



Evolution of the Human Profile of Fatness

Jonathan C.K. Wells

KEYWORDS Seasonality. Encephalisation. Agriculture. Adipose Tissue

ABSTRACT The readiness with which humans acquire fat, the basis of the contemporary obesity epidemic, is often attributed to the value of energy stores in accommodating cycles of feast and famine. However, other species inhabiting similar niches have experienced the same stress without adapting similarly. This article reviews the factors that may have favoured high fat levels, and the capacity to acquire them, in human evolution. First, early hominids inhabited increasingly seasonal environments during which fat stores are likely to have helped buffer regular uncertainty in energy supply. Second, the trend towards increased brain size in the genus *Homo* must have increased vulnerability to such uncertainty, favouring increased fat stores in the young offspring and the reproducing female. Third, the evolution of agriculture increased the stress of uncertainty, with sedentary populations, consuming a narrow diet, less capable of preserving energy supply. The human tendency to construct localised ecological niches may also have favoured the evolution of a range of “thrifty genes” that now underlie regional differences in obesity susceptibility. Thus, the interaction of environmental uncertainty and the large human brain may best explain our unique profile of fatness. Given the stability of these ecological stresses over time, the enhanced role of fat stores in human biology may be considered natural, and only problematic when uncertainty in energy supply is reduced. This argument suggests that obesity may be prevented more successfully by addressing the modern obesogenic environment, rather than relying on individuals voluntarily altering their diet and physical activity patterns.

Author's Address: Jonathan Wells, MRC Childhood Nutrition Research Centre, Institute of Child Health, 30 Guilford Street, London WC1N 1EH, U.K.
Telephone: + 207 905 2389; *Fax:* + 207 831 9903; *E-mail:* J.Wells@ich.ucl.ac.uk