A physician and his seventeen-year-old son ate leftover spaghetti with homemade pesto sauce for several days, each time after it had been unrefrigerated for an hour or two. On the fourth day, the food had a peculiar odor, but the father heated it in a pan anyway. About a half hour after lunch, father and son developed severe abdominal pain. The father recovered, but the son began to behave strangely, becoming listless, then very sleepy. A yellow pallor indicated that his liver was malfunctioning.

Because of the rapid onset of abdominal pain after eating reheated food, food poisoning was likely. Indeed, the boy's body fluids and the pan used to reheat the spaghetti contained *Bacillus cereus,* a type of bacterium that produces a toxin that can cause abdominal pain. In the boy, the toxin took a deadly turn to the liver.

To learn how the bacterial toxin harms the liver, researchers applied toxin from the boy to rat liver cells growing in culture. This experiment revealed that the toxin targets mitochondria, the organelles that house the biochemical reactions that extract energy from nutrients. Specifically, the toxin destroys the mitochondria's ability to break down fats. Ironically, liver cells have many mitochondria to power the energy-requiring reactions that break down toxins. With his liver mitochondria severely impaired, the boy's liver literally ran out of energy and shut down. He died four days after the spaghetti meal. ■