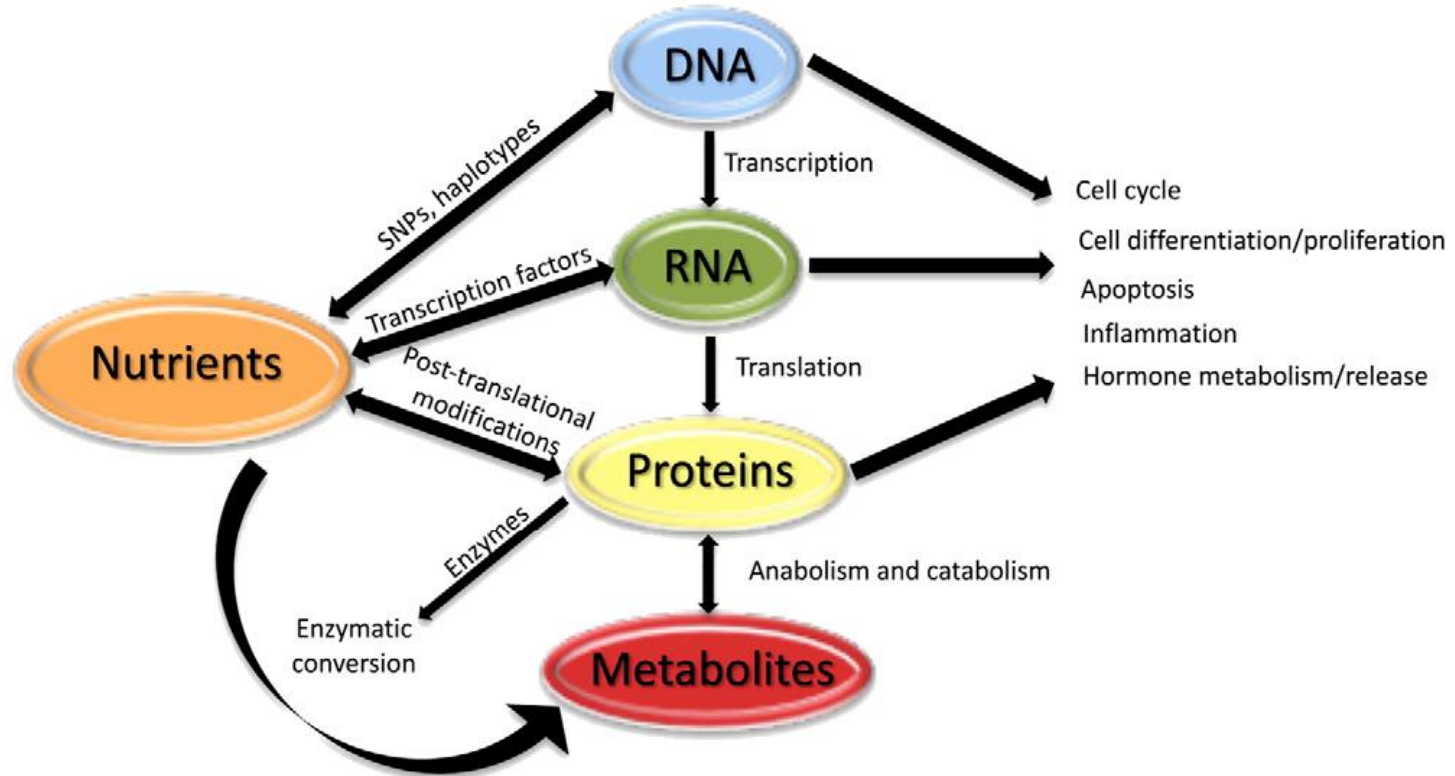
**99.9%**

Source: National Human Genome Research Institute

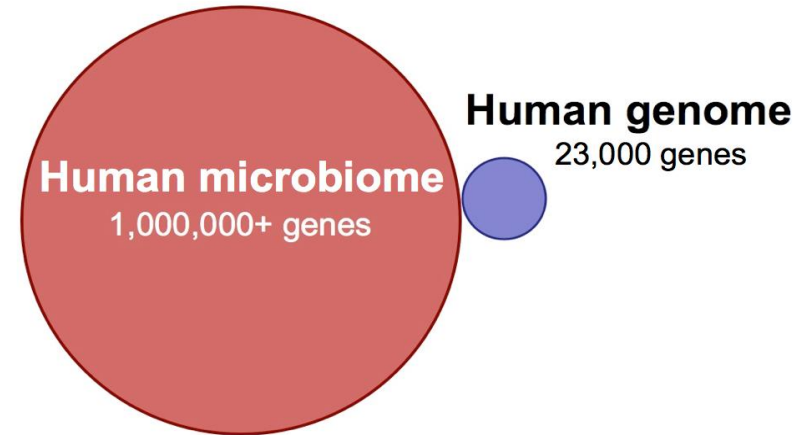
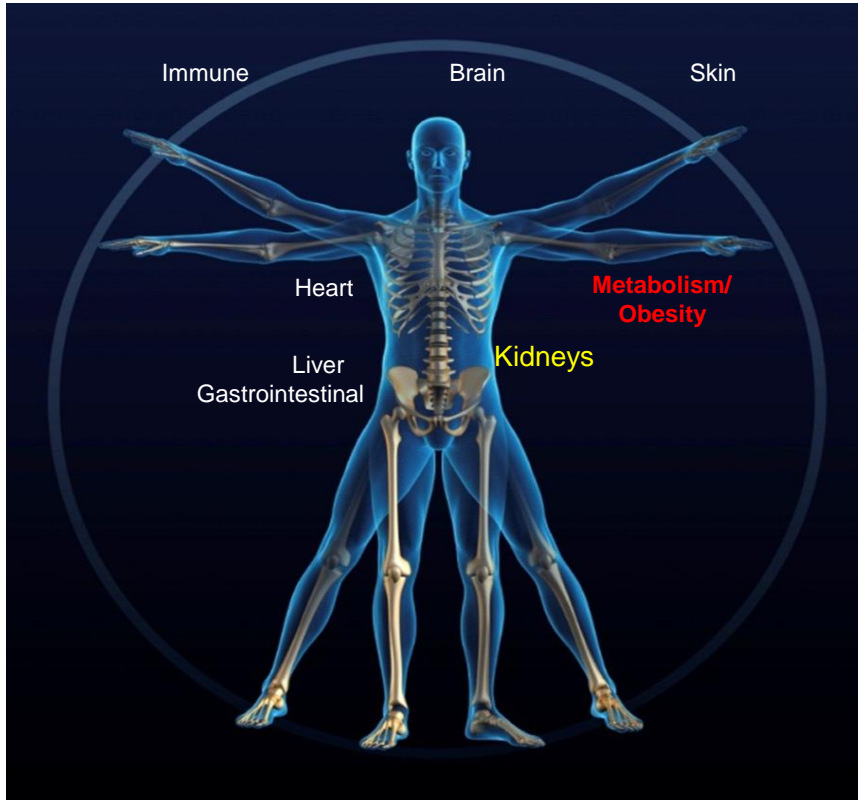


BUSINESS INSIDER

# From DNA to Individual Phenotype



# Your Microbiota Affects All Systems Of Your Body!



# We are all different

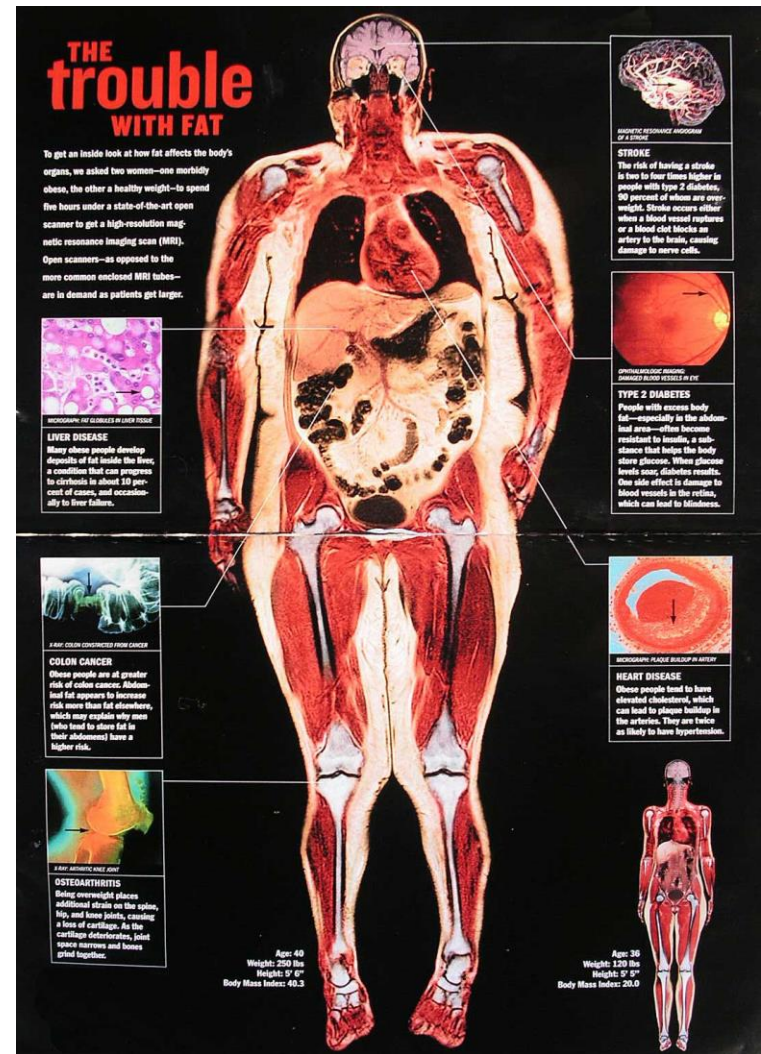


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# The Trouble With Fat

- Physiological fat depot
- Excess quantity
- Ectopic fat depot
- Fat/lean body mass ratio





# NIH Awards \$170 Million for Precision Nutrition Study



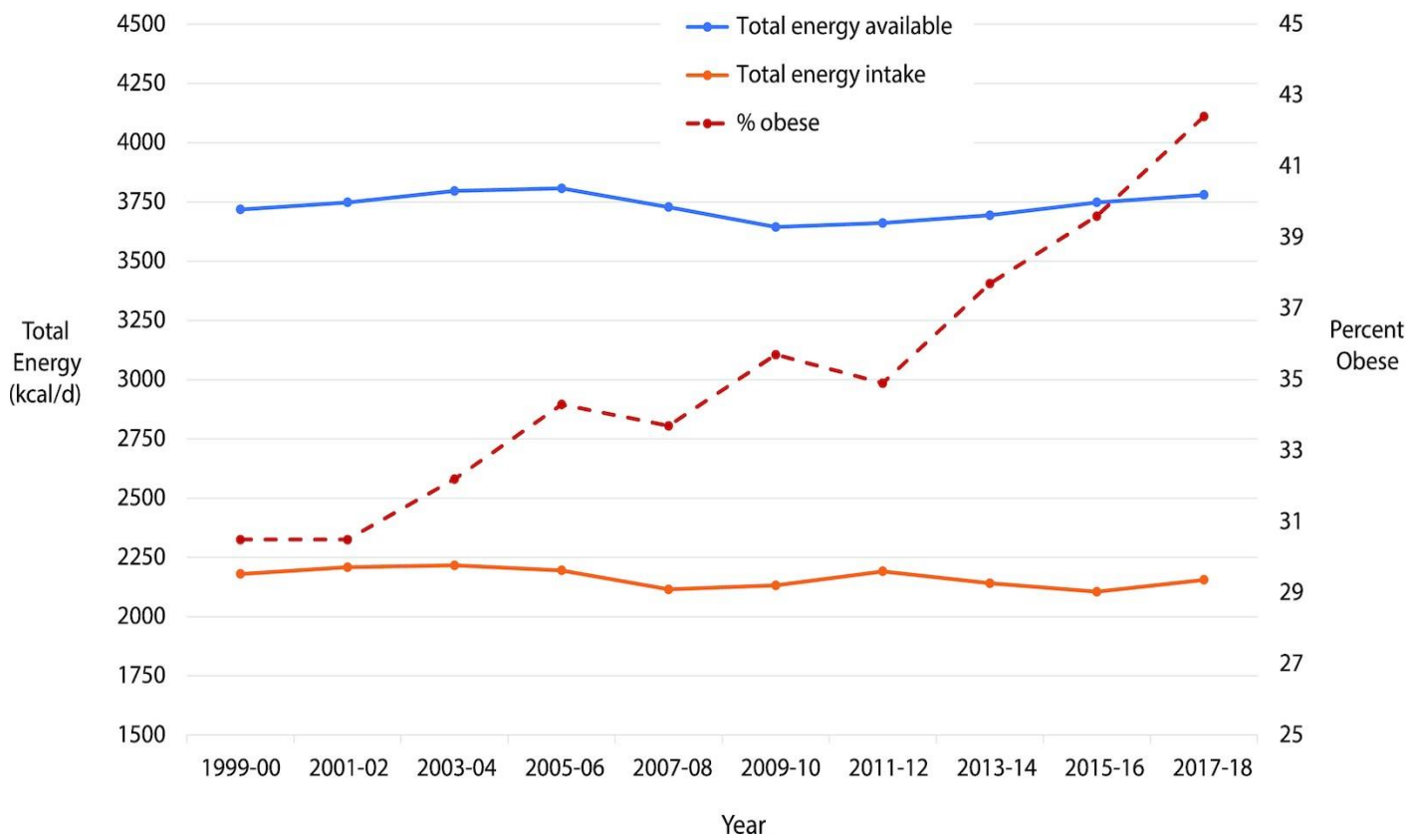
National Institutes of Health  
*Office of Strategic Coordination – The Common Fund*



**Nutrition  
for Precision  
Health**

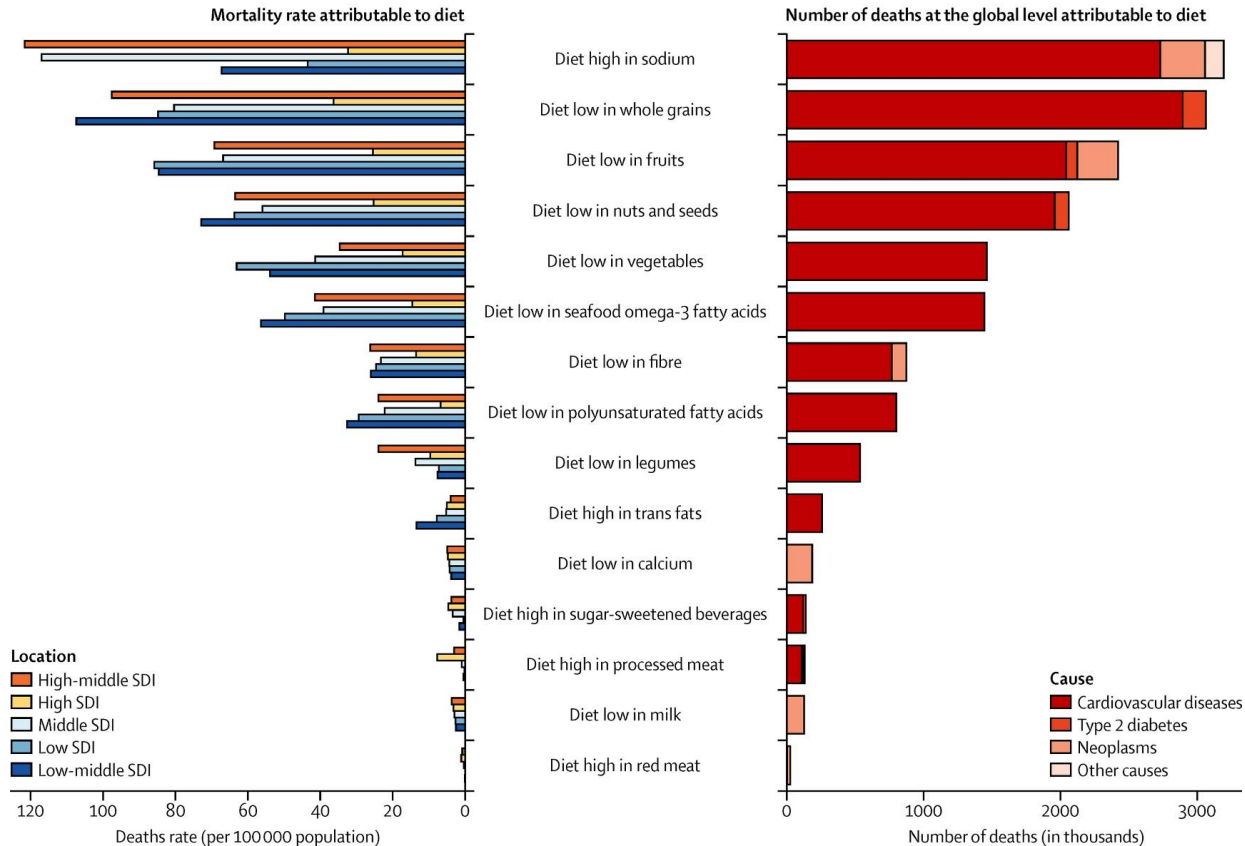
**All of Us**  
RESEARCH PROGRAM

# Total energy consumed, total energy available, and prevalence of obesity among US adults



# The Lancet:

## Globally, 1 in 5 deaths are associated with poor diet



Number of deaths and DALYs and age-standardised mortality rate and DALY rate (per 100 000 population) attributable to individual dietary risks at the global and SDI level in 2017

DALY=disability-adjusted life-year.

SDI=Socio-demographic Index.

**What is the Difference?**



# Carbohydrate Sources

Sugar sweetened beverages



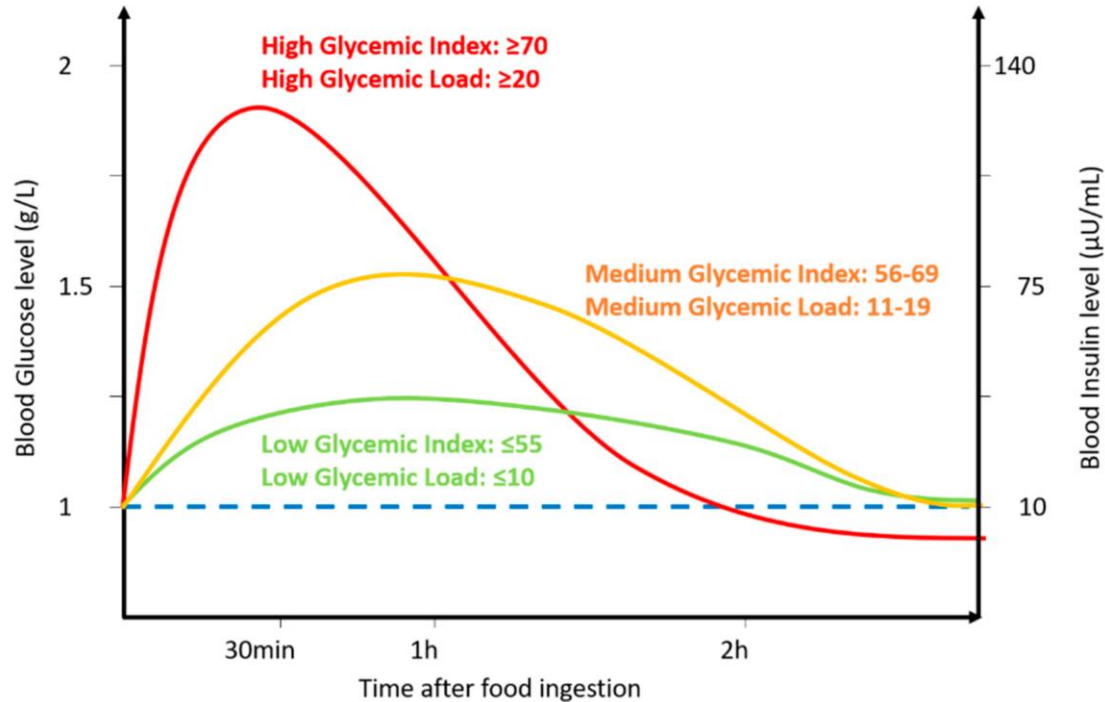
Whole Grains



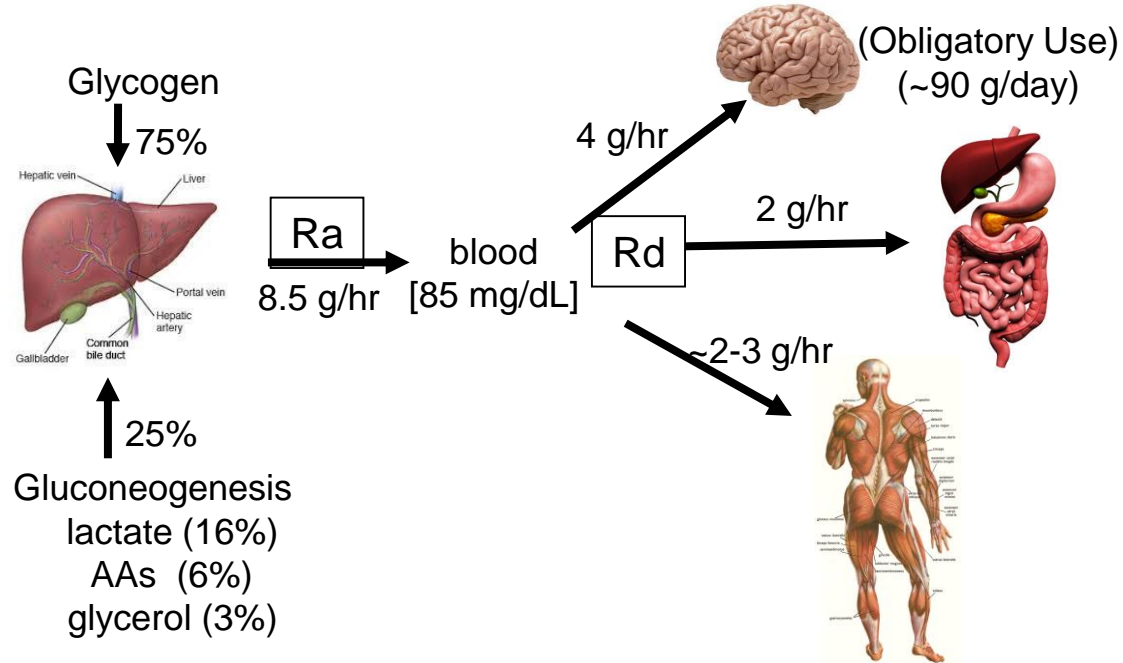
Vegetable



# Glycemic Index and Glycemic Load



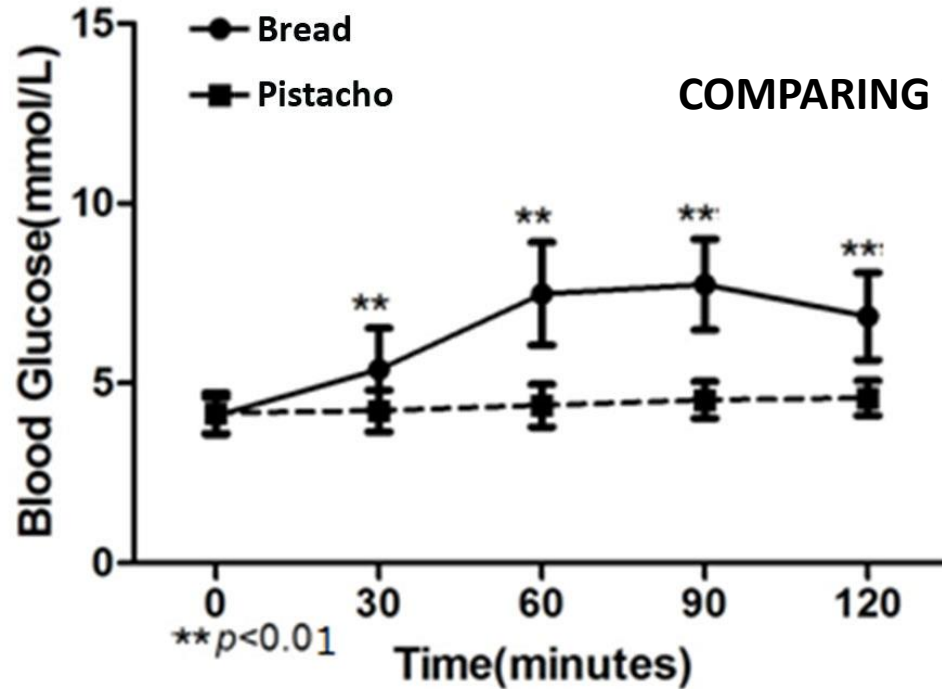
# Fasting Glucose Homeostasis



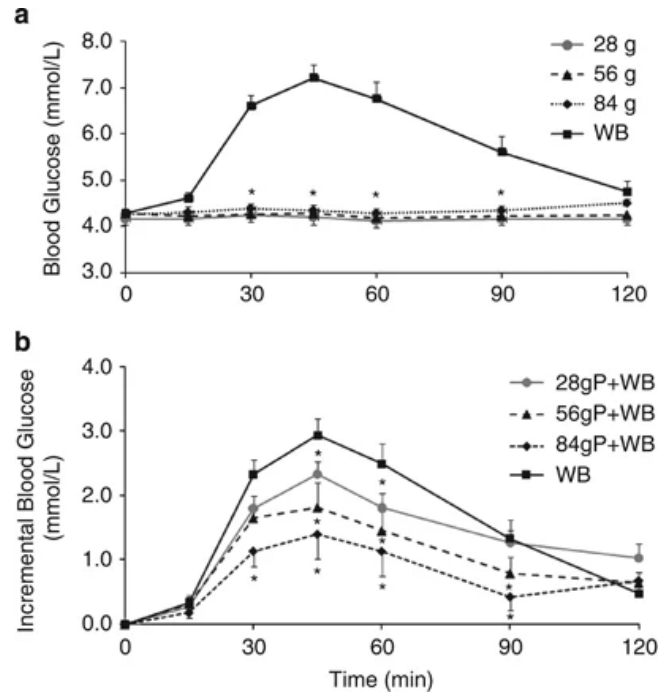
# Portion controlled Whole Grains!!!



# Blood Glucose Response



# Pistachio intake on post-prandial glycemia



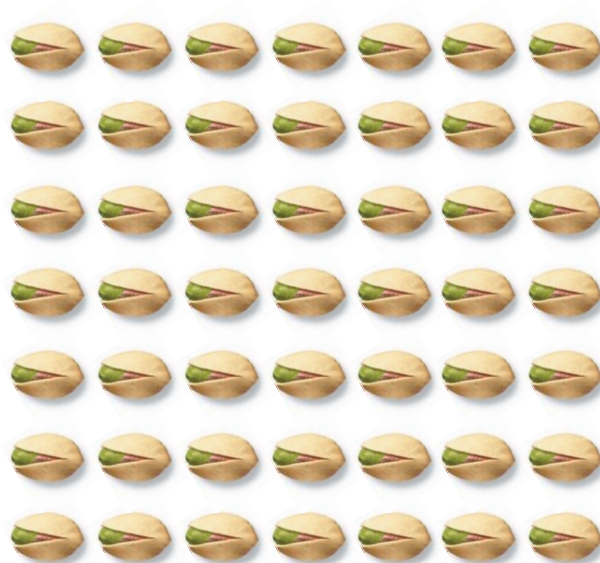
European Journal of Clinical Nutrition volume 65, pages696–702 (2011)

# All calories and fats not equal for weight loss



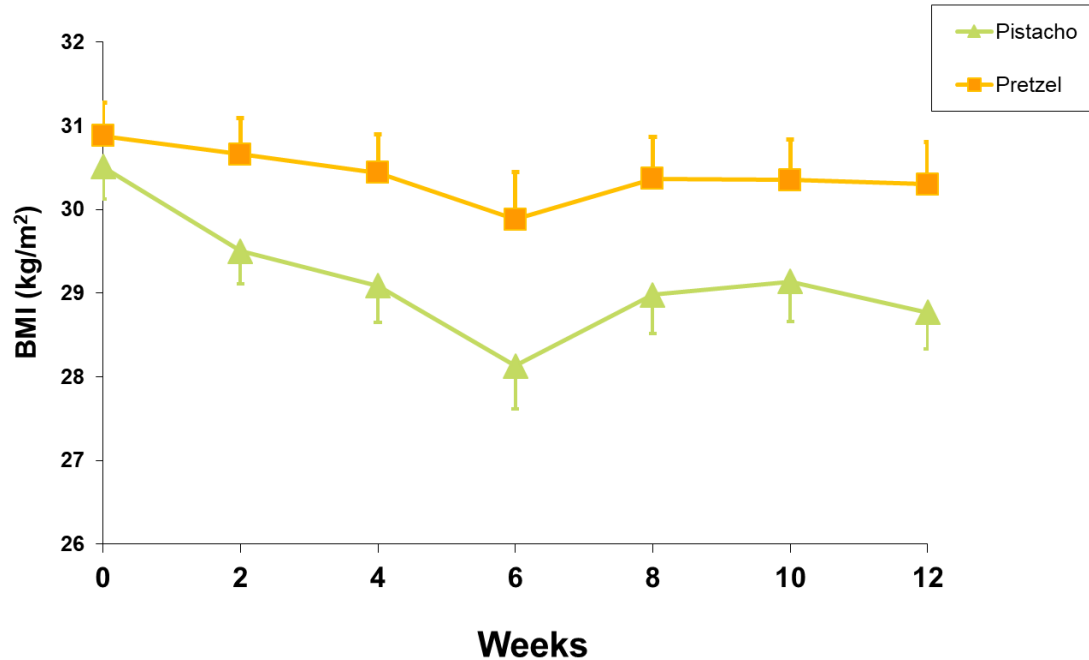
half a pretzel

=



49 pistachios

# Enhance weight loss with pistachio

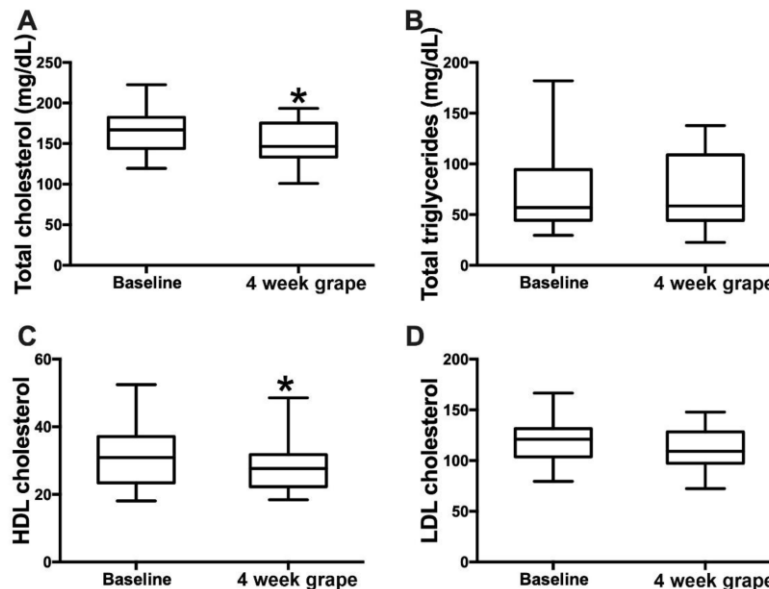


Journal of the American College of Nutrition 2010;29(3):198-203. doi: 10.1080/07315724

# Grape Consumption on Cholesterol



1 ½ cups of grapes  
~180 calories

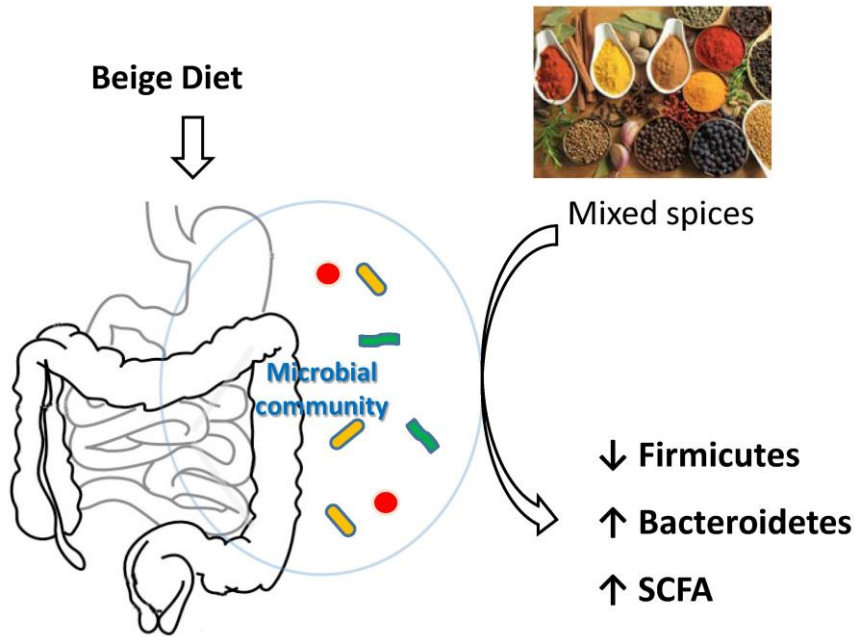


Nutrients 2021, 13(11), 3965; <https://doi.org/10.3390/nu13113965>

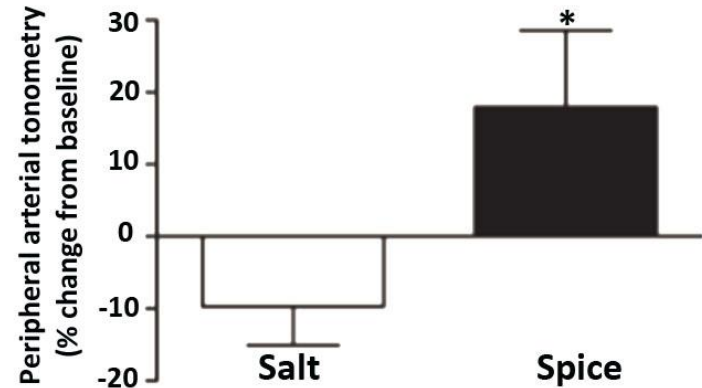
# Spices & Herbs That Strengthen Your Immune System



# Spice for Healthy Life



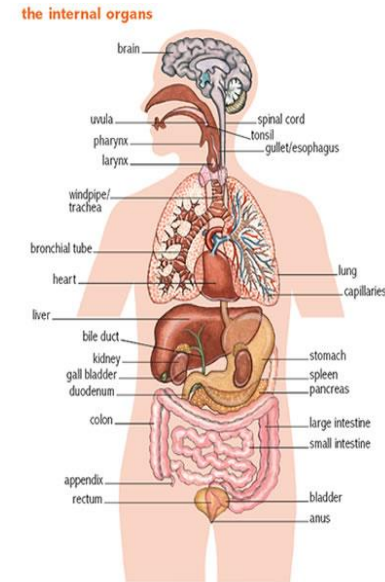
Nutrients, 2019 May 19;11(6):1425



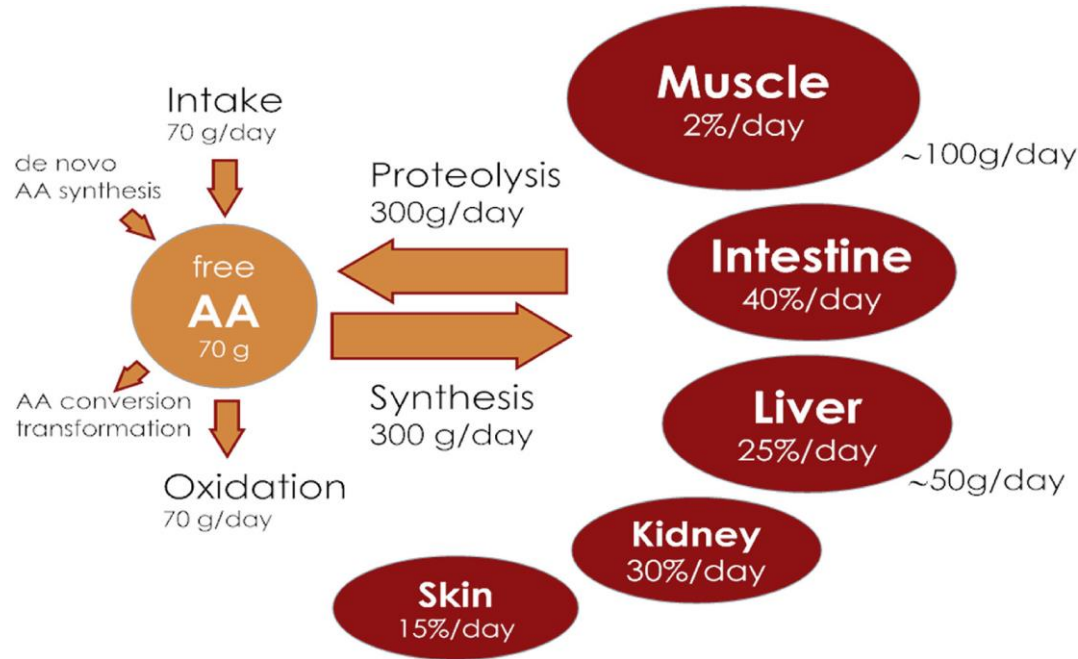
Diabetic Medicine, 2013 May;30(5):590-595

# Protein

- Essential to improve immune system
- Diverse metabolic roles:
  - Leucine – mTOR (protein synthesis)
  - Arginine – nitric oxide (blood flow)
  - Cysteine – glutathione (antioxidant)
  - Lysine – carnitine (fatty acid oxidation)
  - Arginine – creatine (muscle ATP)
  - Methionine – 1-carbon metabolism (DNA & RNA)

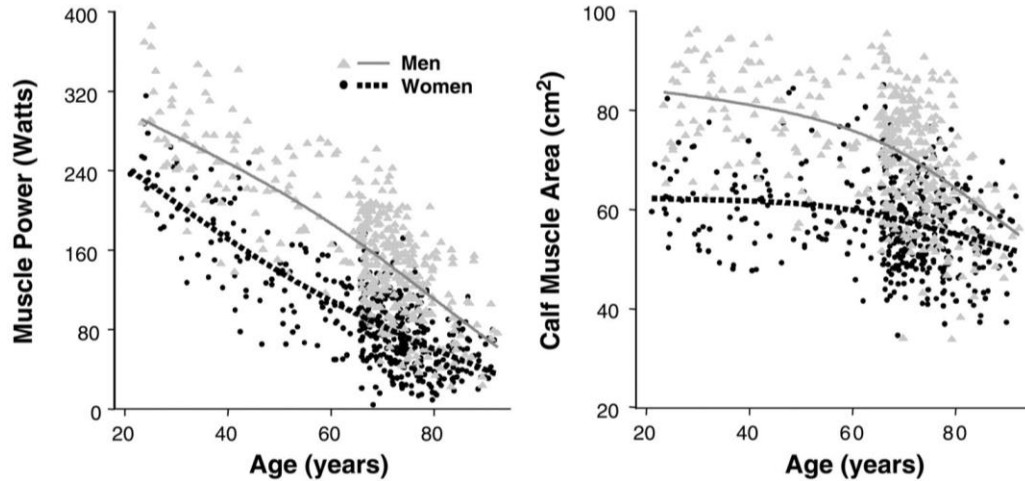


# Protein Turnover and Body Protein



# Sarcopenia

- Loss of muscle mass with aging

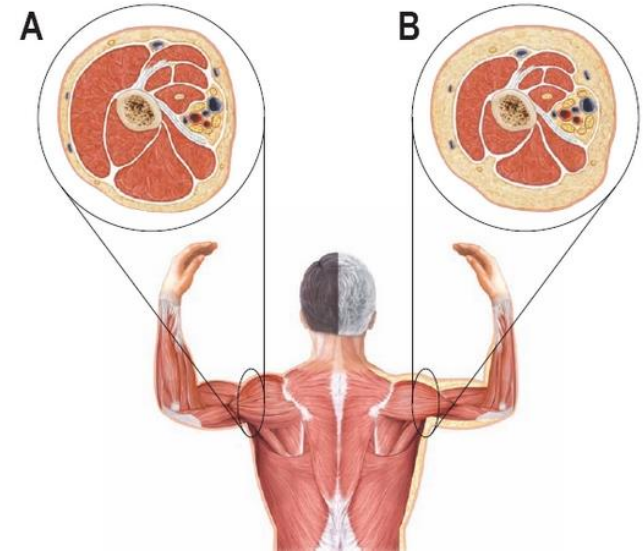
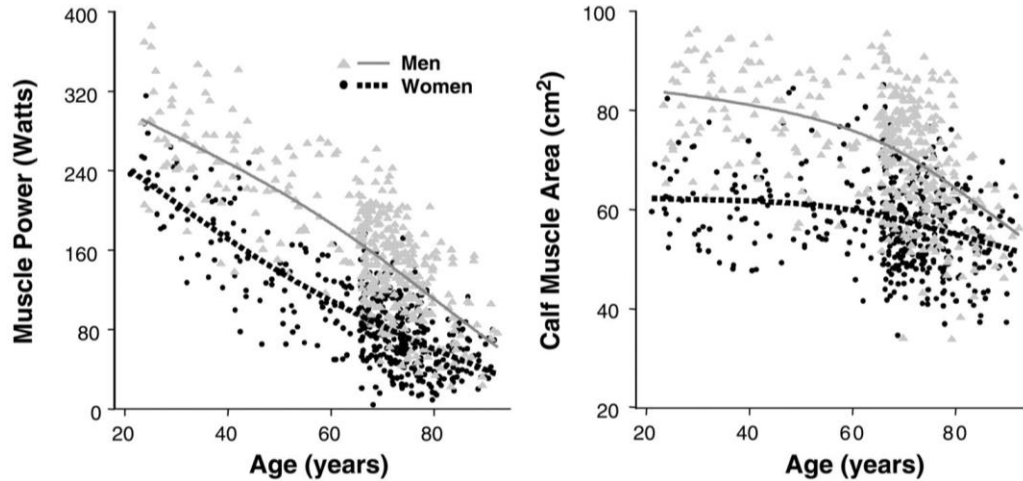


- Muscle mass: up to 1% per year
- Muscle strength: up to 3% per year

J Appl Physiol (1985). 2003;95(5).

# Sarcopenia Obesity

- Sarcopenia + increased body fat



# The changing view of protein needs

Aging reduces efficiency of protein utilization

“Anabolic Resistance”

*Muscle-centric Protein Needs*

Muscle-centric health requires protein intake of 1.2 to 1.7 g/kg

# Protein Biological Value

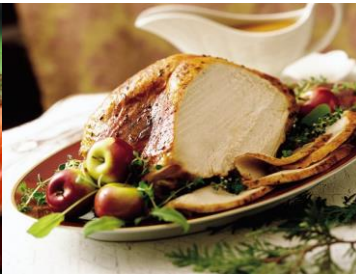
Muscle-centric health requires protein intake of 1.2 to 1.7 g/kg



Chicken



Fish



Turkey



Egg



Protein Powder



Soy



Chickpea



Quinoa

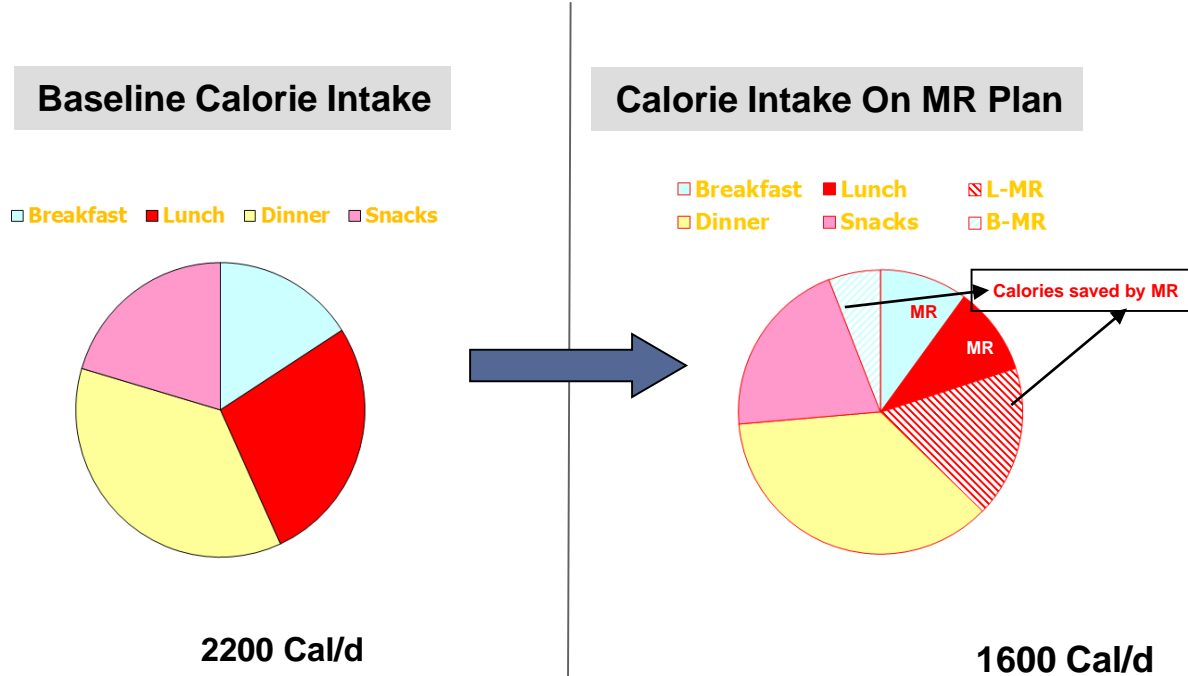


Pistachio



Plant Protein Mix

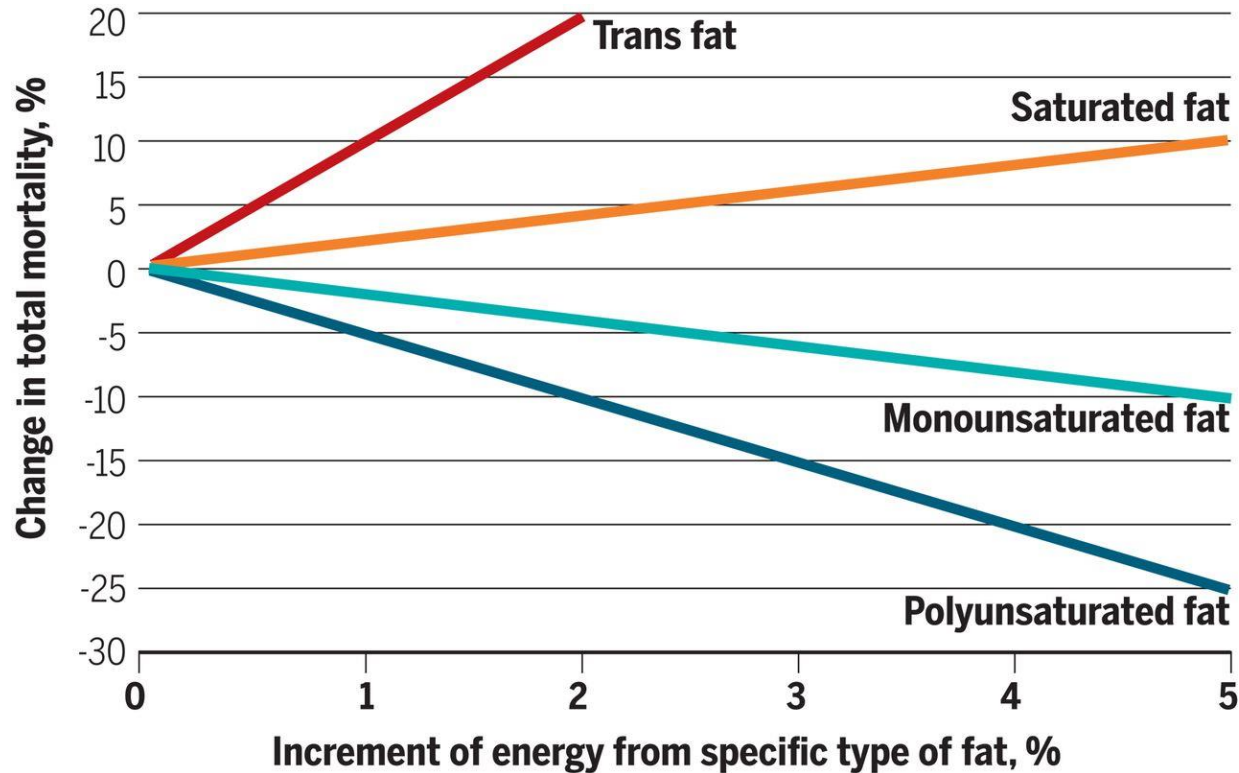
# Protein meal replacement



# Leucine Content Of Food Proteins And Calories Required To Stimulate Meal Threshold Response (2.5 g Leu/meal)

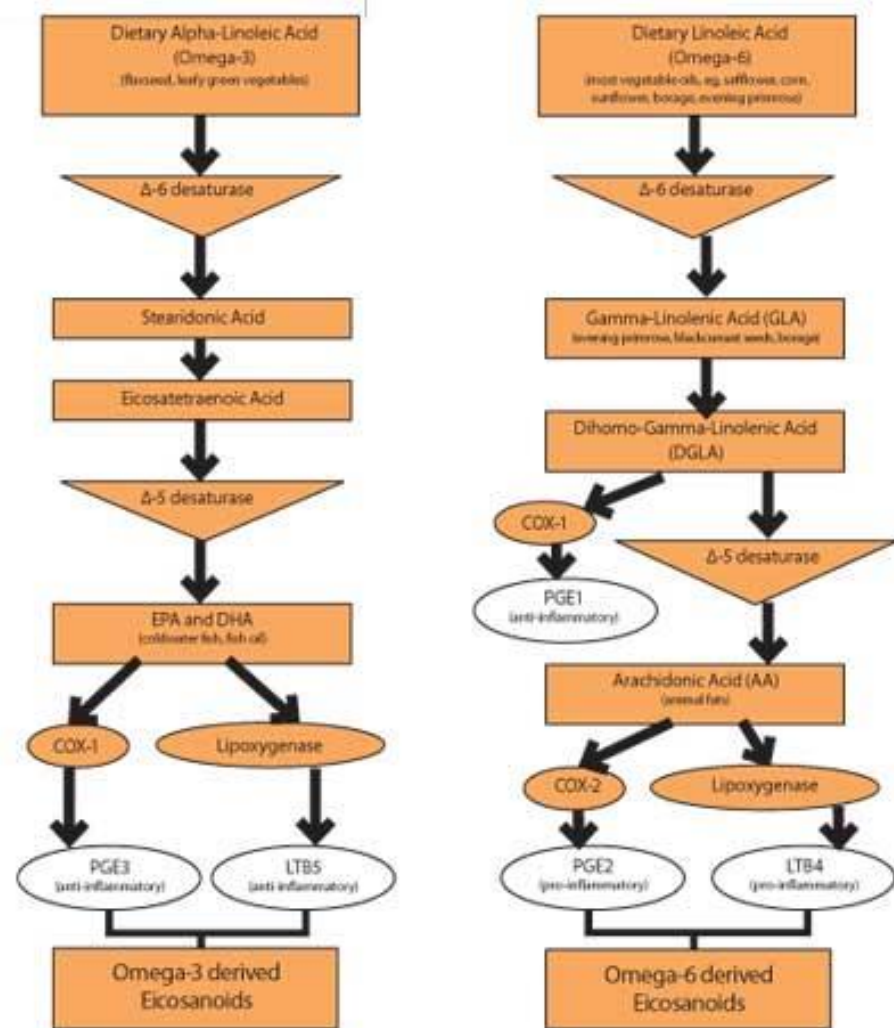
	Leu content (%, w/w)	Protein required (g/meal)	<u>g protein</u> 100 kcal	kcal consumed
whey	11.0	23	18.0	128
milk	9.5	26	9.6	270
beef	9.0	28	16.7	168
soy	7.8	32	8.6	372
chickpea	7.1	36	5.4	670
wheat	6.8	37	3.5	1,057
quinoa	6.0	42	3.7	1,135

## Intakes of Fats in Relation to Total Mortality (in comparison to isocaloric carbs)

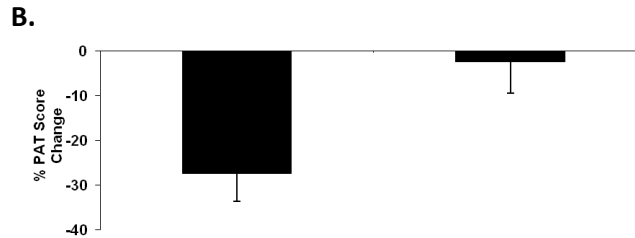
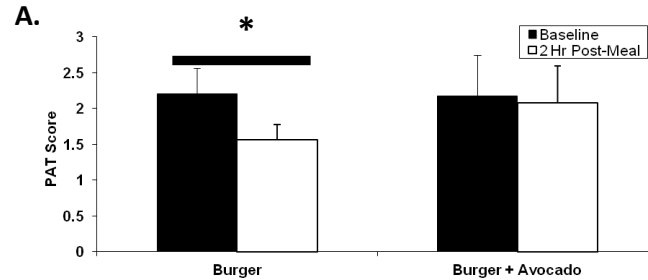


# Ratio of Omega 3 and 6

- Paleolithic Man 2:1
- Current American 15:1 to 30:1
- WHO recommendation 5:1 to 10:1



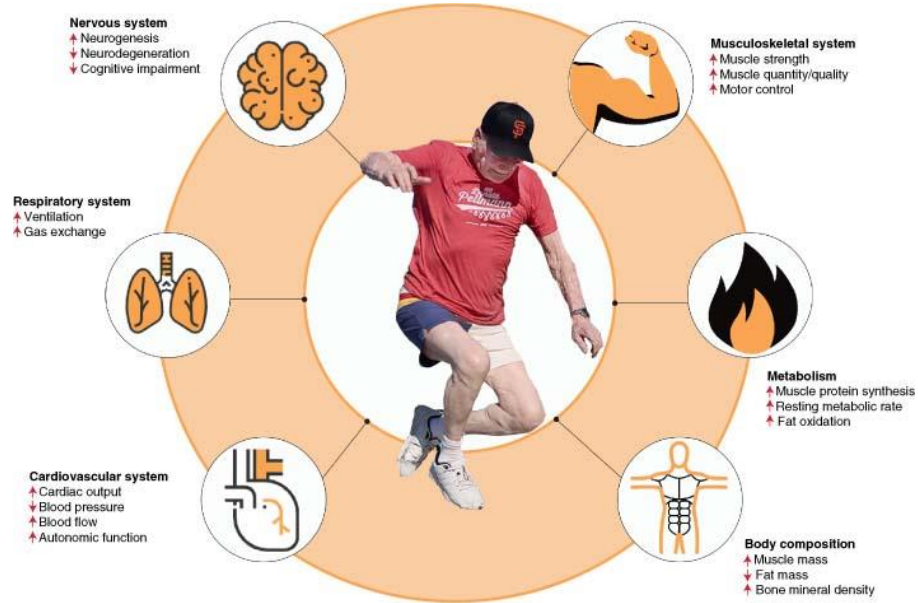
# Avocado Attenuates Postprandial Burger Induced Vasoconstriction



# Healthy Meals

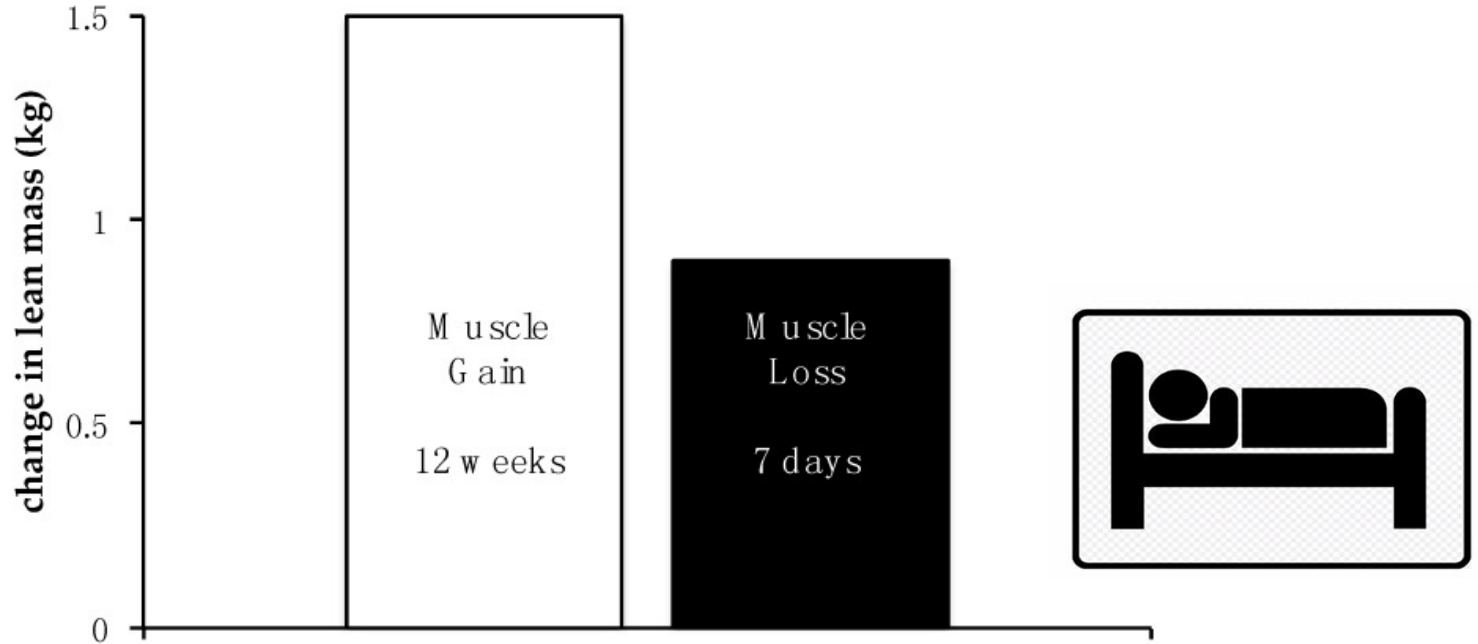
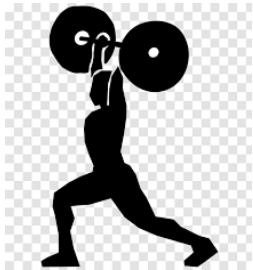


# Physical Exercise is Essential



Major Reference Works, Pages: 1281-1304, First published: 19 September 2019, DOI: (10.1002/cphy.c190002)

# Inactivity -> Anabolic Resistance



Only in Los Angeles, CA



# Stress eating



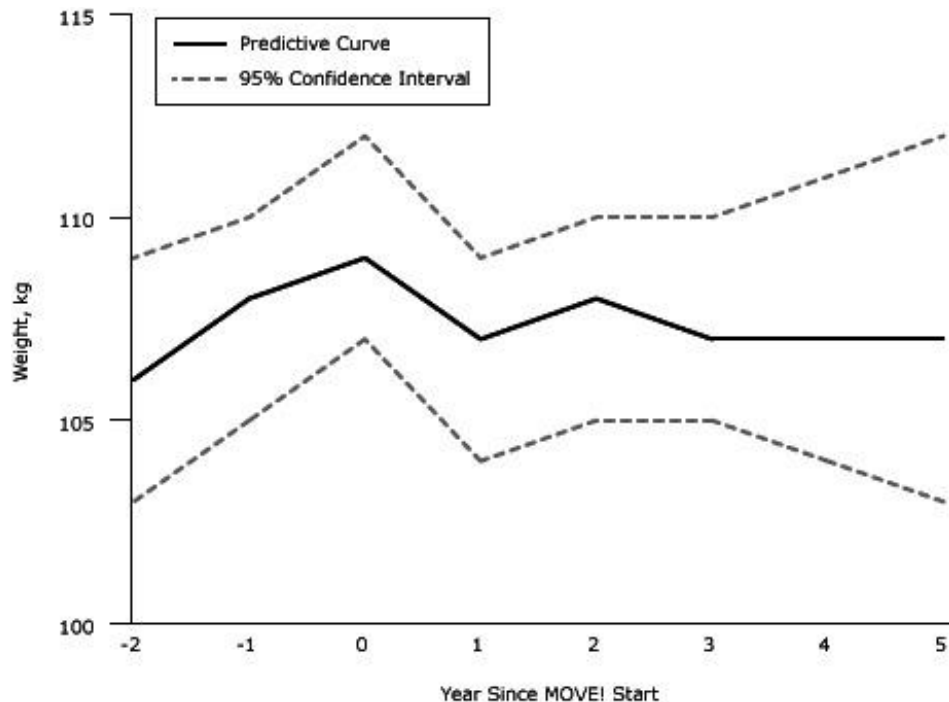
# Everything is around foods



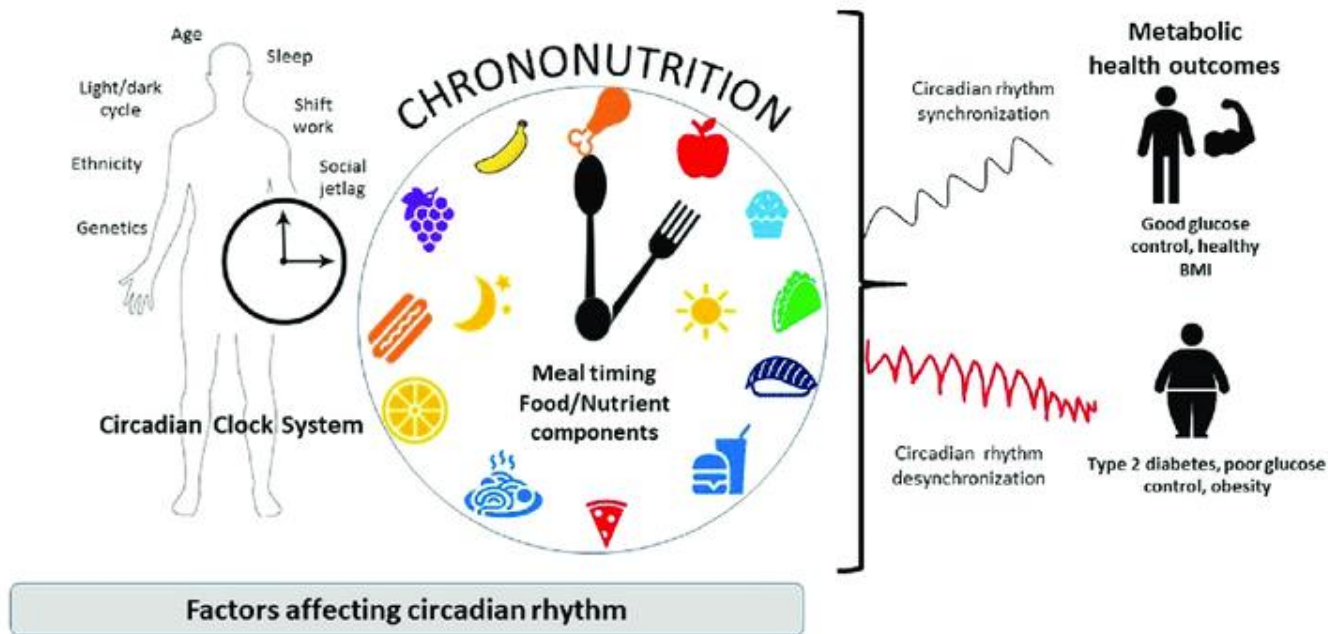
# MOVE! Multidisciplinary Weight Loss Program in Veterans

- MOVE! Consisted of 2 hour nutrition class, 8 weekly interdisciplinary meetings with physicians, dietitians, physical/recreational therapists, and psychologists
- Changes were made in nutrition, physical activity, and healthy behavior
- Veterans went from gaining 1.4 kg/yr to losing 2.2 kg/yr

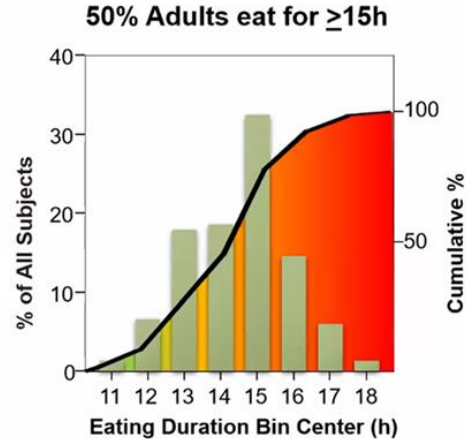
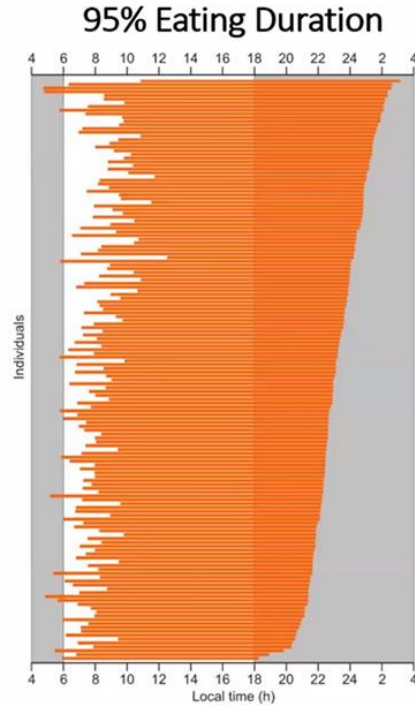
Prev Chronic Dis. 2013



# Chrononutrition



# Eating Patterns and Eating Windows among Adults



*Gill and Panda, Cell Metabolism 2015*



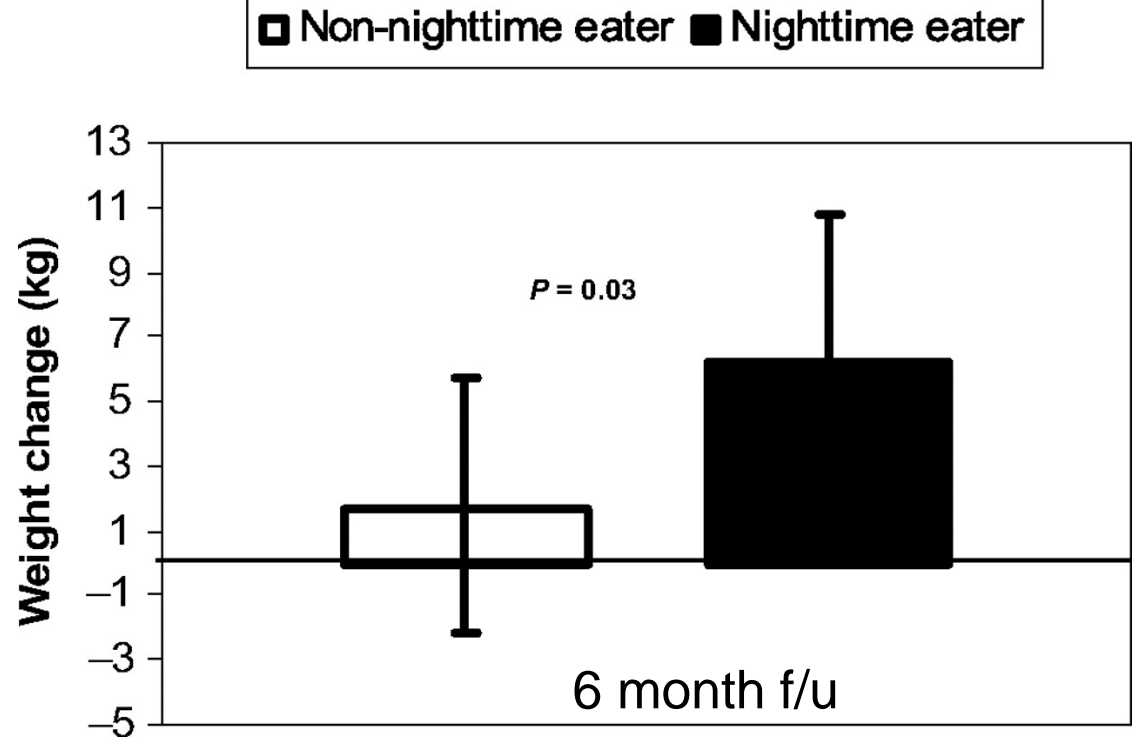
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# Weight gain in nighttime eaters was greater than non-nighttime eaters



3 day stay at metabolic ward



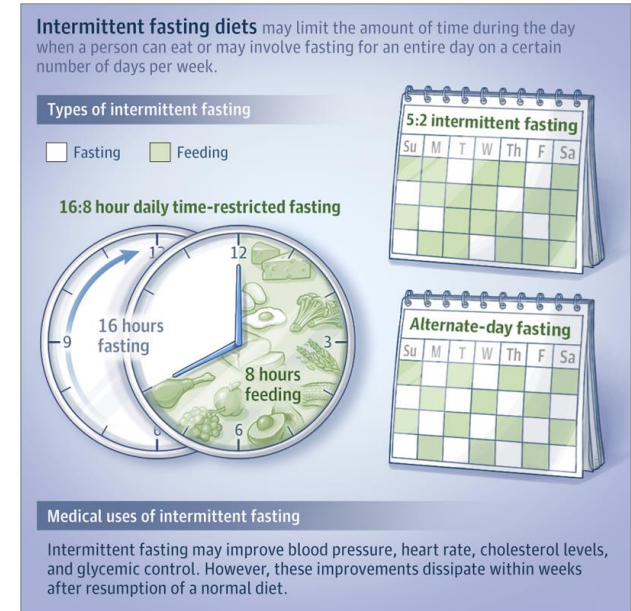
# Intermittent Fasting: Strong Behavior Tool

## Scheduled Eating

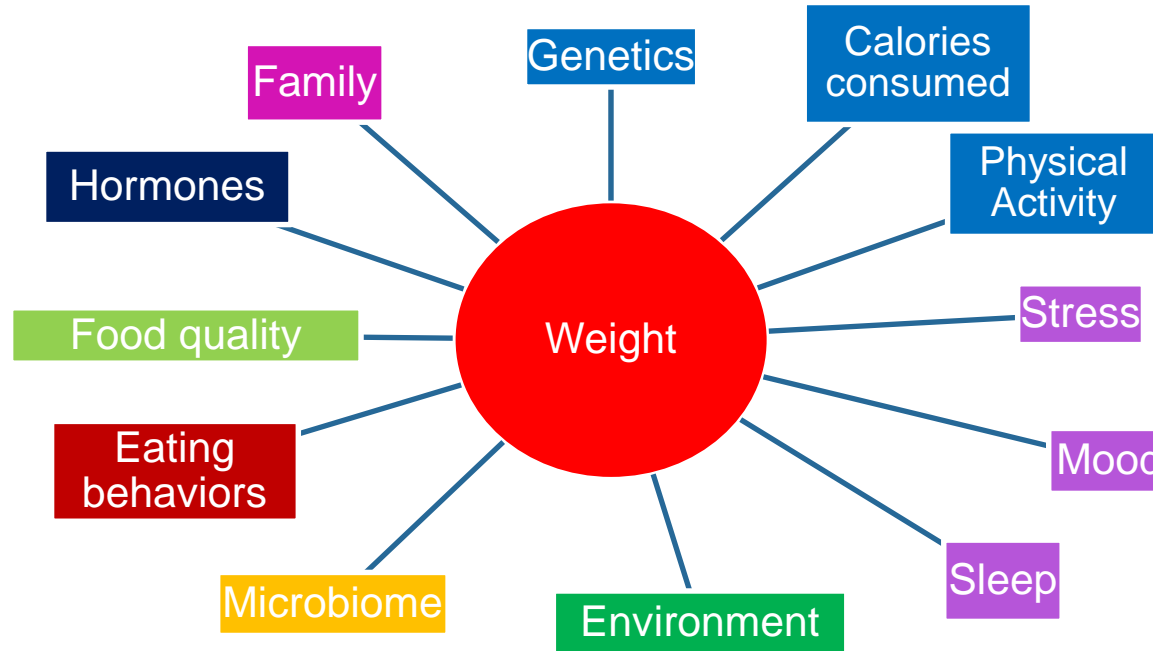
- Time restricted eating
- Alternate day fasting
- 5:2 intermittent fasting

Focus is on when and how often you eat (meal frequency), not on what you eat.

JAMA. 2021;326(13):1338. doi:10.1001/jama.2020.15140



# Weight Gain is a Symptom



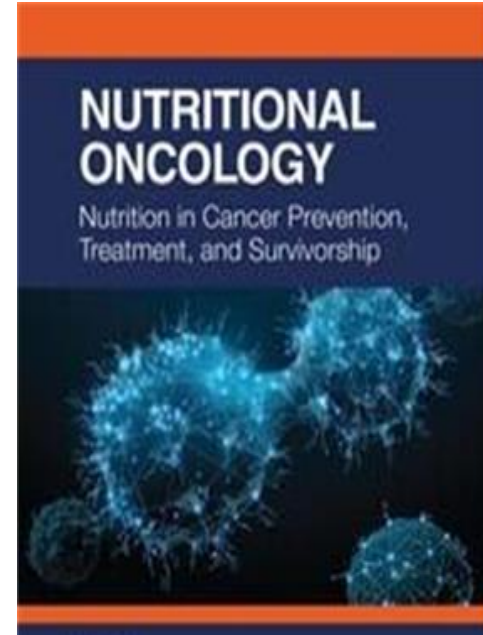
# Personalized Nutrition in Primary Care 2022

## Nutrition in Cancer Prevention, Treatment & Survivorship

UCLA CME Oct 22, 2022

Live and Online

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