What is the point of investing in safer cereal foods if you can’t tell anyone about them?

Food safety concerns form the foundation of modern food regulation in the United States, or at least since the passage of the Pure Food and Drug Act of 1906. Nonetheless, food safety remains a work in progress. Though children no longer die from milkborne tuberculosis, the food industry deals with evolving foodborne pathogen priorities on a daily basis.

Until fairly recently, food safety regulators concerned themselves primarily with the mischief inflicted by microbes on animal products. The primary culprits were salmonella and campylobacter (eggs and poultry), Listeria (dairy), E. coli (beef), and the Norwalk virus (seafood). In the more recent age of HACCP, major initiatives were launched both at the micro (pun intended) and macro levels of the industry to erect barriers to foodborne contamination. Now it’s the cereal foods industry’s turn.

Bakers and other cereal food manufacturers need to take note: today’s vectors include fruits, peanuts, pistachios, spices, chocolate, and … grains, especially whole grains that, by definition, have undergone only minimum processing to reduce microbiological loads prior to their incorporation into foods.

This is spurring at least some manufacturers and cereal ingredient suppliers to invest in new technologies to improve the safety of their products. New technologies cost money; however, enhanced safety comes at a price. Can more expensive albeit “safer” foods and ingredients compete? It depends on the following questions:

- How many consumers are willing to pay premiums for food products that are demonstrably safer than those of their competitors?
- How can food companies best communicate the premium benefits of “safer” products in today’s regulatory environment?

The limited success of the organic foods industry demonstrates that some consumer segments are willing to pay price premiums for the perception of safety (e.g., no pesticides, non-GMO). What about the rest of the population?

The current dynamics of food safety devolve as follows: an accident triggers a massive recall, management panics lest the brand be besmirched, and the company invests in new technology so that it never happens again, which buys time until the next accident. Surely, we can do better than that.

If only food companies could reap the rewards of investing in new food safety technologies in advance of calling in the crisis management teams. To do so, they first need to be able to explain clearly why added safety merits price premiums.

To Tell a Tale

In 1991, two partners and I founded a company dedicated to commercializing in-the-shell pasteurization of whole eggs (currently manufactured and marketed by National Pasteurized Eggs, Lansing, IL, U.S.A.). At the time, the CDC estimated that salmonella afflicted up to 1.5 million consumers per year, about 500 fatally. In-the-shell egg pasteurization—a great public service, right? The technology was developed and proven, but the challenge arose: What to say on the package label? The term “pasteurized” was allowed because we had demonstrated to the satisfaction of the FDA, a 5-log reduction of selected salmonella strains in eggs using our process. The problem, we discovered, was that “pasteurization” had lost its punch—to most consumers, the term connoted “processed.”

So, could we call it “a safer egg”? “No, non, nein, nyet,” replied the FDA. We could not imply that other eggs (also under FDA jurisdiction) were unsafe. They were right. We were dealing with a metarisk variable, not an acute point of fact. While one in 20,000 eggs might be contaminated with salmonella, the other 19,999 eggs in the statistical sample were perfectly safe.

Eventually, the FDA declined to object to a claim that the eggs were “pasteurized for your safety,” allowing at least this point of market differentiation to justify the higher retail price (the dynamics of foodservice sales, with the attendant liability issues, were very different). Still, context was missing. We still could not clearly quantify the benefits of the process; for most people, pasteurization meant “processed,” and food safety remained an abstraction.

The Safer Grains Challenge

Siemer Milling, Teutopolis, IL, U.S.A., largely pioneered the introduction of heat-treated and pasteurized grain ingredients to the cereal foods and other industries. This has at least, in part, been driven by microbiological concerns.

“A big part of demand is from manufacturers of cold products, such as refrigerated cookie doughs, ice-cream inclusions, and cold-pressed nutrition bars, where elevated water activity can encourage microbial growth,” explains Sunil Maheshwari, Siemer’s director of new product technology.

However, Maheshwari has also noticed an increase in microbiological awareness among large bakers and other processors, even though they subject their products to a final bake (ergo “kill”) step.
“Simply put,” says Maheshwari, “these manufacturers don’t want the microbes in their plants, knowing the problems that they entail.”

Whole seeds at harvest come layered with microorganisms. It is not unusual to receive whole seeds at plants with total plate counts topping in the millions of CFUs per gram. Barring extensive refining and milling of the seeds to remove the hulls, this means that whole grain ingredients bring large numbers of unwanted microbial guests to colonize bakeries and cereal plants. Yeasts, molds, and coliforms are especially problematic, but small numbers of pathogens may lurk as well.

Microbes disperse by air in manufacturing environments, seeking moist new homes in which to raise families. Bakeries provide moist environments, between dough mixing, forming, proofing, baking, or extrusion. Or, moisture can collect from condensation during temperature extremes in summer and winter.

Every company has at least one brand name to protect, so any event linking a brand to foodborne contamination is very bad news indeed. However, until they happen, food safety incidents remain hypothetical propositions. For ingredient companies, to invest in the capital and QA/QC compliance resources needed to ensure “safer” ingredients without a compensatory increase in revenues tends to be problematic for many corporate finance decision-makers.

Grain ingredient manufacturers have the means to reduce microbial loads in their whole grains at incremental cost. Whether using dry, wet, or infra-red (i.e., “macro-wave”) heat, these processes alter ingredient characteristics and add cost. Especially if the grains must be heated to meet 5-log pasteurization standards in order to even imply their enhanced safety.

A New Standard of Safety

Cereal foods companies should invest in safer food technologies.

Incentives should include permitting bakers and other cereal food manufacturers companies to claim and promote, for example, a standard of microbial reduction that ensures greater safety for their products. This should not be “pasteurization.”

The presence of food pathogens on dry (even whole) cereal grains is typically measured in less than 10 CFUs per gram (i.e., “negative”), not 100,000s CFUs per gram. The 5-log pasteurization standard was developed for high-moisture, low-acid products conducive to pathogen outgrowth, not for low-water activity grains where microbial outgrowth is minimal if at all. For grains, a 5-log pasteurization standard is gross overkill. And besides, the term “pasteurization” has probably lost all meaning for most consumers.

Perhaps new, less severe standards of microbial-count reduction, sufficient to eliminate microbial pathogen risks, are called for in the case of dry ingredients.

This could only happen with the complete buy in of the FDA. The development of such standards, tailored to specific dry, heat-treated ingredients combined with appropriate FDA-approved descriptors (i.e., a “brand”), will allow bakery and cereal foods manufacturers to better communicate the inherent cleanliness and safety of its products. They will also protect ingredient quality and make food safety more affordable.

Redefining a new, low-water activity “pasteurization” standard for the baking and cereal foods industries, using well-defined standards and a clear, strong brand identification, will enable our industry to clearly communicate to consumers that high standards of microbial safety are consistently being met without sacrificing quality and at a very reasonable cost. This could not but be to the benefit of all.

It should be a winning proposition, all around.

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