Paul Nakroshis

Losing weight by eating (good) fat.

An N=1 experiment with LCHF & Ketogenic diets.
Disclaimer:
I’m a physics doctor, not a medical doctor
I don’t know the best diet for you
(or even for me right now)
Rough Outline

❖ Why do the experiment?
❖ Historical Background
❖ The experiment
❖ Future?
❖ References
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Detailed Outline

❖ Why do the experiment?
  • obesity/T2DM
  • the REAL reason

❖ Historical & Medical Background
  • Ancel Keys & saturated fat
  • Cholesterol and CHD

❖ The experiment
  • Beginning numbers
  • Weight change/Lipid Profile changes
  • Endurance exercise benefits
  • What happened

❖ Results

❖ References
Obesity ➔ Metabolic Syndrome

- **Blood pressure** equal to or higher than 130/85 mmHg
- **Fasting blood sugar** (glucose) equal to or higher than 100 mg/dL (150?)
- **Large waist circumference** (length around the waist):
  - Men - 40 inches or more
  - Women - 35 inches or more
- **Low HDL cholesterol**:
  - Men - under 40 mg/dL
  - Women - under 50 mg/dL
- **Triglycerides** equal to or higher than 150 mg/dL

Type 2 Diabetes Mellitus (T2DM)

- 69% of americans (age 20 and over) are overweight; 35.1% are obese. (2011-2012 from CDC)
- Unchecked Metabolic Syndrome —> T2DM
- In 2012, 29.1 million Americans, or 9.3% of the population, had diabetes.
- In 2010 the figures were 25.8 million and 8.3%.
- 7th leading cause of death in 2010
- Obesity / T2DM cost the US $190 billion in 2005

by 2030, if obesity trends continue unchecked, obesity-related medical costs alone could rise by $48 to $66 billion a year in the U.S.

http://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/
Trends in Obesity among children and adolescents
United States: 1963-2008

NOTE: Obesity is defined as body mass index (BMI) greater than or equal to sex- and age-specific 95th percentile from the 2000 CDC Growth Charts.

http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm#figure1
Prevalence of diabetes in the United States

Cases per 100,000 people

What is the environmental trigger to explain this increase?
Complications

- Diabetes
- Alzheimer's disease (linked to insulin levels)
- High blood pressure
- Heart disease and stroke (atherosclerosis)
- Some cancers
- Gallbladder disease and gallstones
- Osteoarthritis
- Gout
- Breathing problems, such as sleep apnea and asthma
EBOLA!!

OBESITY: 300,000 DEATHS PER YEAR

TOBACCO: 450,000 DEATHS PER YEAR

ALCOHOL: 88,000 DEATHS PER YEAR

USA
August 2011

The Real Reason for the Experiment

“Papa…YOU have a pot-belly!”
Historical/Medical Background

Ancel Keys
"Six" Countries Study
Correlation does not prove causation
Figure 1

# of ice creams sold

Murder Rate
Ice Cream Consumption

Crime Rate

CORRELATION
The Experiment

Contrary to what I’d been taught:

❖ there is NO daily nutritional requirement for carbohydrate (old standard 150 g/day rec)

❖ Olive oil, coconut oil, grass fed butter, eggs = good

❖ Bacon, grass fed beef = good

❖ Saturated fat raises HDL Cholesterol, Raises LDL (usually only slightly) lowers Triglycerides
What drives weight gain?
What drives weight gain?

Insulin

Carbohydrate consumption drives insulin secretion which drives increases in body fat stores which leads to overeating and further weight gain.
Effect of a Low-Carbohydrate Diet on Appetite, Blood Glucose Levels, and Insulin Resistance in Obese Patients with Type 2 Diabetes

Guenther Boden, MD; Karin Sargrad, MS, RD, CDE; Carol Homko, PhD, RN, CDE; Maria Mozzoli, BS; and T. Peter Stein, PhD
Andreas Eenfeldt, MD

http://www.dietdoctor.com/blood-sugar-two-different-meals-diabetes-conference
http://www.dietdoctor.com/blood-sugar-two-different-meals-diabetes-conference
Rough Weight History

Pot Belly Comment
(no more ice cream)

1st Daughter Born

Eliminate Grains
(All sugar too)

Weight (pounds)

Age (years)
Nutritional Ketosis

- Ketosis is a metabolic state in which the liver produces small organic molecules called ketone bodies that most cells in our body can use for fuel.

![Ketone figures](http://eatingacademy.com/wp-content/uploads/2012/11/Ketone-figures-1-645x230.jpg)
How to enter ketosis

- For most people: need to restrict carbohydrate intake to < 50 grams/day
- “induction” may take several weeks
- nutritional ketosis is reached when your \( \beta \)-Hydroxybutyrate levels are above 0.5 mMol/Liter
DO NOT eat these foods:

**Sugar:** The worst. Soft drinks, candy, juice, sports drinks, chocolate, cakes, buns, pastries, ice cream, breakfast cereals. Preferably avoid sweeteners as well.

**Starch:** Bread, pasta, rice, potatoes, French fries, potato chips, porridge, muesli and so on. “Wholegrain products” are just less bad. Moderate amounts of root vegetables may be OK (unless you’re eating extremely low carb).

**Margarine:** Industrially imitated butter with unnaturally high content of omega-6 fat. Has no health benefits, tastes bad. Statistically linked to asthma, allergies and other inflammatory diseases.

**Beer:** Liquid bread. Full of rapidly absorbed carbs, unfortunately.

**Fruit:** Very sweet, lots of sugar. Eat once in a while. Treat fruit as a natural form of candy.
Do eat these:

**Meat:** Any type, including beef, pork, game meat, chicken, etc. Feel free to eat the fat on the meat as well as the skin on the chicken. If possible try to choose organic or grass fed meat.

**Fish and Shellfish:** All kinds: Fatty fish such as salmon, mackerel or herring are great. Avoid breading.

**Eggs:** All kinds: Boiled, fried, omelettes, etc. Preferably choose organic eggs.

**Natural Fat, High-Fat Sauces:** Using butter and cream when you cook can make your food taste better and make you feel more satiated. Try a Béarnaise or Hollandaise sauce, check the ingredients or make it yourself. Coconut oil and olive oil are also good options.

**Vegetables that Grow Above Ground:** All kinds of cabbage, such as cauliflower, broccoli, cabbage and Brussels sprouts. Asparagus, zucchini, eggplant, olives, spinach, mushrooms, cucumber, lettuce, avocado, onions, peppers, tomatoes etc.

**Dairy products:** Always select full-fat options like real butter, cream (40% fat), sour cream, Greek/Turkish yogurt and high-fat cheeses. Be careful with regular milk and skim milk as they contain a lot of milk sugar. Avoid flavored, sugary and low-fat products.

**Nuts:** Good to eat instead of candy in front of the television (preferably in moderation).

**Berries:** Okay in moderation, if you are not a super strict or sensitive. Good with whipped cream.
The brain needs a great deal of energy to keep all those membrane potentials maintained - to keep pushing sodium out of the cells and pulling potassium into the cells. In fact, the brain, which is only 2% of our body weight, uses 20% of our oxygen and 10% of our glucose stores just to keep running. (Some cells in our brain are actually too small (or have tendrils that are too small) to accommodate mitochondria (the power plants). In those places, we must use glucose itself (via glycolysis) to create ATP.)
23 km  ~ 7 h 30 min, 2200 m vertical
20.2 km  2 h 14 min, 420 m vertical
Potential Pitfall

❖ For some people lipid levels can go pretty crazy!
Rough Weight History

- 1st Daughter Born
- Pot Belly Comment (no more ice cream)
- Trail Running begins
- Nutritional Ketosis
- Eliminate Grains (All sugar too)
- Discovered Bacon

Weight (pounds) vs. Age (years)
Lipid Profile


- Total Chol.
- Trig
- HDL
- LDL
- VLDL
- APO-B
REFERENCES: Articles

- Comprehensive Biomarker Testing of Glycemia, Insulin Resistance, and Beta Cell Function Has Greater Sensitivity to Detect Diabetes Risk Than Fasting Glucose and HbA1c and Is Associated with Improved Glycemic Control in Clinical Practice. Link


Lipid researcher, 98, reports on the dietary causes of heart disease; http://www.sciencedaily.com/releases/2013/02/130227151254.htm


Vulnerability to Fructose Varies, Health Study Finds; NY Times, Oct. 13, 2014 By ’

Low-carb Diet Recommended for Type 1 and 2 Diabetes Patients, Diabetes in Control, August 2014

The Straight Dope on Cholesterol, Dr. Peter Attia; posted at the Eating Academy: http://eatingacademy.com/nutrition/the-straight-dope-on-cholesterol-part-i

Understanding the Lipid Profile: Dr. Thomas Dayspring  http://www.lipidcenter.com/pdf/Understanding_the_Entire_Lipid_Profile.pdf


Immune and Inflammatory Mechanisms of Atherosclerosis, Elena Galkina and Klaus Ley http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2734407/
REFERENCES: Audio/Videos

- Dr. Andreas Eenfeldt: [http://www.dietdoctor.com](http://www.dietdoctor.com); see the video interviews with Gary Taubes, Dr. Stephen Phinney, PhD, Dr. Robert Lustig and others.

- Chris Masterjohn on cholesterol & heart disease (Part 1) Listen to the podcast interview [HERE](http://chriskresser.com/the-healthy-skeptic-podcast-episode-11), or read the transcript at [http://chriskresser.com/](http://chriskresser.com/)

- Dr. Peter Attia: [The Straight Dope on Cholesterol](http://www.youtube.com/watch?v=daiax0SyEGE) (YouTube)

- Dr. Robert Lustig: [Sugar, the Bitter Truth](http://www.youtube.com/watch?v=daiax0SyEGE)

- Dr. Robert Lustig: Fructose 2.0

- Lipids: Deeper Look with Dr. Tara Dall and Dr. Dayspring [https://www.youtube.com/watch?v=daiax0SyEGE](https://www.youtube.com/watch?v=daiax0SyEGE)

- Healthy Eating, Prof. Tim Noakes, MD

- Professor Tim Noakes on the topic: "The Great Diet Controversy: UCT taught me to Challenge Beliefs."

- Prof. Tim Noakes, Medical Aspects of the Low Carbohydrate Lifestyles

- Dr. Stephen Phinney, Achieving and Maintaining Nutritional Ketosis
REFERENCES: Books

❖ Taubes, Gary, Why We Get Fat
❖ Taubes, Gary, Good Calories, Bad Calories
❖ Phinney, Stephen & Volek, Jeff, The Art and Science of Low Carbohydrate Living
❖ Phinney, Stephen & Volek, Jeff, The Art and Science of Low Carbohydrate Performance
❖ Teicholz, Nina, The Big Fat Surprise—Why Butter, Meat & Cheese Belong in a Healthy Diet
❖ The Real Meal Revolution, by Prof. Tim Noakes, MD, order from kalahari.com
Based on Your 60-year Career in the Field and as a Nonagenarian Yourself, What Dietary Advice Would You Give to Aid the Avoidance of Coronary Artery Disease?

This is what I currently eat:

• Breakfast: A scrambled egg, cooked whole grains and oatmeal served with several kinds of fruit, including banana and those with colored skin, topped with whole milk, a few walnuts, pecans or almonds, and plain yogurt. I drink a glass of whole milk with this. I eat an egg because it has all the amino acids that are required to synthesize the apoproteins, which carry lipids as lipoproteins in the blood;

• Lunch: Meat or fish prepared under the broiler or baked, potatoes, some fresh or frozen vegetables, a lettuce salad with olive oil and lemon juice dressing, fruit and a glass of whole milk;

• Dinner: Sometimes, vegetables or vegetable soup that uses up any vegetable leftovers, a piece of whole wheat bread with cheese, fruit and a glass of whole milk.

My best dietary advice is to eat a balanced diet with a differing protein source every day, avoid all trans fats and don't drink soda pop.

-Fred A Kummerow
(98-year-old emeritus professor of comparative biosciences at the University of Illinois)
Eat Butter.
Scientists labeled fat the enemy. Why they were wrong
BY BRYAN WALSH