



# Dietary Approaches to Obesity Management

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Chika V. Anekwe, MD, MPH is board-certified in General Preventive Medicine and Public Health as well as Obesity Medicine. She is also certified by the National Board of Physician Nutrition Specialists. Dr. Anekwe is the Obesity Medicine Clinical Director at the Massachusetts General Hospital Weight Center in Boston, Massachusetts. Her professional interests are in the areas of clinical nutrition, obesity, nonsurgical weight management, pre- and post-operative bariatric weight management, health policy, and community health outreach, with a special interest in underserved communities. She has authored numerous manuscripts, book chapters and blog posts on the topics of obesity and weight management.

# Disclosures

- None

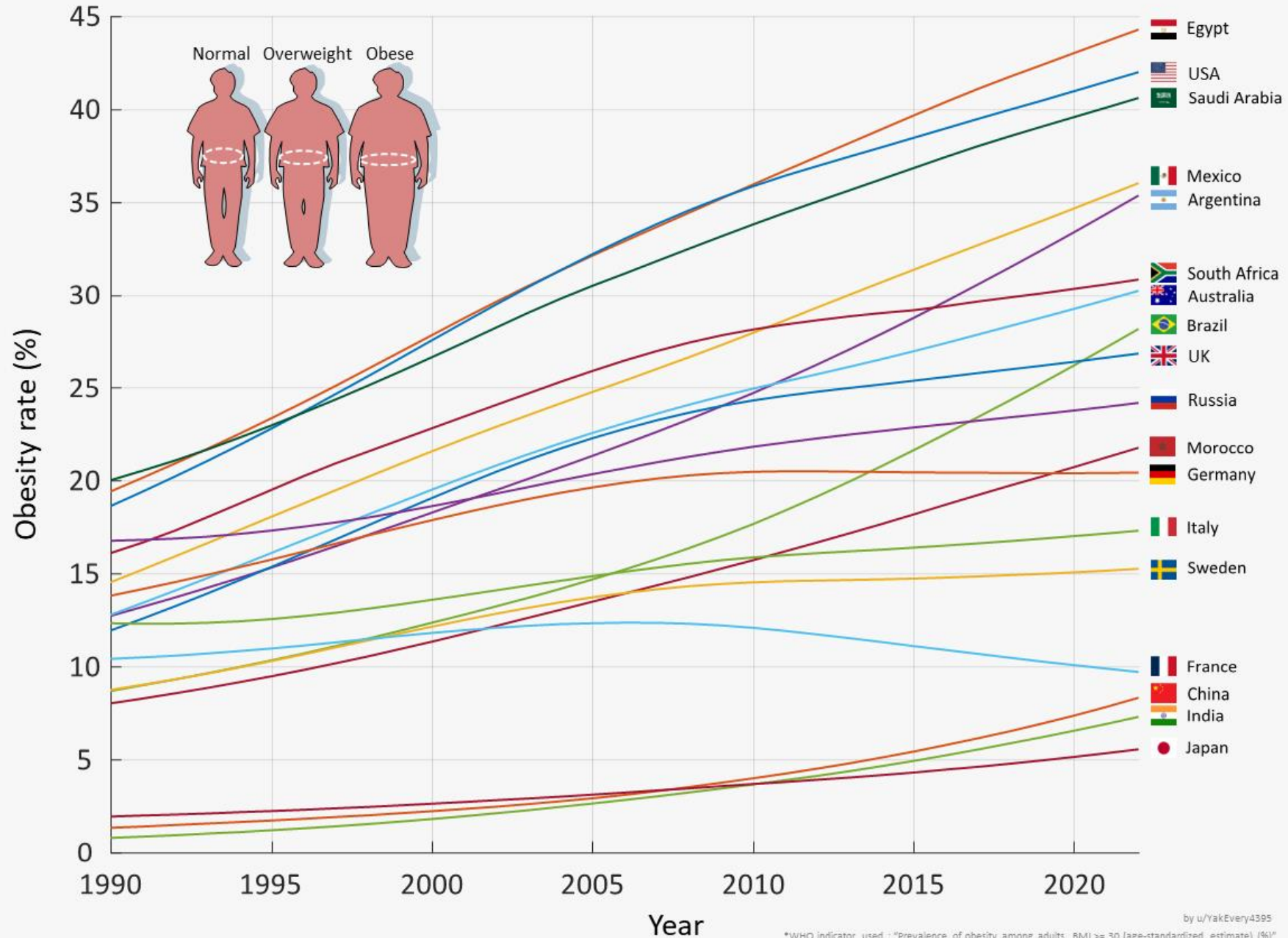
# Objectives

- Recognize dietary intake as a key lifestyle component for treating obesity
- Become familiar with the scope of dietary strategies for treating obesity
- Review approaches for targeting barriers to dietary change in patients with obesity



# Obesity rate by country

(BMI  $\geq 30$ , data source: WHO\*)



by u/YakEvery4395

\*WHO indicator used : "Prevalence of obesity among adults, BMI  $\geq 30$  (age-standardized estimate) (%)"

# Obesity in the US

Figure 4. Trends in age-adjusted obesity and severe obesity prevalence among adults aged 20 and over: United States, 1999–2000 through 2017–2018

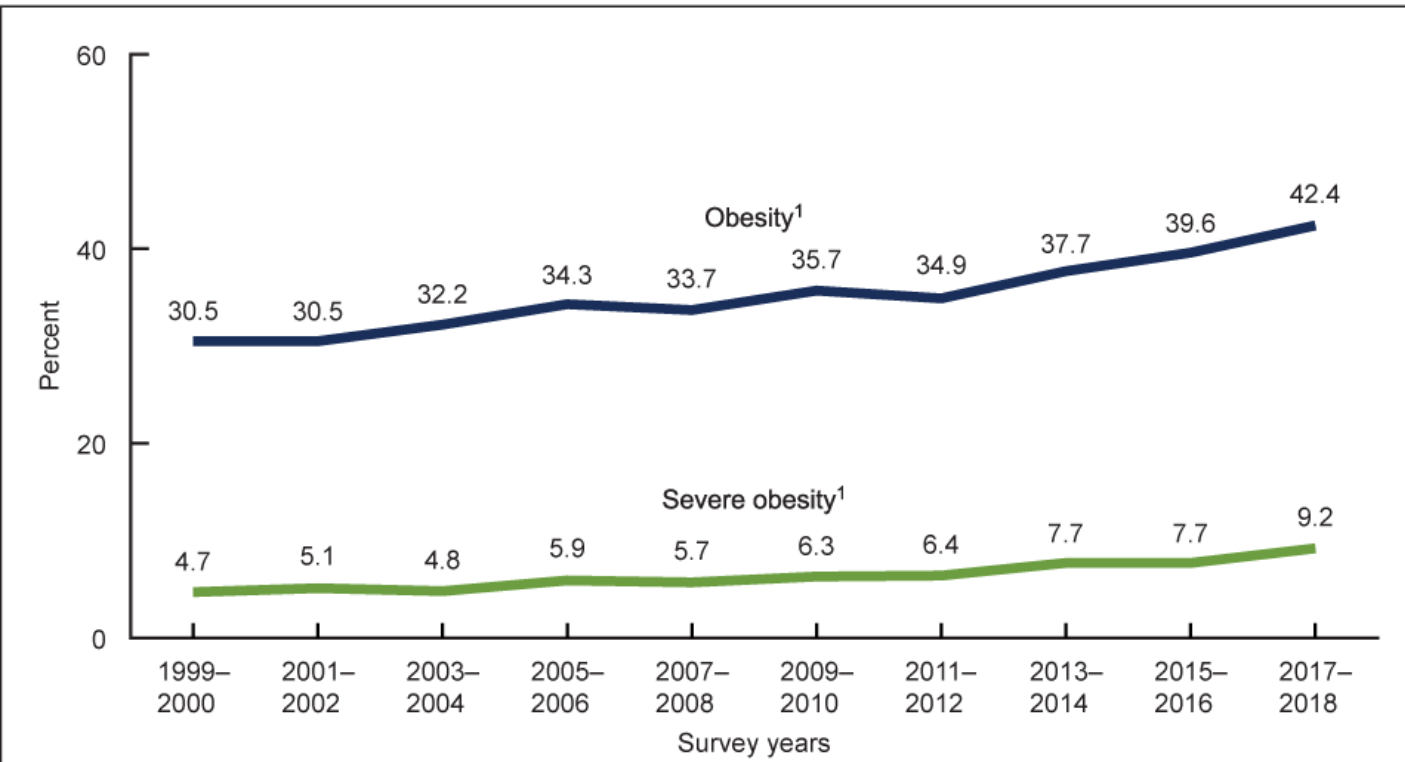
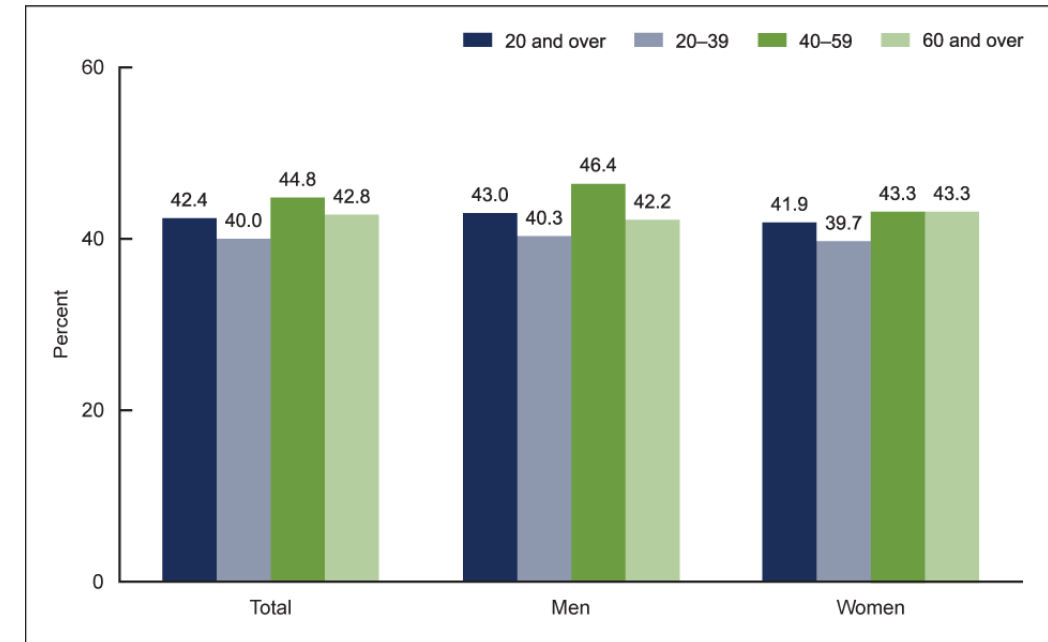


Figure 1. Prevalence of obesity among adults aged 20 and over, by sex and age: United States, 2017–2018

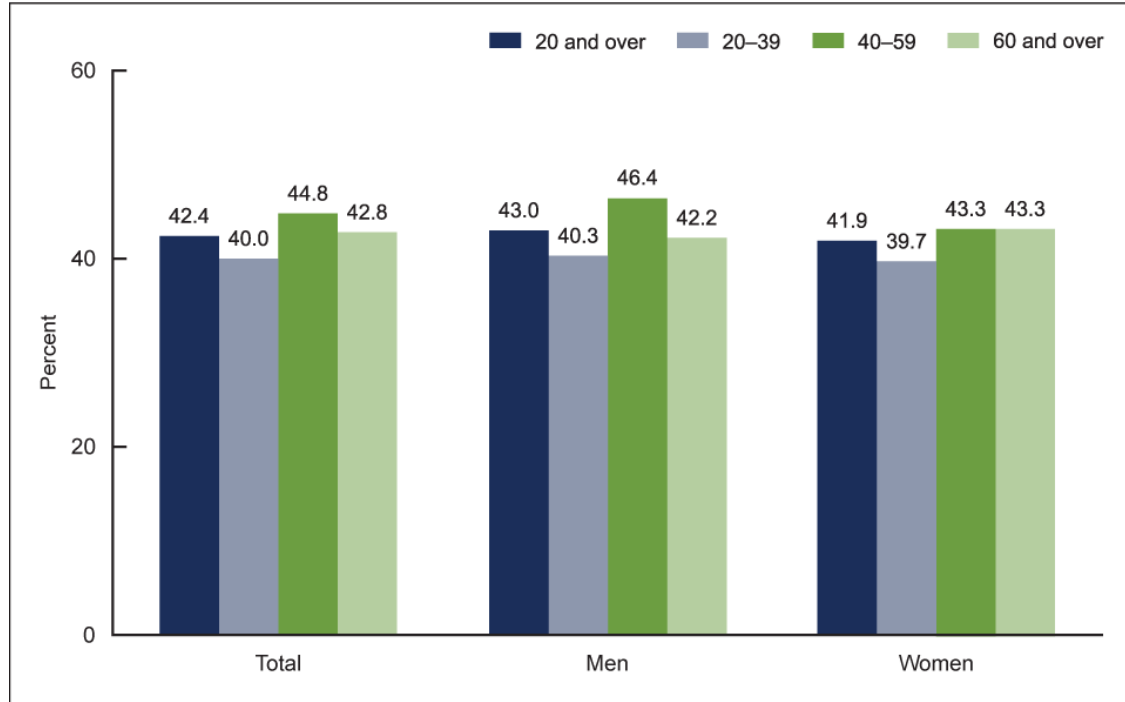


NOTES: Estimates for adults aged 20 and over were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over. Crude estimates are 42.5% for total, 43.0% for men, and 42.1% for women. Access data table for Figure 1 at: [https://www.cdc.gov/nchs/data/databriefs/db360\\_tables-508.pdf#1](https://www.cdc.gov/nchs/data/databriefs/db360_tables-508.pdf#1).  
SOURCE: NCHS, National Health and Nutrition Examination Survey, 2017–2018.

NHANES Survey 2017-2018

# Obesity rate in U.S. adults no longer growing, new CDC data suggests

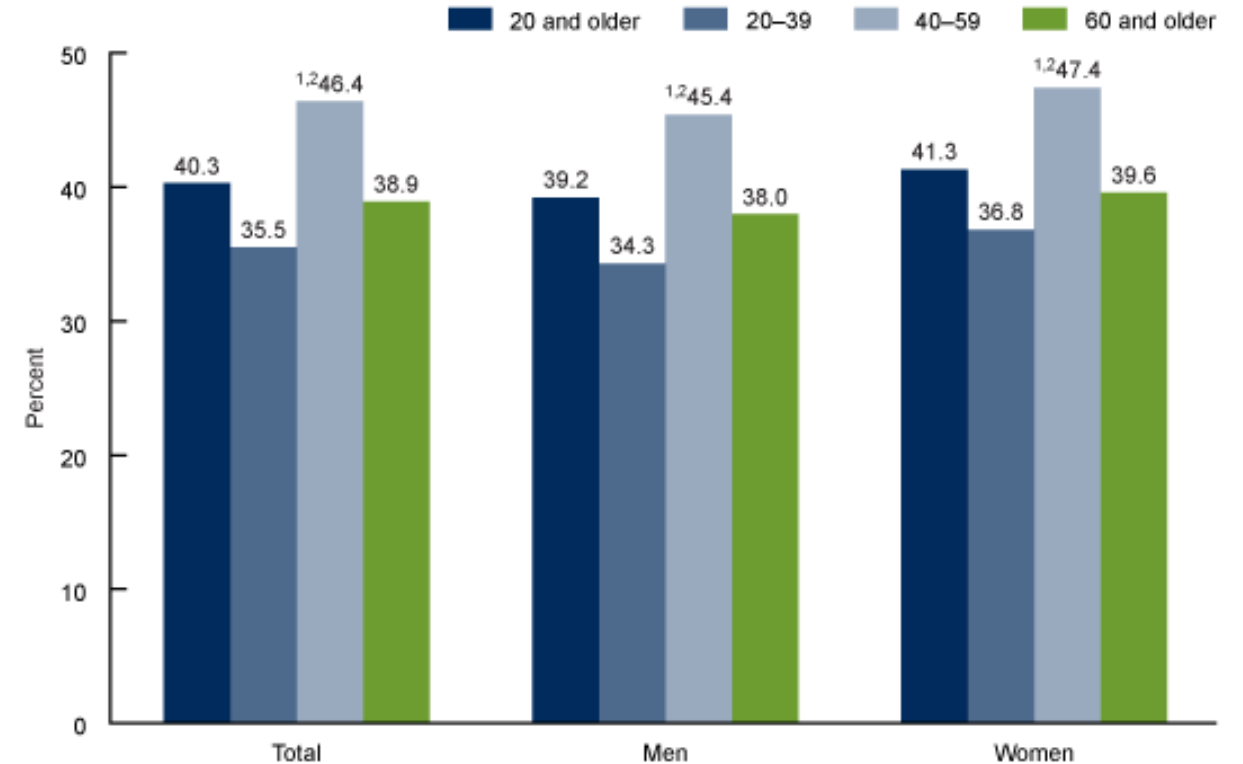
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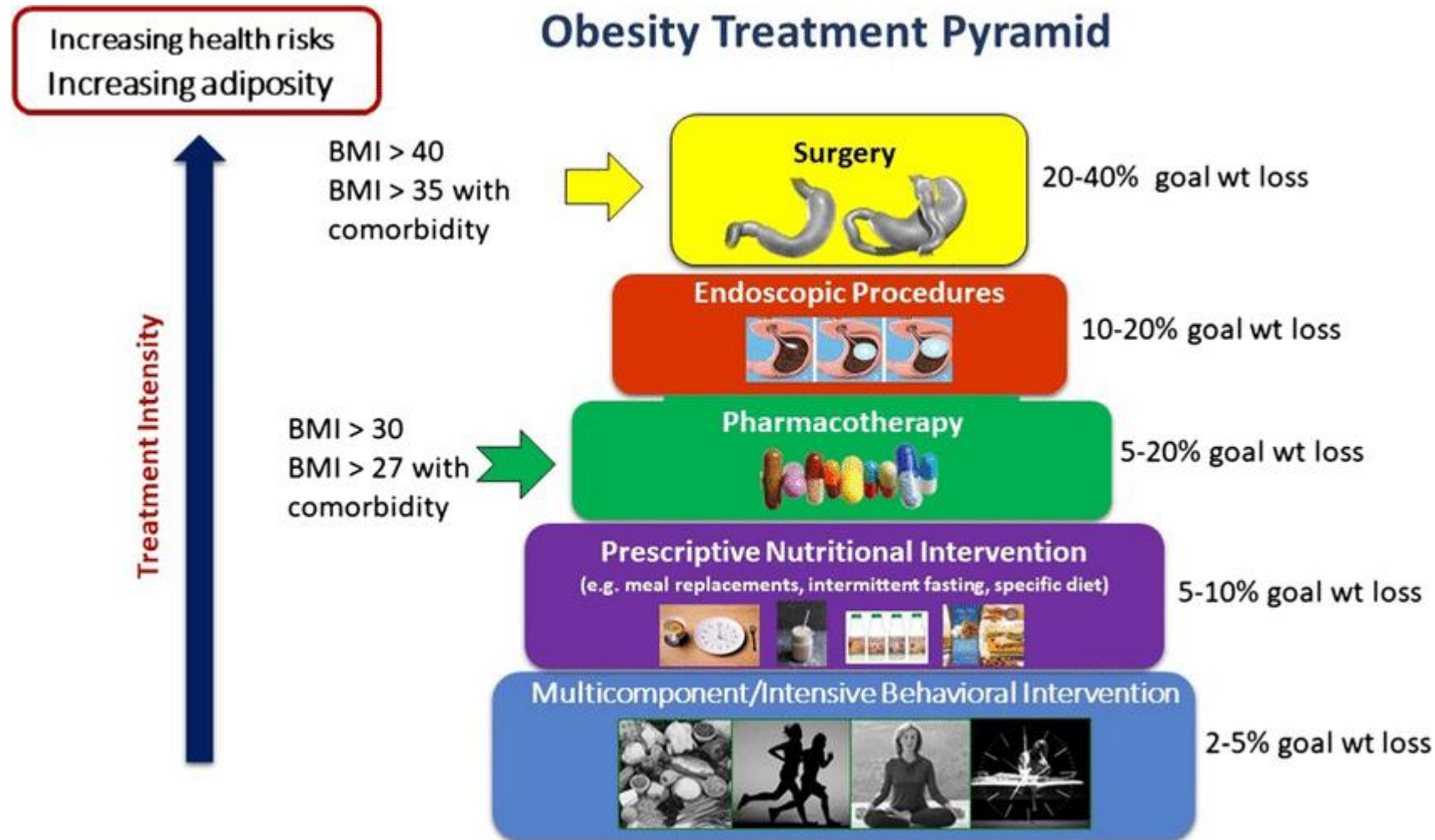
SOURCE: NCHS, National Health and Nutrition Examination Survey, 2017–2018.

NHANES 2017-2018



NHANES 2021-2023

# Introducing Interventions for Treating Obesity





# Diets by the Decades



1920s



1930s



1940s



1950s



1960s



1970s



1980s



1990s



2000s



2010s

# Dietary patterns with weight loss data

- Low-fat
- Low carb/ low glycemic index
- High-protein
- Mediterranean
- Plant-based/vegetarian/vegan
- Meal replacement
- Intermittent fasting

# Low Fat

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# Low Fat

*Lancet Diabetes Endocrinol.* 2015 December ; 3(12): 968–979. doi:10.1016/S2213-8587(15)00367-8.

## **Effect of Low-Fat vs. Other Diet Interventions on Long-Term Weight Change in Adults: A Systematic Review and Meta-Analysis**

**Deirdre K. Tobias, ScD<sup>1,2</sup>, Mu Chen, ScD<sup>2</sup>, JoAnn E. Manson, MD<sup>1,3,\*</sup>, David S. Ludwig, MD<sup>4,2,\*</sup>, Walter Willett, MD<sup>2,3,5,\*</sup>, and Frank B. Hu, MD<sup>2,3,5,\*</sup>**

- random effects meta-analysis of RCTs to estimate the long-term effect of low-fat vs. higher fat dietary interventions on weight loss
- 53 studies representing 68,128 participants

# Low Fat

- long-term effect of low-fat diets on body weight depends on the intensity of intervention in the comparison group
  - low-fat interventions → greater weight loss only when compared with usual diet
- low-carbohydrate interventions led to significantly greater weight loss than low-fat interventions




# Low Carb



ORIGINAL ARTICLE |  Open Access |    

## Effectiveness of low-carbohydrate diets for long-term weight loss in obese individuals: A meta-analysis of randomized controlled trials

Giovanni Antonio Silverii MD , Claudia Cosentino MD, Federica Santagiuliana RD, Francesco Rotella MD, Federica Benvenuti MD, Edoardo Mannucci MD, Barbara Cresci MD

First published: 04 April 2022 | <https://doi.org/10.1111/dom.14709>

- meta-analysis of 25 randomized controlled trials longer than 3 months

# Low Carb Definition and Study Aims

- non-carbohydrate–restricted diets: 45%-60% of total calories from carbohydrates
- mild LC diets: 26%-45% of total calories from carbohydrates
- very LC diets: < 26% of total calories from carbohydrates and/or less than 130 g of carbohydrates daily.
- Study aim: To assess whether low-carbohydrate (LC) diets are associated with differences in weight loss and well-being in people with obesity, and their cardiovascular and renal safety.

# Low Carb

- Greater short-term weight loss than non-carbohydrate-restricted diets and a longer-term favorable effect on cardiovascular risk factors.




# Low Fat vs. Low Carb



*Review*

## **The Effect of Low-Fat and Low-Carbohydrate Diets on Weight Loss and Lipid Levels: A Systematic Review and Meta-Analysis**

Shreya Chawla <sup>1</sup>, Fernanda Tessarolo Silva <sup>2</sup>, Sofia Amaral Medeiros <sup>2</sup>, Rania A. Mekary <sup>3,4,†</sup>  
and Dina Radenkovic <sup>5,\*,†</sup> 

- meta-analysis of 38 studies assessing a total of 6499 adults.

# Low Fat vs. Low Carb Definitions and Study Findings

- low-carb: <40% carbohydrate content
- low-fat: <30% total fat content

## Findings:

- low-carbohydrate diets are effective at improving weight loss, HDL and TG lipid profiles
- potential consequences of raised LDL and total cholesterol in the long-term



# High Protein Diet

- RDA to avoid protein deficiency: 0.80 g/kg body wt (BW)/day  
= ~48–56 g/day (10%–15% of the total daily energy expenditure)

- High protein: > 1g/kg BW (>20% total daily EE)

## Protein Requirement for Wt Loss in Obesity:

- 1.2 g/kg body wt (1.9 g/kg FFM)

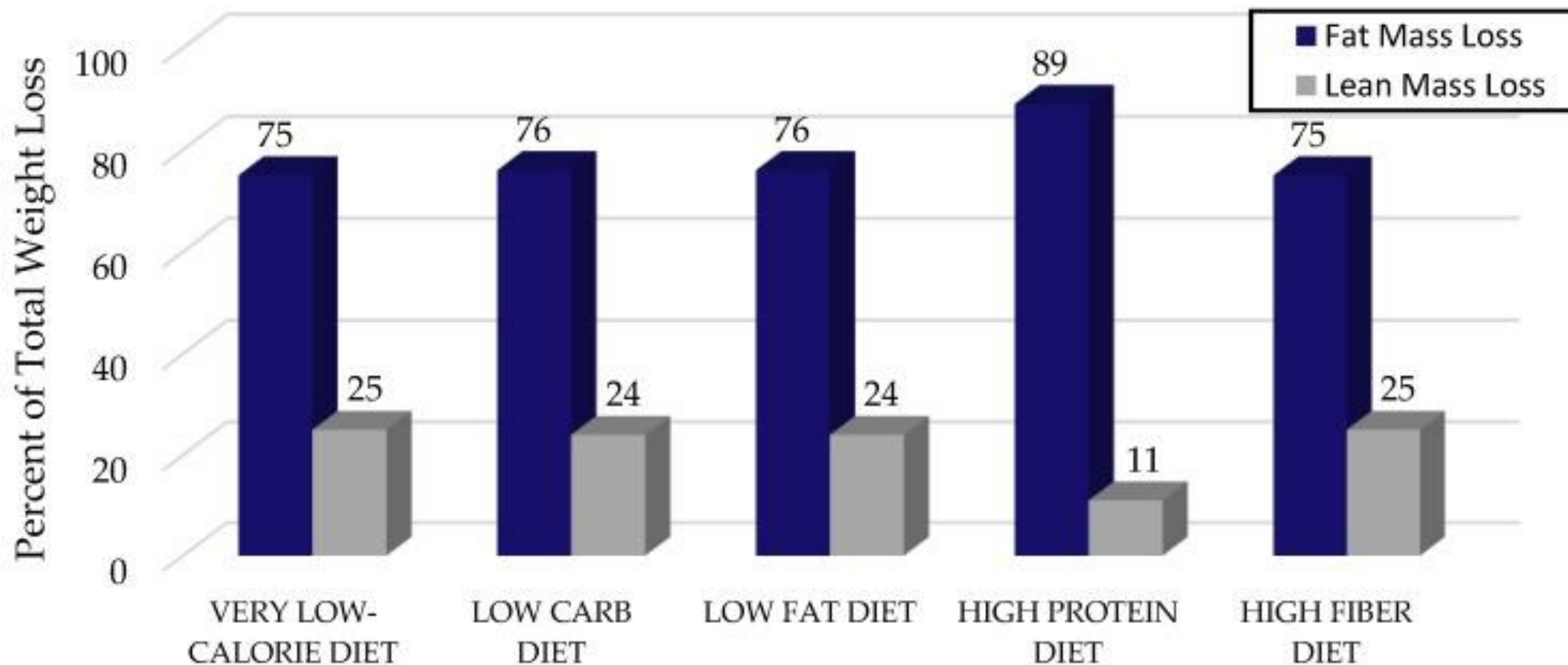


# High Protein Diet

- Increased protein intake above RDA reduces body weight and enhances body composition by decreasing fat mass while preserving fat-free mass (FFM) in both low-calorie and standard-calorie diets.



## Percent Fat and Lean Mass Loss for Various Diet Programs





# Mediterranean Diet

🏠 Metabolic Syndrome and Related Disorders > Vol. 9, No. 1 > Review Article

## Mediterranean Diet and Weight Loss: Meta-Analysis of Randomized Controlled Trials

Katherine Esposito ✉, Christina-Maria Kastorini, Demosthenes B. Panagiotakos, and Dario Giugliano

Published Online: 20 Jan 2011 | <https://doi.org/10.1089/met.2010.0031>

- 16 randomized controlled trials with 19 arms and 3,436 participants



# Mediterranean Diet

- Useful tool to reduce body weight, especially when it is energy-restricted, associated with physical activity, and more than 6 months in length.
- Does not cause weight gain, despite relatively high fat content.



# Mediterranean Diet



CLINICAL RESEARCH STUDY

THE AMERICAN  
JOURNAL of  
MEDICINE®

## Systematic Review of the Mediterranean Diet for Long-Term Weight Loss



Joseph G. Mancini, BSc,<sup>a</sup> Kristian B. Fillion, PhD,<sup>a,b</sup> Renée Atallah, MSc,<sup>a</sup> Mark J. Eisenberg, MD, MPH<sup>a,b,c</sup>

<sup>a</sup>Division of Clinical Epidemiology, Lady Davis Research Institute, Jewish General Hospital/McGill University, Montreal, Quebec, Canada;

<sup>b</sup>Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, Quebec, Canada; <sup>c</sup>Division of Cardiology, Jewish General Hospital, Montreal, Quebec, Canada.

- Five RCTs (n = 998) met inclusion criteria.
- Trials compared the Mediterranean diet to a low-fat diet (4 treatment arms), a low-carbohydrate diet (2 treatment arms), and the American Diabetes Association diet (1 treatment arm).

# Mediterranean Diet

- systematic review of randomized controlled trials (RCTs) to determine the effect of the Mediterranean diet on weight loss and CV risk factor levels after 12 months.
  - Comparators: low-fat diets, low-carbohydrate diets, calorie-restricted diets, and diets that are part of the usual care for certain medical conditions.
- similar weight loss and cardiovascular risk factor level reduction as comparator diets in individuals with overweight or obesity trying to lose weight

# Vegan/Plant Based Diet

[Diabetes Metab Syndr Obes.](#) 2020; 13: 3433–3448.

Published online 2020 Sep 30. doi: [10.2147/DMSO.S272802](https://doi.org/10.2147/DMSO.S272802)

## Effects of Plant-Based Diets on Weight Status: A Systematic Review

[Elisabeth Tran](#),<sup>1</sup> [Hanna Fjeldheim Dale](#),<sup>1,2,3</sup> [Caroline Jensen](#),<sup>1</sup> and [Gülen Arslan Lied](#)<sup>1,2,3</sup>

- Evaluate intervention studies assessing the effects of different plant-based diets on body mass index and weight.
- 22 publications from 19 studies were included.
- The majority were RCTs comparing a low-fat vegan diet to an omnivore diet in participants with overweight, type 2 diabetes mellitus and/or cardiovascular disease.





# Vegan/Plant Based Diet

- All studies reported weight reductions
- Among the RCTs: 7 - significant differences; 4 - non-significant differences between the intervention and the control groups.
- The weight reduction can be explained by an **increased intake of fiber, polyunsaturated fats and plant proteins**, including a reduced intake of energy, saturated fats and animal proteins.
- Due to restrictions in fat intake in many studies, followed by reduced energy intake, the effects of the different interventions differ depending on the specific plant-based diets investigated.
- Results suggest that plant-based diets may improve weight status in some patient groups.

Original Investigation

# Comparison of Weight Loss Among Named Diet Programs in Overweight and Obese Adults A Meta-analysis

Bradley C. Johnston, PhD; Steve Kanters, MSc; Kristofer Bandayrel, MPH; Ping Wu, MBBS, MSc; Faysal Naji, BHSc;  
Reed A. Siemieniuk, MD; Geoff D. C. Ball, RD, PhD; Jason W. Busse, DC, PhD; Kristian Thorlund, PhD;  
Gordon Guyatt, MD, MSc; Jeroen P. Jansen, PhD; Edward J. Mills, PhD, MSc

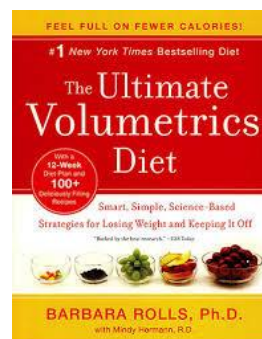




Table 1. Diet Classes Based on Macronutrient Composition

Type of Diet	Branded Diets <sup>a</sup>	Carbohydrates, % kcal	Protein, % kcal	Fat, % kcal
Low carbohydrate	Atkins, South Beach, Zone	≤40	Approximately 30	30-55
Moderate macronutrients	Biggest Loser, Jenny Craig, Nutrisystem, Volumetrics, Weight Watchers	Approximately 55-60	Approximately 15	21-≤30
Low fat	Ornish, Rosemary Conley	Approximately 60	Approximately 10-15	≤20

- Significant weight loss observed with any low-carbohydrate or low-fat diet.
- Weight loss differences between individual named diets were small.
- Behavioral support and exercise enhanced weight loss.
- ***This supports the practice of recommending any diet that a patient will adhere to in order to lose weight.***

# Meal replacements

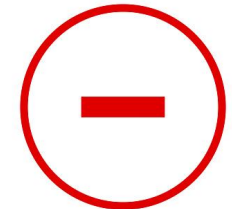
## Pros

- Convenient
- Portion-controlled
- Nutritionally complete
- Eliminate decision fatigue



## Cons

- Processed
- Lack fiber
- Lack social element



# Meal replacements

OBESITY TREATMENT

WILEY **obesity**reviews

## A systematic review and meta-analysis of the effectiveness of meal replacements for weight loss

Nerys M. Astbury<sup>1,2</sup>  | Carmen Piernas<sup>1</sup>  | Jamie Hartmann-Boyce<sup>1,2</sup>  |  
Sophia Lapworth<sup>1</sup> | Paul Aveyard<sup>1,2</sup>  | Susan A. Jebb<sup>1,2</sup> 

- 23 studies with 7884 adult participants with BMI > 25 kg/m<sup>2</sup>
- RCTs of interventions incorporating the use of one or more MR daily, as part of a hypocaloric diet intended for weight loss
- Excluded interventions in which daily energy intake was restricted to < 3347 kJ (800 kcal)/ day

# Meal replacements

- Programs incorporating meal replacements led to greater weight loss at 1 year than comparator weight loss programs and should be considered as a valid option for management of overweight and obesity in community and health care settings.

# Intermittent Fasting

## THE 5:2 DIET

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Eat normally	Women: 500 calories Men: 600 calories	Eat normally	Eat normally	Women: 500 calories Men: 600 calories	Eat normally	Eat normally

## THE 16:8 DIET

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
MIDNIGHT							
4 AM	FAST	FAST	FAST	FAST	FAST	FAST	FAST
8 AM							
12 PM	First meal	First meal	First meal	First meal	First meal	First meal	First meal
4 PM	Last meal by 8PM	Last meal by 8PM	Last meal by 8PM	Last meal by 8PM	Last meal by 8PM	Last meal by 8PM	Last meal by 8PM
8 PM	FAST	FAST	FAST	FAST	FAST	FAST	FAST
MIDNIGHT							

## ALTERNATE-DAY FASTING

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Eat normally	24- hour fast  OR Eats only a few hundred calories	Eat normally	24- hour fast  OR Eats only a few hundred calories	Eat normally	24- hour fast  OR Eats only a few hundred calories	Eat normally

# Intermittent Fasting

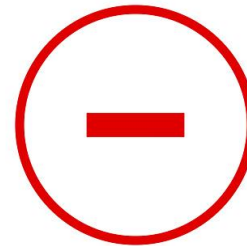
- Pros

- Removes emphasis on specific foods types and amounts (no macronutrient or calorie monitoring)
- May increase longevity
- May help improve glucose control



- Cons

- Increased hunger during fasting period
- May promote overeating
- Lack of emphasis on nutrition
- May not be sustainable long term





# Intermittent Fasting

## **Clinical application of intermittent fasting for weight loss: progress and future directions**

[Krista A. Varady](#) , [Sofia Cienfuegos](#), [Mark Ezpeleta](#) & [Kelsey Gabel](#)

[Nature Reviews Endocrinology](#) **18**, 309–321 (2022) | [Cite this article](#)

# Intermittent Fasting

- Mild to moderate weight loss (3–8% loss from baseline) over short durations (8–12 weeks).
  - on a par with traditional dieting approaches (daily calorie restriction).
- The ability of these intermittent fasting protocols to help to manage weight long-term is still poorly understood
  - majority of studies to date have run for short durations.
- Some studies demonstrate that intermittent fasting improves cardiometabolic risk factors such as blood pressure, LDL cholesterol and triglycerides, insulin resistance and HbA1C, while others show no benefit on these parameters.
- Intermittent fasting is generally safe and produces few gastrointestinal, neurological, hormonal or metabolic adverse effects.

### Group 1 Unprocessed or Minimally Processed Foods

Fresh, dry, or frozen vegetables or fruit, grains, legumes, meat, fish, eggs, nuts and seeds.



Processing includes removal of inedible/unwanted parts. Does not add substances to the original food.

### Group 2 Processed Culinary Ingredients

Plant oils (e.g., olive oil, coconut oil), animal fats (e.g., cream, butter, lard), maple syrup, sugar, honey, and salt.



Substances derived from Group 1 foods or from nature by processes including pressing, refining, grinding, milling, and drying.

### Group 3 Processed Foods

Canned/pickled vegetables, meat, fish, or fruit, artisanal bread, cheese, salted meats, wine, beer, and cider.



Processing of foods from Group 1 or 2 with the addition of oil, salt, or sugar by means of canning, pickling, smoking, curing, or fermentation.

### Group 4 Ultra-Processed Foods

Sugar sweetened beverages, sweet and savory packaged snacks, reconstituted meat products, pre-prepared frozen dishes, canned/instant soups, chicken nuggets, ice cream.



Formulations made from a series of processes including extraction and chemical modification. Includes very little intact Group 1 foods.

Increasing Level of Processing



# Avoidance of Ultra-Processed Foods



Cell Metabolism

## Clinical and Translational Report

### Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of *Ad Libitum* Food Intake

Kevin D. Hall,<sup>1,5,\*</sup> Alexis Ayuketah,<sup>1</sup> Robert Brychta,<sup>1</sup> Hongyi Cai,<sup>1</sup> Thomas Cassimatis,<sup>1</sup> Kong Y. Chen,<sup>1</sup> Stephanie T. Chung,<sup>1</sup> Elise Costa,<sup>1</sup> Amber Courville,<sup>2</sup> Valerie Darcey,<sup>1</sup> Laura A. Fletcher,<sup>1</sup> Ciaran G. Forde,<sup>4</sup> Ahmed M. Gharib,<sup>1</sup> Juen Guo,<sup>1</sup> Rebecca Howard,<sup>1</sup> Paule V. Joseph,<sup>3</sup> Suzanne McGehee,<sup>1</sup> Ronald Ouwerkerk,<sup>1</sup> Klaudia Raisinger,<sup>2</sup> Irene Rozga,<sup>1</sup> Michael Stagliano,<sup>1</sup> Mary Walter,<sup>1</sup> Peter J. Walter,<sup>1</sup> Shanna Yang,<sup>2</sup> and Megan Zhou<sup>1</sup>

- Investigated whether people ate more calories when exposed to a diet composed of UPFs compared with a diet composed of unprocessed foods
- Diets matched for daily calories, sugar, fat, fiber, and macronutrients
- → **people consumed more calories when exposed to the UPF diet as compared to the unprocessed diet. Furthermore, people gained weight on the UPF diet and lost weight on the unprocessed diet.**

# Health Risks of Ultra-Processed Foods

- Ultra-processed foods associated w major health outcomes:
  - All-cause and cause-specific mortality
  - Cardiovascular disease
  - Overweight and obesity
  - Unfavorable body composition and fat deposition
  - Diabetes
  - Cancer
  - GI and other diseases
- Potential mechanisms: nutrient displacement, factors that influence adiposity, and processing



# Cultural Acceptability

*Am J Lifestyle Med.* 2009 ; 3(1): 64S–68S. doi:10.1177/1559827609335552.

## Culturally tailored foods and CVD prevention

**Donna M. Winham, DrPH**

Department of Nutrition, Arizona State University

### Abstract

Culture plays an integral role in people's food choices and lifestyle decisions. Health care messages may conflict with cultural beliefs for many immigrant, minority, and low income populations. The multiple ways that culture can positively and negatively affect disease risk must be utilized in the development of 'culturally tailored' messages or interventions. Only through the creation of interventions that are meaningful and culturally-relevant can successful behavior stability or change occur. The recognition of current health-promoting factors is important to develop rapport and credibility with individuals and population groups in order to reduce the risk of CVD and other lifestyle-based chronic diseases for optimal health.

# Cultural Acceptability

- Culturally tailoring, or adapting a dietary message, can promote acceptance of a dietary change to reduce CVD risk
- The use of positive health-promoting foods and dietary practices already in place, can boost the success of dietary changes

# Dietary Patterns *Without* Data for Weight Loss

- GOLO diet
- Detox diets
- Blood-type diet
- Cabbage soup and grapefruit diet
- hCG diet
- Bullet proof coffee diet

# GOLO Supplement

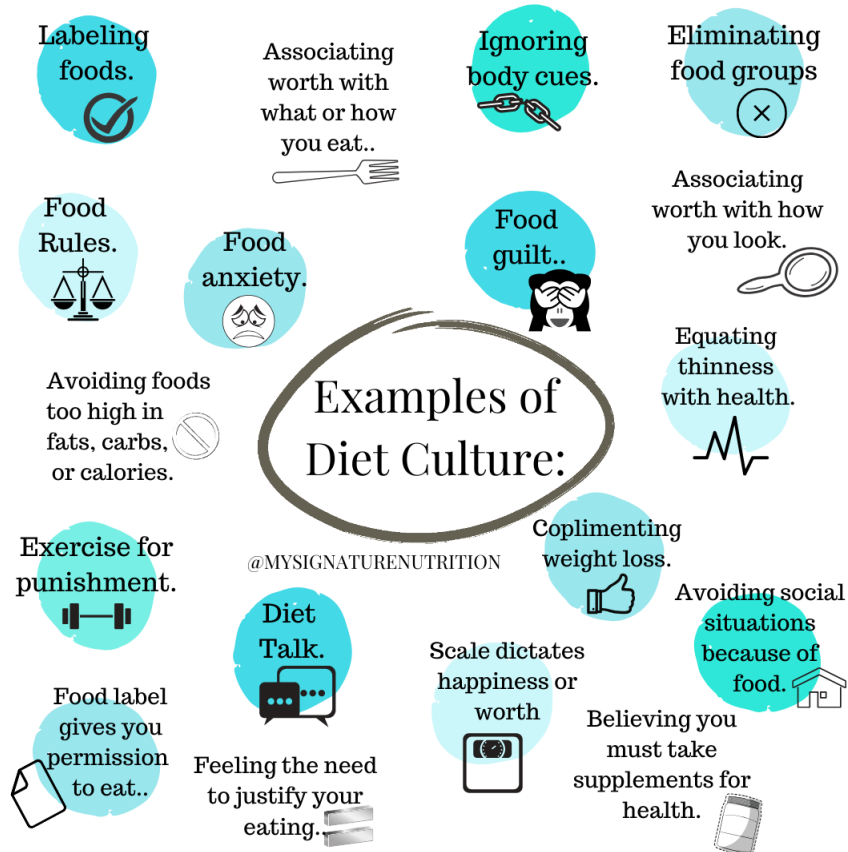
- Blend of 7 plant extracts and 3 minerals
- magnesium, zinc, and chromium – the major minerals associated with insulin sensitivity
- GOLO diet mainly encourages a focus on healthy eating habits with regular exercise.

Supplement Facts		
Serving Size: 1 Capsule		Servings Per Container: 90
Amount Per Serving	% Daily Value	
Magnesium (as Albion™ dimagnesium malate)	15 mg	4%
Zinc (as TRAACS™ zinc bisglycinate chelate)	10 mg	91%
Chromium (as TRAACS™ chromium nicotinate glycinate chelate)	70 mcg	200%
Proprietary Blend	297 mg	
Rhodiola extract ( <i>Rhodiola rosea</i> L, root), [standardized to 3% rosavins and 1% salidrosides]		**
Inositol		**
Berberine extract ( <i>Berberis vulgaris</i> , bark and root) [from standardized Barberry ]		**
Gardenia extract 10:1 ( <i>Gardenia jasminoides</i> , fruit)		**
Banaba extract ( <i>Lagerstroemia speciosa</i> , leaf) [standardized to 18% corosolic acid]		**
Salaretin® Salacia extract 6:1 ( <i>Salacia reticulata</i> , bark)		**
Apple extract ( <i>Malus domestica</i> , fruit) [standardized to 75% polyphenols]		**
** Daily Value not established		

**Other ingredients:** Vegetable cellulose (capsule), rice fiber, magnesium stearate (vegetable), silica.

This product does not contain soy, gluten, dairy, eggs, fish, shellfish, tree nuts, peanuts or wheat.

# Avoid “Diet Culture”



## Examples of Diet Culture

- Labeling foods as good or bad
- Exercising to “burn off” a specific amount of calories or to “earn a treat”
- Limiting/avoiding entire food groups for being “bad” (e.g., carbohydrates, dairy, sugar)
- Feeling guilt or shame for eating
- Attempting to suppress your appetite with caffeine, nicotine, skinny teas, or water
- Avoiding certain situations to avoid eating
- Worshiping thinness and weight loss
- Assuming that your body is responsible for good or bad things happening
- Engaging in fat shaming or body shaming
- Feeling envious of others for their weight or perceived self-control





# Best Diet for Weight Loss?





# What characterizes the best diet for treating obesity?

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- Sustainable
- Culturally acceptable
- Reduced energy
- Nutrient dense
- High quality
- Whole food
- Plant predominant
- Sufficient protein
- Minimally processed
- Minimal added sugars



# Questions and Comments?

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