

Firat Güder admits it, albeit a bit chagrined. He often leaves unopened yogurt in his office at room temperature for several weeks before he eats it. So far, he's escaped any ill effects. "They're still good to eat," he said. "I have not gotten sick from them yet. Of course, I don't suggest other people do this."

Güder, assistant professor in the department of bioengineering at Imperial College London, knows maybe he's just been lucky. Like many consumers, he thinks about food safety, but tries to keep his perspective about the risks. "I do throw away items myself, but usually just use the 'use-by' dates as a reference point," he said. "I do not solely rely on them."

He's referring to the often baffling dates stamped on food labels, which, in reality, have little to do with safety—and pose little danger if ignored, except in the case of infant formula—according to the U.S. Department of Agriculture. "Sell by" tells the store how long—for inventory reasons—to display the product. "Use by" is the last date the food will be at its peak, similar to "best by," the last date for optimal flavor and quality. In response to consumer confusion, the government created a detailed list of how long foods can be considered fresh. Nevertheless, dates on packaging confuse people and often prompt many shoppers to toss food that's still safe and wholesome to eat.

Güder thinks he's come up with an idea that will help solve this problem. He's invented an inexpensive sensor that can be embedded in a smartphone and held up against a food package at home or in the store to detect whether the food is still fresh. The sensor, which costs about two cents to make, identifies spoilage gases—ammonia and trimethylamine, for example—and are linked to "near field communication" (NFC) tags, microchips that smartphones easily can read.