

18th Annual HIV CONFERENCE
of the Florida/Caribbean AIDS Education and Training Center

May 1-2, 2009
Orlando, FL

Diet, Nutrition and HIV

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Disclosure of Financial Relationships

This speaker has the following significant financial relationships with commercial entities to disclose:

- **Strativa Pharmaceuticals, Consultant**
- **Digestive Care, Inc., Consultant**

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Program Outline

- **Basic nutrient review**
- **Disease management**
 - HIV
 - Cardiovascular
 - Diabetes/insulin resistance
- **Food safety**
- **Cooking on a budget**

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**“Let food be thy medicine, and
let thy medicine be food.”**

Hippocrates

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Malnutrition in HIV

Studies have shown:

- 91-100% of PWH/A's lose weight.
- 88% of AIDS patients are classified as malnourished.
- 62% incidence of >10% weight loss at 6-8 months after diagnosis.
- AIDS patients typically lose 30% of ideal body weight during last four months preceding death.

Goals for HIV Nutrition

Meeting needs for

- **Macronutrients**
 - Carbohydrates, fat, protein, fluids
- **Micronutrients**
 - Vitamins and minerals

Macronutrients

- **What are macronutrients?**

Macronutrients are nutrients that provide calories or energy. Nutrients are substances needed for growth, metabolism, and for other body functions. Since “macro” means large, macronutrients are nutrients needed in large amounts. There are four macronutrients:

- Carbohydrate
- Protein
- Fat
 - Alcohol
- Water

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Carbohydrates

- **Carbohydrates are the macronutrient that we need in the largest amounts.**
- **According to the dietary reference intakes published by the USDA, 45% - 65% of calories should come from carbohydrate. We need this amount of carbohydrate because:**
 - Carbohydrates are the body’s main source of fuel.
 - Carbohydrates are easily used by the body for energy.
 - All of the tissues and cells in our body can use glucose for energy.
 - Carbohydrates are needed for the central nervous system, the kidneys, the brain, the muscles (including the heart) to function properly.
 - Carbohydrates can be stored in the muscles and liver and later used for energy.
 - Carbohydrates are important in intestinal health and waste elimination.
- **One gram of carbohydrate is 4 calories.**

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Dietary Guidelines for Americans,
2005
Nutrition.gov

Carbohydrates: Two Types

- **Simple**

- Sugars in the form of:

- Fructose (fruit sugar), dextrose/glucose (corn sugar), lactose (milk), and sucrose (table sugar)
 - Soda, desserts, candy, juice, white bread, white rice, pasta, milk, sweet cereals (co-co puffs)



- **Complex**

- Contain fiber

- Whole fruits and vegetables, whole grain bread products, legumes
 - Usually contain higher nutrient content than simple CHO



Complex Carbohydrates

- **Fiber is the part of plant foods that cannot be digested**
- **Two forms of fiber:**
 - Soluble fiber
 - Gummy type of fiber that will absorb water
 - Beans, oatmeal, fruit
 - Most helpful with lowering cholesterol
 - Insoluble fiber
 - “Roughage”
 - Vegetables, the skin on fruit, whole grains
 - “Gassy” food
- **Recommendations are 25-35 grams of fiber daily, preferably 10-15 of soluble**

Protein

- According to the dietary reference intakes published by the USDA 10% - 35% of calories should come from protein. Most Americans get plenty of protein, and easily meet this need by consuming a balanced diet. We need protein for:
 - Growth (especially important for children, teens, and pregnant women)
 - Tissue repair
 - Immune function
 - Making essential hormones and enzymes
 - Energy when carbohydrate is not available
 - Preserving lean muscle mass
- One gram of protein has 4 calories

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Dietary Guidelines for Americans,
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Protein

- Protein is found in all animal products (fish, red meat, poultry, pork, and dairy), nuts, legumes and tofu
- Certain vegetable proteins can be eaten together or with animal proteins to compliment proteins for proper amino-acid ratios
 - Beans
 - High in lysine, low in methionine
 - Grains
 - High in methionine, low in lysine



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Fat

- According to the dietary reference intakes published by the USDA 20% - 35% of calories should come from fat. We need this amount of fat for:
 - Normal growth and development.
 - Energy (fat is the most concentrated source of energy).
 - Absorbing certain vitamins (like vitamins A, D, E, K, and carotenoids).
 - Providing cushioning for the organs.
 - Maintaining cell membranes.
 - Providing taste, consistency, and stability to foods.
 - Although fats have received a bad reputation for causing weight gain, some fat is essential for survival.
- One gram of fat has 9 calories.

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Fat, cont.

- Calorie dense, makes food taste good
- Types
 - Saturated: lard, butter, red meats, dark pork and poultry, bacon, hot dogs, whole milk/cheese/ice cream, sour cream, coconut, palm kernel oil
 - Mono-unsaturated: nuts, olives, avocado, sesame seeds, canola oil
 - Poly-unsaturated: corn/sunflower oils, sunflower seeds, flax seeds, fatty fish (tuna, salmon, bluefish, swordfish, sardines, mackerel, herring, cod)
 - Trans-fatty: vegetable shortening, stick margarine, processed cakes, candy, chips, doughnuts



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Alcohol

- Alcohol doesn't really fall into any nutrient category, but with meal planning, it is counted as a FAT
- 1 gram of alcohol= 7 calories



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Water

- The human body is two-thirds water. Water is an essential nutrient that is involved in every function of the body.
- Water helps transport nutrients and waste products in and out of cells.
- Water is necessary for all digestive, absorption, circulatory, and excretory functions.
- Water is needed for the utilization of the water-soluble vitamins.
- It is needed for the maintenance of proper body temperature.
- It is recommended that you drink at least six 8-ounce glasses of water each day.

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Dietary Guidelines for Americans, 2005
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Vitamins and Minerals

- Vitamins and minerals are essential to keep healthy. They protect against opportunistic infection by ensuring that the lining of skin, lungs and gut remain healthy and that the immune system functions properly. Of special importance are vitamin A, vitamin C, vitamin E, certain B-group vitamins and minerals such as selenium, zinc and iron.
- *Vitamin A* is important to keep the lining of skin, lungs and gut healthy. Vitamin A deficiency increases the severity of diseases such as diarrhea while infection will increase the loss of vitamin A from the body. Good vitamin A sources are dark green, yellow, orange and red vegetables and fruit. These include spinach, pumpkin, cassava leaves, green peppers, squash, carrots, amaranth, yellow peaches, apricots, papaya and mangoes. Vitamin A is also contained in red palm oil, yellow maize, orange and yellow sweet potatoes, egg yolks and liver.

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Vitamins and Minerals, cont.

- *Vitamin C* helps to protect the body from infection and aids in recovery. It is found particularly in citrus fruits such as oranges, grapefruit, lemons and mandarins. Guavas, mangoes, tomatoes and potatoes are also good sources of vitamin C.
- *Vitamin E* protects cells and aids resistance to infection. Foods containing vitamin E are green leafy vegetables, vegetable oils, peanuts and egg yolks.
- *Vitamin B-group*. This group is necessary to keep the immune and nervous system healthy. Vitamins, however, may be lost from the body through the use of certain medicines for the treatment of tuberculosis. Good food sources include white beans, potatoes, meat, fish, chicken, watermelon, maize, grains, nuts, avocados, broccoli and green leafy vegetables.

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Vitamins and Minerals, cont.

- *Iron.* Iron-deficiency anemia is a widespread problem in many countries, especially among women and children. Good iron sources are green leafy vegetables, seeds, whole-grain products, dried fruit, sorghum, millet, beans, alfalfa, red meat, chicken, liver, fish, seafood and eggs.
- *Selenium* is an important mineral because it helps to activate the immune system. Good sources include whole grains such as wholegrain bread, maize and millet and dairy products such as milk, yoghurt and cheese. Meat, fish, poultry, eggs and other protein-rich foods are also good sources, as are peanut butter, dried beans and nuts.
- *Zinc* is also important for the immune system. Zinc deficiency reduces the appetite. Sources include meat, fish, poultry, shellfish, whole-grain cereals, maize, beans, peanuts and milk and dairy products.

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Vitamins and Minerals cont.

- **When food intake is low, multivitamin and mineral supplements - often in the form of pills - can help to meet increased requirements.**
- **If supplements are considered necessary, the following guidelines should be adhered to:**
 - Always take vitamin pills on a full stomach. Be consistent and take them regularly.
 - It is probably cheaper to take a combined product with minerals rather than several pills containing different vitamins and minerals. However, iron may be a problem for people with HIV/AIDS as it can increase the activity of some bacteria. Supplements that do not contain iron are therefore better.
 - Take any vitamin or mineral supplementation according to the advice on the label. More is not better. Taking high doses can cause nausea, vomiting, decreased appetite and liver and kidney problems as well as interfere with the immune system. This is particularly true for vitamin A, vitamin E, zinc and iron.
- **Nutrient supplements can be useful but cannot replace eating a balanced and healthy diet.**

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Calories

- A calorie is a measure of the food energy available when a food is digested.
- A calorie is a calorie whether it comes from fat, protein, or carbohydrate.
- Calorie needs for an HIV+ person depends on the stage of the disease.
 - What is important is the *nutrient density* of food.

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Assessing Calorie Needs

Weight in kg [pounds]	Fluid cups per day	Protein grams per day	Calories <i>women</i>	Calories <i>men</i>
45 [100]	8	45-65	1,800	1,800
50 [110]	8	50-75	1,800	1,900
55 [120]	8	55-80	1,900	2,040
59 [130]	9	60-90	2,065	2,210
64 [140]	9	65-95	2,210	2,380
68 [150]	10	70-100	2,244	2,400
73 [160]	10	75-110	2,336	2,410
77 [170]	10	75-110	2,464	2,540
82 [180]	10	80-120	2,500	2,624
86 [190]	10-11	85-125	2,500	2,750
90 [200]	10-11	90-135	2,500	2,750
95 [210]	10-11	95-135	2,500	2,750
100 [220]	10-11	100-150	2,500	2,750

Use the higher number for protein if you are wasting or fighting an opportunistic infection

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KRAUSE'S FOOD & NUTRITION THERAPY,
SEP-2007
ISBN-13: 978-1-4160-3401-8
ISBN-10: 1-4160-3401-3

Dietary Intake

Calories	1,800	2,000	2,200	2,400	2,600	2,800
Food group						
Grains	6	6	7	8	9	10
Fruits and vegetables	7	7	8	8	8	8
Dairy or substitute	2-3	2-3	2-3	2-3	3	3
Meats and alternatives	2-3	3	3-4	3-4	4	4
Fats and oils	5 tbsp	6 tbsp	6 tbsp	7 tbsp	7 tbsp	8 tbsp

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Which food improves cholesterol?

1. Beans
2. Oatmeal
3. Nuts
4. Salmon
5. All of the above

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Which food is not a protein source?

1. Fruit
2. Vegetables
3. Beans
4. Rice
5. Steak

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WHAT DOES FOOD HAVE TO DO WITH.....

- **Medications**
 - Enhance or inhibit absorption
 - Enhance or inhibit plasma concentrations
 - Minimize or maximize side effects
- **Health considerations**
 - Proper nutrient intake
 - Weight issues
- **Socialization**
 - Isolation issues

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Anorexia/Nausea/Vomiting

- **Eat 5-7 small meals rather than 3 meals daily**
- **Keep high calorie snacks within reach**
- **Avoid high fat foods that over fill you or cause gas**
- **Don't drink liquids with meals**
- **Consider appetite stimulants**

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Taste Changes/Mouth Problems

- **Metallic taste common with HIV medications**
- **Dental assessment**
- **Rinse mouth before meals**
- **Experiment with new herbs and spices on foods**
- **Avoid hot temperature foods**
- **Cold foods help numb mouth sores**
- **Try blenderized foods if swallowing is difficult**
- **Avoid simple sugars with thrush**

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Diarrhea

- **Most common side effect & is treatable!**
- **Caused by various conditions:**
 - Medications
 - HIV therapy
 - Excessive use of antibiotics
 - Lactose intolerance
 - HIV enteropathy
 - The HIV virus has entered the enteric mucosa, causing malabsorption
 - Intestinal pathogens
 - Giardia, cryptosporidia, microsporidia, CMV, C. Diff., Mai

Nutrition and Diarrhea

- **Rehydrate your body/replace electrolytes**
- **Increase soluble fiber, decrease insoluble fiber**
- **Avoid gassy or high saturated fat foods**
- **Avoid caffeine, alcohol, and carbonated beverages (don't forget chocolate!!)**
- **Avoid concentrated sweets**
- **Monitor milk/dairy products**
- **Avoid tobacco**

Alternative Tx for Diarrhea

- Glutamine
- Bifidobacteria/Acidophilus/
Saccharomyces
- Fructoligosaccharides (FOS)
- Psyllium fiber
- Lactaid products
- Pancreatic enzymes (Pancrecarb)
- Congee
- Calcium supplements (Tums)

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Causes of Wasting Syndrome

- Poor dietary intake
- Malabsorption/malnutrition
- Diarrhea
- Hypermetabolism

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Interesting Tidbits

- **Controlled weight loss**
 - 40% ↓ in LBM
 - 60% ↓ in fat
- **Weight loss with exercise**
 - 20% ↓ in LBM
 - 80% ↓ in fat
- **Weight loss with infection/injury**
 - 70-80% ↓ in LBM
 - 20-30% ↓ in fat

Hyperlipidemia

- Low HDL, high TC, LDL, VLDL, TG
- Barrios et al: diet intervention IS effective in reducing lipid levels in HIV+ individuals on HAART
- **Caused by:**
 - Medications
 - Hereditary factors
 - High fat or high sugar diet
 - Excess weight
 - Excessive tobacco or ETOH use

Example of Fast Food Diet

- McDonalds special-\$1.99
 - Big Mac, biggie fries, biggie coke
 - 1380 calories, 56 grams of fat
- Burger king special-\$1.99
 - Whopper with cheese, biggie fries, coke
 - 1750 calories, 86 grams fat
- Shaq BK special- \$2.99
 - Sourdough burger, biggie fries, king coke
 - 1410 calories, 64 grams fat
- Taco bell special-\$1.99
 - Burrito supreme, biggie coke
 - 720 calories, 20 grams fat

Cardioprotective Foods

- **Soluble fiber.**
 - Gel-like soluble fiber binds bile (which contains cholesterol) and dietary cholesterol so that the body excretes it.
 - Reduces your low-density lipoprotein (LDL).
- **Omega-3 fatty acids.**
 - Triglyceride-lowering effect.
 - Helps reduce blood pressure and the risk of blood clots.
 - Found in fatty fish, flaxseed, walnuts, canola and soybean oils.
 - Doctors recommend eating at least two to three 3 ounce servings of fish a week.
 - To maintain the heart-healthy benefits of fish, bake or grill it.

Cardioprotective Foods, cont.

- **Soy.**
 - Recent studies show it might be as effective at lowering your cholesterol, but soy does contain vitamins and minerals and is a good source of fiber.
 - Low-fat alternative source of protein.
- **Plant sterols.**
 - Substances found in plants that help block the absorption of cholesterol.
 - Margarine and orange juice fortified with plant sterols can help reduce LDL cholesterol by more than 10 percent.
 - The amount of daily plant sterols needed for results is at least 2 grams — which equals about two 8-ounce servings of plant sterol-fortified orange juice a day.
 - Don't appear to affect levels of triglycerides or of "good" high-density lipoprotein (HDL) cholesterol.

Insulin Resistance

- Inability of sugar to enter cell due to cell receptor not recognizing insulin
- Is not detected by oral glucose tolerance test or HgbA1c
- Caused by:
 - Medications: 40% of pts on PI's will have impaired glucose tolerance
 - Hereditary factors
 - Excess weight—increased ABDOMINAL GIRTH

Waist/Hip Ratio

- **Waist-to-hip ratio or waist-hip ratio (WHR) is the ratio of the circumference of the waist to that of the hips.**
 - It measures the proportion by which fat is distributed around the torso.
 - People with more weight around their waist are at greater risk of lifestyle related diseases such as heart disease and diabetes than those with weight around their hips.

MALE	FEMALE	RISK FACTOR
<.95	<.80	LOW RISK
.96-1.0	.81-.85	MODERATE RISK
>1.0	>.85	HIGH RISK

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Controlling Insulin Resistance

- **Weight control/normal waist measurement**
- **Modified intake of carbohydrates**
 - Very low intake of simple carbohydrates
- **High fiber/low fat diet**
 - Monitor polyunsaturated fats
- **Exercise!!**
- **Medications**
 - Metformin, Actos

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Insulin resistance is the same as diabetes.

1. True
2. False

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Food Safety

- Cook.
 - Even for experienced cooks, the improper heating and preparation of food means bacteria can survive. Use a food thermometer — you can't tell food is cooked safely by how it looks.
- Clean.
 - Bacteria can spread throughout the kitchen and get on hands, cutting boards, knives, and countertops. Frequent cleaning can keep that from happening. And always wash hands with warm water and soap for 20 seconds before and after handling food.
 - Rinse fruits and vegetables under running tap water just before eating. Rub firm-skin produce (or scrub with clean brush) under running tap water.

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<http://www.fightbac.org>

Food Safety, cont.

- Separate.
 - Cross-contamination is how bacteria spreads. Keep raw meat, poultry, and seafood and their juices away from ready-to-eat foods.
- Chill.
 - Bacteria spreads fastest at temperatures between 40°F and 140°F, so chilling food properly (keep a constant refrigerator temperature of 40°F or below) is one of the most effective ways to reduce the risk of foodborne illness.

Food Safety, cont.

- Water
 - Reverse osmosis
 - Distilled
 - One micron filtration
 - American National Standards Institute (ANSI) - accredited organization to ANSI/NSF standard 53 for “cyst removal”
 - Boiling for one minute
 - [Http://www.epa.gov/safewater/dwh/index.html](http://www.epa.gov/safewater/dwh/index.html)

Healthy Eating On A Budget

- **Plan meals**
 - Set aside time each week to plan meals, prepare grocery lists
- **Stick to your grocery list**
- **Use coupons IF it makes the product cheaper than a generic/similar item**
- **Stock your pantry with non-perishable healthy foods to prevent fast food excuses**
 - Beans, lentils, brown rice, barley, soups, tuna
 - Keep extra marinades and condiments available

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Budget Eating, cont.

- **Buy in bulk, and generic**
 - Marinate and freeze in family size portions
 - Cook large amounts and freeze extras
 - Buy frozen vegetables and fruits
- **Invest in a crock pot!**

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Online Coupon Sites

Coolsavings

Coolsavings offers great printable coupons for groceries, baby products, and much more.

Couponsurfer.com

Free internet coupons.

Coupons.com

Print brand-name coupons at home.

Couponbar.com

eBates

Get up to 25% back when shopping online retailers. Free sign up.

eBay

Bid online for coupons like you would their regular auctions. Popular coupons of interest to moms that usually pop up are for diapers and baby formula.

Entertainment Book

Great local coupons for eating out, movies, entertainment, travel and more!

Eversave

Keycode

Printable coupons from merchant partners like sears portrait studio, plus online coupon code listings.

Valpak.com

Enter your zip code and find coupons specific to your area.

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Which source of water is unsafe:

1. Tap
2. NSF 53 filtered
3. Water dispenser
4. Bottled
5. Distilled

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Leftovers are safe up to

1. 2 days
2. 3 days
3. 4 days
4. 5 days

One Last Thought.....

**“The doctor of the future will no longer treat
the human frame with drugs, but rather
will cure and prevent disease
with nutrition.”**

Thomas Edison

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