



# Nutrition & Prostate Cancer

**Greta Macaire, MA, RD, CSO**  
**UCSF Helen Diller Family Comprehensive Cancer Center**

# Nutrition & Disease

- A healthy diet reduces the risk of chronic diseases, such as heart disease, diabetes, & obesity.
- It is estimated that 1/3 of cancer deaths in the U.S. can be attributed to diet in adulthood (CA Cancer J Clin 2012).



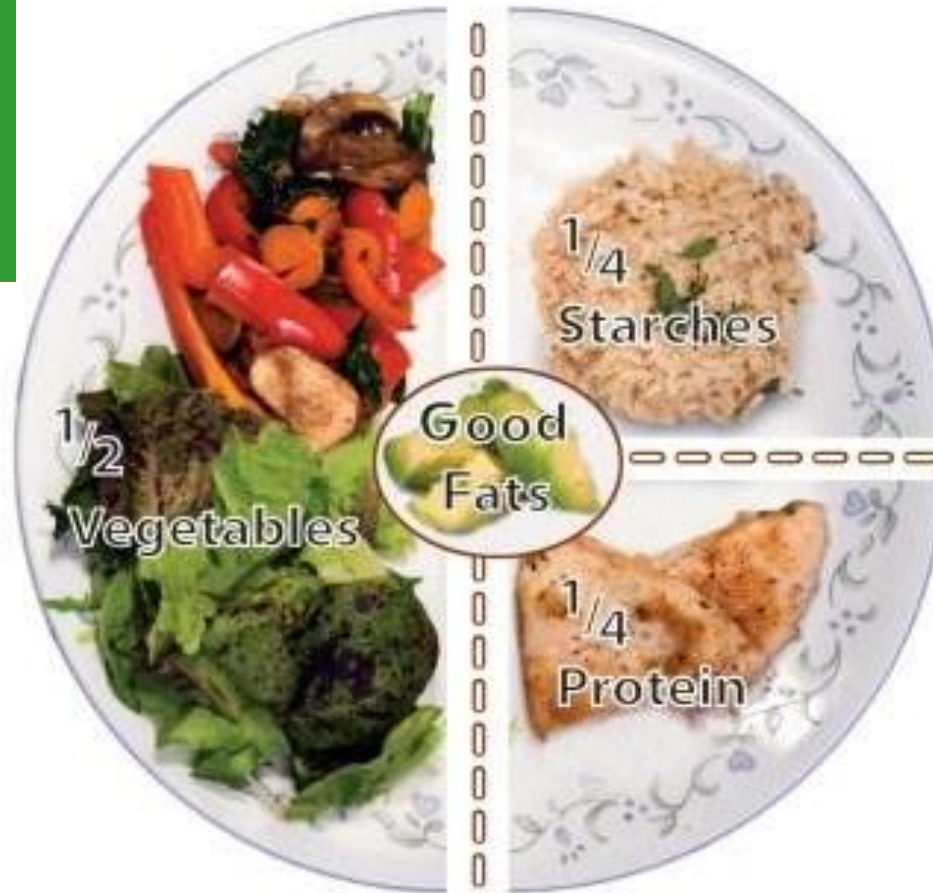
# Nutrition & Prostate Cancer

- “There is growing scientific evidence that diet & lifestyle practices may slow the growth and progression of prostate cancer”.

PCF, 2015.

# Choose Mostly Plant Foods

Higher amounts of vitamins, minerals, fiber, prebiotics, and phytonutrients.



Less calories, animal fats and protein, processed foods, and added sugars.

# Phytonutrients





# The Nutrition Rainbow



*Tips from Food for Life: The more naturally colorful your meal is, the more likely it is to have an abundance of cancer-fighting nutrients. Pigments that give fruits and vegetables their bright colors represent a variety of protective compounds. The chart below shows the cancer-fighting and immune-boosting power of different-hued foods.*

Colors	Foods	Colorful Protective Substances and Possible Actions
Red	Tomatoes and tomato products, watermelon, guava	Lycopene: antioxidant; cuts prostate cancer risk
Orange	Carrots, yams, sweet potatoes, mangos, pumpkins	Beta-carotene: supports immune system; powerful antioxidant
Yellow-orange	Oranges, lemons, grapefruits, papayas, peaches	Vitamin C, flavonoids: inhibit tumor cell growth, detoxify harmful substances
Green	Spinach, kale, collards, and other greens	Folate: builds healthy cells and genetic material
Green-white	Broccoli, Brussels sprouts, cabbage, cauliflower	Indoles, lutein: eliminate excess estrogen and carcinogens
White-green	Garlic, onions, chives, asparagus	Allyl sulfides: destroy cancer cells, reduce cell division, support immune systems
Blue	Blueberries, purple grapes, plums	Anthocyanins: destroy free radicals
Red-purple	Grapes, berries, plums	Resveratrol: may decrease estrogen production
Brown	Whole grains, legumes	Fiber: carcinogen removal



Physicians Committee for Responsible Medicine  
5100 Wisconsin Ave, NW, Suite 400 • Washington, DC 20016  
202-686-2210 • PCRM.org





## Recommendation:

- Eat ½ cup or more of cruciferous vegetables each day

<b>Food (raw)</b>	<b>Serving</b>	<b>Total Glucosinolates (mg)</b>
Brussels sprouts	½ cup (44 g)	104
Garden cress	½ cup (25 g)	98
Mustard greens	½ cup, chopped (28 g)	79
Turnip	½ cup, cubes (65 g)	60
Cabbage, savoy	½ cup, chopped (45 g)	35
Kale	1 cup, chopped (67 g)	67
Watercress	1 cup, chopped (34 g)	32
Kohlrabi	½ cup, chopped (67 g)	31
Cabbage, red	½ cup, chopped (45 g)	29
Broccoli	½ cup, chopped (44 g)	27
Horseradish	1 tablespoon (15 g)	24
Cauliflower	½ cup, chopped (50 g)	22
Bok choy (pak choy)	½ cup, chopped (35 g)	19



## Recommendation:

- Eat  $\frac{1}{2}$  cup or more of cooked tomatoes at least twice a week.

## Food Sources of Lycopene

Product	Serving Size (mg/serving)	Lycopene
Tomato juice	250 mL (1 cup)	25.0
Tomato ketchup	15 mL (1 tbsp)	2.7
Spaghetti sauce	125 mL (1/2 cup)	28.1
Tomato paste	30 mL (2 tbsp)	13.8
Tomato soup (condensed)	250 mL prepared	9.7
Tomato sauce	60 mL (1/4 cup)	8.9
Chili sauce	30 mL (2 tbsp)	6.7
Cocktail sauce	30 mL (2 tbsp)	5.9
Watermelon	368 g (1 slice)	14.7
Pink grapefruit	123 g (1/2)	4.9
Raw tomato	123 g (1 medium)	3.7
Papaya	1 cup	2.6

Source: Heinz Institute of Nutritional Sciences



# Question: What about Organics?



# High Fiber Food

Beans



Whole Grains



Vegetables



Fruits



Nuts



Seeds





## LEGUMES



1/2 cup split peas: 8.1 g



1/2 cup lentils: 7.8 g



1/2 cup black beans: 7.7 g



1/2 cup chickpeas: 6.2 g

## VEGETABLES



1 cup sweet potatoes: 6.6 g



1 cup broccoli: 5.1 g



1 cup carrots: 4.7 g



1 cup Brussels sprouts: 4.1 g

## FRUIT



1 cup raspberries: 8 g



1 cup blackberries: 7.6 g



1 medium pear: 5.5 g



1 medium apple: 4.4 g

## WHOLE GRAINS



1 cup whole-wheat spaghetti: 6.3 g



1 cup pearly barley: 6 g



1 cup quinoa: 5.2 g



1 cup steel cut oatmeal: 5 g

\*Source: Barnard, N.D., Levin, S.M., Yokoyama, Y. A Systematic Review and Meta-Analysis of Changes in Body Weight in Clinical Trials of Vegetarian Diets. *Journal of the Academy of Nutrition and Dietetics* (in press)



# FIVE EASY WAYS TO INCREASE FIBER IN YOUR DIET



Choose fresh fruit  
over juice

**#1  
WAY**

**#2  
WAY**

Choose whole grain  
bread over white



Instead of white rice,  
eat brown rice or even  
quinoa

**#3  
WAY**

**#4  
WAY**

Try substituting  
beans for the meat in  
some of your favorite  
recipes



Aim to eat an extra  
serving of non starchy  
vegetables with dinner

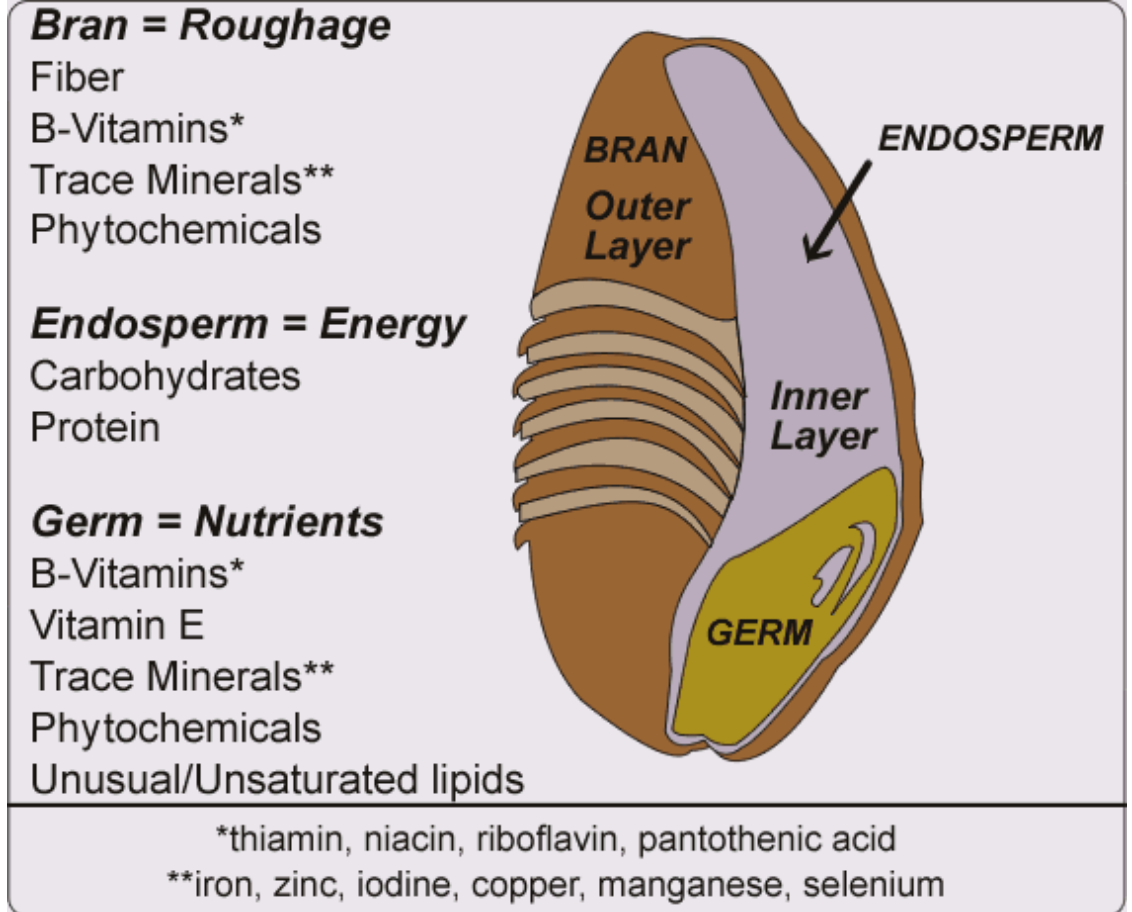
**#5  
WAY**



# Whole Grains

## Examples of whole grains:

Amaranth, barley, brown or wild rice, buckwheat, (kasha), farro, millet, oats, quinoa, rye, spelt, triticale, wheatberries



# The 10:1 rule for choosing whole grain products



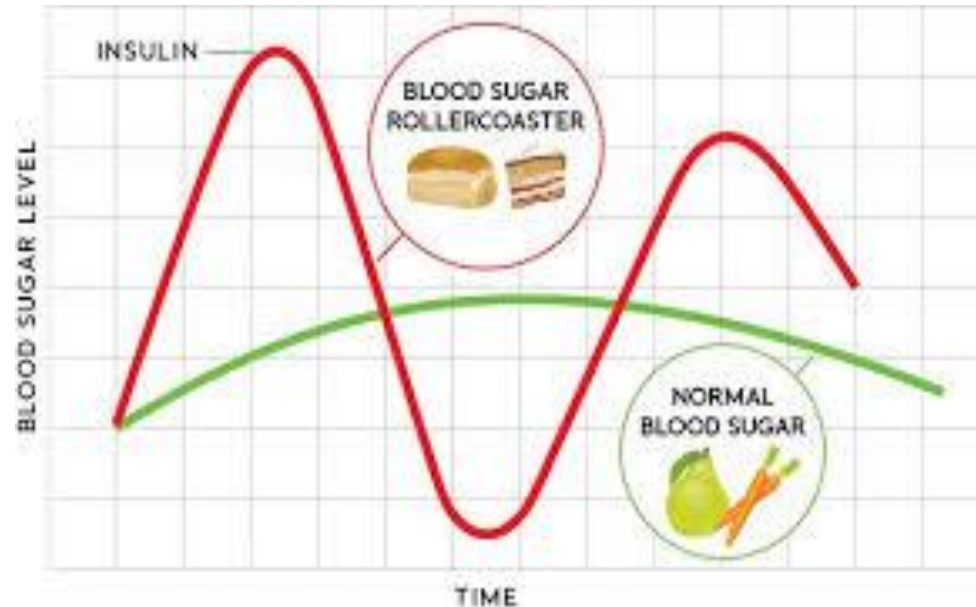
For every 10 grams of carbohydrate there should be at least one gram of fiber.

Why 10:1? That's about the ratio of fiber to carbohydrate in a genuine whole grain.

<b>Nutrition Facts</b>	
Serving Size 1 roll (43g) Servings Per Container 8	
Amount Per Serving	
<b>Calories</b> 100	Calories from Fat 10
% Daily Value	
<b>Total Fat</b> 1 g	<b>2%</b>
Saturated Fat 0 g	<b>0%</b>
Trans Fat 0 g	
Polyunsaturated Fat 0 g	
Monounsaturated Fat 0 g	
<b>Cholesterol</b> 0 mg	<b>0%</b>
<b>Sodium</b> 170 mg	<b>7%</b>
<b>Total Carbohydrate</b> 23 g	<b>8%</b>
Dietary Fiber 5 g	<b>20%</b>
Sugars 2 g	
<b>Protein</b> 4 g	
Vitamin A 0% *	Vitamin C 0%
Calcium 4% *	Iron 6%
Thiamin 8% *	Riboflavin 4%
Niacin 4% *	Folic Acid 8%
*Percent (%) Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower based on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Saturated Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram: Fat 9 * Carbohydrate 4 * Protein 4	

# Limit Added Sugars/Refined Grains

- Diets high in added sugars and refined grains
- =
- High glycemic load
- Low nutrient value
- Negative effects on the immune system
- Blood sugar fluctuations → swings in mood, energy and thinking ability.
- Weight/fat gain



# Sugar

***Current US daily intake:***

**22 tsp Sugar Daily → 355 calories daily**

***Recommended Guidelines:***

(added in processing, cooking or table)

≤ 100 calories daily – females

≤ 150 calories daily – males





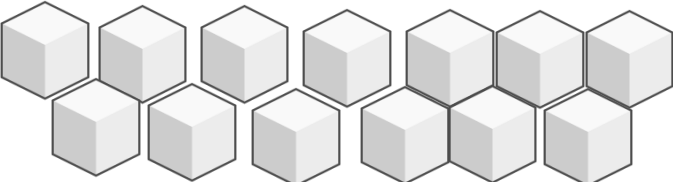
**How many teaspoons is that? Daily:**

5 tsp for females

9 tsp for males



# Where's the added sugar?

	<b>Added Sugar per serving</b>	
Breakfast: Sweetened yogurt	10 grams	
Lunch: Salad with bottled dressing	8 grams	
Snack: Energy Bar	21 grams	
Dinner: Chicken with teriyaki sauce	14 grams	
<b>Daily Total: 53 grams (212 calories)</b>		

**Various Names  
for Added Sugar  
Used in  
Processed  
Foods &  
Beverages**

agave

BARLEY MALT SYRUP

brown sugar

BROWN RICE SYRUP

cane crystals

*cane sugar*

**corn syrup**

corn sweetener

crystalline fructose

*dehydrated cane juice*

*dextrose/dextrin*

evaporated cane sugar

FRUCTOSE

fruit juice concentrate

high-fructose corn syrup

**honey**

invert sugar

lactose

*maltose/maltodextrin*

maple syrup

molasses

**nectars**

raw/powdered sugar

*sorghum syrup*

sucrose

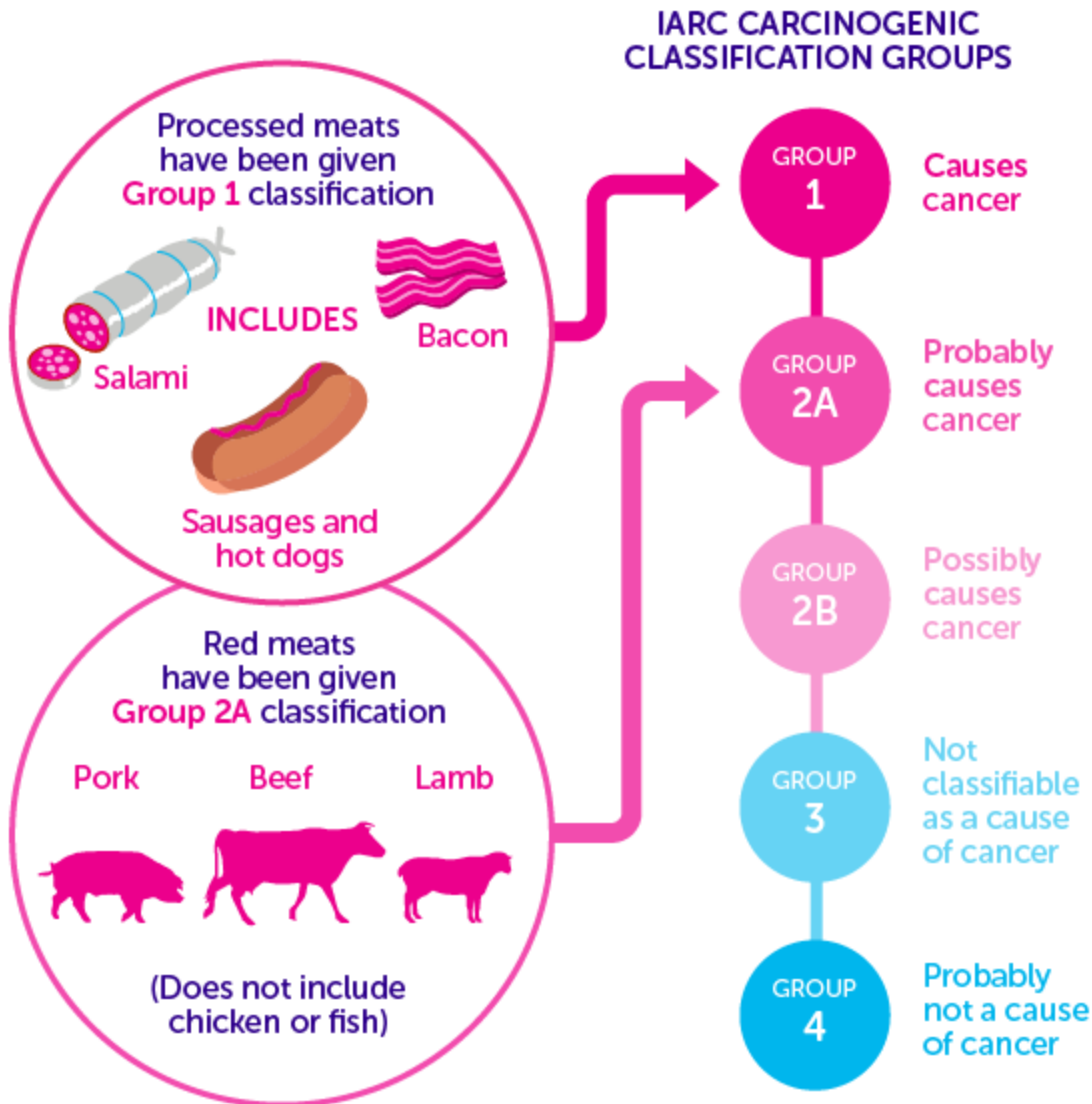
turbinado sugar

# Low Glycemic Load Diet

- **Eat real, whole foods!**
- Avoid eating “naked” carbs; combine carbs with protein/healthy fats (ex: nuts and fruit or whole grain bread with nut butter).
- Eat foods in their natural packages → Vegetables, fruits, whole grains, beans, etc....
- Minimize processed foods → Refined grains, added sugars, desserts, fried, fast foods
- Limit/avoid sugary beverages → Fruit juices, juice drinks, sweetened tea/coffee, sodas

# MEAT AND CANCER

## HOW STRONG IS THE EVIDENCE?



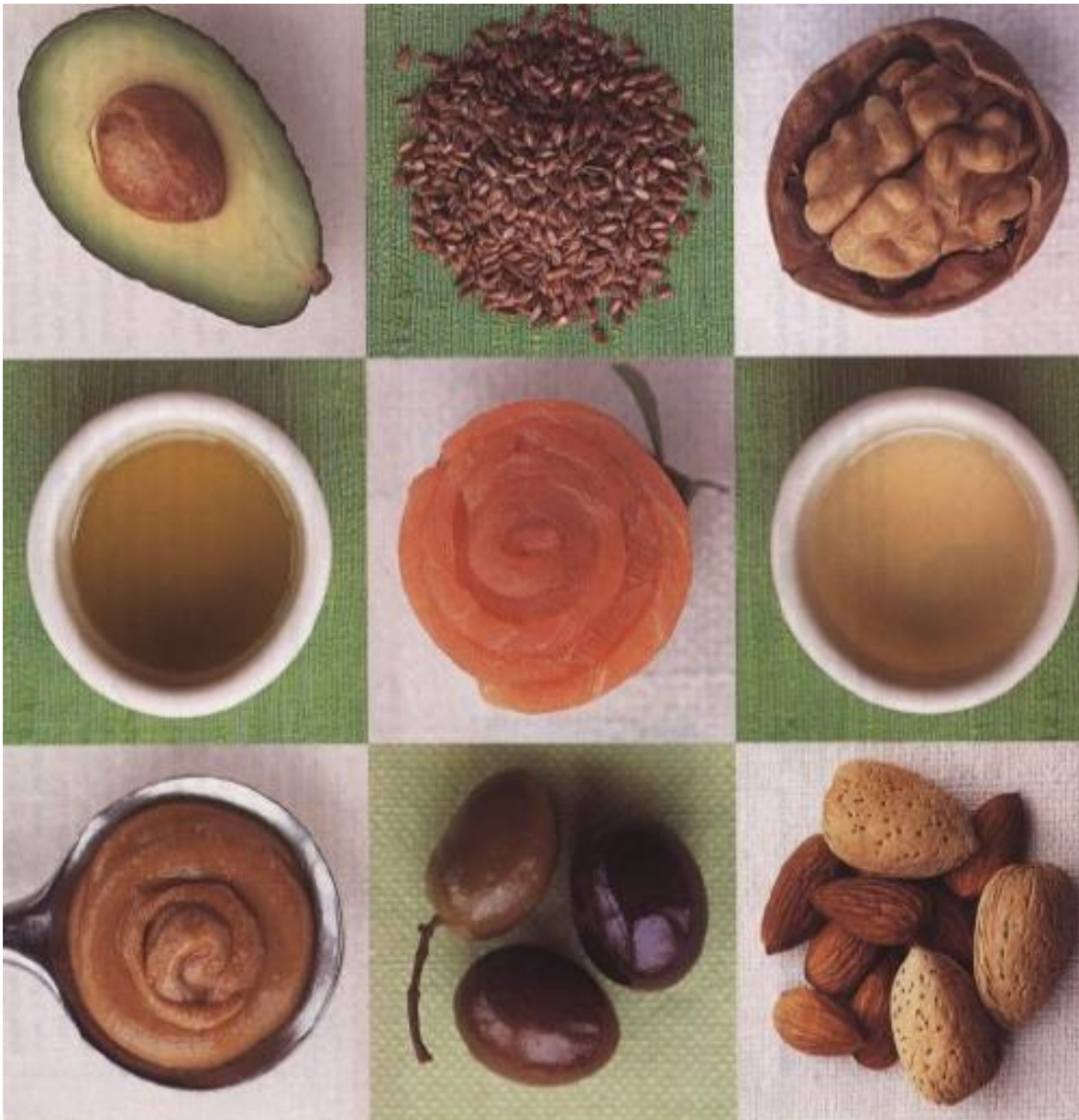
These categories represent how likely something is to cause cancer in humans, not how many cancers it causes.

### Recommendation:

- Avoid processed meats completely
- Avoid or limit red meat



# Healthy Fats



Omega-3 (EFA-  
PUFA)rich foods:

Cold water fatty fish:  
salmon, sardines,  
black cod, trout,  
herring – Include 2 x  
week

Ground flax seeds,  
walnuts, pumpkin  
seeds, chia seeds

Omega-9 (MUFA)  
rich foods:

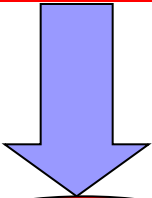
Olive oil, olives,  
almonds, avocado,  
canola oil,  
macadamia nut oil

# Balance Your Essential Fatty Acids (EFAs)

## Omega-6 fatty acids

### Decrease Sources:

Meats (especially grain-fed), dairy fat, egg yolks, sunflower oil, safflower oil, cottonseed oil, corn oil, & processed foods made with these oils.



**Pro-Inflammatory Compounds:**  
Promote inflammation, tumor growth, progression & angiogenesis  
Suppress immune function

**Standard American Diet (SAD) contains far more omega-6 than omega-3 fats.**

**Imbalance can have negative affects on various aspects of health.**

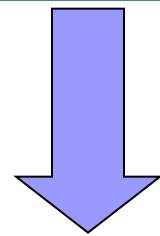


Eicosanoid Production

## Omega-3 fatty acids

### Increase Sources:

Cold-water fish (wild salmon, trout, sardines, herring, black cod), flaxseeds, chia seeds, walnuts, pumpkin seeds, & purslane.



**Anti-Inflammatory Compounds:**  
Inhibit tumor growth & angiogenesis  
Immune enhancing

# How Much Animal Fat? Comparing 2 meals

## Breakfast #1

**Coffee cake with nuts, 1 slice**

(Calories: 420, Total fat: 23g, Sat fat: 13g)

**Café Mocha made with 2%  
milk and whipped cream, 16 oz**

(Calories: 330, Total fat: 15 g, Sat fat: 8g)

**Apple, 1 medium**

(Calories: 80, Total Fat: 0 grams)

**Total calories: 830**

**Total fat: 38 grams**

**Saturated fat: 21 grams**

## Breakfast # 2

**Whole Grain Bread, 2 slices**

(Calories: 250, Total fat: 1.5g, Sat fat: 0g)

**Hummus, 2 Tbsp**

(Calories: 54, Total fat: 2.0g, Sat fat: 0g)

**Tomato, 6 slices**

(Calories: 25, Total fat: 0g,

**Apple, 1 medium**

(Calories: 80, Total Fat: 0 grams)

**Latte made with soy milk, 12 oz**

(Calories: 130, Total Fat: 4g, Sat Fat: 0.5g)

**Total calories: 539**

**Total fat: 7.5 grams**

**Saturated fat: 0.5 grams**

# Nutrition Facts

Serving Size 149g

## Amount Per Serving

**Calories** 31      Calories from Fat 4

## % Daily Value\*

**Total Fat** 0g      1%

Saturated Fat 0g      0%

Trans Fat

**Cholesterol** 0mg      0%

**Sodium** 13mg      1%

**Total Carbohydrate** 7g      2%

Dietary Fiber 2g      7%

Sugars

**Protein** 1g

Vitamin A 19% • Vitamin C 65%

Calcium 1% • Iron 4%

\*Percent Daily Values are based on a 2,000 calorie diet.  
Your daily values may be higher or lower depending on your calorie needs.

[NutritionData.com](http://NutritionData.com)

**Ingredients:** ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMINE MONONITRATE [VITAMIN B1], RIBOFLAVIN [VITAMIN B2], FOLIC ACID), WHOLE GRAIN WHEAT FLOUR, SOYBEAN OIL, SUGAR, **PARTIALLY HYDROGENATED COTTONSEED OIL**, HIGH FRUCTOSE CORN SYRUP, LEAVENING (CALCIUM PHOSPHATE, BAKING SODA), SALT, SOY LECITHIN (EMULSIFIER).

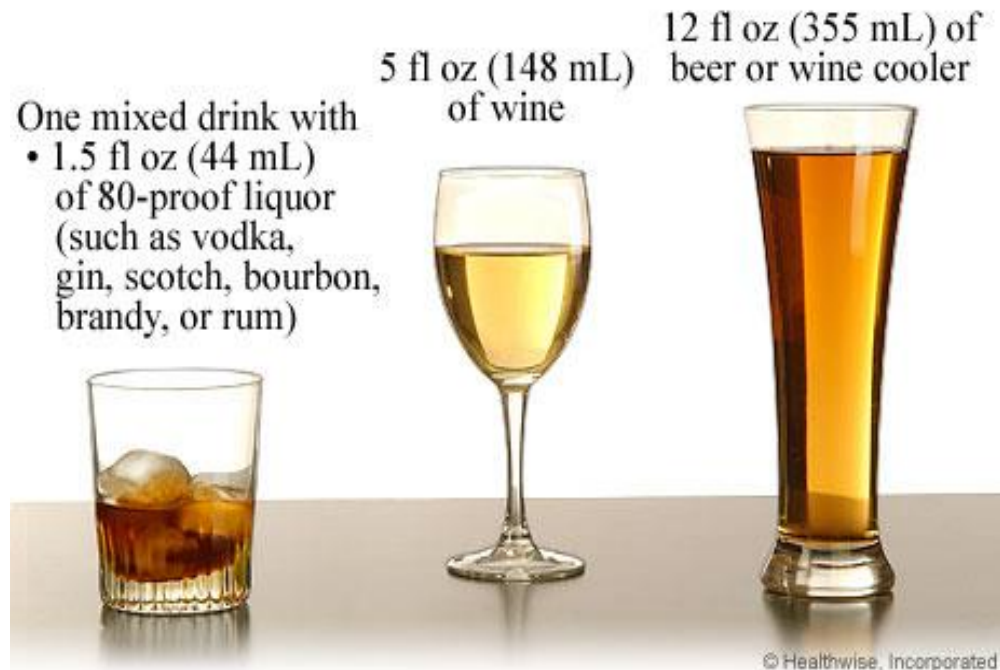


# Other Animal Foods of Concern



# What about Alcohol & Coffee?

- Drinking coffee is safe and may even have some health benefits → Consider what you put in your coffee.
- Alcohol in moderation is also fine, limit to guidelines → Men:  $\leq 2$  drinks/day, Women:  $\leq 1$  drink/day



# Supplements and Cancer Risk

- No strong evidence that supplements reduce cancer risk.
- Best to get nutrients from food whenever possible.
  - Supplements have been linked with an increased risk of cancer in some studies. For example:
    - Vitamin E and Prostate Cancer
    - Excess Calcium and Prostate Cancer
- Supplements may be important for other health concerns.

# Vitamin D



- Important for →
  - Bone Health
  - More research needed but has been associated with lower cancer risk (colorectal, breast, and others)
  - Immune System Function
- Sources: Sunlight, fatty fish, fortified foods & dietary supplements
- Adults requirements =  $\geq 600$  IU Vitamin D3/day.
- 75% of Americans are estimated to have low blood levels of Vitamin D.
- Test blood **25-OH vitamin D level**, especially if undergoing ADT.



# Body Weight & Exercise

- Higher body mass & physical inactivity may contribute to prostate cancer risk.
  - ‡ A cohort study reported obese men to have a 20% increased risk of dying from prostate cancer & those men who were severely obese had a 34% elevated risk (NEJM 2003).
- A UCSF study of over 2,000 men found that men who maintained a healthy body weight had a lower risk of recurrence (Urol 2005).
  - ‡ Obese men ↑ recurrence by 30%
  - ‡ Very obese men ↑ recurrence by 69%

# Exercise



- Build at least 30 minutes of exercise in to your schedule on most days.
- Prostate cancer survivors who performed  $\geq 3$  hours per week of vigorous activity had a 60% lower risk of death from prostate cancer compared to those getting  $< 1$  hour of activity per week.
- Men who walked  $\geq 3$  hours per week at a brisk pace ( $\geq 3$  mph) after diagnosis had a 57% lower risk of prostate cancer recurrence compared to men who walked  $< 3$  hours per week at an easy pace ( $< 2$  mph).

# Eat more and weigh less!

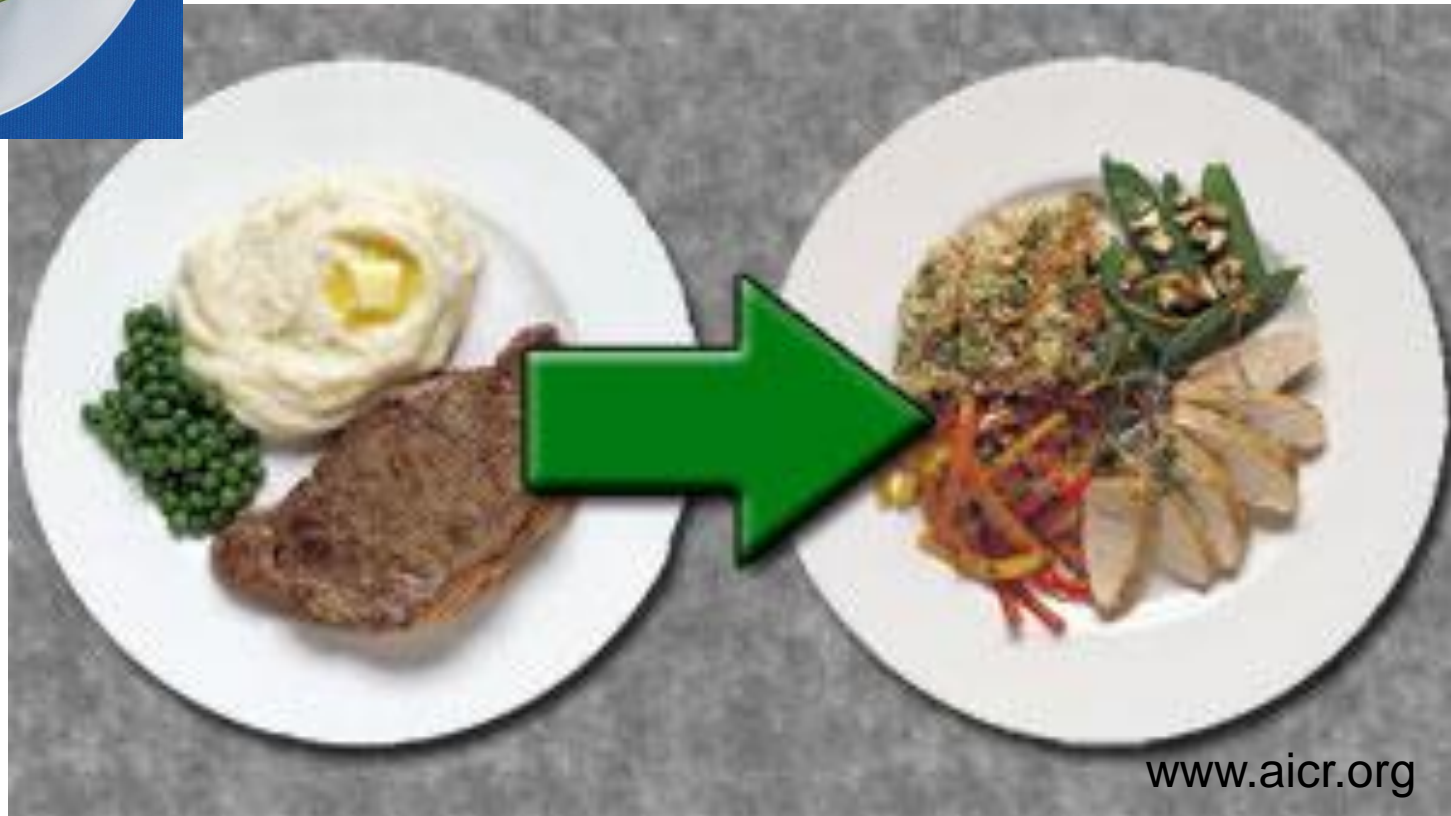
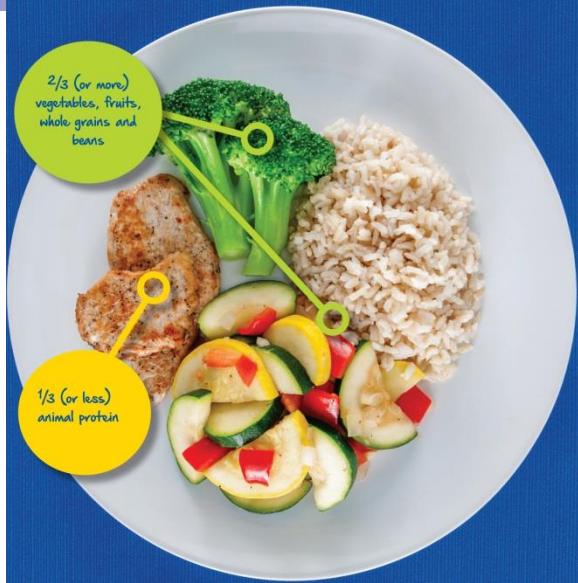


1575 Kcal  
High Energy Density



1575 Kcal  
Low Energy Density

# The New American Plate





# What Can A Healthy Diet Do For Me?

- May help to inhibit prostate cancer growth
- Reduce risk of chronic diseases
- Enhance immune system
- Increase energy levels
- Facilitate recovery → ↓ toxicities of treatment

# Healthy Prostate Cancer Diet

## Plant-Based

- 8-10 COLORFUL fruit & vegetable servings daily
  - Eat 1 cup or more vegetables with at least 2 meals
  - Include cruciferous vegetables daily
  - Include cooked tomatoes at least twice a week
- Beans/legumes & whole grains
  - 30-45 grams of fiber daily
- Limit meats, poultry skin, eggs & dairy, avoid processed meats
- Limit processed & refined foods → avoid WHITE

# Healthy Prostate Cancer Diet (cont.)

- **Healthy fats** → cold-water fish, flaxseed, walnuts, almonds, pumpkin seeds, other nuts and seeds, olive oil, avocados
  - Eat at least 1 servings of plant based fat daily:
    - 1 T olive oil, 1 oz of nuts/seeds, ¼ avocado
  - Include Fish – 2 x week but limit the high mercury fish such as swordfish, shark, ahi tuna, king mackerel
- **Green Tea** → 1-4 cups daily
- **Vitamin D** (1000 IU or more if needed)
  - Consider serum 25-OH test
- **Physical activity** to achieve or maintain a healthy body weight.

## Sample Meal Plan

**Breakfast:** *Oatmeal mixed with walnuts, ground flaxseed, cinnamon and berries, low sodium tomato juice*

**Lunch:** *Salad with dark, leafy greens, tomatoes, peppers, free range chicken breast or lentils, avocado, olive oil, turmeric, black pepper and lemon juice*

**Dinner:** *Baked wild caught salmon or tempeh with wild rice cooked with herbs and garlic and roasted broccoli/ greens*

**Snacks:** *Handful of almonds with an orange OR humus with chopped vegetables*

**Drink plenty of water throughout the day.**





# Practice Precaution

- Always discuss changes in diet & supplement use with your health care practitioner(s).



# Words of Wisdom



- “Let food be your medicine & medicine be your food.”
  - Hippocrates

# Resources

## Cookbooks

- The Cancer-Fighting Kitchen, 2<sup>nd</sup> edition – written by Rebecca Katz, 2017
- Cancer Wellness Cookbook – written by Kimberly Mathai, 2014
- Eat to Beat Prostate Cancer – written by David Ricketts, 2006

## Websites

- <http://www.aicr.org>
- <http://cancer.ucsf.edu/crc>
- <http://www.consumerlab.com>