DIETARY GUIDELINES FOR CARBOHYDRATES IN MEXICO

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INNSZ
• Nutrition of a given individual is the result of the dynamic interaction of his/her genome with his/her environmental history which includes:
  - the alimentary history and
  - the long-term relation with the physical (altitude, climate, etc.), biological (microorganisms for example), psycho-emotional and socio-cultural environment.

• In humans is not only biological, but integrally biological, psycho emotional and socio cultural.

• Diet as the unit of feeding.
EATING BEHAVIOR
Determining Factors

- Biological, intellectual, emotional, social, cultural, economic, religious, geographic, ritual, historic and commercial.

- Hunger and satiety. Other mechanisms?
- Also participate:
  - Appetite
  - Likes and Preferences
  - Attitudes and fears
  - Beliefs
  - Caprices
  - Emotions
  - Myths
  - Knowledge and prejudices
  - Memories & states of mind
  - Values
  - Traditions
  - Habits
  - Costumes
  - Fashions
  - Availability
  - Access
CARBOHYDRATES

- Monosaccharides MS: Glucose, galactose, fructose, inositol*, ascorbic acid*, ribose, desoxyribose.
- Disaccharides DS: Sucrose (Gl-Fr), lactose (Gal-Gl), maltose (Gl-Gl)
- Oligosaccharides OS
- Polysaccharides PS: Starches, glycogen, dietary fiber
- Poliols: sorbitol, mannitol
INTAKE AND DIGESTION

• INTAKE
  - Largest source of energy in many diets; comparatively less expensive
  - Intrinsic or extrinsic to diet
  - Starches >> sucrose >> lactose; fiber.
  - Starches ← cereal grains and tubers.
  - Sucrose mainly extrinsic.
  - Lactose

• DIGESTION
  Starches digested by α amylases in saliva and pancreatic juice. Variable digestibility:
  - rapid (cooked cereal seeds)
  - slow but complete (raw cereal seeds)
  - resistant (banana, raw potato, legume seeds); fermentation in colon

Disaccharides. Digested by glucoamylase and disaccharidases (sucrase, lactase, maltase) Milk intolerance Sucrose digestibility
Fiber. Fermentation
ABSORPTION

• Only MS
• Active absorption for glucose and galactose and facilitated diffusion for fructose
• Metabolic effects: glycemic response
• Velocity of absorption influences glycemic response and insulin secretion
• Glycemic index (GI) and glycemic load (GL) (GL= GI x amount of CHO provided)
• Food and meal GI and GL

• Starches vs (added) sucrose.
• Importance of fiber
• CHO as energy and non-energy sources
• Contribution to energy intake and balance
• Glucose storage and oxidation
• Special needs for CNS and platelets estimated to be covered by 130g/day in adults
• Overnight fasting Gluconeogenesis
• Sweet beverages and satiety
• Sucrose & caries, obesity, CVD, Hypertension, dislipidemia, tumors.
MEXICAN DIETARY GUIDELINES

• As in many countries, Mexico’s Health Authorities have recently established revised dietary guidelines which consider the local circumstances, resources and problems.

• Dietary guidelines built on the bases of:
  - the Mexican Dietary Reference Values (DRV) 2005
  - the NOM-043-SSA2-2005 Regulation of population dietary guidance (DG)

• Special concern about malnutrition. Child PEM still prevalent in many rural areas, iron deficiency anemia highly prevalent and increasing prevalence and precocity of the epidemics of obesity and co-morbidities.
DRV

- Workshop ~ 50 experts from 17 national health institutions backed by the Secretary of Health and the National Academy of Medicine 2003-2005

- Use of DRV and DG in:
  PLANNING (Food supply systems. Intake goals for populations)
  EVALUATION OF DIETS (Adequacy index)
  OTHER Nutrition research, nutrition programs, institutional feeding, new products development, labeling regulation, nutrition education

- TERMS USED IN MÉXICO
  - RNP Mean nutrient requirement
  - IDR (RNP + 2 sd) Daily Recommended Intake (RDA)
  - IDS Daily suggested intake (AI)
  - LSC Upper intake limit (UL)
LOCAL DIFFERENCES IN

- Genetic composition. Polymorphisms
- Demographic profile of the population
- Availability of foods. Bioavailability of nutrients in local diets
- Composition and characteristics of local diets
- Eating patterns. Traditions
- SE conditions
- General health status. Type, frequency and severity of malnutrition or adiposity in the population
- Body weight and composition. Height
- Rate of growth
- Physical activity
- Birth weight. Mother's milk volumes
- Biological environment (flora, pathogens)
IDS (AI)

- **IDS for total CHO:**
  - 0-6 months: 60 g (from human milk)
  - 7-12 months: 95 g
  - Thereafter: 130 g
  - Pregnancy last third: 175 g
  - Lactation: 210 g
  - These are *minimum recommendations*

- **Fiber IDS (AI):** 30-35 g for adults
- **LSC (UL):** Sucrose no >10 %
ACCEPTABLE ENERGY SOURCES DISTRIBUTION RANGE
(as % of Dietary Energy Value)

• Protein 12-15 % (vegetal/animal 2/3)
• Fat 25-30 % (Saturated <7, MUFA 12-14, PUFA 6-7). n-6/n-3 4/1, no added trans

• CHO: 55-63 %
  [starches 45-53 %, sucrose ~10 %]
  LSC (UL) sucrose no >10 % of requirement
NOM-043-SSA2-2005

• Similar to Health and Education Act
• Instrument for regulation of dietary guidance to population
• Food-based
• Centered on diet as the unit of feeding
• Food groups.
• Combination and variation
• Selection, conservation and appropriate and hygienic preparation of dishes
• General principles and provisions

• Image: El plato del bien comer (The plate of well eating)
El Plato del Bien Comer

VERDURAS Y FRUTAS

CEREALES

COMBINA

LEGUMINOSAS Y ALIMENTOS DE ORIGEN ANIMAL

FUENTE: NOM-043-SSA2-2005
DIETARY GUIDELINES

• Three 3 complementary food groups. Substitution within each group; allows variation
• Based on foods and centered in diet
• Stress on complementary combination, on variation of foods from each meal to next and on moderation (in total quantity as well as in sugar, fat and salt consumption)
• Numerous recommendations on food selection and preparation in designing a healthy diet
• Avoid quantitative and hierarchical connotations
• Stress on the value of nixtamal products, legume seeds (common beans) and fresh vegetables and fruit
• In Mexico pasta soup (part of cereal group) is a common dish. Attractive, culturally valuable, inexpensive.
RELATION BETWEEN ESPECIFIC FOODS AND OBESITY AND COMORBIDITIES

• Adipose tissue accumulation -and fat toxicity- is a physiological response to excess energy i.e. intake > requirement
• Energy intake should be = to requirements.
• Composition of intake does not seem to be relevant. No theoretical basis and no data to suggest it does
• However, importance of energy density, GI and GL