

Functional Soups

South Denver Cardiology

Functional Foods

- Aren't all foods functional?
 - Taste,
 - Aroma
 - Texture
 - Nutrients
 - Calories
 - Vitamins
 - Minerals
- Additional Benefits
 - Provide an additional physiological benefit beyond that of meeting basic nutritional needs
 - Associated with reduced risk of disease
 - Associated with delayed onset of age-related diseases
 - Lessen the effect of some diseases

Functional Foods

- Foods or dietary components that may provide a *health benefit beyond basic nutrition*
- One of the fastest-growing segments of the food industry. Retail sales now top \$10 billion a year
- Consumers prefer extra nutrients in their food rather than from supplements
- Examples: Foods/drinks with plant sterols, added fiber, cereals with added antioxidants, etc.



Functional Foods

- Natural
 - Antioxidants
 - Fiber
 - Healthy Fats
- Fortified
 - Ingredients added to boost health benefits



Benefits of Functional Foods

- Cardiovascular disease
 - Decrease LDL and total cholesterol
 - Decrease triglycerides (blood fats)
 - Increase HDL
 - Lower Blood Pressure
 - Reduce clotting
- Cancer
 - Reduce runaway cell division
- Inflammation
 - Major effect on CVD and health in general

Benefits of Functional Foods

- Diabetes
 - Increase insulin sensitivity
 - Moderate blood glucose level
- Cognitive impairment
 - Omega 3 fats are highly concentrated in the brain
- Alzheimer's disease
- Immune Dysfunction
 - Lessen symptoms rheumatoid arthritis
- Macular degeneration

Protective Components

- Antioxidants
 - Found in fruits, vegetables, whole grains
 - Lutein & Zeaxanthin (vision)
 - Lycopene (prostate cancer)
 - Flavanols & Proanthocyanidins (CVD)
- Plant Sterols/Stanolols
 - Plant form of cholesterol
 - Add to foods such as margarine, OJ, bread
- Fiber
 - Soluble
 - Beta Glucan
 - Insoluble

Protective Components

- Vitamin D
 - Not found naturally in many foods
 - Fatty fish, eggs, some mushrooms
 - Fortified foods
 - Miracle vitamin/hormone of the 21st century
- Isoflavones
 - Natural plant hormones
 - Concentrated in soy foods
 - Protect against CVD, injure cancer cells
- Probiotics
 - Feed good bacteria that keep our gut healthy
 - Yogurt most common source
- Lignans (phytoestrogens)
 - Flaxseeds are the richest source

Putting it Together

Health Benefit	Bioactive Component	Food Source
↓ LDL-C	Soluble Fiber Soy Protein MUFA Plant Sterols	Barley, Oats, Apples Soy Beans Avocado, Olive Oil Fortified Margarine
↓ Triglycerides, ↓ Heart Attack	Omega 3 Fats	Fatty Fish
↓ Cancer Risk	Lycopene Sulforaphane Beta-carotene Polyphenols	Tomatoes, Watermelon Cruciferous Vegetables Sweet Potatoes Tea, blueberries, grapes
↓ Inflammation	Flavanones Omega 3 Fats Plant Sterols	Apples, Broccoli, Onions, Tea Fatty Fish, Walnuts, Flaxseeds, Canola Oil Fortified Bread

Putting it Together

Health Benefit	Bioactive Component	Food Source
↑ Eye Health (Macular degeneration, Night vision)	Lycopene Vitamin A Lutein	Tomatoes Carrots, Pumpkin, Mangoes Avocado
↑ Immune Health	Zinc Polyphenols Vitamin C Vitamin E Quercetin	Whole Grains, Wheat Germ, Salmon Coffee, Apples, Citrus, Pomegranates Berries, Kiwi, Peppers Almonds, Sunflower seeds, Papaya Apples, Onions
↓ Blood Sugar	Fiber	Whole Grains, Fruits, Vegetables, Beans, Soy

Putting it Together


Health Benefit	Bioactive Component	Food Source
↑ Bone Health	Vitamin D Calcium Potassium	Fish, Eggs, Fortified Milk (cow or soy) Milk, Yogurt, Fortified Products Bananas, Beans, Nuts, Avocado, Potatoes
↓ Blood Pressure	Omega 3 Fats Vitamin D Antioxidants Potassium	Fatty Fish Fish, Eggs, Fortified Foods Fruits & Vegetables, Garlic Avocado, Mushrooms
↑ Digestive Health	Probiotics Fiber	Yogurt Whole Grains, Fruit, Vegetables

SPECIFIC FUNCTIONAL FOODS

Fruits and Vegetables

- Benefits
 - Lower Blood Pressure
 - Lower Cholesterol
 - Weight Management
- Loads of Antioxidants
- Fiber
- Synergistic effects
- 5 or more servings a day
- "Evidence of dietary protection against cancer is strongest and most consistent for diets high in vegetables and fruits"

World Cancer Research Fund and the American Institute for Cancer Research 1997 Report



Fruit Superstars (antioxidants, fiber, V&M)


- Berries
- Avocado
- Oranges
- Cherries
- Apples
- Apricots
- Bananas
- Cantaloupe
- Grapefruit
- Kiwi
- Papaya

Vigilant Vegetables (antioxidants, fiber, V&M)

- Sweet potatoes
- Dark Leafy Greens: Spinach and kale
- Cruciferous vegetables like broccoli, cauliflower, cabbage and Brussels sprouts
- Tomatoes
- Carrots
- Onions, Leeks, Scallions
- Acorn and Butternut squash, Pumpkin
- Eggplant
- Cucumber
- Artichokes
- Mushrooms

Hearty Grains (fiber, beta-glucan, phytochemicals)


- Benefits
 - Lower Blood Pressure
 - Lower Cholesterol
 - Digestive Health
- Sources
 - Barley
 - Brown Rice
 - Oats
 - Bulgar
 - Flaxseed
 - Wheat Germ
- Must be WHOLE
- 5 or 6 servings a day



Soy (Phytosterols, isoflavones, phytoestrogens, minerals)


- Benefits
 - Reduce LDL and total cholesterol/CVD
 - Breast cancer prevention
 - Type 2 diabetes management
 - Osteoporosis prevention
 - Improved cognitive function, memory?
 - Lower blood pressure
 - Constipation and diarrhea prevention
 - Reduce hot flashes
 - Reduce muscle soreness caused by exercise
- Sources

- Soybeans/Edamame	- Soy Milk	- Soy Cheese
- Tofu	- Soy Nuts	



Legumes (fiber, potassium, magnesium)

- Benefits
 - Reduce LDL
 - Heart Health
 - Cancer Prevention
- Sources
 - Beans
 - Anasazi, Black, Kidney, Black-eyed peas
 - Garbanzo
 - Fava
 - Lentils
 - Peas
 - Peanuts
 - Soy beans



Fish, Nuts & Seeds (omega 3 fats, MUFAs)

- Benefits
 - Heart Health
 - Reduce Inflammation
- Fatty Fish
 - Salmon (Atlantic)
 - Tuna
 - Trout (lake)
 - Herring
 - Sardines
 - Anchovies
- Walnuts
- Flaxseeds
- Almonds
- Cashews

FUNCTIONAL SOUPS



Functional Soups

- What are they?
 - Soups that do more than fill your tummy
 - Contain functional foods
 - Support you immune system
 - Support heart health
 - Stave off disease, i.e., cancer, type 2 diabetes
 - Help with weight management
 - VERY TASTY

Chicken Soup

- First Functional Soup?
 - Prescribed as cure for common cold in early Egypt, ~3150 BC
 - Persian physician referred to the soup's curative powers (10th century)
 - Jewish physician Moses Maimonides (12th century) wrote: Soup "has virtue in rectifying corrupted humours." Recommended it for convalescents, hemorrhoid and early stages of leprosy
- Recipe
 - tough chickens were boiled, de-boned, and then chicken was broken up and put back in the water

Chicken Soups

- China
 - Chicken broth with seasoned with ginger, spring onions, star anise, black pepper, soy sauce, rice wine and sesame oil.
- Columbia (*ajjaco*)
 - Typically includes sweet corn, several types of potatoes, avocado, capers, an herb called *guascas*, served with a dollop of sour cream
- Romania
 - Chicken and vegetable broth, extremely fine noodles
- Greece (avgolemono: remedy for colds and hangovers)
 - Chicken, lemon and eggs, and served with small bits of pasta.
- Israel
 - Lots of vegetables, garlic, parsley, dill, tumeric, flat egg noodles, and Matzah balls.

US Chicken "Noodle" Soup

- Chicken broth
- Diced chicken
- Carrots, celery, onion
- Parsley
- Wide egg noodles



Health Properties of Chicken Soup

- Study by Dr. Stephen Rennard of University of Nebraska Medical Center
- Cold symptoms mostly due to inflammatory response
- Cells that respond to infection had limited movement when exposed to soup
- Thus soup may reduce cold symptoms by preventing inflammatory response
- Commercial recipes found to have similar effect
- Conclusion: Chicken soup may have a mild anti-inflammatory effect.

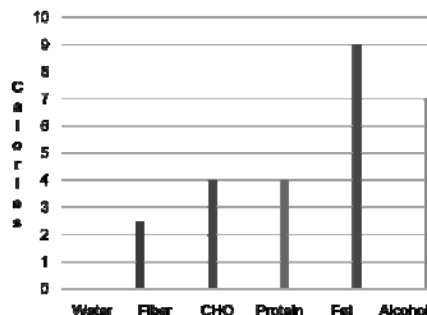
Health Properties of Chicken Soup

- A second study by researchers at Mount Sinai Medical Center in Florida.
- Compared changes in air flow and mucus in the noses of volunteers who had taken in cold water, hot water, and chicken soup.
- Results
 - Symptoms decreased (stuffy, runny nose) temporarily
 - Hot fluids perform better than cold.
 - Chicken Soup better than hot water.
- **Take away:** while above experiments are not conclusive, we know chicken soup with vegetables contains lots of healthy nutrients, increases hydration and tastes good.

Volumetrics & Soup

- Weight management program by Dr. Barbara Rolls, Ph.D., Professor of Nutrition at Penn State
 - Expert in hunger, obesity and factors that determine how people eat.
- She found that energy density plays a big roll in how many calories people eat.
- Energy Density (ED)
 - The amount of calories (energy) per amount (gram) of food.
 - Gram for gram, carbohydrates and protein have fewer calories than fats.
 - Foods with high water content have a lower ED
- Research shows foods with lower ED help people lose weight and keep it off.

Energy Density of Food Groups



Energy Density of Foods

Crackers, Chips, Chocolate Candies, Cookies, Nuts, Butter, Full-fat Condiments	High Energy Density
Meat, Cheese, High-fat Mixed Dishes, Salad Dressings, Some Snack Food	Medium Energy Density
Cooked Grains, Breakfast Cereal, Low-fat Meat, Beans, Legumes, Low-fat Main Dishes, Salads	Low Energy Density
Fruit, Veggies, Skim Milk, Broth-based Soups	Very Low Energy Density

Adapted from Volumetrics: Feel Full on Fewer Calories by Barbara Rolls, Ph.D., and Robert A. Barnett

Soup, a Great Low ED Food

- Study #1
 - Women given a first course at lunch
 - a. 10 oz of water or
 - b. a chicken and rice casserole + 10 oz of water or
 - c. the same casserole with 10 oz of water mixed in to make a soup.
 - Women who received the soup consumed 100 fewer calories at lunch and didn't make up for it at dinner.
- Study #2
 - 500 people, the more soup participants ate the fewer calories they consumed and the more weight they lost.
- Study #3
 - In similar study, participants preferred the strategy of including soup to just reducing calories.

How Soup works

- Ingredients
 - High water content
 - Filling
 - Low energy density
 - Protein
 - Slows digestion, keeping you feeling full longer
 - Fiber
 - Not 100% digestible so provides fewer calories
 - Expands making you feel full
- Starts a meal off right
 - Visual cue sets expectation for satiety
 - Activates “stretch receptors” that notify brain of satiety
 - Leaves stomach slowly
- Because it’s hot, we tend to eat it more slowly

Principles of Volumetrics

- Just cutting calories isn’t an effective form of weight management.
- Satiety and satisfaction are possible by consuming larger portions of foods with low ED.
- Low ED foods have high a water content and thus are low in calories.
- Eat foods that have low ED.
- Limit portions of foods with high ED.
- Starting meals with broth-based soup signals the brain early and promotes satiety.

Volumetrics: Feel Full on Fewer Calories by Barbara Rolls, Ph.D., and Robert A. Barnett

What’s in a Functional Soup?

- | | |
|-----------------------|---|
| • Broth or stock | Volume |
| • Protein | Slows digestion |
| – Legumes | Fiber, minerals, flavonoids |
| – Lean Meat | Lean protein |
| – Fatty Fish | Omega 3 fats |
| • Vegetables or Fruit | Antioxidants, fiber, vitamins, minerals |
| • Starch | Fills you up |
| – Whole Grains | Fiber, antioxidants, minerals |
| – Starchy Vegetables | Fiber, antioxidants |
| • Seasonings | Flavor, phytochemicals |
| • Flavorings | Flavor, MUFAs |
| • Toppings | Flavor |

Stock

- Store-bought
 - High in sodium
- Homemade
 - Beef or Chicken
 - Cover the bones with cold water
 - Beef: oxtail, chuck, shank, bottom round, short ribs
 - Chicken: bones of older chicken produce more flavor
 - Add a splash of vinegar.
 - acidity helps extract more minerals from the bones
 - Bring to a boil
 - Reduce to simmer and skim the top
 - Add vegetables if you like
 - Reduce temperature and simmer for 3 hours to 6 hours.
 - Strain the liquid

Never boil the stock. Boiling makes the broth cloudy and unattractive.

Stock

- Homemade
 - Fish
 - Cover the fish bones with cold water
 - Add vegetables for more flavor
 - Leeks are classic
 - Bring to boil.
 - Reduce temperature and simmer for ½ hour.
 - Strain the liquid

Stock

- Homemade
 - Vegetable
 - Add carrots, parsnips, onions, leeks, shallots, celery, tomatoes, mushrooms, ...
 - Add garlic, parsley, fennel, celeriac, other spices and herbs
 - Cover with cold water
 - Bring to boil
 - Reduce to simmer and cook for ½ - 1 hour
 - Mash vegetables extract juices
 - Strain the liquid

Protein

- Chicken
 - Boneless, skinless chicken
- Beef
 - Lean cuts of beef
 - Trim fat around the edges
- Fish/Shellfish
 - Fish fillets
- Beans
 - Any kind of cooked beans
- Animal proteins can be added cooked or cooked in the broth after straining
- Cut chicken, beef, or fish into bites size pieces

Vegetables

- Root: carrots, parsnip, rutabaga
- Onion
- Celery
- Mushrooms
- Bok Choy
- Broccoli, cauliflower, cabbage
- Asparagus
- Tomatoes

Starchy Vegetables

- Winter Squash
- Sweet Potatoes / White Potatoes

Starches

- Optional
- Beans
- Noodles
 - Whole wheat pasta
 - Bean thread (mung bean)
 - Rice
 - Udon
- Grains
 - Barley
 - Quinoa
 - Brown Rice
- Dumplings
- Ravioli

Seasonings

- Black, White, Green Peppercorns
- Garlic
- Parsley
- Rosemary
- Oregano
- Curry
- Nutmeg
- Cinnamon
- Cilantro
- Spicy Peppers
- Add dry spices and garlic earlier than fresh herbs

Flavorings & Toppings

- Flavorings
 - Olive Oil
 - Sesame Oil
 - Soy Sauce
 - Vinegar
- Toppings
 - Breadcrumbs
 - Cheese
 - Nuts
 - Dumplings

Dysfunctional Soups

- Creamy base
 - Cream
 - Butter
- Fatty Protein
 - High fat cuts of meat
 - Untrimmed poultry
- Too much salt
 - Full-salt store-bought stocks/broths
- Fatty Flavorings
 - Bacon
- Toppings
 - Full-fat cheeses
 - Full-fat sour cream
 - Too much of the good things (nuts, avocados)



References

- Helpful Websites
 - <http://www.mayoclinic.com/health/healthy-soup-recipes/RE00122>
 - http://www.eatingwell.com/recipes_menus/collections/healthy_soup_recipes
- Recipe Books
 - Fix-It and Forget-It Lightly: Healthy, Low-Fat Recipes for you Slow Cooker by Phyllis Pellman Good
 - The Volumetrics Eating Plan by Barbara Rolls, Ph.D. Techniques and Recipes for Feeling Full on Fewer Calories