

Why do we eat what we eat: biology of food choice

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The vast array of factors influencing food choice was introduced in a previous issue of Food Today. This article examines how our biological characteristics determine our food selection and the role of appetite, palatability and taste in food choice. Future articles will examine the socio-economic determinants of food choice, barriers to dietary change and models of behavioural change.

Our physiological needs provide the basic determinants of food choice. Humans need energy and nutrients in order to survive and will respond to the feelings of hunger and satiety (satisfaction of appetite, state of no hunger between two eating occasions). In general, humans can select their food from a wide range, be it of plant or animal origin.

Appetite and food choice

Hunger and satiety are the result of complex physiological processes. Following specific signals (e.g. blood depletion of nutrients, empty stomach), the sensation of hunger arises and creates the need for eating food. As food is eaten satiation will take place leading to the termination of the eating occasion and bringing a state of no hunger called satiety. The balance between hunger, stimulating appetite, and food intake, satisfying appetite and bringing satiety, is controlled by the central nervous system. Satiety signals play a role in influencing the timing of the next meal, and can also influence the size of a subsequent meal. Satiety is known to play a role in energy regulation.

The macro-nutrients i.e. carbohydrates, proteins, fats, also generate satiety signals of varying strength. The balance of evidence suggests that fat has the lowest satiating power, carbohydrates have an intermediate effect and protein has been found to be the most satiating (1). Independent of fat content, low energy density diets generate greater satiety than high energy density diets, suggesting that an important regulatory signal may be the weight or volume of food consumed.

Palatability and food choice

Palatability is proportional to the pleasure someone experiences when eating a particular food. It is dependent on the sensory properties of the food such as taste. Sweet and high-fat foods have an undeniable sensory appeal and elicit rewarding post-ingestive effects, known as the 'pleasure response'. These effects are mediated through the brain. It is not surprising then that food is not solely regarded as a source of nourishment but is often consumed for the pleasure value it imparts.

The influence of palatability on appetite and food intake in humans has been investigated in several studies. There is an increase in food intake as palatability increases, but the effect of palatability on appetite in the period following consumption is unclear. Increasing food variety can also increase food and energy intake and in the short term alter energy balance (2). However, effects on long-term energy

regulation are unknown.

Taste and food choice

A like for sweetness and dislike for bitterness are considered innate human traits, present from birth (3). However, these are readily modified by experience. Preferences for specific foods develop largely through associations of the sensory attributes of a food with the situations and frequency with which it is eaten, and its post-ingestional effects and are strongly influenced by experience and the environment.

Summary

Biological factors related to food choice are important, and exist among a wide set of factors influencing what are ultimately voluntary decisions of what, when and how much is eaten. Strategies promoting dietary change need to consider not only physical health but also the sensory pleasure response and a wide range of demographic, economic and socio-cultural variables, some of which will be discussed in future editions of Food Today.

References

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