

■ **hypoglycemia** A medical condition characterized by low blood sugar.

“You are what you eat” may contain more than a grain of truth.

habits, vitamin deficiencies, environmental contaminants, and the endocrine system. We now turn to those issues.

Ingested Substances and Nutrition

One of the first studies to focus on chemical imbalances in the body as a cause of crime was reported in the British medical journal *Lancet* in 1943.⁵² The authors of the study linked murder to **hypoglycemia**, or low blood sugar. Low blood sugar, produced by too much insulin in the blood or by near-starvation diets, was said to reduce the mind's capacity to reason effectively or to judge the long-term consequences of behavior. More recent studies have linked excess consumption of refined white sugar to hyperactivity, aggressiveness, excitability, and impairment of the ability to make reasoned decisions, and popular books like *Sugar Blues* provide guides for individuals seeking to free themselves from the negative effects of excess sugar consumption.⁵³

Even the courts have accepted the notion that excess sugar consumption resulting in hyperglycemia may be linked to crime. In the early 1980s, for example, Dan White, a former San Francisco police officer, was given a reduced sentence after his lawyers used what came to be known as the “Twinkie Defense.”⁵⁴ They argued that White's nightlong binge on large amounts of Coca-Cola and Twinkies before he murdered San Francisco Mayor George Moscone and City Councilman Harvey Milk was evidence of White's unbalanced mental state; the consumption of junk food was presented as evidence of depression because White was normally very health conscious.

More than ten years later, however, a well-conducted 1994 study reported in the *New England Journal of Medicine* seemed to contradict the notion that sugar may lead to hyperactivity;⁵⁵ neither sugar nor artificial sweeteners were shown to have any link to an increase in learning disabilities. In the study, researchers at Vanderbilt University and the University of Iowa varied the diets of supposedly sugar-sensitive youngsters from a diet that was high in sugar to a diet that was low in sugar but that contained the artificial sweetener aspartame, and a third experimental diet contained very little sugar but had added saccharin. After surveying parents, teachers, and babysitters and testing the study group for changes in memory, concentration, and math skills, the researchers concluded, “We couldn't find any difference in terms of their behavior or their learning on any of the three diets.”⁵⁶ Hence, to date, the evidence concerning sugar's impact on behavior is unclear.

Some studies have implicated food additives, such as the flavor enhancer monosodium glutamate, dyes, and artificial flavorings, in producing criminal violence.⁵⁷ Other research has found that coffee and sugar may trigger antisocial behavior;⁵⁸ researchers were led to these conclusions through finding that inmates consumed considerably greater amounts of coffee, sugar, and processed foods than others.⁵⁹ It is unclear, however, whether inmates drink more coffee because of boredom or whether “excitable” personalities feel a need for the kind of stimulation available through coffee consumption. On the other hand, habitual coffee drinkers in nonprison populations have not been linked to crime, and other studies, like the one conducted by Mortimer Gross of the University of Illinois, showed no link between the amount of sugar consumed by inmates and hyperactivity.⁶⁰ Nonetheless, some prison programs have been designed to limit intake of dietary stimulants through nutritional management and substitution of artificial sweeteners for refined sugar.

Other studies appear to show that diets deficient in various vitamins and other nutrients can increase aggressiveness and agitation, and can open the door to crime. In recent years, for example, **Stephen Schoenthaler**, a researcher at the California State University in Stanislaus, has demonstrated significant declines in bad behavior in incarcerated adults and in schoolchildren receiving specifically designed vitamin-mineral supplementation.⁶¹ In one of Schoenthaler's studies, for example, schoolchildren receiving vitamin supplements showed a 47% lower rate of antisocial behavior than children who received placebos.⁶² More important, the drop in disciplinary infractions among children taking the supplements was due mostly to a decrease in infractions by those who had been identified as habitual offenders before entering the study.

Other nutrients have been studied to assess their possible behavioral impact. In 2003, for example, Ingrid Bergliot Helland reported that maternal diet during pregnancy can strongly affect IQ and early infant behavior, and concluded that it might also determine the risk of delinquency and criminality in later life.⁶³ Helland and her colleagues supplemented the diets of pregnant and lactating women with either omega-3 (DHA) or omega-6 fatty acids and followed the development of their offspring for years after the supplementation program had ended. They found that children receiving dietary omega-3 supplementation had significantly higher IQ levels by age four and performed better on problem-solving tests than those receiving omega-6 fatty acids.

A year later, a study of the relationship between omega-3 intake levels and chronic hostility among 3,600 urban young adults concluded that higher consumption of omega-3 fatty acids was related to significantly lower levels of hostility, with researchers stating that “high dietary intake of DHA and consumption