

Nature is a Cooperative System

- All of her parts are constantly intertwining and communicating in both macro and microscopic bits.
- She is constantly seeking balance, harmony, homeostasis- not perfection.
- There really is a divine, breathtaking ordered synchronistic pattern.
- We can learn how to apply this design in daily modern life for optimal health.

The Human Body is Miraculous

- We have 500 muscles attached to 200 bones and 7 miles of nerve fiber.
- Within our 3 pound brain are 13 billion nerve cells; perception & control are relayed in elaborate feedback loops through 1,000 billion, billion protein molecules; 4 million pain sensitive structures; 500 thousand touch detectors; 200 thousand temperature detectors.
- Within our 5 quarts of blood are 22 trillion cells each second replaced by another 2 million.
- Within every cell are millions of molecules within each there is an atom & electron complex oscillating 10 million times each second.
- There are minute differences in DNA assemblage that differentiate us from other animals; we inherent generational family traits within creative twists- nobody is exactly the same- we are unique wonder filled temples!

Take Out Your Microscopes

- Every cell in your body has a specific coordinated function.
- Cells have elaborate communication systems to transmit information.
- Energy metabolism is the core of life.
- We derive energy from myriad sources.
- Essential is food; ingestion of carbohydrates, amino acids, lipids, vitamins and minerals.

Molecular Structure Definitions

- Carbohydrates: 3 or more carbon chain with more than one hydroxyl group; plus aldehyde or keto group- sugars, starches and cellulose; found in all plants.
- Lipids: 3 or more carbon chain with high ratio of hydrocarbons to polar atoms; poorly water soluble; ether or fat soluble; found in plants and animals.

- Amino Acids: An Amino group with an acidic carboxyl group and a variable hydrocarbon group attached to a central carbon; protein building blocks; 10 essential (Histidine, Isoleucine, Leucine, Lysine, Methionine, Valine, Phenylalanine, Threonine, Tryptophan, Arginine) - found in plants and animals.
- Vitamins: Essential micronutrients; must be ingested for normal body functions; organic (carbon base) compounds- found within a huge variety of whole foods.
- Minerals: Essential micronutrients; inorganic cation compounds- found within whole foods.

Efficient Energy Conservation

- We are designed to keep alive!
- Extra food consumed not used for immediate energy will be stored.
- Sugars, starches convert to either glycogen (liver & muscle; not brain) or fat.
- Fat (Lipids) cannot convert to glucose; will convert to adipose tissue.
- Protein will convert to fat or (depending on type) can convert to glucose for energy.

Introducing... the key nutrients

- B Complex; eight water soluble synergistic vitamins- must be consumed regularly; eliminated through urine.
- Thiamin B1; coenzyme Thiamin pyrophosphate, TPP; critical interchange in energy production, carbohydrate and amino acid metabolism- found in whole grains (brown color includes germ & bran), nuts, seeds and meat.

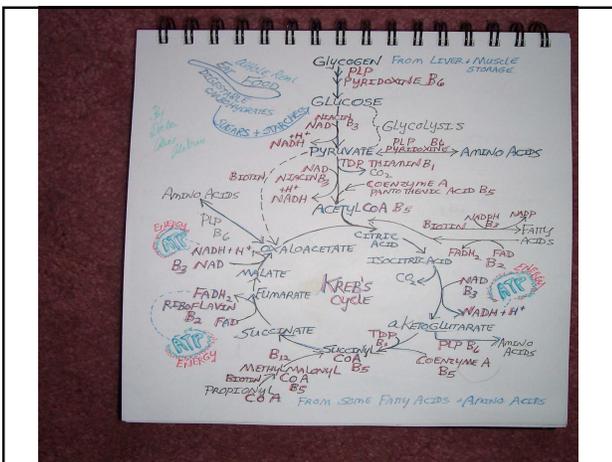
- Riboflavin B2; coenzyme Flavin adenine dinucleotide, FAD; essential to major energy producing cycle, Krebs's/Citric Acid- found in meat especially liver, dairy, eggs, whole grains, some vegetables and mushrooms.
- Niacin B3; coenzyme Nicotinamide adenine dinucleotide, NAD; another essential in Krebs's cycle- found in whole grains, nuts, meat.
- Pantothenic Acid B5; coenzyme A; another essential in Krebs's cycle- found in whole grains, nuts, seeds, legumes, meat and dairy.

- Pyridoxine B6; Pyridoxal phosphate; coenzyme for many reactions; another essential in Krebs's cycle conversion to amino acids- found in whole grains, vegetables, non citrus fruit and meat.
- Biotin; coenzyme essential for Pyruvate and Acetyl CoA carboxylase in Krebs's cycle- found in whole grains, nuts, legumes and liver.
- Magnesium; coenzyme essential for the Adenosine tri-phosphate, ATP molecule- found in green leafy, chlorophyll rich vegetables, whole grains, nuts and legumes.

- Vitamin C found in nature attached to Bioflavonoids, Anthocyanins and Polyphenols is a water soluble complex with multiple integrated physiological roles.
- Keynote in energy production is cofactor creating epinephrine from adrenal glands during sympathetic nervous system activation- stress; fight, flight or freeze.
- Most primates can produce; humans cannot; must be ingested- found in fresh, colorful vegetables and fruits.

Our Cell Factories

- Every living cell has a Cytosol with an outside membrane- energy production and synthesis specific for each organ.
- Within the Cytosol are several different compartments- the Nucleus, reproduction; Golgi Apparatus, complex molecule synthesis & packaging; Lysosomes, molecule degradation; Mitochondria, Kreb's cycle & other detailed energy production; Transport system, out & in, elaborate and coordinated for communication.



Glucose Metabolism; Mitochondria and ATP Basics

- Glucose produced from ingesting sugars & starches or from glycogen storage retrieval is converted via 10 biochemical reactions into pyruvate (glycolysis).
- Mitochondria, double membrane, "cell within a cell" (not found in red blood cells) is the home for Krebs's or Citric Acid cycle; Pyruvate is converted to Acetyl CoA via several more reactions and oxygen consumption then enters the cycle; each turn produces 38 ATP; releases CO₂ and H₂O and connections are made with amino acids and lipids to produce more ATP; fulfill body needs.
- ATP with Mg²⁺ is vital for innumerable metabolic processes; it is the biological charged battery for all tissues; an active cell requires 2 million ATP molecules per second- after energy is delivered it becomes ADP.

Standard American Diet The Problems

- We live in an artificial, commercial, mechanized world- goal is lengthening food shelf life; most packaged products are loaded with refined sugars; sucrose, dextrose, fructose, corn syrup and refined salt; pure NaCl; devoid of natural and harmonizing trace minerals.
- Typical diets are- soda/sugared/caffeinated/flavored beverages; minimal fresh water; lots of candy; refined (white) flours in pasta, rice, bread, muffins, cakes; meat; dairy; starch laden vegetables; some fruit, often sugar enhanced; almost no dark green leafy vegetables.
- Required nutrients for normal metabolism are minimal.

Reactive Hypoglycemia & Alcoholism

- Nature intended our food to be a rich variety of carbohydrates, amino acids, lipids, vitamins and minerals- each tasty morsel ingested; slowly assimilated; yields a steady supply of glucose, magnesium, B & C vitamins to fuel ATP production.
- Refined, denatured sugar need minimal digestion; it quickly converts to glucose; levels spike; body resources are depleted; insulin from pancreas is mobilized fast for distribution to cells (remember our bodies are efficient).
- Blood glucose drops fast because excess insulin recruited remains in the blood- hunger, uncomfortable feelings physical exhaustion prompt more empty calorie consumption as a quick fix to keep going.

- The brain needs a steady supply of glucose- it has no glycogen stores- red blood cells delivering glucose, oxygen and nutrients do not have mitochondria; limiting replenishment.
- Alarm signals activate sympathetic system to mobilize adrenals to send epinephrine (vitamin C utilized) whenever blood glucose dips below 60mg/dl- hormones glucagon, releasing glucose from storage & insulin, delivering glucose- rescue our brain- avoid body shut down and death.

- Symptoms include fatigue, weakness, perspiration, palpitations, nausea, hunger, headache, confusion, marked emotional crisis manifesting as profuse anger, irritability and depression.
- We are designed to easily accommodate this acute crisis- but- chronic ups and downs orchestrate a fight for homeostasis- generate entrenched disease.
- The set up is ripe for hypoglycemia, insulin resistance, diabetes, several interrelated endocrine disorders, heart disease and alcoholism.

- Alcohol consumed is rapidly oxidized in the liver via three different enzyme systems to acetaldehyde.
- It is a short cut for quick energy- this fermented beverage bypasses about ten steps used in normal glycolysis.
- The problem; end product produces too much NADH + H+ relative to NAD; it pushes the reaction backwards; stops Kreb's cycle and glucose storage retrieval in the liver.
- Chronic poorly nourished alcoholics experience hypoglycemia; liver damage exacerbates; leads to more glucose imbalance, emotional distress and cravings to imbibe again; stop discomfort.

Possible Solutions

- Check health status; get Glucose Tolerance Test; it measures insulin and glucagon hormone efficiency.
- Evaluate refined sugar cravings- check reactive hypoglycemia symptoms via daily chart prior/after meals.
- Scrutinize product labels; be aware the nutrition label uses scientific terms & evaluates break down; always read the tiny ingredient list, from most to least prevalent, for specifics.
- Learn the connoisseur's delight for all five tastes; sweet, sour, bitter and pungent.
- Learn to eat fresh, in season vegetables, fruits and whole grains.
- Stop ingesting the "white powders" refined, denatured sugar, flour/grains and salt.
- Avoid shaking the boney finger- blame, shame & guilt.
- Work a healthy nutrition 12 step recovery program.

Questions

1. What is missing in the standard American diet?
2. Which nutrients foster physiological and emotional stability?
3. What dietary choices damage healthy energy production; contribute to addictive physiology?
4. What resources are available in your community?

May Everyone Have Joy Full Health



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