

Diet Monitoring Software

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INTRODUCTION

Obesity has been a known problem for over 60 years. As early as 1943, Metropolitan Life Insurance Company declared “Overweight is so common that it constitutes a national health problem of the first order.” In 1952, the American Heart association identified obesity as a cardiac risk factor (AHA, 1952). In 1974, obesity was identified as “the most important nutritional disease in the affluent countries of the world” (LANCET editorial, 1974).

Over a few decades, the obesity epidemic has continually been creeping up in all developed countries around the world; this has accelerated rapidly in the last decade, and it appears to have reached a crisis level with unprecedented numbers, particularly in America, joining the overweight or obese categories (Anderson, Konz, Frederich, & Wood, 2001; Mokdad, Serdula, Dietz, Bowman, Marks, Koplan, 1999).

In 2003, the U.S. Surgeon General Richard Carmona said in addressing the House of Representatives, “I welcome this chance to talk with you about a health crisis affecting every State, every city, every community, and every school across our great Nation. The crisis is obesity. It’s the fastest growing cause of death in America.”

To add to the problem, from 1952 until 2003, the ratio of food prices to all other goods dropped by 12%, making it easier to overindulge in our favorite foods (Philipson, Dai, Helmchen, & Variyam, 2004). In recent years, fresh fruit and vegetables have become more expensive as a proportion of disposable income, while foods with refined grains, sugars, and fats have become cheaper (Sturm, Dai, Helmchen, & Variyam, 2005). Females trying to balance work and family life often turn to the convenience of prepackaged foods with short preparation times, and take-away foods (Lin, Guthrie, & Blaycock, 1996; McCrory, Fuss, Hays, Vinken, Greenberg, & Roberts, 1999; Schluter & Lee, 1999). These tend to be high in calories (Nielsen, Siega-Riz, Popkin, 2002). The environment has become obesogenic (Hill, Wyatt, Reed, & Peters, 2003); Ulijaszek (2007) has called this a “disorder of convenience” (p. 185).

Fast food does not normally equate with healthy food. Certain foods can be high in fat, salt, sugar, and calories. They can also be low in nutrition. Salt in burgers and chips, and phosphorous found in soft drinks, contribute to calcium losses. Sugar causes leaching of calcium, magnesium, and B vitamins. Foods kept warm for long periods experience loss of Vitamin C. Cooking causes losses of B and C vitamins, while fried foods increase our need for the antioxidants A, B, C, E, and zinc.

Weight management has tended to be based on calorie counting (Dietary Guidelines Advisory Committee Report, http://www.health.gov/dietaryguidelines/dgq2005/report/PDF/D2_Energy.pdf) with percentages of calories being split between the three elements: protein, carbohydrates, and fat. But the diet for optimum health also needs to consider the levels of essential vitamins and minerals being consumed. The requirements of all these elements, vitamins and minerals vary with age and gender. This makes it very difficult to monitor your diet without the help of diet monitoring software.

Note: For convenience, the term obesity is used in this article to mean overweight or obese.

BACKGROUND

According to the World Health Organization, more than one billion adults are overweight worldwide, and more than 300 million of these are classed as obese (<http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/>).

An estimated 17.6 million children under five years old are overweight worldwide; this has doubled since 1980, while the number of overweight adolescents have trebled over the same period.

The body mass index (BMI) measurement is used to identify whether a person is overweight or obese. This is a statistical measure that was developed between 1830 and 1850 by the Belgian polymathematician Adolphe Quetelet. The BMI is still widely in use today. The BMI formula is $BMI = \text{weight in kilos, divided}$

by height in meters squared. In general, overweight people are defined as having a BMI over 25, obese people over 30, and morbidly obese people, over 35. BMI measurements tend to increase amongst middle-aged and elderly people, which significantly contribute to osteoarthritis.

Overweight and obesity are defined as having excessive body fat that may impair the health of such individuals. This body fat is normally accumulated over many years of energy imbalance between the calories consumed and the calories expended—in other words, due to overeating and a sedentary lifestyle. A pound of body fat is achieved by consuming 3,500 calories more than the calories being burned off as energy. Even adding one plain biscuit containing 65 calories to your daily diet will make you gain almost 7 pounds per year. Over time, this accumulates into stones. Dieting to lose weight without doing any physical activity causes muscle loss, and can be harmful to an individual's health. Muscle cells contain mitochondria cellular organelles which consume fat. The more muscle you have, the more mitochondria also increases in number, consuming more fat. Consuming less fat causes the mitochondria to use up the fat cells stored in your body as their source of fuel.

Obesity differs between countries with China, Japan, and some African nations at one end of the scale, falling below 5%, while at the other end, the incidence in urban Samoa rises above 75%.

To add to the confusion regarding the number of calories you need to maintain weight, our muscles start to deteriorate by 1% per year by the age of 45 (Sceppa & Layne, 2005). Less muscle lowers the metabolic rate,

and that means fewer calories are required at the resting rate. So maintaining exactly the same diet and exercise regime will see individuals overeating without even realizing it. Sceppa's research into reversing muscle loss examines protein deficiency that forces the body to use the amino acids from muscle tissue, leading to muscle loss. The researchers are now reassessing the adult dietary protein requirement, which is currently 0.8 grams per kilo of body weight.

Becoming overweight can adversely effect temperature regulation and put strain on the body's organs and systems over time. This often leads on to high blood pressure, high blood cholesterol and triglycerides, and insulin resistance. Continuing into obesity is known to increase the risk of serious health problems in some individuals, and the more excess fat you have, the higher your risk of chronic disease and disability (Must, Spadano, Coakley, Field, Colditz, & Dietz, 1999). These risks include respiratory difficulties, chronic musculoskeletal problems, skin problems, and infertility at the less serious end, Type 2 diabetes and high blood pressure at the middle of the range, to life-threatening diseases such as some forms of cancer, gallbladder disease, heart disease, and stroke at the most serious end. Other less life-threatening diet related ailments include anemia, ulcers, constipation, irritable bowel syndrome, and kidney stones.

According to the World Health Organization, heart disease and stroke are the world's number one cause of death in the developed world with an estimated 17 million people each year being struck down prematurely (World Health Organization FactSheet, 2006).

Table 1. Recommended dietary allowance of calories for sedentary lifestyle

Age	Female	Male
0-5 months	108 * weight	108 * weight
5 – 12 months	98 * weight	98 * weight
1 – 3 years	102 * weight	102 * weight
4 – 6 years	90 * weight	90 * weight
7 – 10 years	70 * weight	70 * weight
11 - 14 years	47 * weight	55 * weight
15 – 18 years	40 * weight	45 * weight
19 – 24 years	38 * weight	40 * weight
25 – 50 years	36 * weight	37 * weight
51 and over	30 * weight	30 * weight

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