

Dietary Assessment Continued

January, 2001

Choline

- AI: 550 µg, men and 425 µg, women
- Humans may not be able to make adequate amounts under certain conditions- results in liver damage
- Dementia, CVD, Cancer???
- UL: 3.5 g/day critical effect hypotension and fishy body odor

Antioxidant Definition

A dietary antioxidant is a substance in foods that significantly decreases the adverse effects of reactive species, such as reactive oxygen and nitrogen species on normal physiological function in humans.

Vitamin C

- RDA
 - 90 mg/day adult men
 - 75 mg/day adult women
 - +35 mg/day for smokers
- UL
 - 2 g/day
 - Adverse effects: osmotic diarrhea and GI disturbances

Vitamin E

- RDA

- 15 mg/day α -tocopherol, (*RRR* α -tocopherol or *2R* stereoisomeric forms)
- 30 mg/day of *all rac* α -tocopherol (supplements, and fortified foods)
- Recommendation is not based on lowering risk of chronic dx
- UL 1000 mg/day supplemental α -tocopherol (hemorrhage)

Selenium

- RDA
 - 55 μ g/day
 - Based on maximal synthesis of glutathione peroxidase
- UL: 400 μ g/day

β - Carotene

- RDA based on provitamin A activity will be established in concert with Vitamin A RDA.
- No RDA is established, but recommend increased consumption of carotene rich foods.
- Supplements are not advisable.

Users manual

- Uses and Interpretations Subcommittee
- A “practical and easy to read” manual for health professionals
- To be published within a few years

Daily Values

- Reference Daily Intakes (RDI):

- The highest 1968 RDA value within specific age groups.
- Four versions
- Daily Reference Values (DRV):
 - Protein based on RDA
 - Others cover dietary components that have no true RDA

Comparison of RDIs and DRIs

Food Pyramid Servings

Supplements?

Exceptions

- Fluoride: Consumption of fluoridated water
- Calcium:
 - Dairy product consumption
 - Fortified foods?
- Folate: 5 svg. Fortified foods ~400 µg DFE
- Vitamin D: supplement in the elderly
- B₆ and B₁₂: fortified foods or supplements in the elderly
- Failure to consume 1600 kcal

Energy Requirements

- Basal (resting) energy expenditure
- Activity related expenditure
- Thermic effect of food (diet induced thermogenesis)

Harris-Benedict Equation

REE (males)

$$66 + [13.7 \times \text{weight}(\text{kg})] + [5.0 \times \text{height}(\text{cm})] - [6.8 \times \text{age}] = \text{kcal/day}$$

REE (females)

$$665 + [9.7 \times \text{weight}(\text{kg})] + [1.8 \times \text{height}(\text{cm})] - [4.7 \times \text{age}] = \text{kcal/day}$$

Adjusted body weight for Obese patients

Adjusted body weight =

$$[(\text{current body weight} - \text{ideal body weight}) \times .25] + \text{ideal body weight}$$

Weight Control

Obesity

- Obesity = BMI \geq 30
- Waist Circumference
 - 39 inches for men
 - 35 inches for women
- Increased risk of co-morbidities begins at BMI $>$ 25 (overweight)

Co-morbidities associated with Obesity

Relative Risk \gg 3

- Diabetes
- Gallbladder Disease
- Dyslipidemia
- Insulin Resistance
- Breathlessness
- Sleep Apnea

Relative Risk \sim 2-3

- Coronary Heart Disease
- Hypertension
- Osteoarthritis (knees)
- Hyperuricemia and gout

Factors involved in the development of obesity

Obesity can only occur when energy intake exceeds energy expenditure

Genetics

- Factors affecting energy expenditure
 - Efficacy of the coupling of electron transport to oxidative phosphorylation
- Proteins like Leptin
 - Decreases food intake in rodents
 - Levels are increased in humans-Resistance?

Environment

- Diet
 - High fat
 - High energy density
 -
- Physical activity

Genetics X Environment

- 25% - 75% of body weight variation may be explained by genes.
- U.S. genotype has not changed: body weight has increased

Treatment of Obesity

- First goal should be to prevent weight gain.

- 10% reduction in body weight associated with health improvement

Goals

Behavioral Weight Loss Treatment

- Diet
- Physical Activity

Surgical Weight Loss Treatment