

¹⁻⁷²**RAISING A HEALTHY EATER**
Annotated Selected References
Compiled October 2008

Abraham S, Collins G, Nordsieck M. Relationships of childhood weight status to morbidity in adults. *HSMHA Health Rep.* 1971;86:273-284.

Notes: This 35 year longitudinal study was done of 1,963 Hagerstown, MD white males who were 9-13 years old between 1923 and 1928 and 47/48 years old at followup. It showed that lean boys who became fat men had a twofold elevated risk of cardiovascular disease, whereas fat boys who remained fat as adults had only an average risk. The study demonstrated that prevalence rates for hypertensive vascular and cardiovascular renal disease varied within the average, moderately overweight, and markedly overweight adult groups, and that the adult who had been a below average weight child had the highest rate in each category, respectively. ES note: It appears that it is not fatness, per se, but unstable body weight that is correlated with cardiovascular disease.

Andres R, Elahi D, Tobin JD, Muller DC, Brant L. Impact of age on weight goals. *Ann Intern Med.* 1985;103:1030-1033.

Notes: Independent analysis of actuarial statistics involved in the 1979 Build study. Showed the body weight associated with lowest mortality to have increased progressively with age (20 to 29, 60 to 69 years). By the time a woman reaches her sixties, for example, the BMI associated with lowest mortality is 27.3. The study prepared height-weight tables that were age-specific and deleted sex and body frame type as variables. These weight standards are lower for younger adults and higher for older adults than those previously recommended. The BMIs associated with the lowest mortality by ages and sex were [20-29: 21.4/19.5], [30-39: 21.6/23.4], [40-49:22.9/23.2], [50-59:25.8/25.2], [60-69:26.6/27.3].

Andres R, Muller DC, Sorkin JD. Long-term effects of change in body weight on all-cause mortality. A review. *Ann Intern Med.* 1993;119:737-743.

Notes: Summary of published studies analyzing all-cause mortality. Thirteen reports from 11 diverse population studies, 7 from the United States and 4 from Europe. The highest mortality rates occur in adults who either have lost weight or have gained excessive weight. The lowest mortality rates are generally associated with modest weight gains.

Bacon L, Stern JS, Van Loan MD, Keim NL. Size acceptance and intuitive eating improve health for obese, female chronic dieters. *J Am Diet Assoc.* 2005;105:929-936.

Notes: Bacon et. al. treated white, obese female chronic dieters aged 30 to 45 years with either a health at every size program or a weight-reduction-diet program. Subjects were seen weekly for six months and monthly for additional six months. At two years' followup, health at every size group members maintained weight, showed improved metabolic fitness (blood pressure, blood lipids), energy expenditure, eating behavior (decreased restraint, eating disorder pathology), and improved psychological indicators (self-esteem, depression, body image). Diet group participants lost weight and showed improvement in many variables at 1 year. After 2 years, weight was regained and improvement in other parameters was not sustained. Six-month attrition was 41% in the

diet group and 8% in the health at every size group. Attrition (6 months) was high in the diet group (41%), compared with 8% in the health at every size group.

Beal VA. On the acceptance of solid foods and other food patterns of infants and children. *Pediatrics*. 1957;20:448-456.

Notes: Children under age 4 months who are introduced to solid foods tend to accept them reluctantly and engage in feeding struggles. These same children accept solid foods readily when they are older.

Bender R, Trautner C, Spraul M, Berger M. Assessment of excess mortality in obesity. *Am J Epidemiol*. 1998;147:42-48.

Notes: Patients 18-75 years at entry (n=6,193) with BMI between 25 and 74 were recruited between 1961 and 1994 in Dusseldorf, Germany and followed for an average of 14 years. During 87,179 patient-years of follow-up, 1,028 patients died (16.6%). Compared with subjects with BMI in the lowest quartile (BMI between 25 and 32), relative risks (RRs) of death for subjects with BMIs in the second quartile (BMI between 32 and 36), third quartile (BMI between 36 and 40), and highest quartile (BMI>40) were 1.02, 1.50, and 2.10, respectively, for men and 1.23, 1.33, and 2.25, for women.

Blair SN, Brownell K, Collins G, Lisner L. Body weight change, all-cause mortality and cause-specific mortality in the Multiple Risk Factor Intervention Trial. *Ann Int Med*. 1993;119(749-757).

Notes: Cooper institute study between 1973 and 1985 of 10,529 men 35-57 years old in the upper 10% to 15% of risk for heart disease (overweight, high blood pressure, high cholesterol). During the study there were 228 deaths from CVD and 380 total deaths. In all cases examined, men whose weights remained stable had lower mortality risk than those whose weight changed. Men who lost more than 5% of their body weight had a 61 to 242% higher mortality than men whose weights remained within 5% of their initial body weight. In a subgroup of men who were >20 lb. above average weight (BMIs between 26 and 29), a 5% weight loss correlated with cardiovascular disease mortality of 195% more than men of similar BMIs who did not lose weight. Weight gain did not significantly increase mortality from heart disease.

Body Positive. *Body Talk 1: Teens Talk About Their Bodies, Eating Disorders and Activism*

. Berkeley, CA: Body Positive; 1999.

Notes: (Ages 12 & up). Award-winning video on body esteem for teen audiences. Youth from diverse backgrounds discuss the messages they receive from media, family and friends about their bodies. The video focuses on their struggles as well as their healing from those struggles. 28 minutes.

Briefel R, Reidy K, Karwe V, Devaney B. Feeding infants and toddlers study: Improvements needed in meeting infant feeding recommendations. *J Am Diet Assoc*. 2004;104:31-37.

Notes: About 2/3 of infants introduced to solid foods by 4 to 6 months; 17% consumed juice by six months. Twenty-two percent of infants nine to 11 months consumed cow's milk on a daily basis before the recommended age of 12 months or later.

Briefel R, Reidy K, Karwe V, Jankowski L, Hendricks K. Toddlers' transition to table foods: impact on nutrient intakes and food patterns. *J Am Diet Assoc.* 2004;104:38-44. Notes: The mean percentage of energy from table foods increased from 25% at 9 to 11 months to 63% at 19 to 24 months. Mean intakes of energy, macronutrients, sodium, folate, iron, and fiber were significantly higher for children 9 to 11, 12 to 14, and 15 to 18 months in the highest table food energy quartiles compared to the lowest. Nutritional status is better for the high-table-food consuming children despite the fact that high-table-foods-consuming children also consume more pizza, carbonated sodas, French fries, candy and other sweets.

CASA: The National Center on Addiction & Substance Abuse at Columbia University. The Importance of Family Dinners IV. 2007; accessed April 25, 2008. Web Page. Available at:

<http://www.casacolumbia.org/ViewProduct.aspx?PRODUCTID={296A5E1E-B68F-44fa-A64D-95ABC1FB6CA0}>.

Notes: At age 12, 50% of teens report having family dinners 7 times weekly. By age 17, that number drops to 27%. Compared to teens who have five or more family dinners per week, teens between ages 12 and 17 who have two or less family dinners are twice as likely to try marijuana, smoke cigarettes and drink alcohol. The younger the adolescent, the stronger the relationship between lack of family dinners and substance abuse. Compared with 12-year-olds who have frequent family dinners, 12-year-olds who have infrequent family dinners are 6 times as likely to try marijuana, 4 1/2 times as likely to smoke cigarettes and 1 1/2 times as likely to drink alcohol.

Cassady D, Jetter KM, Culp J. Is price a barrier to eating more fruits and vegetables for low-income families? *J Am Diet Assoc.* 2007;107:1909-15.

Notes: The 2005 Dietary Guidelines market basket would require a low-income family to devote 43% to 70% of their food budget to fruits and vegetables.

Chatoor I. Feeding disorders in infants and toddlers: diagnosis and treatment. *Child Adolesc Psychiatr Clin N Am.* 2002;11:163-83.

Notes: The Mother-Infant Toddler Feeding Scale is an observational scale that assesses the behavior of infants/toddlers and mothers during feeding. It has been tested for reliability and validity. Subscales are: Dyadic reciprocity; Maternal non-contingency; Dyadic conflict; Bargaining about food; Struggle for control. Feeding disorders are: 1) Feeding disorder of state regulation, 2) Feeding disorder of reciprocity 3) Infantile anorexia 4) Sensory food aversions 5) Feeding disorder associated with concurrent medical condition 6) Posttraumatic feeding disorder. The scale and the videotape illustrating its use is available from Infant and Toddler Mental Health Center, Department of Psychiatry, Children's National Medical Center, George Washington University, 111 Michigan Avenue, Washington, DC 20010, USA

Chatoor I, Dickson L, Shaefer S, Egan J; A developmental classification of feeding disorders associated with failure to thrive: Diagnosis and treatment. Drotar D. *New Directions in Failure to Thrive: Implications for Research and Practice.* New York: Plenum; 1986:235-258.

Notes: When medically stable children grew poorly, there was a disruption in any one or all three stages of development: Homeostasis, attachment or separation-individuation.

The newborn may be colicky and have difficulty achieving regulation of state. The 2-6 month old and parent show a lack of pleasure in each other and the child may vomit or have diarrhea. The 6-36 month old refuses food and struggles for control, peaking at age 9 months. Poorly-growing children showed no delays in cognitive or speech development.

Council of Economic Advisers to the President (CEAC) . *Teens and Their Parents in the 21st Century: An Examination of Trends in Teen Behavior and the Role of Parental Involvement*. 2000.

Notes: Analysis of the Adolescent Health Study, using a national probability sample of adolescents and parents. This is the largest federally funded study of American teenagers. It found a strong association between regular family meals (five or more dinners per week with a parent) and academic success, psychological adjustment, and lower rates of alcohol use, drug use, early sexual behavior and suicide risk. Results held for both one-parent and two-parent families and after controlling for social class.

Crow RA, Fawcett JN, Wright P. Maternal behavior during breast- and bottle-feeding. *J Behav Med*. 1980;3(3):259-277.

Notes: Bottle-feeding parents of small babies were more active in feeding and their babies grew less well than breast feeding mothers of small babies, who were not overactive. Average-sized breast- and bottle-fed babies were fed similarly and grew equally well.

Crow S, Eisenberg ME, Story M, Neumark-Sztainer D. Psychosocial and behavioral correlates of dieting among overweight and non-overweight adolescents. *J Adolesc Health*. 2006;38:569-74.

Notes: Dieting in the previous year was reported by 55.2% of girls and 25.9% of boys in a sample of 4746 adolescents in public schools. Dieting was associated with similarly elevated rates of extreme weight control behaviors, body dissatisfaction, and depression in both the non-overweight and overweight groups for both boys and girls. Girls reporting dieting behavior in both the non-overweight and overweight groups had similarly elevated risk for cigarette use, alcohol use, and marijuana use. Regardless of weight status, dieting may be a marker for other unhealthy behaviors and depressed mood in adolescents.

Drewnowski A, Ahlstrom Henderson S, Shore AB, Fischler C, Preziosi P, Hercberg S. Diet quality and dietary diversity in France: implications for the French paradox. *J Am Diet Assoc*. 1996;96:663-669.

Notes: The French paradox is the lower-than-expected rate of mortality from coronary heart disease in a society where the diet is rich in fat and saturated fat. Habitual dietary intakes of a representative sample of 837 adults were evaluated using a dietary quality index (DQI) to assess compliance with the Dietary Guidelines, a dietary (DD) score to count the number of major food groups consumed; and a dietary variety score (DVS) to count the total number of foods consumed on a regular basis. Only 14% of respondents ate less than 30% of energy from fat and only 4% consumed less than 10% of energy from saturated fat. As a result, 63% had DQI scores of 0 or 1. In contrast, close to 90% of respondents scored a maximum of 5 in DD (as compared with 33% of Americans from other studies). The average repertoire of core foods appeared to be around 30 items

(compared with about half that in American diets). As DQI went up, DVS went down. Persons whose diets met US dietary recommendations also had the lowest DVS scores. There was no correlation between dietary fat and cholesterol and DD.

Drewnowski A, Hann C. Food preferences and reported frequencies of food consumption as predictors of current diet in young women. *Am J Clin Nutr.* 1999;70:28-36.

Notes: (n = 87) frequencies of food consumption, the core of the food-frequency approach, were associated with food likes and dislikes. Food preferences were a predictor of dietary intakes. College-age women (n = 87) completed a 98-item food-frequency questionnaire and rated preferences for many of the same foods on a 9-point category scale. Estimated intakes of fat, fiber, and vitamin C were obtained by using 3-d food records. Food preferences were a predictor of dietary intakes

Durazo-Arvizu RA, McGee DL, Cooper RS, Liao Y, Luke A. Mortality and optimal body mass index in a sample of the US population. *Am J Epidemiol.* 1998;147:739-749.

Notes: NHANES I Epidemiologic Follow-up Study of 13,242 men and women ~50 years old. BMI of minimum mortality was 27.1 for black men, 26.8 for black women, 24.8 for white men and 24.3 for white women. This BMI could vary by 4.5 units over and under the minimum with no more than a 20% increase in mortality.

Eisenberg ME, Olson RE, Neumark-Sztainer D, Story M, Bearinger LH. Correlations between family meals and psychosocial well-being among adolescents. *Arch Pediatr Adolesc Med.* 2004;158:792-796.

Notes: 1998-1999 school-based survey of 4746 11- to 18-year-old middle school and high school students from ethnically and socio-economically diverse communities in metropolitan Minneapolis/St Paul, Minn.

Family meals eaten together per week:

Never: 14%
1-2 : 19%
3-4 22%
5-6: 19%
7: 10%
>7: 18%

As family meals and family connectedness went up, grade point average and self esteem went up and negative parameters went down: depression, suicidal ideation and attempts, cigarette, alcohol and marijuana. Authors dropped out family connectedness in an attempt to illustrate that family meals alone affected dependent variables. Associations with all parameters were considerably weakened and remained significant only between boys with substance use and depressive symptoms.

All items were self-report from the adolescents. Frequency of family meals was assessed with the question, "During the last 7 days, how many times did all or most of your family living in your house eat a meal together?" Family connectedness was measured with two questions, worded to consider each parent separately and therefore add up four questions: "How much do you feel your (mother, father) cares about you?" and "Do you feel you can talk to your (mother, father) about your problems?"

Ernsberger P, Koletsky RJ. Biomedical rationale for a wellness approach to obesity: an alternative to a focus on weight loss. *Journal of Social Issues*. 2000;55:221-259.

Notes: Despite considerable moderating evidence, the prevailing wisdom is that obesity is a severely life-threatening condition. Health professionals, the media and the general public remain convinced that even modest elevations in BMI drastically shorten life expectancy and increase incidence of degenerative diseases such as heart disease, cancer and diabetes. Ernsberger gives abundant evidence that current thinking on extreme health risks associated with obesity has survived due to biased thinking and selective perception of both clinical practice and the literature. Obesity experts have maintained their certainty by reviewing and citing articles that assign a high risk to obesity, including relying primarily on cross-sectional morbidity studies. Participants are asked height and weight and diseases their doctors have told them they have. Physicians expect certain diseases in obese persons and diagnose them more readily. Obesity experts cite with far less frequency clinically unbiased mortality studies which show elevated body weight to be more benign and even show low body weight and/or weight loss to carry health risks. The resulting conviction that obesity is medically extremely dangerous has produced health policy that consistently recommends weight loss as the first line of intervention, even though it is abundantly clear that there is no method for achieving and maintaining weight loss. In fact, the conviction is so powerful that policy makers have even stated that it is better to lose and *gain weight back again* than it is not lose at all. Defining the problem so narrowly (and fervently) as *excess weight* and the solution as *weight loss* has denied ill patients medical treatment as well as delayed framing the problem in a way that it can be solved. Weight stabilization (or the avoidance of weight fluctuation secondary to attempts at weight loss) is associated with positive health benefit, as is improved nutritional status and improved physical fitness.

Faith MS, Scanlon KS, Birch LL, Francis LA, Sherry B. Parent-child feeding strategies and their relationships to child eating and weight status. *Obes Res*. 2004;12:1711-1722.

Notes: Of 22 studies isolated from a comprehensive literature review, parental food restriction, but no other feeding domain, was associated with increased child food intake and body weight.

Fit WIC Project. *Beyond Nutrition Counseling: Reframing the Battle Against Obesity*. Cincinnati, OH: Cincinnati Children's Hospital Medical Center; 2005.

Notes: 20-minute documentary intended to encourage discussion among health care professionals and policy makers about the fact that parents may be unable to implement nutritional advice without improved child-rearing skills.

Flegal KM, Graubard BI, Williamson DF, Gail MH. Excess deaths associated with underweight, overweight, and obesity. *JAMA*. 2005;293:1861-1867.

Notes: Current analyses of NHANES surveys of BMI found a slight *decrease* in relative risk of mortality of in 25-to-59-year-olds with BMIs of 25 to 30 compared with the "normal" weight category of 18.5 to 25. Relative risks for age categories in BMI ranges <18.5; 18.5 to 25; 25 to 30; 30 to 35; and 35 plus were:
25-to-59-years old: 1.38, 1.00; 0.83; 1.20, 1.83. 60-to-69 years old: 2.30; 1.00; 0.95; 1.13; 1.63 >70 years old: 1.69; 1.00; 0.91; 1.03; 1.17

Excess deaths in 2000 in the United States relative to reference BMI category (BMI 18.5 to <25): Underweight (BMI <18.5) was associated with 33 746 excess deaths;

Overweight (BMI 25 to 30) was associated 86 094 *fewer* deaths; Obesity (BMI 30-35) was associated with 111 909 excess deaths. Extreme obesity? Longitudinal analysis of the data showed that overweight that had persisted for at least 10 years was still associated with no excess risk and underweight was still associated with an increased relative risk. ES note: Critics of this analysis claimed arcane issues of statistical analysis that were successfully refuted by Flegal, et al. They also claimed that the poor results for overweight had to do with recent weight change. Flegal pointed out that weight had persisted for at least 10 years.

Folsom AR, French SA, Zheng W, Baxter JE, Jeffrey RW. Weight variability and mortality: the Iowa Women's Health Study. *Int J Obes (Lond)*. 1996;10:704-709.
Notes: In 1986, 33,760 Iowa women free of heart disease and cancer (55-69 y/o) completed a mailed questionnaire about self-reported weight at ages 18, 30, 40, 50 and currently. In 1991, mortality was assessed. Age-adjusted risks of death were highest in women who had a large weight loss (>10%) or a large cycle of weight change (>10% loss-gain or gain-loss) compared with women who had a stable weight (within 5%). Women in the maintained weight lost categories had 70% higher risk of heart disease death but not increase of cancer. Unintentional loser had poorer health than intentional. Steady weight gain did not increase risk significantly over no weight gain. In the discussion, the authors negate their data by surmising the correlations to be due to "other unhealthy characteristics and pre-existing disease among those displaying increased weight variability. ...it is premature to conclude weight variability is a direct cause of increased mortality. More research is needed...."

Galloway AT, Fiorito LM, Francis LA, Birch LL. 'Finish your soup': counterproductive effects of pressuring children to eat on intake and affect. *Appetite*. 2006;46:318-323.
Notes: Children consumed significantly more food when they were not pressured to eat and they made overwhelmingly fewer negative comments. Children who were pressured to eat ate less food and were smaller.

Garner DM. *Eating Disorders Inventory 2*. Odessa, FL: Psychological Assessment Resources, Inc.; 1991.

Gillman MW, Rifas-Shiman SL, Frazier AL, et al. Family dinner and diet quality among older children and adolescents. *Arch Fam Med*. 2000;9:235-240.
Notes: A study of the nutritional quality of the diets of 16,000 children ages 9-14 who were sons and daughters of the ongoing Nurse's Study found those children who ate dinner with the family more often had better overall nutrient intakes. Approximately 17% of participants ate dinner with members of their family never or some days, 40% on most days, and 43% every day. More than half of the 9-year-olds ate family dinner every day, whereas only about one third of 14-year-olds did so. The results showed those who ate dinner as a family had a higher consumption of fruits and vegetables as well as nutrients such as folate, calcium, iron and vitamins B6, B12, C and E. Children and teens who ate dinner with their families had an overall lower consumption of fat, soda, and fried foods. Children and teens who never or infrequently ate dinner with their family consumed one less serving of dairy foods each day (about 350 mg of calcium) than those who ate dinner with their family every day. Increased frequency of family dinner was also associated with substantially higher intake of several nutrients, including fiber,

calcium, folate, iron, vitamins B6, B12, C, and E; lower glycemic load; and lower intake of saturated and trans fat as a percentage of energy. We observed little or no effect on intakes of whole dairy products, red meat, or snack foods. Patterns were similar for boys and girls.

Hammond-Meyer A. *Stabilizing Eating and Weight Using a Nondiets Treatment As a Means to Improve Biomedical Health Parameters in an Overweight Population of Women: A Health at Any Size Perspective [Dissertation]*. Seattle, WA: Seattle Pacific University; 2005.

Notes: Six subjects using eating competence model improved after 24 weeks (12 treatment, 12 followup) in eating attitudes and behaviors, blood lipids, blood glucose and circulating insulin. Weight stabilized.

Hirdes JP, Forbes WF. The importance of social relationships, socioeconomic status and health prices with respect to mortality among healthy Ontario males. *J Clin Epidemiol.* 1992;45:175-192.

Notes: The Ontario Longitudinal Study of Aging. Mortality was highest in underweight men (BMI < 20; RR = 1.00) and lowest in the overweight group (BMI of 25-30; RR = 0.50). Mortality in the severely obese men remained lower than that of the underweights (BMI > 30; RR = 0.75). Any role for “occult wasting disease” can be ruled out, because only those reporting good or excellent health at baseline were included.

Hofferth SL. How American children spend their time. *Journal of Marriage and the Family.* 2001;63(295-308).

Notes: Meal time: The University of Michigan study of 3- to 12-year-old children found that more meal time at home was the single strongest predictor of better achievement scores and fewer behavioral problems. Meal time was far more powerful than time spent in school, studying, church, playing sports, and art activities. Results were statistically controlled for age and gender of child, race and ethnicity, education and age of the head of the family, family structure and employment, income, and family size

Jackson E. Eating Order: A 13-week trust model class for dieting casualties. *J Nutr Educ Behav.* 2008;40:43-48.

Notes: Chronic dieting distorts eating behaviors and causes weight escalation. Desperation about losing weight results in pursuit of extreme weight loss measures. Instead of offering yet another diet, nutrition educators can teach chronic dieters (dieting casualties) to develop eating competence. Eating Order, a 13-week class for chronic dieters based on Satter’s How to Eat protocol, within a Health at Every Size framework, was successful for 36 women in improving eating attitudes and behaviors, body image, and self-esteem, regardless of initial degree of eating disturbance or weight. This practice model has the potential for ameliorating societal weight escalation and multigenerational struggles with eating and weight.

Jahns L, Siega-Riz AM, Popkin BM. The increasing prevalence of snacking among US children from 1977 to 1996. *J Pediatr.* 2001;138:493-498.

Notes: Used data from the 1977-78 (NFCS77) and the Continuing Surveys of Food Intake by Individuals for 1989-91 (CSFII89) and 1994-96 (CSFII96). The sample consisted of 21,236 individuals aged 2 to 18 years. The prevalence of snacking increased

in all age groups. The average size of snacks and energy per snack remained relatively constant; however, the number of snacking occasions increased significantly, therefore increasing the average daily energy from snacks. Compared with non-snack eating occasions, the nutrient contribution of snacks decreased in calcium density and increased in energy density and proportion of energy from fat. **ES note:** This study gives evidence of grazing. This is problematic from the point of view of lack of necessary structure in child feeding and, instead, giving children unlimited access to food.

Kempson KM, Palmer Keenan D, Sadani PS, Ridlen S, Scotto Rosato N. Food management practices used by people with limited resources to maintain food sufficiency as reported by nutrition educators. *J Am Diet Assoc.* 2002;102:1795-9.

Notes: 51 nutrition educators from the New Jersey Expanded Food and Nutrition Education Program and Food Stamp Nutrition Education Program conducted interviews about the food management practices used by people with limited resources to ensure food sufficiency. Well-documented stratagems, such as overeating when food is available and cycling monthly eating patterns, were confirmed. Novel practices were identified including those causing food safety or nutritional risks: removing spoiled sections, slime, mold, and insects from food; eating other people's leftovers; and eating meat found as road kill.

Kern DL, McPhee L, Fisher JO, Johnson S, Birch LL . The postingestive consequences of fat condition preferences for flavors associated with high dietary fat. *Physiol Behav.* 1993;54:71-76.

Notes: Hungry 3- and 4-year-old children showed a marked preference for food they had found by previous experience to be calorically dense. **ES note:** This appears to be a sophisticated tactic that children instinctively use to maintain their energy balance. When their energy needs are high, ie, when they are growing fast or very active, they choose food of higher caloric densities (higher in fat or sugar) to supply them with the energy they need. Conversely, when their energy needs are low, they are less likely to eat high-caloric-density foods.

Lissner L, Odell PM, D'Agostino RB, et al. Variability of body weight and health outcomes in the Framingham population. *N Engl J Med.* 1991;324:1839-1844.

Notes: 23-year follow-up data showed subjects with highly variable body weights had increased total mortality from coronary heart disease. This study controlled for body weight over time and independent cardiovascular risk factors. The increase in cardiovascular disease in obese patients could be entirely explained by taking two facts into account . First, obese people were more like to go up and down in weight than thin people. Second, weight cycling was associated with increased rates of death from cardiovascular disease. Obese people who maintained a high but steady weight had only an average risk of death or cardiovascular disease.

Lohse B, Satter E, Horacek T, Gebreselassie T, Oakland MJ. Measuring Eating Competence: psychometric properties and validity of the ecSatter Inventory. *J Nutr Educ Behav* . 2007;39 (suppl):S154-S166.

Notes: ecSatter Inventory (ecSI) responses from a convenience sample of 863 adults compared to outcomes from 5 validated instruments and pre-tested food preparation questions affirmed ecSI construct validity. ecSI tertile differences were clear and concise

as well as compatible with hypothesized relationships. Tertile (for total and subscale scores) increases were related to decreases in restrained eating, disinhibition, hunger, weight dissatisfaction, food dislikes, drive for thinness and other indicators of eating disorders. Tertile increases were related to increases in physical activity, stage of change for fruit and vegetable intake, and food preparation. The instruments and questions were Stunkard's Three Factor Eating Questionnaire, Garner's Eating Disorders Inventory (EDI), Drewnoski's food preference survey, fruit and vegetable stage of change algorithm, Expanded Food and Nutrition Education Program questions, and demographic, health and food-preparation items generated for the battery of tests. Based on the EDI, competent eaters are emotionally and socially healthier than people with low levels of eating competence. They also have decreased levels of body dissatisfaction and decreased drive for thinness.

Mayfield, B. Promoting Family Meals. accessed January 31, 2006. Web Page. Available at: <http://www.cfs.purdue.edu/CFF/Templates/promoting/index.html>.

Notes: The "Promoting Family Meals" project, funded by the Hancock Faculty Fellowship and the Center for Families at Purdue University, will serve to further study the importance of family meals to parents and children. It will investigate the barriers and supports for achieving a family meal routine, and develop message concepts for promoting the family meal within communities. Resources for promoting family meals will be made available via the Center for Families web site and via partnerships with extension specialists and educators, community advocates and policy makers, health and social service providers, corporations, and the media.

Monsivais P, Drewnowski A. The rising cost of low-energy-density foods. *J Am Diet Assoc.* 2007;107:2071-6.

Notes: High-energy-density foods provided the most dietary energy at least cost. Energy cost of foods in the bottom quintile of energy density, beverages excluded, was \$18.16/1,000 kcal as compared to only \$1.76/1,000 kcal for foods in the top quintile. The 2-year price change for the least energy-dense foods was +19.5%, whereas the price change for the most energy-dense foods was -1.8%.

Murphy SP, Foote JA, Wilkens LR, et al. Simple measures of dietary variety are associated with improved dietary quality. *J Am Diet Assoc.* 2006;106:425-429.

Notes: The analysis sample included 4,964 men and 4,797 women aged 19 years and older who participated in the Continuing Survey of Food Intakes by Individuals 1994-96. Variety contributes to nutritional adequacy. All types of dietary variety were positively associated with mean nutrient adequacy across 15 nutrients, but those identified using a count of basic commodities (similar to that used for the HEI) and a count of 22 FGP subgroups had the highest correlations. All variety measures were inversely associated with intakes of added sugars and saturated fat, and the 22 FGP subgroups showed a positive association with intakes of sodium.

Musher-Eizenman DR, Holub SC, Hauser JC, Young KM. The relationship between parents' anti-fat attitudes and restrictive feeding. *Obesity (Silver Spring).* 2007;15 :2095-2102.

Notes: Parental concern about child overweight was related to higher restrictive feeding practices for both mothers and fathers. Parents' anti-fat attitudes also predicted restrictive

feeding above and beyond the effects of parent and child BMI and parental concern about overweight.

Najjar MF, Rowland M; BMI for females and males 28-74 years of age: tables 10 and 11. *Vital and Health Statistics, Series 11, No 238, DHHS Pub. No. (PHS) 87-1688*. Washington, D.C.: Public Health Service; 1987:21-22.

Notes: This report represents descriptive data for triceps skinfold and BMI (body mass index) including tables for means and percentiles of BMI by age, race, and sex for ages 18-74 years. Provides estimates of overweight and severe overweight (as defined by >85th or 95th %tile). BMI 25 is roughly at the 50th percentile for men throughout life and for women at age 45-54 or younger. BMI 25-30 encompasses women up to the 75th percentile from age 35 onward and men in the 75th to 85th percentile throughout life. BMI 30 to 35 encompasses women at the 85th to 90th percentiles and men at the 90th to 95th percentiles, again throughout life. SD approximates 4 for men and 5.6 for women.

Neumark-Sztainer D, Wall M, Guo J, Story M, Haines J, Eisenberg M. Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: how do dieters fare 5 years later? *J Am Diet Assoc*. 2006;106:559-568.

Notes: After controlling for initial BMI, 13 to 16 year olds using both healthful and unhealthful weight-control behaviors were 4 or 5 times more likely to be overweight heavier 5 years later than adolescents not using any weight-control behaviors. Girls pursuing healthful dieting were heavier than girls pursuing unhealthful dieting. Both boys and girls were almost 10 times more likely to report binge-eating with a loss of control. One-third of adolescents using unhealthful weight-control behaviors were at extreme risk for eating disorders and for extreme weight-control behaviors such as self-induced vomiting and use of diet pills, laxatives, and diuretics. Even adolescents reporting nondieting but using at least one weight-control behavior reported binge eating and loss of control compared with adolescents who reported no behaviors. "Healthful" behaviors include exercising more and eating more fruits and vegetables and less fat and sweets. Unhealthful behaviors included fasting or eating very little food, using a food substitute such as a powder or special drink, skipping meals, using diuretics, laxatives or diet pills, and vomiting.

Neumark-Sztainer D, Wall M, Story M, Fulkerson JA. Are family meal patterns associated with disordered eating behaviors among adolescents? *J Adolesc Health*. 2004;35:350-359.

Notes: In general, adolescents who reported more frequent family meals, high priority for family meals, a positive atmosphere at family meals, and a more structured family meal environment were less likely to engage in disordered eating. For example, 18.1% of girls who reported 1-2 family meals/week engaged in extreme weight control behaviors compared with 8.8% of girls who reported 3-4 family meals/week. Making family meals a priority, in spite of scheduling difficulties, emerged as the most consistent protective factor for disordered eating. Associations between family meal patterns and disordered eating behaviors tended to be stronger among girls than among boys.

Neumark-Sztainer D, Wall M, Story M, van den Berg P. Accurate Parental Classification of Overweight Adolescents' Weight Status: Does It Matter? *Pediatrics*. 2008;121:e1495-1502.

Notes: Regarding a group of equally-overweight children, parents who classified their child as overweight were no more likely to engage in recommended weight management behaviors than parents who did not classify their child as overweight. Recommended behaviors were having more fruits/vegetables and fewer soft drinks, salty snacks, candy and fast food at home; having more family meals; watching less TV during dinner; encouraging children to engage in healthful food choices and increased physical activity. Instead, parents who recognized their adolescents as overweight were more likely to encourage them to diet. Parental encouragement to diet predicted poorer adolescent weight outcomes 5 years later, particularly for girls. Thus, perceiving the child as overweight appears to be counterproductive.

Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA*. 2006;295:1549-1555.

Notes: Data obtained from the 2003-2004 National Health and Nutrition Examination Survey (NHANES), a nationally representative sample of the US population, is interpreted to mean that 17.1% of US children and adolescents were overweight and 32.2% of adults were obese, including populations from 2 to >60 years old. ES notes: There were only 402 2-6 year olds: 119 whites, 125 blacks and 111 Mexican-Americans. Setting aside inflammatory language, trends in BMIs indicate that both Mexican-American and black children have higher body density than white children. Body density of children in all ethnic groups tends to be highest at age 6 to 11 years, then decreases at 12 to 18 years. Adults' body density is lowest at 20 to 39 years, increases to near high-levels at age 40 to 59 years, then varies slightly above or below the high level above age 60 years.

Olson CM, Bove CF, Miller EO. Growing up poor: long-term implications for eating patterns and body weight. *Appetite*. 2007;49:198-207.

Notes: Experiences in childhood appear to super-motivate some women to actively avoid food insecurity in adulthood. Poverty-associated food deprivation leaves women with a prevailing fear of going hungry, panic when inadequate food was available and tendency to binge-eat when food again becomes available.

Orrell-Valente JK, Hill LG, Brechwald WA, Dodge KA, Pettit GS, Bates JE. "Just three more bites": an observational analysis of parents' socialization of children's eating at mealtime. *Appetite*. 2007;48:37-45.

Notes: 85% of parents of kindergartners prompted children to eat more. 83% of children ate more, than they might otherwise have, with 38% eating moderately to substantially more. Boys were prompted to eat as often as girls and children were prompted to eat as many times in single- as in two-parent households. Children were very rarely restricted in their mealtime intake. High-SES parents used reasoning, praise, and food rewards significantly more often than low-SES families. Mothers used different strategies than fathers: fathers used pressure tactics with boys and mothers praised girls for eating.

Pelchat ML, Pliner P. Antecedents and correlates of feeding problems in young children. *J Nutr Educ*. 1986;18(1):23-28.

Notes: Half of 79 mothers of 2-7 year old children complained about their children's poor food acceptance, preference for "junk" food and poor behavior at the table. Children with high problem scores with eating grew less well, acted out more in other areas, and had mothers who prodded, rewarded and punished more around feeding. Children who were reluctant to try new foods had mothers who presented a limited array of food and catered to the child's food preferences.

Psota T, Lohse B, West S. Associations between eating competence and cardiovascular disease biomarkers. *J Nutr Educ Behav*. 2007;39 (suppl):S171-S178.

Notes: Eating competence as measured by the ecSatter Inventory (EC) is related to measures of cardiovascular disease risk. EC is significantly and positively related to HDL-cholesterol and inversely associated with systolic and diastolic blood pressure. Trends were noted between EC and triglycerides, interleukin-1 and interleukin-6 (both indicators of inflammation) and soluble vascular cell adhesion molecule -1 (sticky molecule reputed to play a role in atherogenesis).

Rolls BJ. Sensory specific satiety. *Nutr Rev*. 1986;44:93-101.

Notes: People in general and children in particular tire of even favorite food and select otherwise. Internal processes promote variety in the diet.

Satter EM. The feeding relationship. *J Am Diet Assoc*. 1986;86:352-356.

Notes: The feeding relationship is the complex of interactions that takes place between parent and child as they engage in food selection, ingestion and regulation behaviors. The parent is responsible for what is presented to the child to eat, as well as for the physical and emotional setting. The child is responsible for how much is eaten or even whether anything is eaten. Successful feeding demands a caretaker who trusts and depends on information coming from the child about timing, amount, preference, pacing and eating capability. An appropriate feeding relationship supports the child's developmental tasks and helps the child develop positive attitudes about self and the world. It helps him/her learn to discriminate feeding cues and respond appropriately to them. It enhances the child's ability to consume a nutritionally adequate diet and to regulate appropriately the quantity eaten. The feeding relationship is characteristic of the overall parent/child relationship. Distortions that show up in feeding are likely to appear in other aspects of the interaction. Health professionals who intervene with feeding must be aware of the implications for the relationship. A primary objective with any feeding intervention is to increase or protect the parents' sensitivity to the child's feeding cues. If the feeding relationship is disrupted, the health professional should consider a referral for psychosocial evaluation.

Satter EM. A moderate view on fat restriction for young children. *J Am Diet Assoc*. 2000(100):32-36.

Notes: At a given meal, include foods of a variety of caloric—and fat—densities. If fat-reduction strategies are used, limit them to one at any given meal. To support children's abilities with food regulation, offer some foods that are low in fat (like vegetables and fruit), some moderate (meat, chicken and fish prepared with added fat or fat-containing casseroles) and some high (salad dressings, table spreads and/or whole milk). Then allow

children to pick and choose from the foods available, eating as much or as little as they want. This approach will allow children to apply their considerable abilities with food selection and regulation to eating what they need at any given time to maintain nutritional status and energy balance. Children are good regulators, and they eat more or less of all foods—including high-fat food—depending on their energy needs.

Satter EM. Eating Competence: definition and evidence for the Satter Eating Competence Model. *J Nutr Educ Behav*. 2007;39 (suppl):S142-S153.

Notes: Eating competence as defined by the Satter Eating Competence Model is being positive, comfortable and flexible with eating as well as matter-of-fact and reliable about getting enough to eat of enjoyable and nourishing food. ecSatter is predicated on the utility and effectiveness of biopsychosocial processes: hunger and the drive to survive, appetite and the need for pleasure, the social reward of sharing food and the biological propensity to maintain preferred and stable body weight. ecSatter trusts the powerful and reliable tendency to eat satisfying amounts of rewarding food and to maintain stable body weight that is unique for the individual.

The evidence- and practice-based Satter Eating Competence Model (ecSatter) outlines an inclusive definition of the interrelated spectrum of eating attitudes and behaviors. According to ecSatter, competent eaters, 1) have positive attitudes about eating and about food, 2) have food acceptance skills that support eating an ever-increasing variety of the available food, 3) have internal regulation skills that allow intuitively consuming enough food to give energy and stamina and to support stable body weight, and 4) have skills and resources for managing the food context and orchestrating family meals. ecSatter is an alternative way of operationalizing the Dietary Guidelines and as such is an alternative to the MyPyramid, not an adjunct.

Satter EM. Hierarchy of food needs . *J Nutr Educ Behav*. 2007;39 (suppl) :S187-188.

Notes: Maslow's hierarchy of needs outlined the necessity for satisfying fundamental creature needs before self actualization can be approached. Satter translated Maslow's hierarchy into a hierarchy of *food* needs. The foundation is the basic survival need of getting enough to eat, followed closely by the need for food that is familiar and respectable. Satisfying *present* needs allows focusing on reliable access to food, and then aesthetics: familiar and good-tasting food.

While many foods selected for basic needs are nutritious, selecting foods primarily for nutritional value is roughly equivalent to Maslow's *self actualization*. This is the use of food for instrumental reasons: consuming food that is believed to produce a certain outcome. In history, instrumental eating would be eating the enemy's heart to imbibe courage. In our culture, instrumental eating is selectively choosing or avoiding certain foods to promote attractiveness or prolong life. In any culture, such concerns can only be addressed after satisfaction of other, more-pressuring needs.

Satter EM. Nutrition education with the Satter Eating Competence Model. *J Nutr Educ Behav* . 2007;39 (suppl):S189-S194.

Notes: To do nutrition education with the Satter Eating Competence Model (ecSatter), maintain a positive tension between discipline and permission. Emphasize the discipline of structure: predictable sit-down meals and between-meal snacks and eating in a tuned-in fashion. Give strong permission: encourage choosing preferred food at those regular eating times and eating it in amounts that satisfy hunger and appetite. Permission and

discipline reinforce each other. Having rewarding food at meals and snacks supports structure; Structure supports access to rewarding food. Once the food is on the table, decisions about *how much* and *whether* to eat depend on moment-to-moment levels of hunger and appetite. Even for the cook, appetite varies unpredictably and determines what actually tastes good at any given meal.

Seccareccia F, Lanti M, Menotti A, Scanga M. Role of body mass index in the prediction of all cause mortality in over 62,000 men and women: the Italian RIFLE Pooling Project. *J Epidemiol Commun Health.* 1998;52:20-26.

Notes: A representative population sample in Italy showed lowest mortality in women at a BMI of 32 and in men at a BMI 29. Italian population samples made of 32,741 men and 30,305 women. For young women, the minimum mortality of the curve was located at 27.0, but the risk was also very low between BMI 24.0 to 30.0. For older women, the nadir was at 31.8 with almost similarly low risk in the range BMI 25.5 to 38.2. No relation was found for young men while for mature adult men only the model for all subjects showed any relationship, with the minimum mortality at 29.3 and the range of low mortality between BMI 22.4 and 36.2. That is, there was a U-shaped mortality risk curve.

Sen B. Frequency of family dinner and adolescent body weight status: evidence from the national longitudinal survey of youth, 1997. *Obesity (Silver Spring).* 2006;14:2266-76.

Notes: Among 5014 respondents between 12 and 15 years of age, the frequency of family dinners (FFD) distribution was as follows: 0, 8.3%; 1 or 2, 7.3%; 3 or 4, 13.4%; 5 or 6, 28.1%; 7, 42%. For whites, higher FFD was associated with reduced odds of being overweight in 1997, reduced odds of becoming overweight, and increased odds of ceasing to be overweight by 2000. No such associations were found for blacks and Hispanics.

Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do obese children become obese adults? A review of the literature. *Prev Med.* 1993;22:167-177.

Notes: A meta-analysis of epidemiologic studies found obese children to be at higher risk for obesity as adults, but most obese adults were not obese as children. Obesity was defined by skinfold measurement, densitometry, or various calculations of W/H. Among obese infants and toddlers, less than 25% were found to be obese as young adults. Among obese preschool children, 26-41% were found to be obese as adults and among obese school-age children, 42-63% were obese as adults. The proportion of adults who were obese as children ranged from 5 to 20%. (The one outlier statistic was from France and showed that 44% of obese 18 -25 years olds had been obese as preschoolers.) This is a meta-analysis of epidemiological studies conducted in either the United States or Europe between 1970 and 1992. To be included studies had to have anthropometric measurements of participants both as children who were less than 18 years of age and as adults who were 18 years and older. The literature search identified 17 published reports from 15 study populations. The age at initial obesity assessment varied between 6 months and 16 years and the age at final obesity assessment range from 18 years to 53 years. The interval between initial and final assessment ranged from 2 years to 45 years. The risk for adult obesity was greater among children who were at more extreme levels of obesity and for children who were obese at older ages.

ES Note: When evaluating this article it is important to remember the laws of

conservation of growth. Children's growth tends to track--to follow a consistent growth channel. An older infant or toddler who stabilizes at the 25th percentile or the 95th percentile is likely to remain in that percentile throughout life. As a consequence it would be valid to expect a correlation between "obesity" (or any W/H category) in children and in adults of 100%. In contrast, this article found correlations of only about 5 to 63% between obesity in childhood and obesity in adulthood. *While authors emphasized the risk of retaining obesity into adult life, in reality, this meta-analysis shows that the tendency is to slimming.*

Sherry B, Springer DA, Connell FA, Garrett SM. Short, thin or obese? Comparing growth indexes of children from high- and low-poverty areas. *J Am Diet Assoc.* 1992;92:1092-1095.

Skinner JD, Carruth BR, Houck K, et al. Mealtime communication patterns of infants from 2 to 24 months of age. *J Nutr Educ.* 1998;30:8-16.

Notes: Documented mealtime communication behaviors used by 98 Caucasian infants who were studied longitudinally from 2 to 24 months of age. Lists age-related food-acceptance and food-refusal behavior of infants. Mothers' responses to food rejection, which fell into 3 categories: "don't worry," "offers alternative" and "tries force or bribery." Percentage of related responses to each of the three categories were 16 months: 25, 70 and 5; 20 months: 30, 60 and 10; 24 months: 40, 45 and 10. ES note: The norm in feeding appears to be short order cooking. Mothers plan meals based on what they think their child will eat, then make alternatives if the child refuses the offering.

Stice E, Presnell K, Spangler D. Risk factors for binge eating onset in adolescent girls: a 2-year prospective investigation. *Health Psychol.* 2002;21:131-138.

Notes: Binge eating predicted obesity onset. Binge eating, in turn, was predicted with 92% accuracy by elevated dieting, pressure to be thin, modeling of eating disturbances, appearance overvaluation, body dissatisfaction, depressive symptoms, emotional eating, body mass, and low self-esteem and social support predicted binge eating onset.

Stotts JL, Lohse B. Reliability of the ecSatter Inventory as a tool to measure eating competence. *J Nutr Educ Behav.* 2007;39 (suppl):S167-S170.

Notes: Internal consistency and test-retest reliability of the ecSatter Inventory provides evidence that the ecSatter Inventory and its subscales are reliable measures of eating competence among a diverse group of adults.

Stunkard AJ, Messick S. The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *J Psychosom Res.* 1985;29(1):71-83.

Notes: This questionnaire systematizes the concept of restraint and disinhibition with eating. The three factors tested include I: Conscious mechanisms for restraining; II: Disinhibitors; III: Feelings of hunger and behavioral consequences. The appendix to the article includes the questions as well as the scoring. ES note: This questionnaire appears to tell something about eating. However, it is from the perspective of controlling and overruling internal regulation, accomplishing successful restraint, "successfully" managing hunger and achieving abstinence.

Taveras EM, Rifas-Shiman SL, Berkey CS, et al. Family dinner and adolescent overweight. *Obes Res.* 2005;13:900-906.

Notes: Of over 15000 9- to 14-year-old boys and girls studied in 1996, 16% had family dinner "never or some days," 40% on "most days," and 44% "every day." Across these categories, overweight prevalence for girls was 19.4%, 16.6%, and 16.7% and for boys was 24.6%, 23.3%, and 22.7%, respectively. In cross-sectional analyses, adjusting for potential confounders, the prevalence of overweight was reduced by 15% among children who ate family dinner on "most days" or "every day" compared with those who ate family dinner "never or some days." Correlations did not hold for longitudinal analysis: Children were not protected from overweight by having had family dinner in the past.

Troiano RP, Frongillo EAJr, Sobal J, Levitsky DA. The relationship between body weight and mortality: a quantitative analysis of combined information from existing studies. *Int J Obes (Lond)*. 1995;20:63-75.

Notes: Most studies have shown a U-shaped relationship between BMI and mortality, with both low and high body weights associated with increased risk of death. For this meta-analysis, over 1000 weight/mortality studies were reviewed and only 19 met criteria for required information and data on cumulative incidence of mortality. A U-shaped relationship between BMI and mortality was demonstrated for 50-year-old men followed 30 years. The minimum mortality BMI was between 23 and 28 and risk increased with low and high BMI outside those ranges. With 10 years of follow-up, detectable differences in mortality were evident with BMI below 22 and above 30. With 30 years of follow-up, increased risk was seen at BMI of below 23 and above 28. For the much smaller number of 50 y/o women, who were followed for only 10 years, all mortality points were low with a slight elevation in mortality at 34-38 BMI. The male sample was 235 BMI groups from 17 studies representing 356,747 men and 38,032 deaths. The female sample was 73 BMI groups from 6 studies representing 248,501 women and 13,707 deaths.

Videon TM, Manning CK. Influences on adolescent eating patterns: the importance of family meals. *J Adolesc Health*. 2003;32:365-73.

Notes: 18,177 adolescents in the first interview of the National Longitudinal Study of Adolescent Health. Almost one in five adolescents reported skipping breakfast the previous day. Adolescents who perceived themselves to be overweight were significantly more likely to have poor consumption patterns. Parental presence at the evening meal is positively associated with adolescents' higher consumption of fruits, vegetables, and dairy foods.

Wei M, Kampert JB, Barlow CE, et al. Relationship between low cardiorespiratory fitness and mortality in normal-weight, overweight, and obese men. *JAMA*. 1999;282:1547-1553.

Notes: For fit men, all-cause mortality rates were essentially the same across BMI categories.

Whitlock EP, Williams SB, Gold R, Smith PR, Shipman SA. Screening and interventions for childhood overweight: a summary of evidence for the US preventive services task force. *Pediatrics*. 2005;116:e125-e144.

Notes: Weight loss results: Among children 8-13 years of age, intensive, generally family-based, short-term (a year or less) behavioral approaches found modest to no changes in BMI results. A few studies found, at most, a 10% decrease in participant BMI

values. Some researchers inflated weight loss data above 10% by reporting percentage decrease in *overweight* rather than a percentage decrease in total body weight or BMI.

Results were similar for adolescents, showing modest to no change in BMI. Sibutramine increased weight loss by about 4%.

At age 13 years, overweight children (95th %tile W/H) have a 50% probability of adult obesity (BMI >30).

Wildman RP, Muntner P, Reynolds K, et al. The obese without cardiometabolic risk factor clustering and the normal weight with cardiometabolic risk factor clustering: prevalence and correlates of 2 phenotypes among the US population (NHANES 1999-2004). *Arch Intern Med.* 2008;168:1617-1624.

Notes: Compared with normal-weight men and women, the age-standardized prevalence of the metabolically abnormal phenotype was significantly higher among overweight and obese men and women. Despite this, 30% of normal-weight women and 21% of normal weight men were metabolically abnormal. In contrast, 50% of overweight men and 57% of overweight women were metabolically normal and 29% of obese men and 35% of obese women were metabolically normal.