

Differences in food safety regulations between countries hamper food trade, leading to the destruction of perfectly healthy food in a world in which one billion people do not have enough to eat. In addition, conflicting regulations impede innovation and investment in new technologies across the food supply chain—technologies that increase production efficiencies, reduce food hazard risks, and improve distribution capabilities to global markets. Decisions to impound, embargo or condemn and destroy food are taken at international borders every day due to determinations that foods are unsafe for human consumption. Of course, there are always potential risks for adulteration of foods during handling, shipping and storage, and adulterated food should not be further distributed. However, the fact remains that a significant amount of safe and wholesome foodstuffs are destroyed each year due to differences in food safety regulations that cannot be scientifically justified.

A number of food scientists from all over the world find it unacceptable that one billion people in the world go hungry while safe and nutritious food is destroyed. As a result, the [Global Harmonization Initiative \(GHI\)](#), an international non-profit network of scientific organizations and individual scientists working together to promote harmonization of global food safety regulations and legislation, was officially established in 2007.

Regulations are not intrinsically wrong, but many lack a scientific basis. Without globally harmonized, science-based food safety regulations, nutritious food needed by millions all over the world will continue to be needlessly destroyed—despite the fact that it is, in reality, safe to consume.

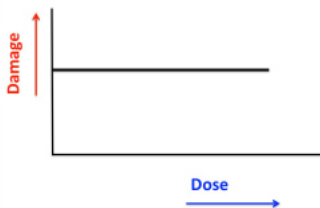
What's the Problem? Communication Disconnect

There is no lack of scientific data. There are thousands of peer-reviewed scientific publications on food safety and more data are generated every day, all over the world. The problem that needs to be addressed is the appropriate use of the data and its communication to stakeholders. Scientists communicate well among themselves but less adequately with those who influence, develop or institute the final regulations. These are the policymakers and politicians, the general public, media outlets, and lobbyists and consumer activists.

The concept of toxicity, or defining what is toxic, is a clear example of such inadequate communication. For hundreds of years, it has been known that “the dose makes the poison”—i.e., that a substance can produce a harmful effect associated with its toxic properties only if it reaches a susceptible biological system within the body in a high enough concentration. Paracelsus, the father of toxicology, based this principle on clinical evidence discovered in the 16th century. More recently, many noted scientists, including Bruce Ames and Edward Calabrese, have substantiated and published research proving this basic principle of toxicology in international scientific journals. Outside of scientific circles, however, “the dose makes the poison” is little understood and poorly communicated, as evidenced by conflicting food safety regulations that result in the destruction of food and headlines that create misperceptions about what constitutes a “safe” food.

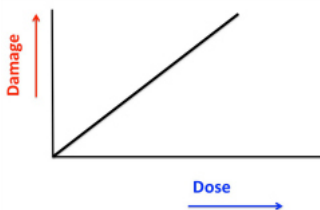
The simple graphs to the left help illustrate these misperceptions:

GRAPH A



Graph A shows the interpretation of toxicity by the general public and other influencers of politicians and policymakers: A toxic substance does damage independent of the dose and therefore, the thinking goes, damage can be prevented only if the substance is totally absent or eliminated.

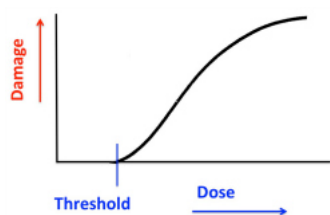
GRAPH B



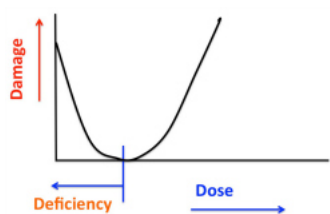
Graph B shows the interpretation of toxicity by politicians and policymakers, who in turn influence the regulators: The higher the dose, the more damage to health, so substances with very low concentrations of intrinsic toxic properties are acceptable in that very few people (i.e., voters) are expected to experience harmful health effects.

Harmonisation: Feeding People, Fueling Innovation (CONT'D)

GRAPH C



GRAPH D



Graph C shows the evidence-based opinion of toxicologists: For many substances, the situation is as Paracelsus discovered: if the dose is too high, damage is done, but there is also a threshold below which there is no effect. In other words, below a certain dose, there will be no damage. For example, in the human body, organs such as the liver and kidneys detoxify harmful substances before they have an adverse health effect. For some substances, too low of a concentration can also pose a health risk, as is the case with vitamins and minerals. Deficiencies or overload of any one of the essential nutrients like Vitamin A or iron cause disease in the body and can even be lethal (Graph D).

Taken together, these graphs illustrate some of the disconnects and misperceptions that lead to the development of non-science-based and conflicting regulations, globally—which in turn, can lead to the destruction of safe and nutritious food. The fact is that all foods naturally contain substances that are intrinsically hazardous, and can be harmful if the dose is too high. Coffee, for example, contains dozens of genotoxic substances, yet there is no evidence that people who drink moderate amounts of coffee have a higher incidence of cancer than those who do not. The mere presence of toxins in coffee (or in potatoes or apples, and so on) or chemical residues on foodstuffs does not necessitate regulations mandating their total absence in order to ensure food safety.

GHI: Creating Connections, Building Consensus

One of GHI's priorities is to collect and communicate sound principles of food safety science to influencers and decision makers—from the general public and the press, to politicians, policymakers and regulatory authorities. The aim is to improve understanding and to better inform all stakeholders so that objective scientific concepts, not political expediency or media hype, become the basis of crafting meaningful, harmonized food safety legislation and regulation in all countries.

In addition to facilitating GHI Working Group meetings to build consensus within the scientific community, GHI is dedicated to creating scientific communications that are concise, easy to understand and can be translated into local languages. With the help of active volunteers in the communications field, GHI is working to develop a variety of educational materials, resources and platforms that are accessible by all around the globe. In addition, many GHI members contribute articles and interviews to national and international popular press outlets, and serve as official GHI Ambassadors to individual nations or regions, sharing and distributing information about GHI and harmonization at the local level.

For more information about the [Global Harmonization Initiative](https://www.globalharmonization.net) and its efforts to feed people and fuel innovation through harmonization of science-based global food safety regulations, please visit us online at www.globalharmonization.net.

