

Evolutionary considerations of a meal

DIET AND HEALTH

Thanksgiving Meal



Paleolithic diet

- Gene-environment mismatch
- Perhaps we are best off eating what our ancestors ate.
- Question – what foods were they?
 - Grains
 - Nuts
 - Meat

Turkeys domesticated and wild



Thanksgiving Turkey

- White meat mostly protein
- Much more massive in farmed turkey
- Less fat in wild game
- Fewer antibiotics



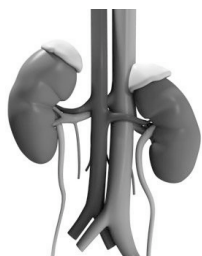
Salt

- Most turkey is injected with brine solution
- Cooks often soak bird in salt water
- Some chefs sprinkle table salt on turkey a day before cooking
- Why does it taste better this way?



Salt and Hypertension

- Some hypertensives are sensitive to salt
- Salt has anti-diuretic properties
- Regulates blood volume and pressure
- Stress makes kidneys hold onto salt
- Fight or Flight

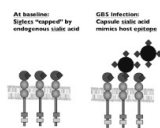


Poultry vs Ham? Which is healthier?



Sialic acid

- Carbohydrates on animal cells
- Used for cellular signaling and normal function
- also used by pathogens to gain entry into cells



- Neu5Gc not made by human cells
- In beef and pork but not poultry or fish
- Diet: anti-neu5Gc antibodies
- Autoimmune disease, heart disease

Varki, A.: Sialic Acids in Human Health and Disease. Trends Mol. Med., 14:351-360, 2008.

Color - Phytopigments

- Primates selected for preference for colorful fruits.
- Higher calorie density, fewer toxins
- Anthocyanins in cranberries antioxidant effects?



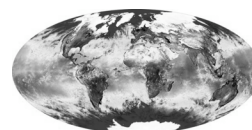
Fruitcake - full of spices

- Why do we spice food?
- What is the most salient feature of a fruitcake?



Function of spices?

- Spices more often used in meat dishes than vegetarian dishes
- Spices used more when ambient temperature is high
- More spice when latitude is low



(Parker and Tavassoli, 2000)
(Sherman and Hash 2001)

Dessert – Pie and Ice cream



Challenge to simplistic diet guidelines

- Inuit – eat diet extremely high in saturated fats – cetacean and seal meat/fat
- Traditional Polynesians eat diet very high in palm oil – saturated fat
- When these traditional communities transition to diet of SPAM and Pepsi, obesity and diabetes occurs.

Omega 3 fatty acids

- Whale and seal meat have high Omega 3s
- Fish
- Eggs



Lactose intolerance

- Lactose is sugar found only in milk
- Lactase is the enzyme that digests lactose
- “Late-onset lactase deficiency is a common disorder...90% American blacks...60-80% Mexican –Americans. Native Americans, Indians, Asians, Middle Eastern populations have abnormal lactose tolerance” AAP, 1985

Lactase Persistence

- | | |
|-----------------------|-------|
| ▪ Northern Europeans | 95% |
| ▪ Middle-East | 30% |
| ▪ Africa (herders) | 80% |
| ▪ Africa (nonherders) | 10% |
| ▪ Asians | 5% |
| ▪ Native American | 0-30% |

Vitamins

- Except deficiency syndromes, vitamins have no benefit
- C & E no effect on cancer or heart disease
- E & Selenium increase rate of prostate cancer
- E increases risk of death, cancer recurrence, heart failure
- A & Beta carotene increased lung cancer in smokers

<http://well.blogs.nytimes.com/2008/11/20/news-keeps-getting-worse-for-vitamins/>

Summary

- Paleolithic diet
- Wild game better than factory farm meat
- Taste for salt may reflect paleolithic scarcity
- Poultry lacks immunogenic sialic acids
- Spice may prevent food-borne illnesses
- Pigments/phytochemical coadaptation
- Omega 3s not stored as visceral fat
- Lactose intolerance – geography, human evol
- Vitamins – evidence agrees with evolutionary predictions