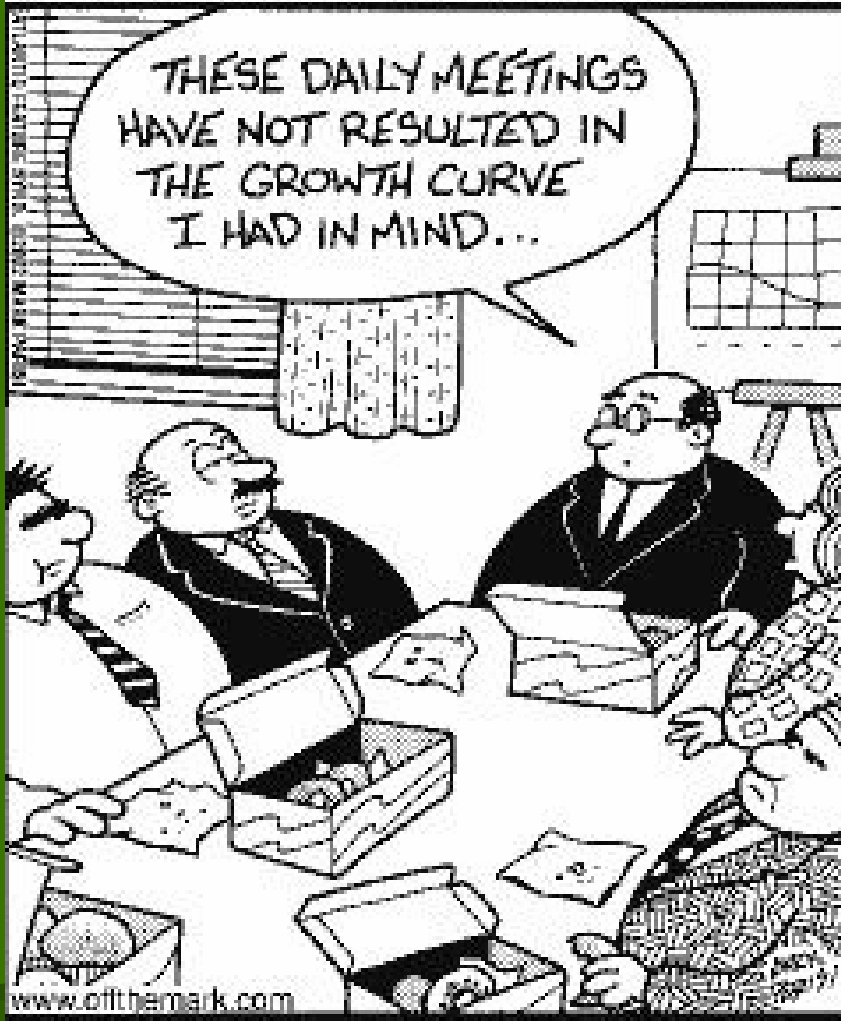


**off the mark**

by Mark Parisi

www.offthemark.com



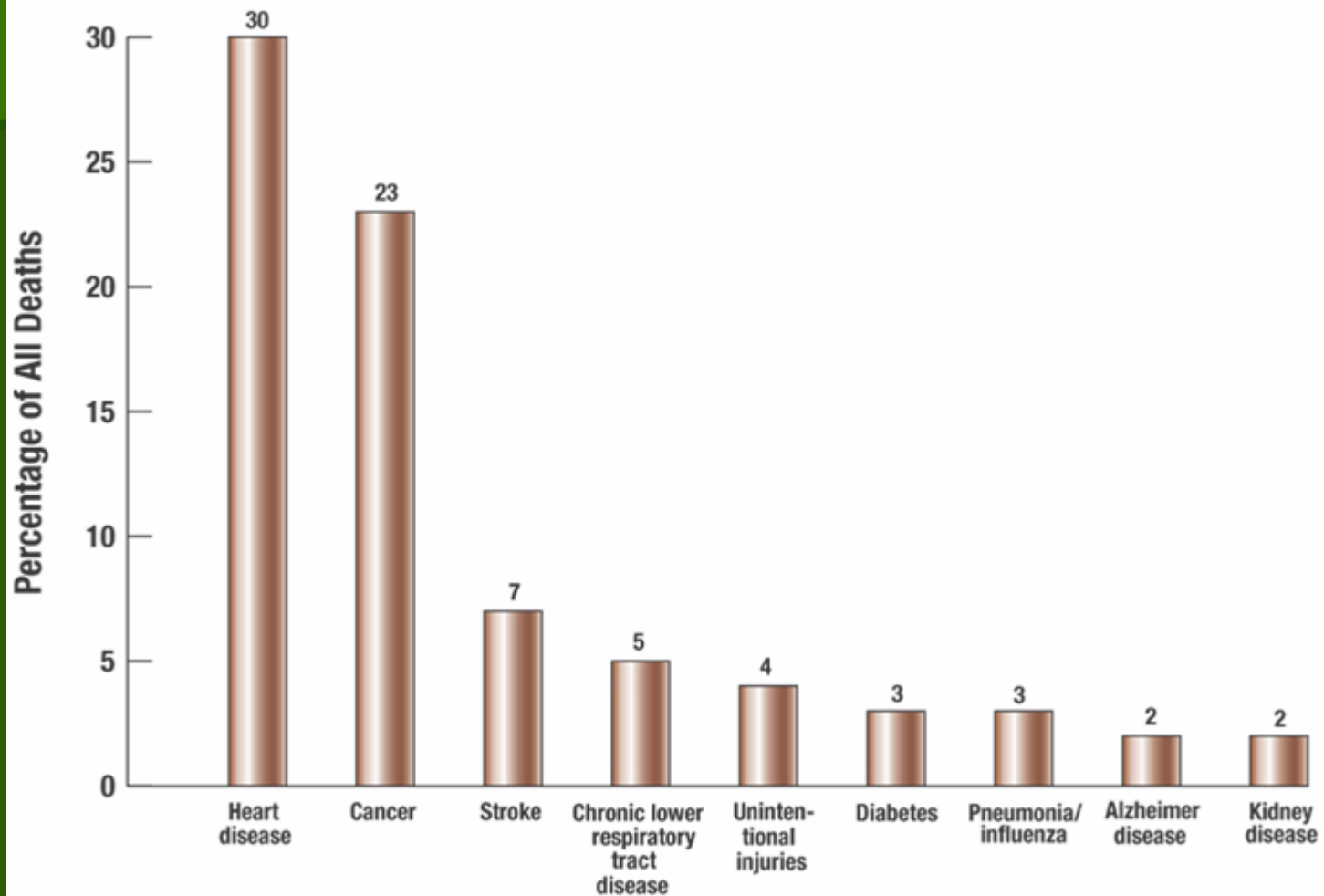
A vegan  
approach to  
chronic  
disease  
prevention

Ole Ersson, M.D.  
NWVeg Master  
Vegetarian Program

# Synopsis

- Overview and scope of the problem
- Macrovascular disease: cardiovascular, cerebrovascular, and peripheral artery disease
- Myocardial infarction, Stroke, and Intermittent Claudication
- Type 2 Diabetes and microvascular disease
- Essential Hypertension
- Breast, prostate, and colon cancer
- Osteoporosis
- Macronutrient nutrition primer
- Chronic disease prevention summary



## Heart Disease and Cancer Lead as Reported Causes of Death





### Top 9 Reported Causes of Death, 2000

Source: Drug Benefit Trends © 2004 Cliggott Publishing, Division of SCP Communications

### Estimated New Cases\*

				<b>Males</b>	<b>Females</b>		
Prostate	234,460	33%			Breast	212,920	31%
Lung and Bronchus	92,700	13%			Lung and Bronchus	81,770	12%
Colon and Rectum	72,800	10%			Colon and Rectum	75,810	11%
Urinary Bladder	44,690	6%			Uterine Corpus	41,200	6%
Melanoma of the Skin	34,260	5%			Non-Hodgkin Lymphoma	28,190	4%
Non-Hodgkin Lymphoma	30,680	4%			Melanoma of the Skin	27,930	4%
Kidney and Renal Pelvis	24,650	3%			Thyroid	22,590	3%
Oral Cavity and Pharynx	20,180	3%			Ovary	20,180	3%
Leukemia	20,000	3%			Urinary Bladder	16,730	2%
Pancreas	17,150	2%			Pancreas	16,580	2%
<b>All Sites</b>	<b>720,280</b>	<b>100%</b>	<b>All Sites</b>	<b>679,510</b>	<b>100%</b>		

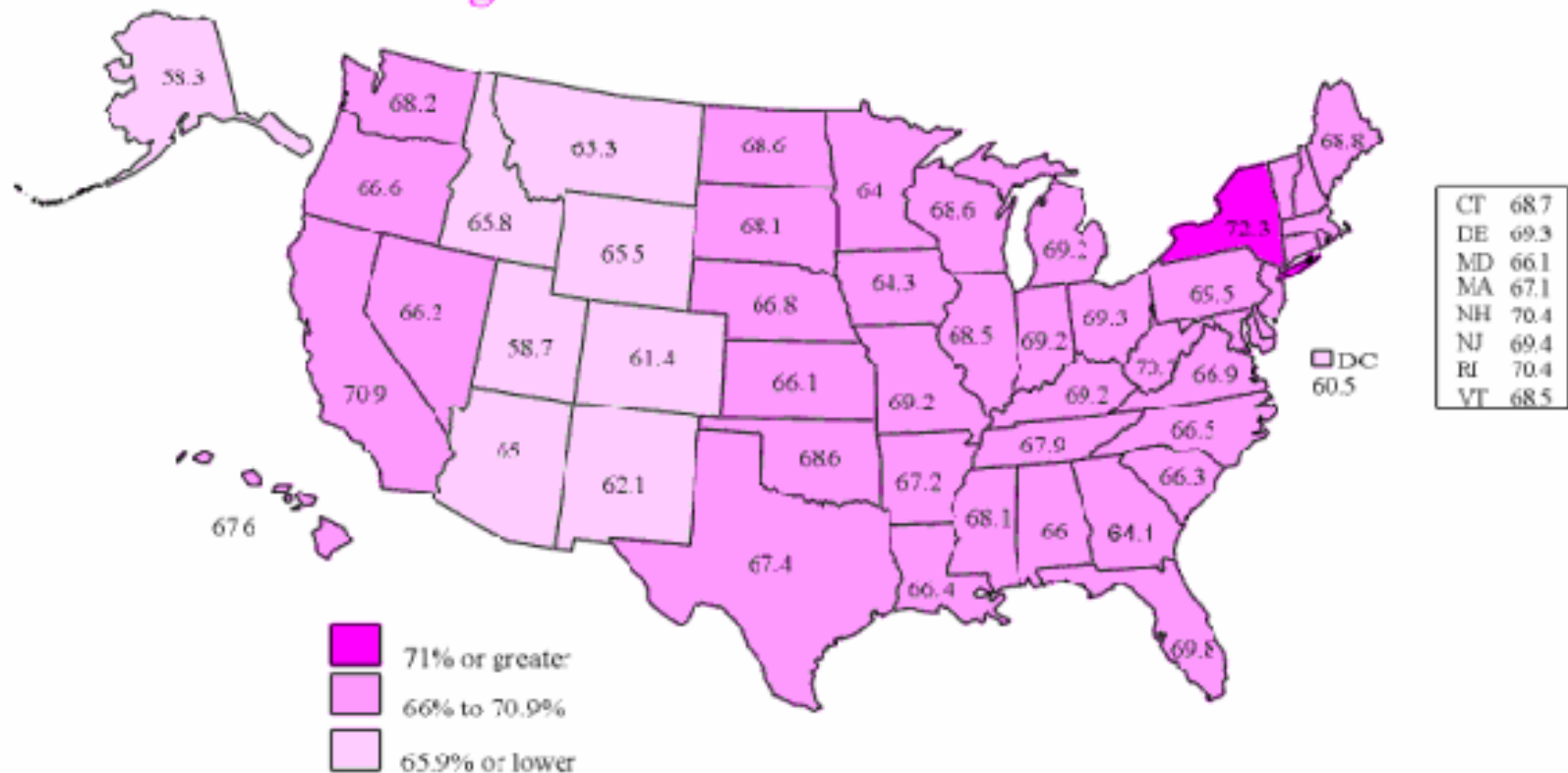
### Estimated Deaths

			<b>Males</b>	<b>Females</b>			
Lung and Bronchus	90,330	31%			Lung and Bronchus	72,130	26%
Colon and Rectum	27,870	10%			Breast	40,970	15%
Prostate	27,350	9%			Colon and Rectum	27,300	10%
Pancreas	16,090	6%			Pancreas	16,210	6%
Leukemia	12,470	4%			Ovary	15,310	6%
Liver and Intrahepatic Bile Duct	10,840	4%			Leukemia	9,810	4%
Esophagus	10,730	4%			Non-Hodgkin Lymphoma	8,840	3%
Non-Hodgkin Lymphoma	10,000	3%			Uterine Corpus	7,350	3%
Urinary Bladder	8,990	3%			Multiple Myeloma	5,630	2%
Kidney and Renal Pelvis	8,130	3%			Brain and Other Nervous System	5,560	2%
<b>All Sites</b>	<b>291,270</b>	<b>100%</b>	<b>All Sites</b>	<b>273,560</b>	<b>100%</b>		

## Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths, by Sex, US, 2006

Source: CA Cancer J Clin 2006; 56:106-130

## Percentage of Deaths Due to Chronic Diseases\*



**Source:** *The Burden of Chronic Diseases and Their Risk Factors*, Centers for Disease Control and Prevention, February 2002.

\* Includes disease of the heart, all cancers, chronic obstructive pulmonary disease, stroke and diabetes.

# Why Chronic Disease?

- Cause major limitations for > 1:10 Americans, or 25 million people.
- >90 million Americans live with chronic illnesses.
- Cause 70% of all deaths in the US, or more than 1.7 million people each year.
- Medical care costs for people with chronic diseases account for >75% of national costs —almost \$1.6 trillion in 2002 (14.9% of GDP)

*-Centers for Disease Control*

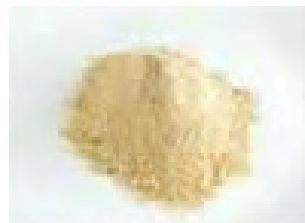
# Why the epidemic of food related chronic illness?

- Our modern industrial food system has resulted in cheap, plentiful food supplies
- Food consumption patterns have changed dramatically in the last 50-100 years
- Refined fats, sugars, and carbohydrates have become ubiquitous in the food supply
- Our genetic program, which evolved in times of food scarcity, is having trouble coping with today's calorie glut

### Cost of 200 Calories: Less than 50 cents



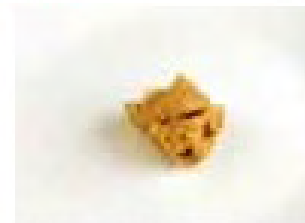
Canola Oil  
**\$0.07**



Wheat flour  
**\$0.07**



Brown Sugar  
**\$0.10**



Peanut Butter  
**\$0.17**



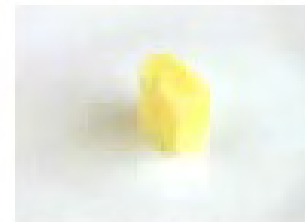
Cornmeal  
**\$0.20**



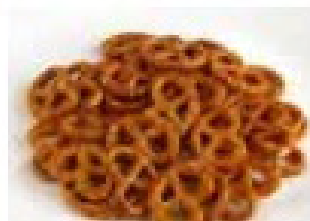
Uncooked Pasta  
**\$0.21**



Glazed Donut  
**\$0.23**



Butter  
**\$0.24**



Salted Pretzels  
**\$0.24**



Wheat Dinner  
Rolls  
**\$0.23**

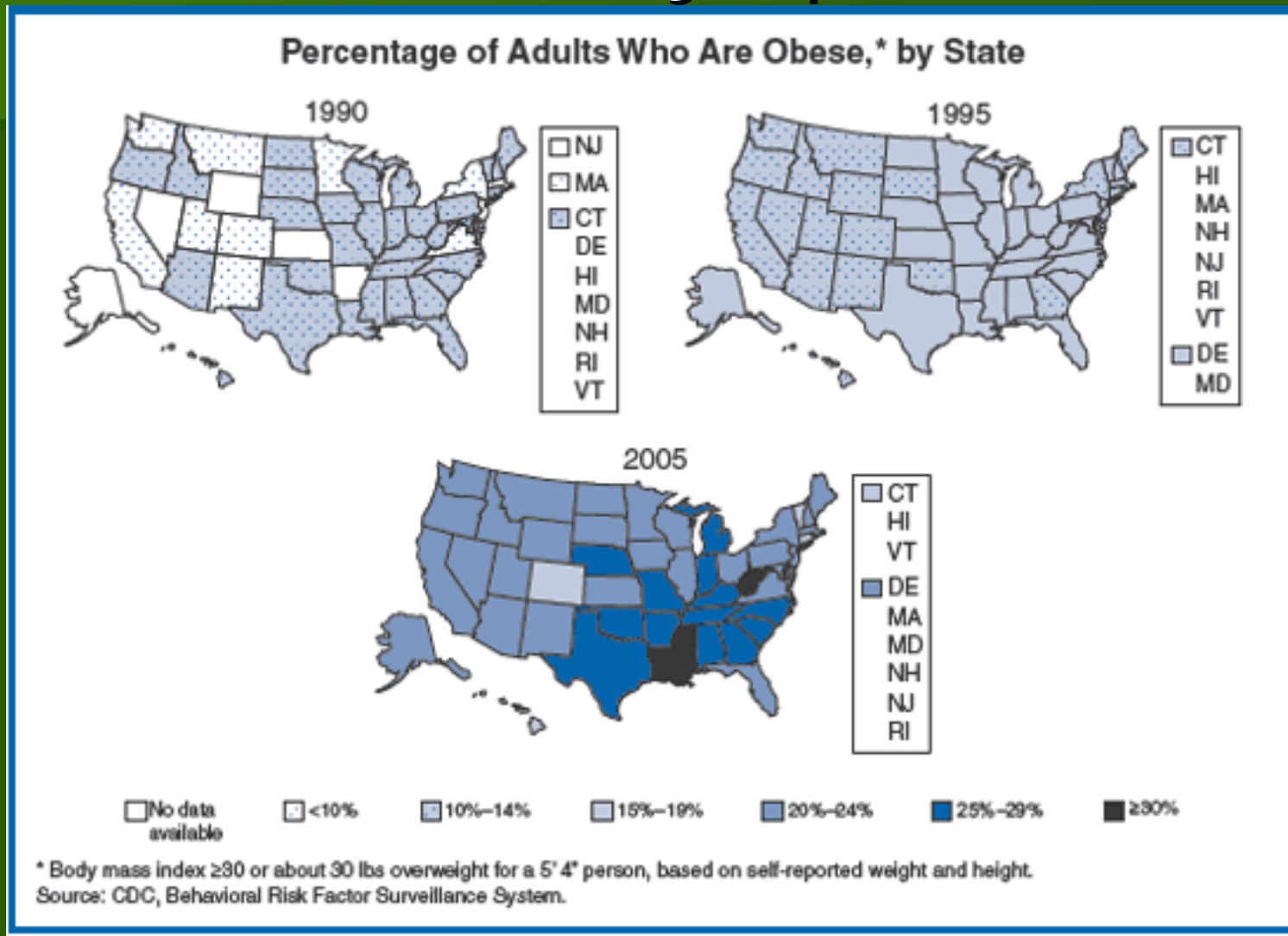


French  
Sandwich Roll  
**\$0.24**



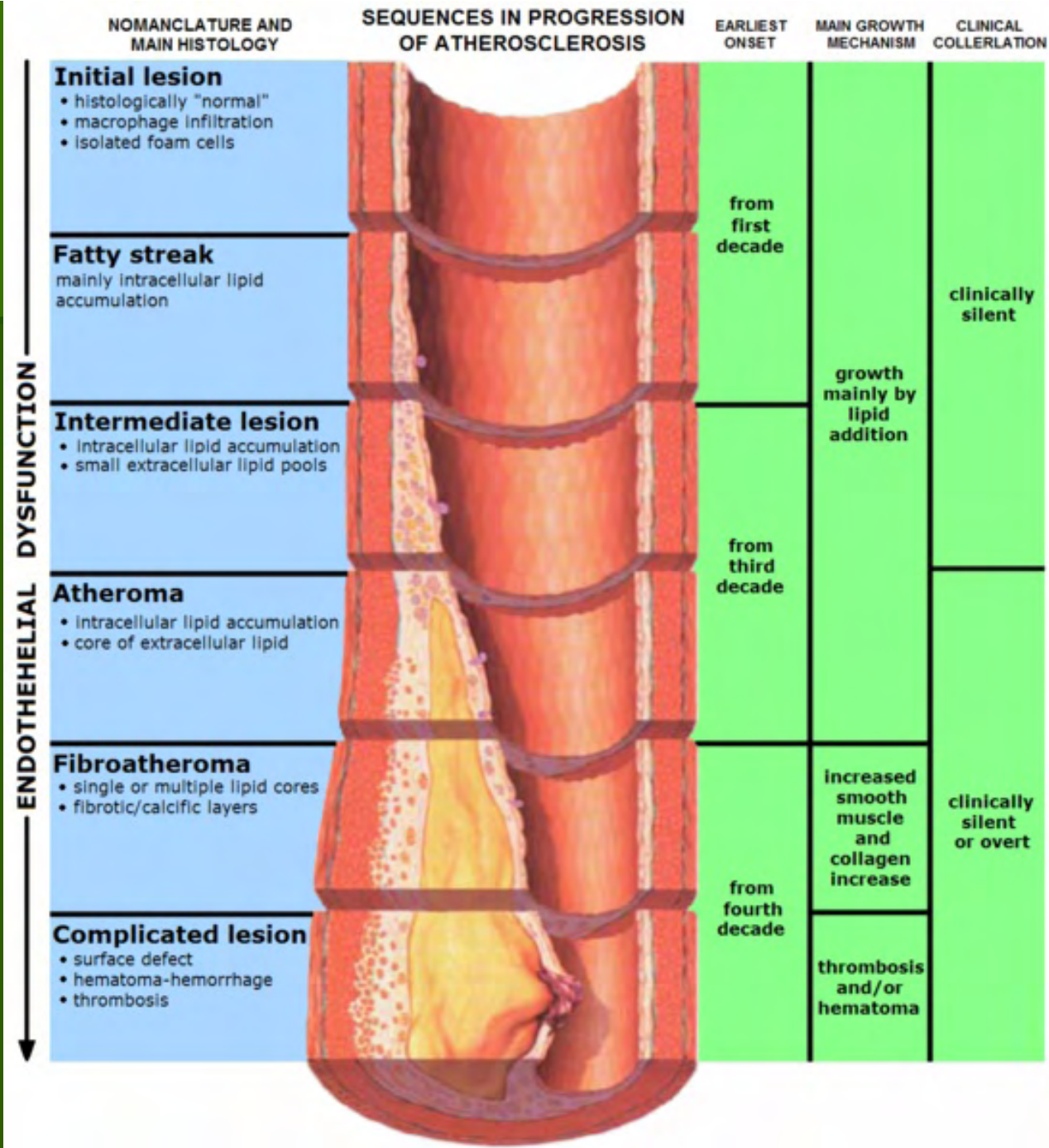
Smarties Candy  
**\$0.24**

# The obesity epidemic

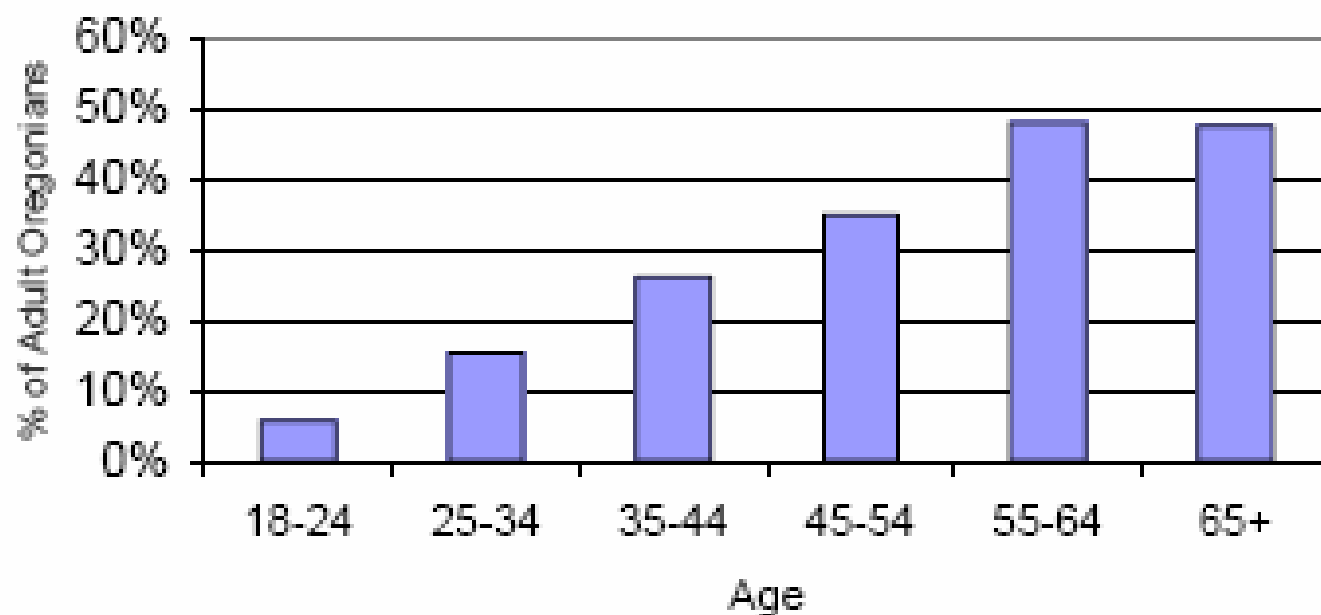


# *Macrovascular disease*

- By far, the leading cause of death world-wide
- Disease of the arteries, vessels that supply oxygen and nutrient rich blood to tissues
- The primary injury is the arterial plaque: a fatty deposit on the *inside* of the artery that occludes blood flow
- Also called atherosclerosis
- Plaques are fragile and when they rupture can cause blood clots that suddenly, totally occlude blood flow



Percentage of Adult Oregonians with Clinically Diagnosed High Blood Cholesterol, by Age, 2003



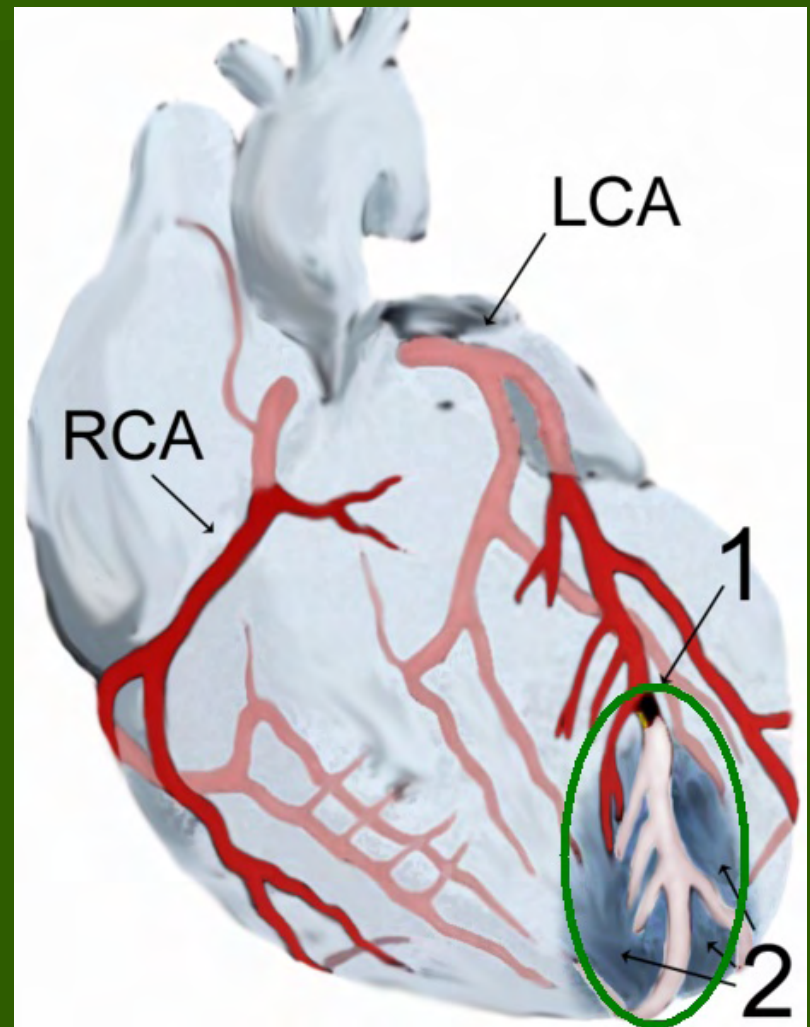
Source: Oregon Behavioral Risk Factor Surveillance System

# Coronary artery disease

- Symptoms of coronary artery disease include chest pain and heart attack
- Chest pain, or angina, is caused by decreased blood flow to the heart
- Angina usually presents during exertion, when blood flow to the heart needs to increase
- Severe angina can present at rest

# Myocardial infarction

- Starts with rupture of a coronary arterial plaque
- This results in a blood clot over the rupture which can completely block blood flow
- Heart tissue “downstream” of this blockage will die if blood flow is not restored
- Half of heart attacks are fatal



# What causes artery injury?

- There are many risk factors, including high blood pressure, smoking, obesity
- But fatty plaque formation cannot occur unless the blood has too much cholesterol
- Diets high in cholesterol and fat, especially saturated and trans fats, lead to high blood cholesterol levels
- Dietary cholesterol is found only in animal products, so diets rich in meat, eggs, and dairy products can raise cholesterol levels

# Stroke

- Stroke occurs when blood supply is suddenly cut off to vital areas of the brain
- This usually is the result of a plaque rupturing in the carotid artery, forming a blood clot which then travels to and occludes smaller arteries
- Such an event is similar to a heart attack, and results in death of brain tissue
- This can lead to paralysis, loss of ability to speak, or other devastating disabilities

# Peripheral vascular disease

- When fatty plaques form in the arteries of the legs blood flow is impeded
- This leads to “angina” of the legs, termed intermittent claudication
- In severe cases blood flow can be cut off resulting in serious injury to the extremity which may require bypassing the diseased vessel

# Dietary recommendations to prevent macrovascular disease

- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low *total* calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**

# Type 2 diabetes

- Diabetes is a disease of high blood sugar. When you have diabetes, your blood sugar is out of balance.
- *Balanced blood sugar* means that your blood sugar level is neither too high nor too low. It is within a healthy range.
- The most common form of diabetes is type 2 diabetes (90-95%)
- When you have diabetes, your body is not able to keep your blood sugar level at a healthy balance on its own.

# Diabetes

- In type 2 diabetes, high blood sugar results from consuming too many calories for one's energy expenditure
- Blood sugar levels will return to normal by eating fewer calories...
- Or, by burning more calories by being physically more active

# Diabetes and obesity

- Obesity also results from consuming more energy than the body needs
- Normally, high blood sugar levels trigger insulin secretion from the pancreas. This causes tissues to take up sugar out of the blood
- In obesity, fat cells respond to increased insulin and remove glucose from the blood to be stored as fat; sugar levels normalize

# Diabetes and obesity

- In type 2 diabetes, fat and other cells become insensitive to insulin and blood sugars rise and stay elevated
- In a sense, diabetes is a defense mechanism against obesity
- If fat cells were not resistant to insulin the diabetic person would continue to gain weight as long as the energy imbalance persisted

**Without the protective effects of "insulin resistance" you might never stop enlarging.**



**"Insulin resistance" has been treated like a disease, but actually can be a lifesaver for those who eat large amounts of unhealthy foods.**

# Why is diabetes so unhealthy?

- High blood sugar levels damage nerves and small blood vessels in the body
- This leads to failure of organs such as the kidney. Diabetes is the leading cause of kidney failure requiring dialysis
- Blood vessel failure in the retina can lead to blindness

# Why is diabetes so unhealthy?

- High sugar levels also impair the immune system, leading to greater risk of infections
- The combination of large and small blood vessel disease, injured nerves, and impaired immune function often results in damage to limbs that require amputation
- But the leading cause of death for diabetics, as for the general population, is macrovascular disease, usually of the coronary arteries

# Dietary recommendations to prevent type 2 diabetes

- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low total calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**
- Following these recommendations can lead to energy balance and maintain proper blood sugar levels causing the diabetic disorder to resolve

# Essential hypertension

- High blood pressure: greater than 140/90
- Essential hypertension means no identifiable cause for elevated blood pressure
- 90-95% of cases of high blood pressure
- tends to develop gradually over many years
- the “silent” killer; asymptomatic
- significant risk factor for developing coronary artery disease, stroke, heart failure, and kidney failure

# Essential hypertension, risk factors

- Age
- Race (black > white)
- Family history
- Overweight
- Excess cholesterol, salt, alcohol intake
- Low potassium intake
- Inactivity

# Potassium Contents of Various Foods, mg K/CAL

Spinach, New Zealand 41.7

Beet greens 23.7

Chard, Swiss 22

Celery, raw 20

Radishes 19

Spinach, raw 18.1

Chard, Swiss, boiled 18

Celery, boiled 17

Lettuce, looseleaf 14.7

Mushrooms 14.7

Spinach, boiled, drained 14

animal foods:

Milk, skimmed 4

Chicken, light meat, roasted, no skin 2.5

BEEF, hamburger, regular 1.6

# Dietary recommendations to prevent essential hypertension

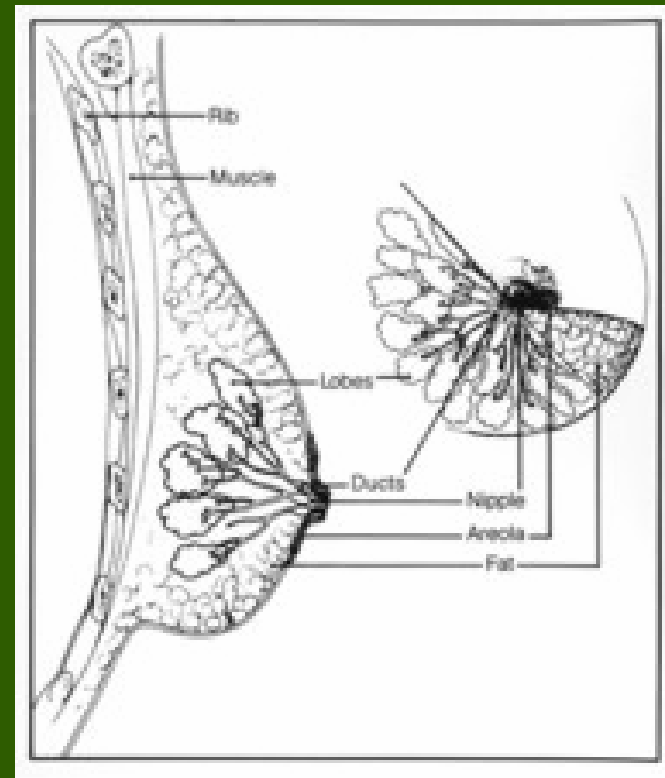
- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low *total* calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**
- Avoid excessive sodium intake

# Breast, prostate, and colon cancer

- Most common types of cancer in women and men
- Among the most deadly cancers
- Breast and prostate cancers are hormone mediated
- Colon cancer has the strongest association with dietary factors

# Breast cancer risk factors

- Female gender
- Age
- High fat diets
- Obesity
- Alcohol
- Hormonal supplements
- Low vegetable consumption
- Earlier onset and later cessation of menses
- Radiation exposure



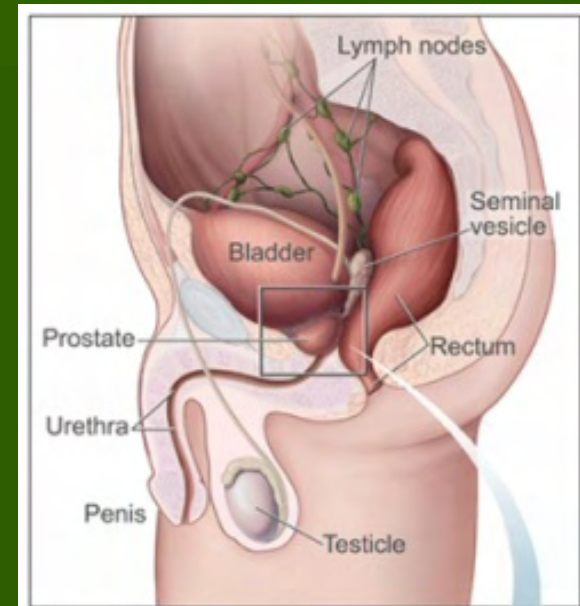
Source: <http://www.cdc.gov/cancer/>

# Lifestyle changes to reduce your breast cancer risk

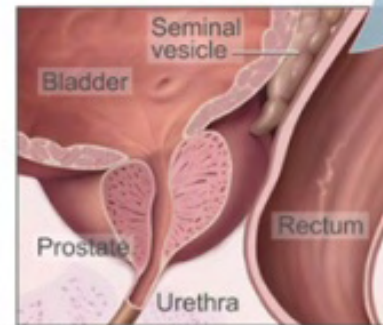
- Limit alcohol.
- Maintain a healthy weight.
- Stay physically active.
- Consider limiting fat in your diet.
- Avoid long term estrogen therapy

# Prostate cancer risk factors

- Age
- High animal fat consumption
- Obesity
- Race
- Family history
- Dairy consumption



This shows the prostate and nearby organs.



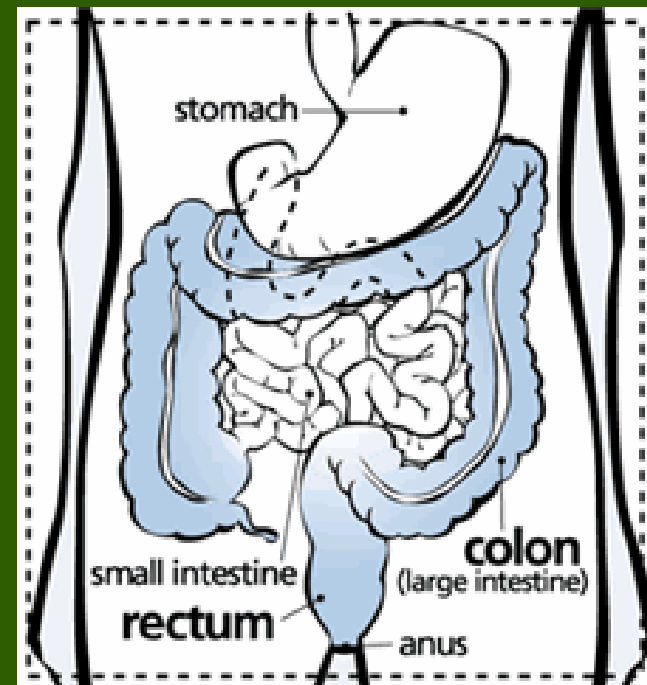
This shows the inside of the prostate, urethra, rectum, and bladder.

# Lifestyle changes to reduce your prostate cancer risk

- Eat plenty of fruits, vegetables and whole grains. Limit fat, especially saturated fat.
- Eat a varied diet to increase the vitamins and minerals you consume.
- Limit alcohol consumption.
- Stop smoking.
- Stay physically active and maintain a healthy body weight.

# Colon cancer risk factors

- Red meat consumption
- Low vegetable consumption
- Low fiber consumption
- Overweight
- Alcohol consumption
- Age



Source: <http://www.cdc.gov/cancer/>

# Lifestyle changes to reduce your colon cancer risk

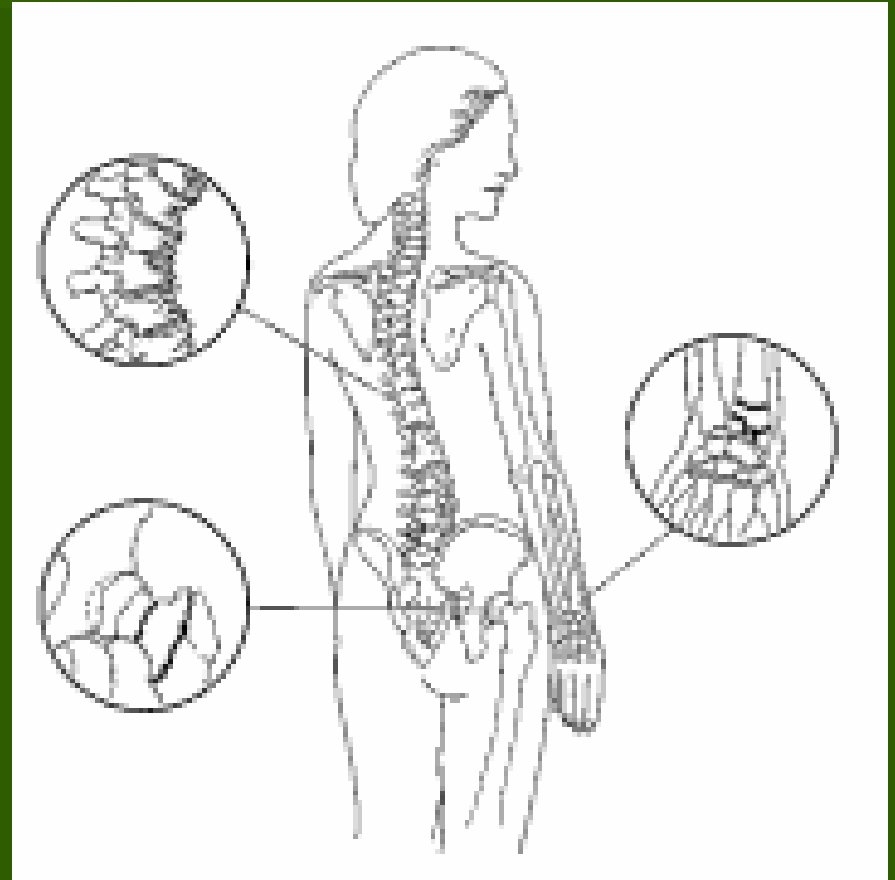
- Eat plenty of fruits, vegetables and whole grains.
- Limit fat, especially saturated fat.
- Eat a varied diet to increase the vitamins and minerals you consume.
- Limit alcohol consumption.
- Stop smoking.
- Stay physically active and maintain a healthy body weight.

# Dietary recommendations to prevent breast, prostate, and colon cancer

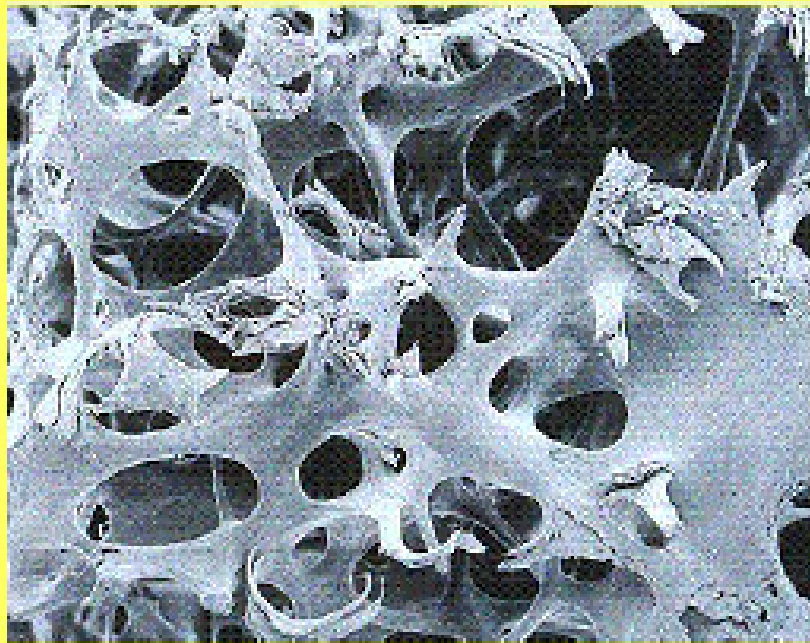
- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low *total* calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**
- Avoid excessive alcohol

# Osteoporosis

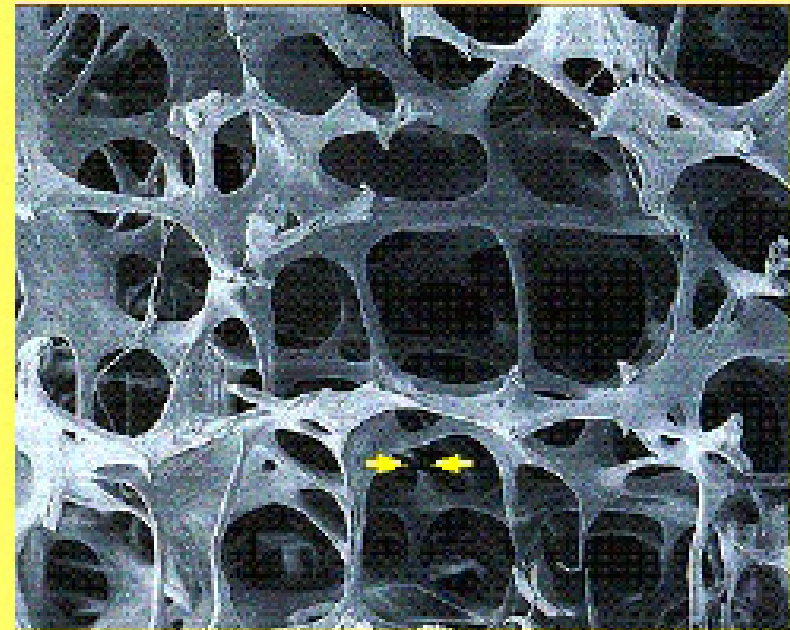
- A disease in which bones become fragile and more likely to break
- The spine, hip, and wrist are most commonly affected
- Women are four times more likely to be affected than men



Bone demineralization weakens bones, increasing susceptibility to fractures with minor trauma



**Normal<sup>2</sup>**



**Osteoporosis<sup>2</sup>**

1. Consensus Development Conference, JAMA 2001; 285: 785-95; 2. Dempster DW et al, JBMR

# Osteoporosis risk factors

- Inadequate calcium and vitamin D (the sunshine vitamin) intake
- Inadequate weight bearing exercise
- Excessive consumption of salt, coffee, alcohol, protein
- Tobacco
- Certain medications, e.g. corticosteroids
- Post menopausal state

# What causes osteoporosis?

- There are two general mechanisms leading to low bone mass:
  - 1. Inadequate early bone mass development during adolescence
  - In general, males develop greater early bone mass and hence are relatively protected in this manner
  - 2. Loss of existing bone mass through sustained negative calcium balance

# Protein and calcium metabolism

- Calcium metabolism is inextricably linked with protein consumption
- Extensive research has shown that even moderate amounts of protein can cause the body to go into negative calcium balance
- High protein intake causes negative calcium balance *regardless of calcium intake*
- Hence, consumption of a moderate protein diet is a cornerstone of osteoporosis prevention

# Osteoporosis and milk

- Ironically, populations that consume the most dairy have the highest rates of osteoporosis
- One reason is that such populations also consume high protein diets
- No clinical trials have ever shown dairy products to prevent osteoporosis

# High protein diets can increase risk of osteoporosis

- The importance of moderate protein diets in preventing osteoporosis remains a poorly understood issue and there is little awareness of this in most information available about osteoporosis
- Most information about osteoporosis prevention erroneously emphasizes calcium consumption as the cornerstone of osteoporosis prevention

# Dietary recommendations to prevent osteoporosis

- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low total calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**
- Additionally, stay physically active, get a modicum of sunshine, and avoid high protein intakes, tobacco, excess alcohol and salt

# Nutrition basics

- Foods consist of macro and micro-nutrients
  - Macro-nutrients are a source of energy
    - Protein 4 calories/gram
    - Carbohydrate 4 calories/gram
    - Fat 9 calories/gram
    - Fiber: non-absorbable part of food; comes only from plants; supplies no calories
  - Micro-nutrients are not a significant source of energy:
    - vitamins, minerals

# Markedly differing calorie density of broccoli and peanut butter



# Examples of refined foods

- Refining process typically removes fiber, water, and valuable micro-nutrients
- Fats: oils, margarine, most salad dressings, etc.
- Sugars: white, brown, honey, etc.
- White flours: grains with bran and germ removed, leaving primarily starch
- Juices
- All these foods tend to be energy rich. It is easy to consume too many calories when one consumes these foods frequently

# A word about *ad lib* and raw foods

- Many raw foods, such as most vegetables, have few calories
- It is much easier to overeat cooked foods
- Most raw foods, and whole foods in general, can be eaten *ad lib*
- In other words, there is no need to limit portion size since overeating is virtually impossible

# Turning healthy foods hazardous



2 large baked potatoes:

- 598g,
- 556 calories,
- 1% fat,
- 92% carbohydrate,
- 7% protein,
- 14g fiber
- Saturated fat 0g
- trans fat 0g



Large McDonalds fries:

- 170g,
- 573 calories,
- 48% fat,
- 48% carbohydrate,
- 4% protein,
- 7 g fiber,
- Saturated fat 6g,
- Trans fat 7g

Source: [nutritiondata.com](http://nutritiondata.com)

# How about just “burning off” those extra calories?

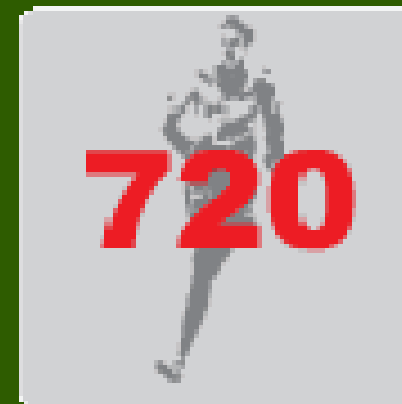
WEIGHTLIFTING



AEROBICS



RUNNING



WALKING



BICYCLING



SWIMMING

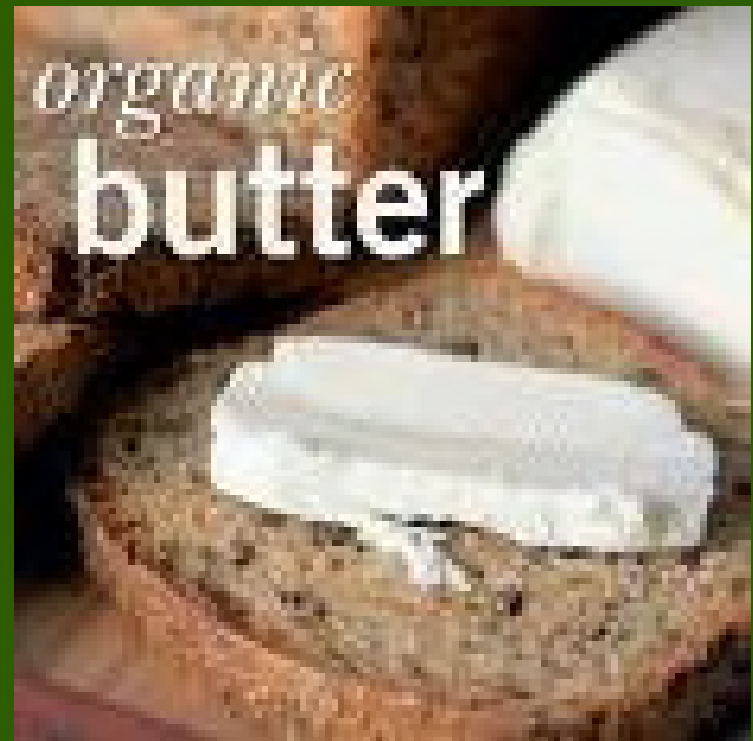


\*All averages for a 150lb person exercising for 1 hour  
Source: [fitresource.com](http://fitresource.com), [caloriesperhour.com](http://caloriesperhour.com)

Butter or margarine,  
one ounce serving, 28g  
140 calories total, 139 from fat

Calorically equivalent to:

- 39 minutes of weight lifting
- 26 minutes of walking
- 17 minutes of aerobics
- 12 minutes of running or fast bicycling



# Markedly different nutrients: human and cow milk

	human	cow
Protein content	1.2 g/100ml 5% calories	3.3 g/100ml 21% calories
Calcium, grams per 100 kcal	45	194
Time to double birth weight	180	47

# Summary recommendations to prevent major chronic diseases:

- High fiber, high micro-nutrient, *whole* foods
- Low refined fats, especially saturated and trans fats
- Low refined carbohydrates like sugars, white flours, and refined or polished grains
- Low dietary cholesterol
- Hence, low *total* calories to maintain healthy body weight
- **In other words: whole foods, primarily or 100% vegan**
- Don't smoke or use tobacco products
- Get plenty of physical activity
- Avoid excessive alcohol and sodium intake

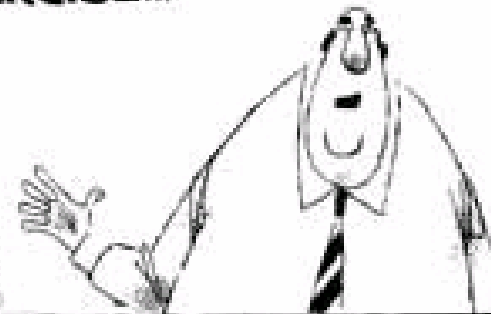
SKELETON

THE TIMES PLAYTIME  
© 1994



**I EAT  
WAY MORE  
THAN I  
SHOULD...**

**I SMOKE  
AND DRINK  
AND NEVER  
EXERCISE...**



**AND  
LIKE MOST  
PEOPLE,  
I WANT  
TO KNOW...**



**WHEN  
IS THE  
GOVERNMENT  
GOING TO TAKE  
RESPONSIBILITY  
FOR AMERICA'S  
HEALTH CARE  
CRISIS?!**

