Weight Issues for Children

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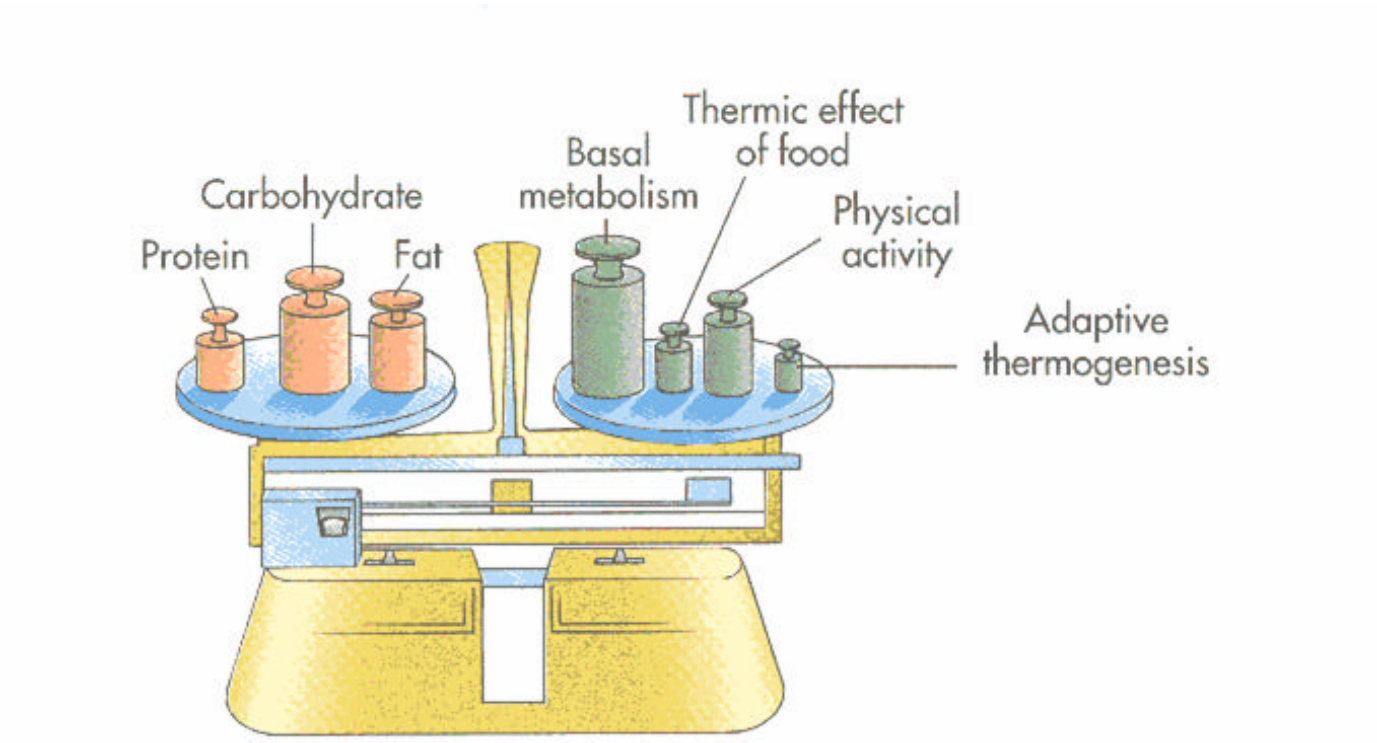
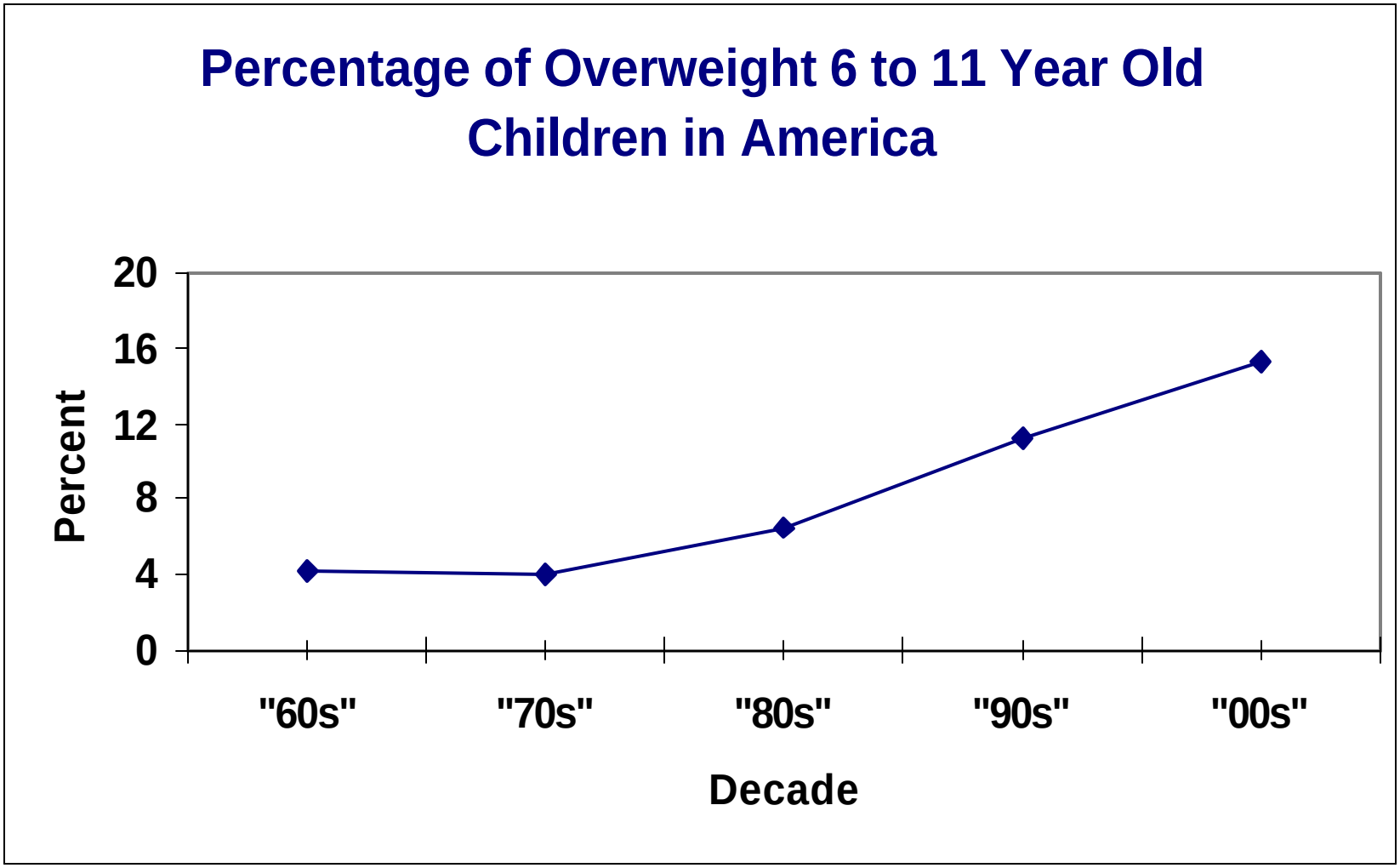
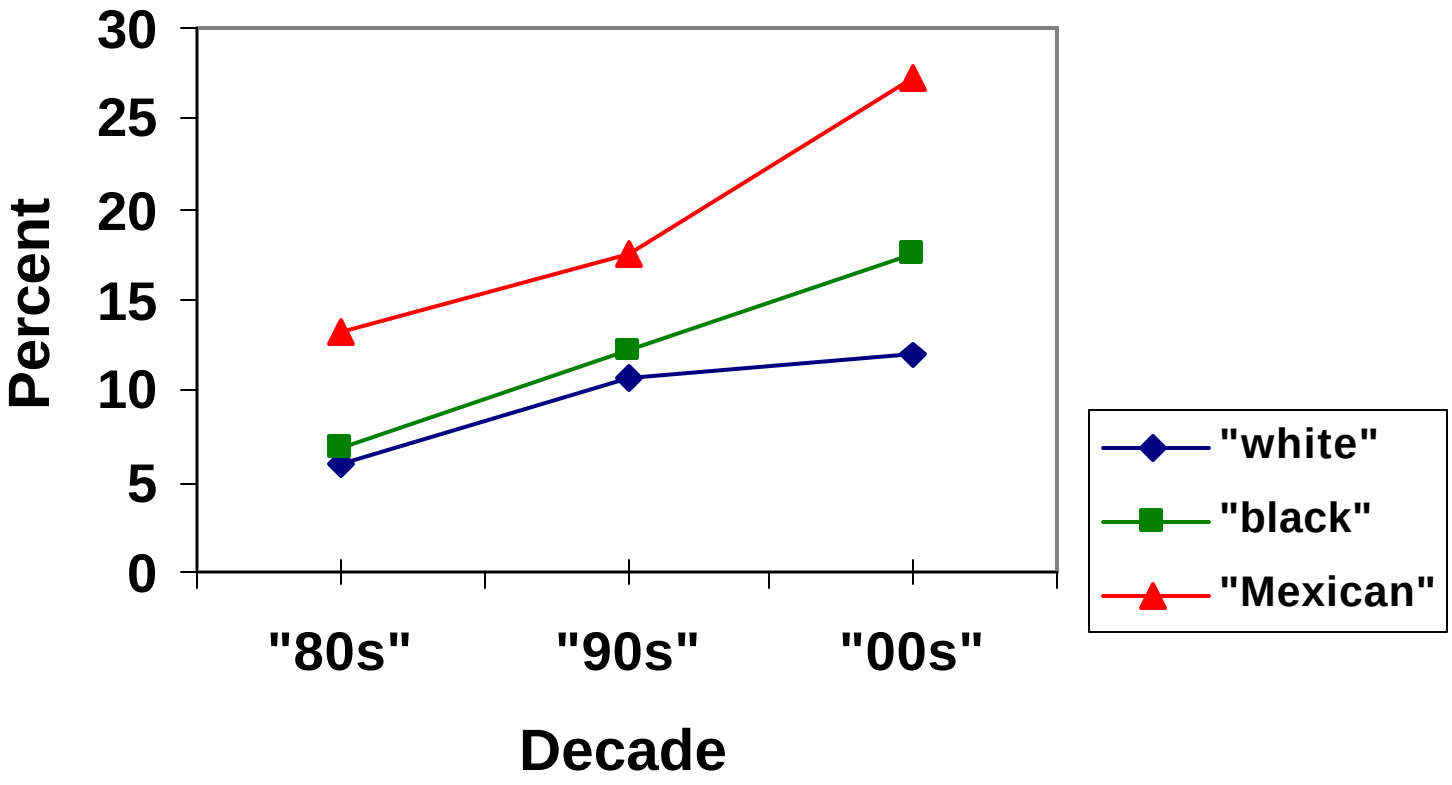




Overweight is defined as body mass index (BMI) at or above the 95th percentile.

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey

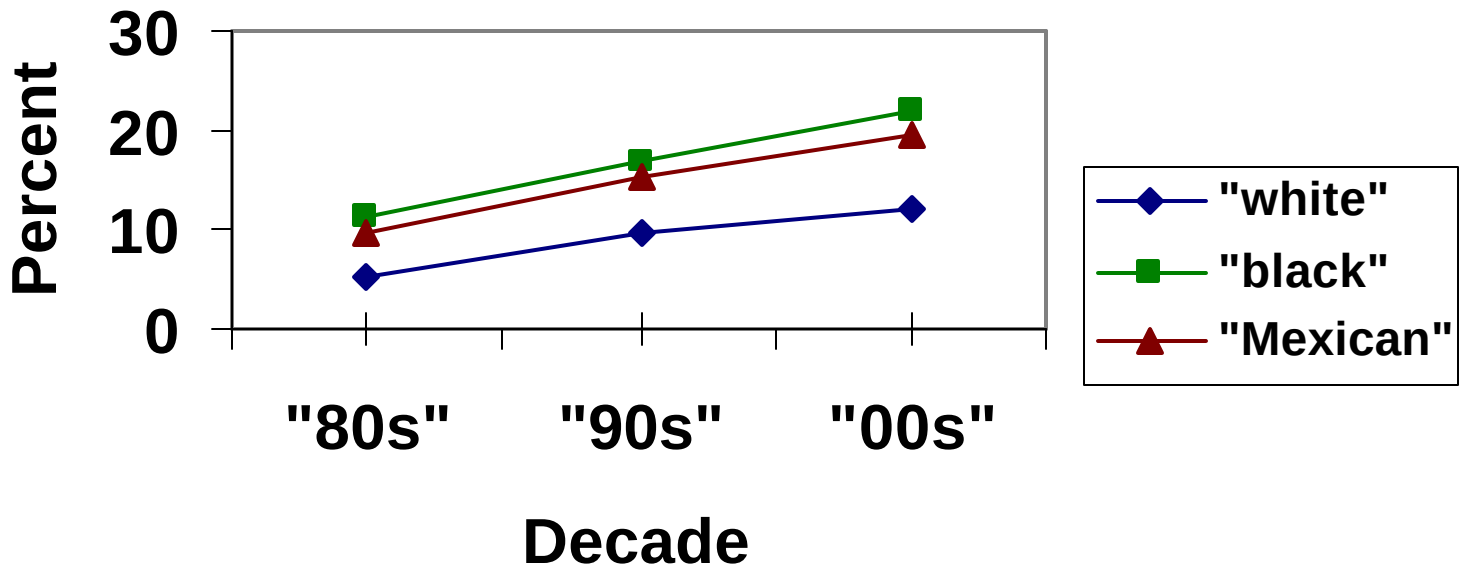
Percentage of Overweight U.S. Boys Aged 6-11



*Overweight is defined as body mass index (BMI) at or above the 95th percentile.

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey

Percentage of Overweight U.S.Girls Aged 6-11



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Childhood Obesity is a Global Issue

- Similar trends in other industrialized setting

  Japan--obese 6-14 year olds increased from 5 to 10% between 1974 and 1993

  Source: World Health Organization. *Obesity: Preventing and Managing the Global Epidemic*. WHO Tech Support series #894, 2000.

- Not limited to industrialized countries

  Some settings have rapidly increasing prevalence of childhood obesity at the same time as relatively large numbers of malnourished children, e.g. several Northern African countries where obesity = 8% and "wasting" = 7%.

  Egypt, Argentina, Malawi, Nigeria, Uzbekistan, Peru, Qatar, South Africa, and Jamaica report higher percentages of overweight children compared to the U.S.

  Source: De Onis M, Blosser M. Prevalence and trends of overweight among pre-schoolchildren in developing countries. *Am J Clin Nutr*. 2000; 72:1032-1039

Childhood Obesity and Associated Health Risks

Bogalusa Heart Study -- Longitudinal study of cardiovascular disease risk factors in a large cohort of African American and white children.

- High total cholesterol and LDL (low-density lipoproteins)-cholesterol concentrations are apparent in adolescence for those overweight through childhood.
  - ~60% of overweight 5-10 yr olds had one cardiovascular risk factor (high blood pressure, hyperlipidemia, or elevated insulin)
  - ~20% of the same cohort of 5-10 yr olds had two or more risk factors
- These risk factors were easily tracked into adulthood.
- Autopsy research demonstrated atherosclerotic lesions and fatty streaks in adolescent and young adults.
- Alarming result: Risk factors for cardiovascular disease present very early.

Reviewed in: Berenson GS, Wattigney WA, Bao W, Srinvasan SR, Radhakrishnamurth B. Rationale to study the early natural history of heart disease: the Bogalusa Heart Study. Am J Med Sci 1995: 310:S22-8

Type 2 Diabetes

Recent research (Pinhas-Hamiel et al. 1996) has documented the tremendous increase in the incidence of type 2 diabetes in children and adolescents.

- **Before 1982 – In 0-19 yr olds type 2 diabetes represent about 4% of 1027 diabetes cases in Cincinnati.**

- **Between 1982 and 1994 – 16% of diabetes cases were type 2, and 33% in 10-19 yr olds.**

- **Obesity was identified as a major risk factor in this study.**

Type 2 Diabetes (cont.)

Conclusions from the previous research

- **Type 2 diabetes is not necessarily a slowly progressing disease that affects adults, but in susceptible individuals, it can attack in adolescence.**

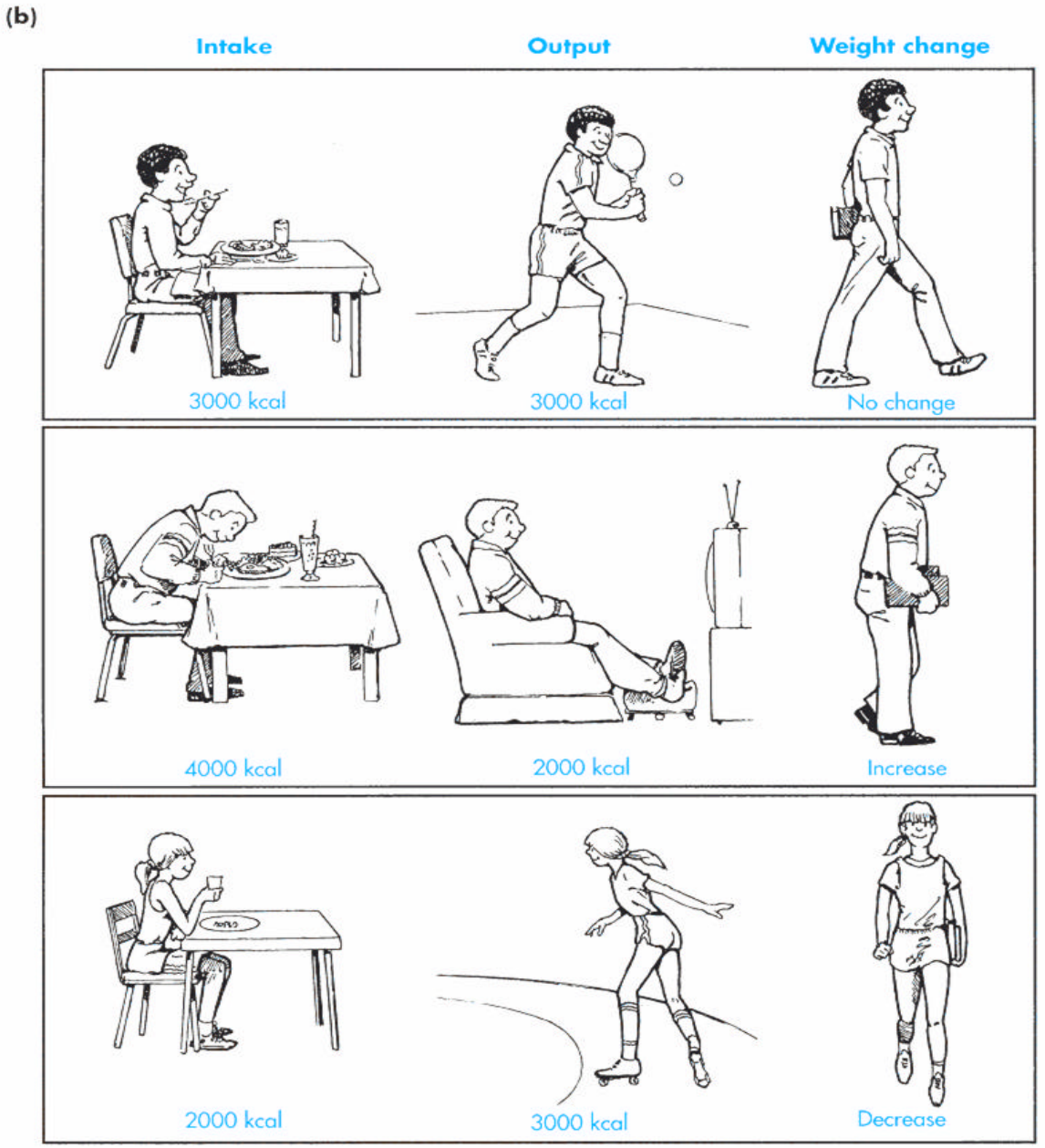
- **Obesity is more than a body weight issue for children**

Source: Pinhaus-Hamiel O, Dolan LM, Daniels SR, Standiford D, Khoury PR, Zeitler P. Increased incidence of non-insulin-dependent diabetes mellitus among adolescents. J Pediatr 1996;128:608-615.

What Causes Obesity in Children?

Simple Problem:

- **Too much intake**
- **Too little output**
- **Is it really that simple?**
  Yes and no



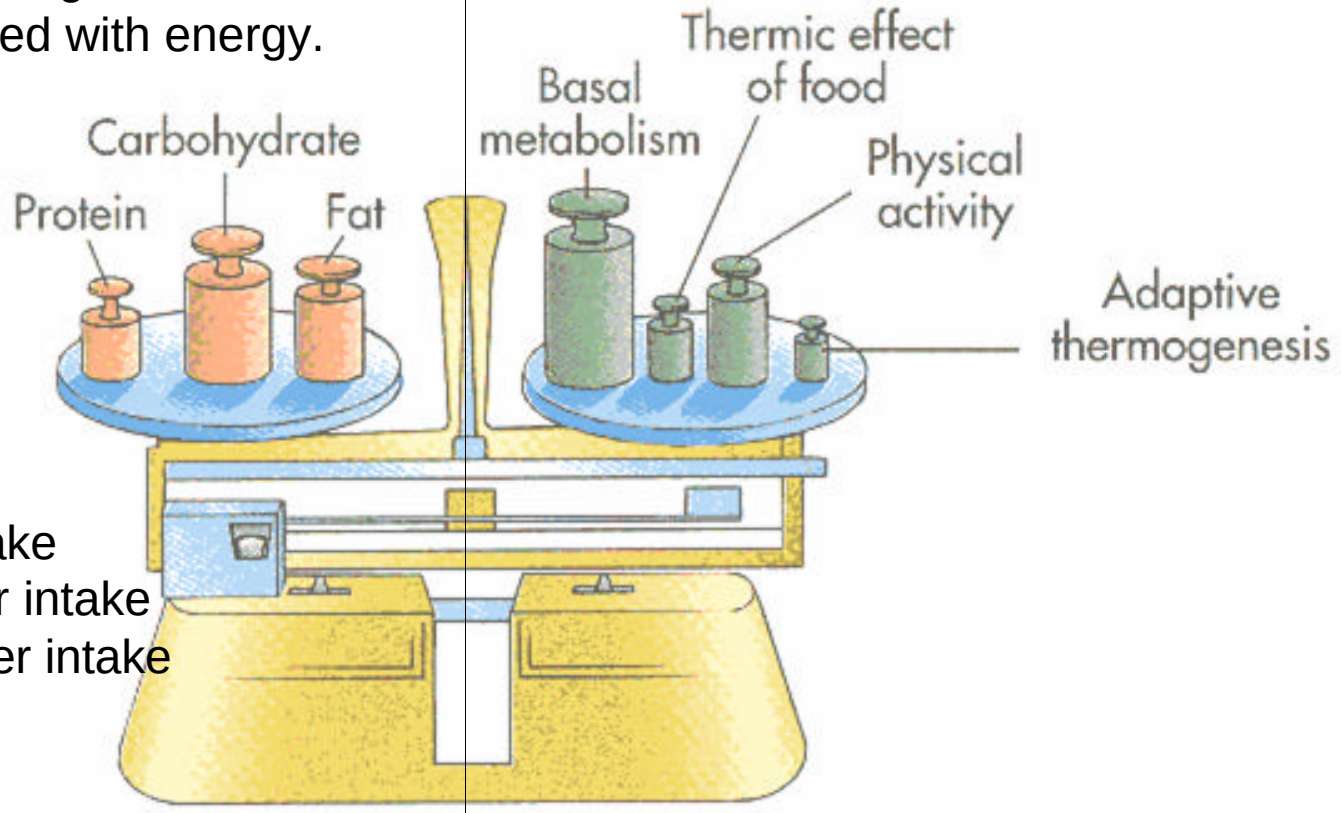
Intake side

Much on this side can be modified. Basic strategy is to consume less calories, by choosing foods that are not densely packed with energy.

- Lower fat intake
- Increase fiber intake
- Increase water intake

Output side

Here physical activity is modifiable, which can affect basal metabolic rate.



- Longer duration of moderate exercise
- Walk or bike to school, or to other activities
- Watch less T.V.

Why its not that simple

- Chronic imbalance, however slight, can lead to obesity.
- Complex homeostatic mechanisms exist to insure that balance is met in spite of large fluctuations in daily levels of intake and expenditures.
- How the body partitions incoming energy is different between people.
- A clear mechanism has not been identified as the culprit in the increased incidence of childhood obesity.

The Debate Continues

Folks do not agree as the relative importance of diet, energy expenditure and/or other factors.

Methodology to measure these components are error-prone.

Clearly both diet and exercise play a role, but what about other metabolic factors that my interfere with homeostasis.

- What role does inheritance play?
- Does early environmental conditions play a role?
- Does large deposits of adipose tissue disrupt normal metabolism?

Recent Findings Shed Light on These Issues

The following are results and interpretations outlined in (Goran, 2001), based on years of research he and his lab has conducted.

- **Energy expenditure (EE), and thus energy requirements, are lower in children than previously considered.**
- **EE is not strongly linked to obesity in children.**
- **One of the major predictors of increased fat gain during growth are initial fat levels.**
- **Still, environmental and behavioral factors relating to physical activity appear more significant than inherent metabolic characteristics.**

Source: Goran MI. Metabolic precursors and effects of obesity in children: a decade of progress, 1990-1999. Am J Clin Nutr 2001;73:158-71

Statistically Speaking

- Overweight women give birth to overweight children.
- Overweight newborns turn into overweight children.
- Overweight children turn into overweight teens.
- Overweight teens turn into overweight adults.
- Overweight children who proceed to become overweight adults possess risk factors for many diseases for two decades longer than those who become obese in adulthood.

Source: Deckelbaum RJ, Williams CL. Childhood obesity: the health issue. Obesity Research 2000;9:239-243.

Prevention -- is an effective and economic public health policy since treatment after the fact is troublesome.

Steps for Prevention of Childhood Obesity

1) Preconception – Mother (and father to a lesser extent)-to-be should prepare for future pregnancy by maintaining, or beginning, a modest exercise plan and to continue, or begin, to consume a healthy diet.

2) Gestation – Pregnant mother should continue to exercise and eat well. Her appetite will increase but she should be careful what foods she selects to satisfy her needs.

Too much weight gain during pregnancy is linked to overweight newborns.

Steps for Prevention of Childhood Obesity (cont.)

3) Postpartum – Breastfeeding is superior to bottle-feeding with respect to healthy growth and weight gain of the infant.

- Babies will grow slower and weigh less, which is good!
- Exclusive breastfeeding for 1st six months

4) Infancy – Introduce a balanced diet, which means parents need to eat healthy since infants will want to eat what parents eat.

- Avoid high-calorie snacks
- Follow weight gain closely and adjust diet accordingly
- Down the road it will be much more difficult to modify dietary behavior

Steps for Prevention of Childhood Obesity (cont.)

5) Preschool – Provide opportunities for children to develop healthy food preferences.

Nutritional education begins during this time, for both parents and children. Families must fight off the marketing ploys that target young children and encourage unhealthy eating.

Continue to monitor weight gain.

6) Childhood – Encourage daily physical activity and continue dietary selection based on nutritional education.

This is the time when safe and fun activities must be offered so children will choose play in the form of exercise over play in the form of video/computer games.