

Fad or Fab?

Exploring Current Diet Trends

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Objectives

- Increase understanding of current trending diets
- Evaluate effectiveness of diets related to weight loss
- Explain impact on blood glucose and health

Ketogenic Diet (KD) History

- Introduced by modern physicians as a treatment for epilepsy in the 1920s
- Modern antiepileptic drug treatment decreased use
- Over the years there has been an explosion in the use, and scientific interest in the KD
- Used to treat diabetes in the pre-insulin era

Ketogenic Diet

- 70-90% of calories from fat
- Generally less than 40g of carbs per day
- Carbohydrate restriction

Ketogenic Diet Defined

- Diet intended to induce ketosis, the state of having elevated ketone bodies in blood
- Ketone bodies are a form of energy produced by the breakdown of fat
- During periods of prolonged fasting or CHO restriction, blood glucose levels do not meet energy requirements
- Fat is broken down leading to ketosis and burned for energy

Difference Between Ketosis and Ketoacidosis

- Ketosis as related to the ketogenic diet
 - Extreme carbohydrate restriction resulting in ketone production
 - Can create bad breath as ketones are broken down for energy producing a by-product acetone (excreted through breath and urine)
- Ketoacidosis related to diabetic ketoacidosis (DKA)
 - Complication for those with T1D
 - Dangerously high ketones and blood sugar levels
 - Can occur in T2D with those who make little or no insulin
 - Symptoms include extreme thirst, frequent urination, dehydration, nausea, vomiting, stomach pain, tiredness, breath that smells of fruit, shortness of breath, feelings of confusion

Ketogenic Diet - What to eat

- Meat (chicken, pork steak, lamb, etc (fattier cuts)
- Seafood (salmon, trout, cod, etc)
- Fats and Oils (butter oil, coconut oil, olive oil, ghee, avocado oil, mayonnaise)
- Low carbohydrate vegetables (cauliflower, cabbage, avocado, broccoli, etc)
- Low carbohydrate fruits (blueberries, blackberries, raspberries) – sparingly
- Nuts (almonds, peanuts, macadamia, pecans, etc)
- High fat dairy (heavy cream, cheese, cream cheese, sour cream)



Comparison of a very low-calorie-ketogenic diet with a standard low-calorie diet in the treatment of obesity

- Subjects: 53 obese adults (BMI 30 or greater)
- Apart from obesity or prediabetes generally healthy adults
 - 18 – 65 years old
 - Hx of failed dietary efforts
 - Exclusion criteria: T1D, insulin therapy, use of any weight loss pills, any hepatic or liver insufficiency, CVD, uncontrolled HTN, females with childbearing potential or who were pregnant or breastfeeding, severe depression or psychiatric disease

Comparison of a very low-calorie-ketogenic diet with a standard low-calorie diet in the treatment of obesity

Methods: Randomized clinical trial with nutrition intervention

- Low calorie (LC) 1400 – 1800 kcal/day
 - 50% carbohydrate, 20% protein, 30% fat
- Very low-calorie ketogenic diet (VLCK)
 - Starts with 600 – 800 kcal/day
 - Low in carbohydrates (<50g daily from vegetables)
 - Lipids (only 10 g of olive oil per day)
 - Protein (0.8 and 1.2g per kg of ideal body weight to insure against lean body mass loss)
 - Supplements of K, Na, Mg, Ca and omega 3 fatty acids

2014 Endocrine

Comparison of a very low-calorie-ketogenic diet with a standard low-calorie diet in the treatment of obesity

80% of target weight loss			20% of target weight loss		Long-term maintenance of weight loss
Multidisciplinary team (dietary counselling / physical activity / psychological support)					
Stage1 Active Stage			Stage2 Dietary re-education		Stage3 Maintenance
Phase 1	Phase 2	Phase 3	Gradual re-introduction of different foods		Balanced diet
VLCK diet ¹ (600-800 kcal/day)			LC diet ² (800-1500 kcal/day)		Maintenance diet (1500-2250 kcal/day)

Nutrition intervention program for the VLCK diet. Stage one is done over 30 – 45 days in total.

2014 Endocrine

Comparison of a very low-calorie-ketogenic diet with a standard low-calorie diet in the treatment of obesity

Results: VLCK was more effective in inducing loss of body weight and the weight loss was mainly related to loss of fat mass

- VLCK diet had more than 10% reduction of original weight at 2 months compared to the LC group which had 3%, this was maintained through the end of the 12 month study
- VLCK had significant changes in HbA_{1c} and total cholesterol
- Side effects for those on VLCK were asthenia, fatigue, headache, muscle weakness, constipation, hyper-uricemia and nausea
- 12 dropped out of VLCK and 14 dropped out of LC group throughout duration of study

2014 Endocrine

Twelve-month outcomes of a randomized trial of a moderate-carbohydrate versus very low-carbohydrate diet in overweight adults with type 2 diabetes mellitus or prediabetes

Subjects: 34 adults

- Type 2 diabetes or pre-diabetes
- HbA_{1c} > 6.0%
- BMI >25
- Exclusion criteria: Participants currently using insulin, or taking more than three glucose-lowering agents

2017 Nutrition and Diabetes

Twelve-month outcomes of a randomized trial of a moderate-carbohydrate versus very low-carbohydrate diet in overweight adults with type 2 diabetes mellitus or prediabetes

Methods: Randomized clinical trial

- Low-carbohydrate ketogenic diet (LCK)
 - Ad libitum very low-carbohydrate, likely ketogenic diet
 - 20 – 50g of carbohydrate or less per day
- Moderate-carbohydrate, calorie-restricted, low-fat diet (MCCR)
 - 45 – 50% of calories from carbohydrate
 - Instructed to eat lower fat and eat 500 fewer kcals/day
- All participants were encouraged to be physically active, get sufficient sleep and practice adherence strategies such as mindful eating

2017 Nutrition and Diabetes

Twelve-month outcomes of a randomized trial of a moderate-carbohydrate versus very low-carbohydrate diet in overweight adults with type 2 diabetes mellitus or prediabetes

Results:

- LCK group lost more weight than the MCCR group at 12 months
 - LCK group: 8.3%
 - MCCR group: 3.8%
- Greater reductions in HbA_{1c} levels in LCK group
 - LCK group: baseline 6.6% at 12 months 6.1%
 - MCCR group: baseline 6.9% at 12 months 6.7%
- LCK group larger reduction in diabetes-related medicine use
 - LCK group: 6/10 stopped sulfonylureas or DPP4-Inhibitors
 - MCCR group: 0/6
- LCK had increased LDL cholesterol at 6 months, at 12 months no significant differences

2017 Nutrition and Diabetes

Short-term safety, tolerability and efficacy of a very low-calorie-ketogenic diet interventional weight loss program versus hypocaloric diet in patients with type 2 diabetes mellitus

Subjects: 89 adults

- Type 2 diabetes
- 30 – 65 years old
- BMI's between 30 - 35
- Exclusion criteria: T₂D longer than 10 years, insulin therapy, HbA_{1c} >9, fasting C-peptide <1 ng ml, impaired liver or renal function, alcohol intake >40g per day men and > 24 g per day for women, pregnancy, lactation or eating/psychiatric disorder

Nutrition & Diabetes 2016

Short-term safety, tolerability and efficacy of a very low-calorie-ketogenic diet interventional weight loss program versus hypocaloric diet in patients with type 2 diabetes mellitus

Methods: Randomized 4 month clinical trial

- 45 subjects on very-low calorie ketogenic diet (VLKD)
 - 600 – 800 kcal/day
 - Low in carbohydrates (<50g daily from vegetables)
 - Lipids (only 10 g of olive oil per day)
 - Protein (0.8 and 1.2g per kg of ideal body weight to insure against lean body mass loss)
 - Supplements of K, Na, Mg, Ca and omega 3 fatty acids
- 44 subjects assigned to a low calorie diet(LC)
 - 500 – 1000 kcal/day
 - 50% carbohydrate, 20% protein, 30% fat

Nutrition & Diabetes 2016

Short-term safety, tolerability and efficacy of a very low-calorie-ketogenic diet interventional weight loss program versus hypocaloric diet in patients with type 2 diabetes mellitus

Results:

- Weight loss was greater in VLCK
 - >85% of the VLCK achieved greater than 10% weight loss
 - >16% of the LC group achieved greater than 10% weight loss
- Fasting blood glucose decreased significantly in both groups
- A1C was only significantly lower in the VLCK group
- Lipid profile at 4 months showed no significant changes between either groups
- Significant decrease in triglycerides in VLCK group

Nutrition & Diabetes 2016

Ketogenic Diet

Benefits

- Weight loss likely due to restrictive diet
- Blood glucose reduction
- Triglyceride reduction
- Satiety

Challenges

- Bad breath
- "Keto flu"
- Hair Loss
- Compliance is challenging
- Expensive
- Risk of nutrient deficiencies if followed long term
- No long term studies (CVD)
- Risk for hypoglycemia for diabetics
- Medical supervision recommended

Paleo Diet History

- Refers to the paleolithic age also known as stone age
- 2.5 million to 10,000 years BC
- Also known as the pre-agriculture time period as compared to the Neolithic period (10,000 BC – today)

Paleo or Paleolithic Diet (Hunter-Gatherer)

- Vegetables – all vegetables
- Fruits – all
- Nuts
- Roots – potatoes, turnips, rutabaga, radish, onions, green onion, carrots, jams, cassava
- Lean meat
- No legumes
- No grains
- No dairy
- No processed foods



Comparison of Ancestral Intake to Modern Day

Nutrients	Estimated ancestral intake	Current Recommendations
Carbohydrate (% daily energy)	35-40	45-65
Added sugar (% daily energy)	2	<25
Protein (% daily energy)	25-30	10-35
Fat (% daily energy)	30 - 40	20-35
Fiber (g/day)	>70	25 - 38

Journal of Gastrointestinal Liver Disease 2005

Long-term effects of a Paleolithic-type diet in obese postmenopausal women: a 2-year randomized trial

Subjects: 70 postmenopausal women

- Non-smoking
- Mean age was 60 years old
- BMI's >27
- Exclusion criteria: abnormal fasting glucose levels, blood pressure exceeding 150/90 mm HG, hormone replacement therapy, statins, beta-blockers or any medication for psychiatric disorders

European Journal of Clinical Nutrition 2014

Long-term effects of a Paleolithic-type diet in obese postmenopausal women: a 2-year randomized trial

Methods: Randomized 2-year trial

- 35 subjects on Paleolithic-type diet (PD)
 - 30% protein, 40% fat, 30% carbohydrates
 - Recommended high intake of MUFA and PUFA's
 - Lean meat, fish, eggs, vegetables, fruits, berries and nuts
 - Additional fat sources were avocado and oils (rapeseed and olive oil) used in food preparation and dressing
 - Dairy products, cereals, added salt and refined fats and sugar were excluded

European Journal of Clinical Nutrition 2014

Long-term effects of a Paleolithic-type diet in obese postmenopausal women: a 2-year randomized trial

Methods: Randomized 2-year trial

- 35 subjects assigned to Nordic Nutrition Recommendations (NNR)
 - 15% protein, 25 - 30% fat, 55 - 60% carbohydrate
 - NNR 2013 - dietary pattern of plenty of vegetables, fruit and berries, pulses, regular intake of fish, vegetable oils, whole grain, low-fat alternatives of dairy and meat, and limited intake of red and processed meat, sugar, salt and alcohol
- Both groups were able to eat *ad libitum* (as desired)
- Each group took part in 12 group sessions by a dietitian (one dietitian per diet over 24 months)

European Journal of Clinical Nutrition 2014

Long-term effects of a Paleolithic-type diet in obese postmenopausal women: a 2-year randomized trial

Methods:

Group sessions consisted of:

- Info on and cooking of the intervention diets
- Dietary effects on health,
- Behavioral changes
- Group discussions
- Recipes with written instruction for preparing meals at home
- Eight group sessions in first 6 months
 - 4 cooking classes and 4 follow-up sessions
- Additional group sessions at 6, 12, 18 and 24 months

European Journal of Clinical Nutrition 2014

Long-term effects of a Paleolithic-type diet in obese postmenopausal women: a 2-year randomized trial

Results:

- 30% (n=21) were lost due to follow-up
- More completed PD than the NNR arm
- PD group adherence to target protein intake was poor
- Medication use did not change during the study period
- Largest weight loss was at 24 months
 - No significant differences between groups
- Triglyceride levels decreased significantly in the PD group
- Fasting glucose did not change between either group

European Journal of Clinical Nutrition 2014

Paleolithic nutrition for metabolic syndrome: systematic review and meta-analysis

Objective: Evaluate whether a Paleolithic nutritional pattern (PNP) improves risk factors for chronic disease more than do other dietary interventions

Design: Review of 4 randomized controlled trials that compared the Paleolithic nutritional pattern with any other dietary pattern in participants with one or more of the 5 components of metabolic syndrome

American Journal of Clinical Nutrition 2015

Paleolithic nutrition for metabolic syndrome: systematic review and meta-analysis

Metabolic Syndrome:

- Elevated blood pressure (greater than 130/85 mmHg)
- High blood sugar levels (insulin resistance)
- Excess fat around the waist
- High triglyceride levels
- Low levels of good cholesterol, or HDL

American Journal of Clinical Nutrition 2015

Paleolithic nutrition for metabolic syndrome: systematic review and meta-analysis

Methods:

- Inclusion criteria for a PNP: vegetables(including root vegetables),fruit(including fruit oils, e.g., olive oil, coconut oil, and palm oil), nuts, fish, meat, eggs, and it excluded dairy, grain-based foods, legumes, extra sugar, and nutritional products of industry (including refined fats and refined carbohydrates)
- Trials could have either provided participants with advice to follow a PNP or delivered foods relevant to a PNP
- For the comparison of the PNP with the control diet, both isocaloric and *ad libitum* designs were included
- Minimum duration of the dietary intervention was 1 week

American Journal of Clinical Nutrition 2015

Paleolithic nutrition for metabolic syndrome: systematic review and meta-analysis

Results from 4 clinical trials (159 participants):

- Paleolithic diet results in greater improvements than the control:
 - Waist circumference
 - Triglycerides
 - Blood pressure
 - HDL cholesterol*
 - Fasting blood sugar*

*Not significant improvements

American Journal of Clinical Nutrition 2015

Paleolithic nutrition for metabolic syndrome: systematic review and meta-analysis

Implications for practice:

Although there is moderate quality evidence from randomized controlled intervention studies to suggest that the Paleolithic diet can improve metabolic syndrome components, we believe that more studies are required before Paleolithic nutrition can be recommended in future guidelines

American Journal of Clinical Nutrition 2015

Paleo Diet

Benefits

- Elimination diet can be useful in identifying food sensitivities
- Increase awareness of what one is eating
- Weight loss likely due to restrictive diet
- Blood sugars likely to improve due to carbohydrate restriction
- Satiety

Challenges

- Compliance is challenging
- Meal planning and prep required
- Expense of fresh meat compared to frozen or canned
- Risk of nutrient deficiencies if followed long term (Ca, Vit D, B-Vitamins)
- No long term studies
- Is it safe for everyone?

THE WHOLE30® PROGRAM History

- Book written by Melissa Hartwig and Dallas Hartwig
 - Neither have nutrition-science backgrounds
- *“Since April 2009, millions of people have successfully completed our Whole30 program with stunning, life-changing results.”*

<https://whole30.com/whole30-program-rules/>

THE WHOLE30® PROGRAM Purpose

- Eliminate the most common craving-inducing, blood sugar disrupting, gut-damaging, inflammatory food groups for a full 30 days
- Let your body heal and recover from whatever effects those foods may be causing
- Push the reset button with your health, habits, and relationship with food
- Learn how the foods you've been eating are actually affecting your day-to-day life, long term health, body composition, and feelings around food
- “This will change your life.”

<https://whole30.com/whole30-program-rules/>

THE WHOLE30® PROGRAM - What to eat

- Vegetables – all vegetables
- Fruits – all
- Nuts
- Moderate portions of meat, eggs, and seafood
- No legumes - green beans, sugar snap peas, and snow peas are allowed
- No grains
- No dairy



<https://whole30.com/whole30-program-rules/>

THE WHOLE30® PROGRAM - What not to eat

- Do not consume added sugar, real or artificial
 - No maple syrup, honey, agave nectar, coconut sugar, date syrup, stevia, Splenda, Equal, Nutrasweet, xylitol, etc
- Do not consume alcohol
- Do not consume baked goods, junk foods, or treats with “approved” ingredients
- Recreating or buying sweets or treats is totally missing the point (even if the ingredients are technically compliant)



<https://whole30.com/whole30-program-rules/>

THE WHOLE30® PROGRAM

Benefits

- Elimination diet can be useful in identifying food sensitivities
- Increase awareness of what one is eating
- Weight loss likely due to restrictive diet
- Blood sugars likely to improve due to carbohydrate restriction
- May broaden ones food palate

Challenges

- Not recommended as a long term plan
- Risk of nutrient deficiencies if followed long term
- No studies done on the program

Diets with more research

Mediterranean Diet History

- The Mediterranean diet is inspired by the eating habits of Greece, Southern Italy, and Spain in the 1940's and 1950's



Mediterranean Diet – What to eat

Emphasizes eating:

- less meat and more fish
- vegetables
- fruits
- legumes
- nuts
- unrefined grains
- olive oil



Mediterranean Diet (MedDiet) and Cardiometabolic Syndrome: A Review.

Definition:
Cardiometabolic syndrome is the relationship between type 2 diabetes, obesity, metabolic syndrome and cardiovascular disease (CVD)

Objective: A scientific literature review examining all cardiovascular risk factors combined and their relationship with adherence to the Mediterranean Diet (MedDiet) pattern as primary prevention against cardiometabolic syndrome

Nutrients 2014

Mediterranean Diet (MedDiet) and Cardiometabolic Syndrome: A Review

Design: Review of 37 articles

- Studies were selected based on sample size, follow-up period and potential confounders (age, sex, energy intake, etc)
- Search was narrowed to the following:
 - 9 Metabolic Syndrome
 - 14 Obesity
 - 4 Type 2 Diabetes
 - 10 Cardiovascular Disease

Nutrients 2014

Mediterranean Diet (MedDiet) and Cardiometabolic Syndrome: A Review.

Results:

- 33 studies provided strong evidence on the association between adherence to a MedDiet and a reduced incidence of collective cardiometabolic syndrome risk in epidemiological studies
- This scientific evidence makes the MedDiet pattern very useful for preventive strategies directed at the general population

Nutrients 2014

DASH - Dietary Approaches to Stop Hypertension Diet History

- Originated in the 1990's
- In 1992, the National Institute of Health (NIH) started funding for several research projects to see if specific dietary interventions were useful in treating hypertension

Nutrients 2014

DASH - Dietary Approaches to Stop Hypertension

Is a lifelong approach to healthy eating that's designed to help treat or prevent high blood pressure (hypertension)

- Vegetables: 4 to 5 servings per day
- Fruit: 4 to 5 servings per day
- Lean meats, poultry and seafood : (6 oz or less per day)
- Fat-free and low-fat milk products: 2 to 3 servings/day
- Grains: 6 to 8 servings/day (choose whole grains)
- Nuts, seeds and dry beans: 4 to 5 servings/week
- Sweets and added sugars: 5 or fewer servings/week
- Sodium: 1500 mg/day (about ¾ tsp salt)
- Moderate alcohol consumption: men – 2 or less; women 1 or less/day



The impact of individualized nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: a prospective randomized study

Subjects: 131 overweight/obese participants

- Participants were all on antihypertensive medications
- Well controlled blood pressure <140/90 mm Hg for at least 6 months
- BMI >25
- Postmenopausal women with no history or hormone replacement
- No history of dietitian advice or organized nutritional counseling
- Exclusion criteria: CAD, heart failure, kidney or liver disease, type 2 diabetes

Kardiologia Polska 2008

The impact of individualized nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: a prospective randomized study

Methods: participants were randomized to either a DASH intervention or the control group

- Each group had a three-month nutritional intervention
- Intervention group received DASH diet education
 - Individualized 3-month diet plan provided along
 - Individual counseling was preceded by a lecture, in groups of 4 to 6 patients
 - Risk factors for HTN, as well as principles of DASH diet were discussed
 - Emphasis was put on weight reduction
 - 4 individual follow-up appointments were scheduled to monitor compliance

Kardiologia Polska 2008

The impact of individualized nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: a prospective randomized study

Methods:

- Control group received only standard recommendations – no nutrition intervention
- BMI, height, waist and hip circumference, body composition, blood pressure, serum glucose, and insulin and leptin concentrations were measured at baseline and after the intervention

Kardiologia Polska 2008

The impact of individualized nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: a prospective randomized study

Results:

- DASH intervention group had significant decrease in BMI, blood pressure, body fat, fasting glucose, insulin and leptin concentrations as compared to the control group

Kardiologia Polska 2018

Conclusions

- No one size fits all diet plan
- All diets cause people to pay more attention to what they are eating so generally they lose weight
- Restrictive/elimination diets haven't been studied for long-term use
- Restrictive diets generally aren't sustainable

Conclusions

- New meal ideas can make meal planning more enjoyable
- Finding a sustainable, tasty, balanced plan per individual is key
- Individualization by a registered dietitian continues to be best standard of practice

Questions? Lets Discuss!

- Have you used these diets in your practice? Why or why not?
- Have you tried any of these diets personally?
- What are your thoughts?
- Anything you would like to add?

Thank you!



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THE WHOLE30® PROGRAM
<https://whole30.com/whole30-program-rules/>



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