# DIETARY GUIDELINES FOR CARBOHYDRATES IN MEXICO

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**INNSZ**

# NUTRITION

- 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** - **Memories & states of mind**
  - **Likes and Preferences** - **Values**
  - **Attitudes and fears** - **Traditions**
  - **Beliefs** - **Habits**
  - **Caprices** - **Costumes**
  - **Emotions** - **Fashions**
  - **Myths** - **Availability**
  - **Knowledge and prejudices** - **Access**

# CARBOHYDRATES

- **Monosaccharides MS**
- **Disaccharides DS**
- **Oligosaccharides OS**
- **Polysaccharides PS**
- **Poliols**

- **MS: Glucose, galactose, fructose, *inositol**, *ascorbic acid**, ribose, desoxyrribose.**
- **DS: Sucrose (Gl-Fr), lactose (Gal-Gl), maltose (Gl-Gl)**
- **OS**
- **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**

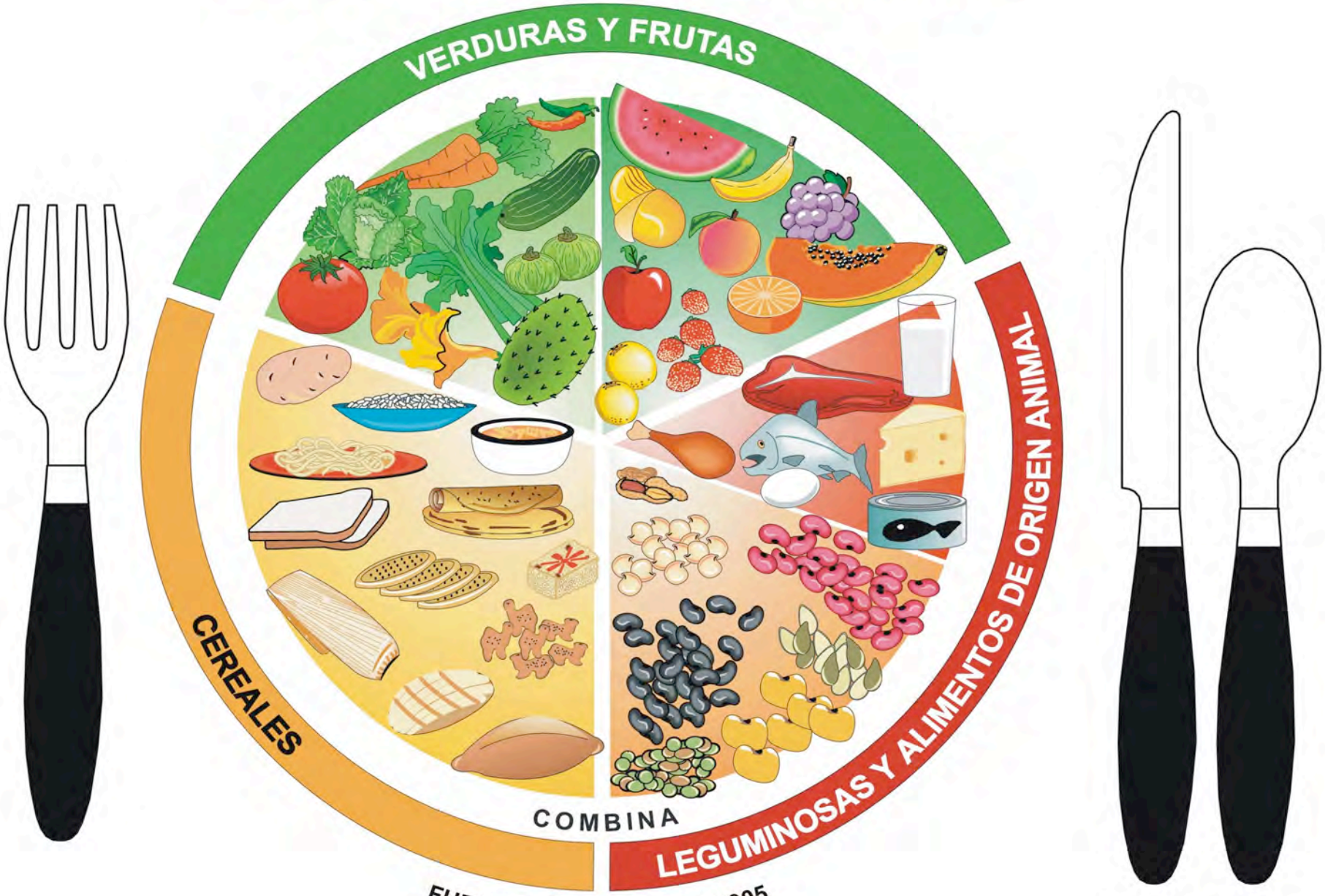
- **CHO: 55-63 %**
  **[starches 45-53 %, sucrose ~10 %]**
  **LSC (UL) sucrose no >10 % of requirement**

# NOM-043-SSA2-2005

- Similar to Health and Education Act
- Instrument for egulation 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




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