Nutritional Anthropology

As a field of study, nutritional anthropology is fundamentally concerned with understanding the interrelationships of biology and social forces in shaping human food use and the nutritional status of individuals and populations.

Ecological Model of Food and Nutrition (Pelto et al.)

Biocultural Perspective

- Combines a number of perspectives
- Explains food systems as an integrated whole within a particular social and historical context.

Biocultural Approach

- Need to examine biological variation in terms of social relationships through which individuals gain access to basic resources
- Need to recognize the link between the local and global
- History and historical contingency are critical to the understanding social change and its biological consequences
- Humans are active agents in constructing their environment
- Ideology and knowledge of researchers and those being researched are key to understanding human action

Discussion Questions

1. How do the three articles (Pelto et al., Lee; Mintz), illustrate some of the different interests of nutritional anthropologists - and what are these interests?
2. What is the interplay between food as a biological necessity and the social and cultural factors that condition its availability and consumption?
3. What is the concept of a food system and why do the authors (Pelto et al.) say it is integral to the development of theory in Nutritional anthropology?
Nutrition Basics

• Food defined culturally:
  – A person’s diet is the result of:
    • Genetics - taste ability (PTC test)
    • Personal life experiences
    • Culture
  • Nutrients: biological requirement

Nutrition Basics

• Nutrients: biological requirement
  – Carbohydrates
  – Protein - amino acids
  – Lipids - oils and fats
  – Vitamins
  – Minerals
  – Water

Nutrition Basics

• Role of Food/ nutrients
  – Food - supplies nutrients: carbohydrate, protein, vitamin, mineral, fat/oils
  – Food/nutrients important for: growth, development, reproduction etc.
  – Food/nutrition plays a major role in human adaptation because:
    • It is an independent stressor
    • Modifier of other stressors (disease)

Nutrition Defined

• Actions in the body include:
  – Ingestion
  – Digestion
  – Absorption
  – Transport
  – Metabolism
  – Excretion

Nutrient Defined

• A chemical or chemical compound that aids in the support of life, and is essential for the normal function, growth and reproduction of the animal.
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Energy Intake
- Food freq. quest.
- 24-hr recall
- Food records
- Food weighing
- Direct observation

Energy Expenditure
- Gas exchange calorimetry
- Heart rate monitoring
- Estimated from activity
  - Motion sensors
  - Activity diary
  - Direct observation
- Doubly labeled water (D218O)

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Nutritional Status
- Clinical exam:
  - Skin
  - Nails
  - Hair
  - Eyes
  - Mouth
  - Thyroid

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Describing the Nutrients
- There are several ways to classify the classes of nutrients.
  - Essential or nonessential
  - Organic or inorganic
  - Macronutrient or micronutrient
  - Energy yielding or not

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Nutrition Basics
- What are Nutrients?
  - Macronutrients: nutrients required in relatively large amounts.
  - Vitamins and minerals
- Provide energy to our bodies
- Carbohydrates, fats and oils, proteins
- Micronutrients: nutrients required in smaller amounts.

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Macronutrients
- Protein
- Carbohydrate
- Lipids (fats & oils)

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Proteins
- Essential for synthesis of body tissue in growth, maintenance & repair
- Collagen, hormones, enzymes, immune cells, DNA, RNA are composed of protein
- Blood clotting, fluid regulation, & acid-base balance require protein
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**Protein**

- Structural materials
- Source of amino acids used to make protein in the body
- Contributes to immune function
- Can provide some energy; can make glucose from amino acids. 4 kcal per gram
- 20 amino acids used in human protein
  - 9 are essential (they must be obtained from food). Complete protein contains all essential amino acids.

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**Carbohydrates**

- Historically, nutritionists have classified carbohydrates as either simple or complex, however, the exact delineation of these categories is ambiguous.
- Today, simple carbohydrate typically refers to monosaccharides and disaccharides, complex carbohydrates means polysaccharides (and oligosaccharides).

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**Carbohydrates: Major Functions**

1. Providing energy and regulation of blood glucose (55-60% of calories in diet. Each gram = 4 kcal)
2. Sparing the use of proteins for energy
3. Breakdown of fatty acids and preventing ketosis
4. Correct working of our brain, heart and nervous, digestive and immune systems
5. Fiber, which is also a form of carbohydrate, is essential for the elimination of waste materials and toxins

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**Simple Carbohydrates**

- Classified according to saccharides
- Monosaccharide: glucose (dextrose), fructose, galactose (building blocks of all other CHO)
- Disaccharide: sucrose, lactose, maltose
- Sugar alcohols: sugar replacers
- Artificial sweeteners

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**Complex Carbohydrates**

- Polysaccharides are complex carbohydrates
- Starches, glycogen, & fiber are polysaccharides
- Starches are the major source of CHO in diet (grains, cereals, breads, pasta, starchy vegetables & legumes)
- Glycogen: animal starch (found in liver & muscle tissue, provides immediate fuel for muscle action)

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**Dietary Fiber**

- Plant foods that cannot be broken down by body to digest
- Fiber eliminated by intestinal waste
- Adds volume, no fuel or energy
- Fiber in diet helps promote regularity of bowel movements, helps in regulating blood sugar, reducing cholesterol, may promote weight loss, reduce risk of colon cancer & diverticular disease
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**Lipids; Fats & Oils**
- Fats (lipids) are the most calorically dense
- Composed of carbon, hydrogen, & oxygen (basic structural unit = glycerol)
- Composed of monoglycerides, diglycerides, & triglycerides
- Lipogenesis - Synthesis of fatty acids

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**Functions of Lipids**
- Fuel source: 9 kcal per gram
- Satiety value
- Organ protection
- Lubrication
- Insulation/ Temperature regulation
- Cell membrane structure

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**Lipids: Fats & Oils**
- Production of fatty acids for the production of phospholipids – in structure of cell membranes.
- Cholesterol is also made from fatty acids and is used for production of sex and adrenal hormones.
- They are also important for the transport of certain vitamins (fat-soluble vitamins).

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**Fats**
- Fatty acids can be Saturated or Unsaturated, Monounsaturated, or polyunsaturated & Trans-fatty acids
- Essential Fatty Acids (Linoleic, Linolenic) must be supplied by diet
- Necessary for metabolic processes
- HDL: major cholesterol carrier in your blood vs LDL:

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**Cholesterol**
- Not a true fat, classified as a sterol
- Body manufactures 1000 mg day
- Component of bile salts, essential component of cell membrane, necessary for production of several hormones (cortisone, estrogen adrenaline, testosterone)
- Elevated blood levels is a major risk factor for CAD (< 200 mg/dL optimal)

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**Water**
- Critical component of body
- Cell function depends on a fluid environment
- 60-70% of body weight
- Muscle contains more water than fat
- Infants have higher total body water
- Fluid needs met by ingesting fluids & solid food high in water content (fruits & veggies)
Functions of Water in Animals

- Numerous functions, which include:
  - Movement of nutrients and metabolites
  - Constant body temperature
  - Media for chemical reactions
  - Takes part in chemical reactions
  - Special roles