Ensuring safe food for all — why collaboration is critical

Bob Baker of Mars, Inc., highlights the importance of collaboration across the food industry and how tackling today's food safety challenges and preparing for those of tomorrow is vital in the journey towards safe food for all.

FOR ANY food manufacturer, ensuring quality and food safety is a must. At Mars we start with a robust Quality Management Program (QMP), which is our global approach to best practice in quality and food safety. It underpins a universal commitment to rigorous, everyday quality and food safety management practices, as well as continuous improvement. Our QMP is applied to all aspects of our supply chain, from sourcing high quality ingredients, to our manufacturing processes, product distribution and measuring customer satisfaction.

Our commitment is based on The Mars Five Principles – Quality, Responsibility, Mutuality, Efficiency and Freedom. These guide the actions we take every day and are present in our approach to work, the decisions we make, and how we care for the global communities in which we operate. I am proud to work for an organisation that dedicates itself continuously to the ethos of what I would call, 'doing the right thing'. This approach also facilitates a culture that encourages people to think beyond today and consider tomorrow.

Our commitment to rigorous operational quality and food safety risk management is critical to our business. It has also led us to take a lead in helping to explore and address the long-term food safety challenges affecting the broader food supply chain.

As a global food manufacturer, we believe we have a clear responsibility to lead in food safety, but we also realise that no one entity can tackle these challenges alone.

We take a collaborative approach, one rooted in fostering mutual sharing and it is the reason why, in September 2015, we opened the Mars Global Food Safety Center (GFSC). By leveraging key collaborations and partnerships, alongside breakthroughs in science and technology, we are dedicated to addressing some of the world's most pressing food safety challenges.

Global food safety challenges

Food safety risks are increasing at an unprecedented rate, with new threats and hazards constantly emerging as a result of changes to the environment, agricultural practices and food production. As they continue to exert pressure on the food supply chain, there is an urgent need to collaborate and share information to raise the bar in global food safety.

Since I became a food scientist – over 30 years ago – there has been a real focus on microbial risk across the food industry and tackling pathogens such as *Salmonella* and *E. coli*. Although great scientific strides have been made in these areas, these hazards still naturally exist today. There is also the very real, related issue of food waste. A study by the United Nations Food and Agriculture Organization (FAO)[1] revealed that unsafe food is a significant reason why a third of food annually produced in the world for human consumption is lost and/or wasted. If we can collectively move to a predictive and preventative model of microbial risk management, we believe it is possible to reduce waste.

Food fraud is another key issue affecting the global food supply chain. Work is under way to protect the integrity of raw materials and finished goods, but despite this, food adulteration and fraudulently labelled imitations remain a risk that is only likely to be exacerbated by the anticipated economic ramifications of COVID-19. Food fraud incidents, such as the Chinese melamine milk incident of 2008[2] and the 2013 horse meat scandal, have led to a demand for greater transparency on the origins of products. As supply chains become more complex, the need to openly share food safety knowledge and work together to identify food integrity and food fraud risks and solutions has never been more important.

Mycotoxins are another area of concern. More than 300 different types of mycotoxins have been identified, with aflatoxins the biggest concern for humans and animals. Each year around 4.5 billion people are exposed to aflatoxins, which are known to contaminate 25 percent of the world's crop area.

The health impacts are devastating; as well as stunting growth, causing damage to the immune system and maternal anaemia, aflatoxins are estimated to play a part in up to 28 percent of all liver cancers globally.[3] Climate change and an increasingly globalised food supply chain means these challenges are likely to affect more areas of the world over time.[4]

In my view, there is also a need to adopt a holistic approach to assure safe food across the global food supply chain. That is about having the effective processes, regulation, governance and training in place to protect the food we eat and the supply chains in which we operate.

Technological innovation and the future of food safety

Technology in microbial risk management has come a long way in recent years. We are now entering a new world of 'omics', genomics, gene sequencing, informatics, even the application of artificial intelligence. More than that, there is a lot of data being generated across the food industry right now. What if, in the future, we could come together and develop a smart way to integrate this data? We could predict risk, tailor interventions and prevent contamination.

Together with partners we are exploring ways to map out the entire environment or microbiome of a factory and supply chains specifically to understand potential changes and risks before they happen. We believe this technology could »

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help transform microbial food safety, enabling us to predict – even prevent – food safety outbreaks before they occur.

Additionally, whole genome sequencing (WGS) is being explored to identify ways to enable quicker, more effective identification of the foodborne pathogens to enhance microbial risk management.

In the area of food integrity, new finger-printing methods could make it more difficult for criminals to adulterate food. This technology could be a potential game-changer for ensuring food safety and minimising food waste.

Overcoming global food safety challenges

Urgent and coordinated action is needed to tackle mycotoxins and food fraud. Arguably, one of the most effective ways to do this is by taking a multipronged approach which aims to share knowledge, build capability and expertise. This should be done through collaboration with strategic partners to develop practical solutions that can be applied at points in the supply chain where they will make the biggest difference.

The Mars GFSC has been collaborating with several partners to establish a global, multidisciplinary and multi-stakeholder community to support the integrity of the global food supply chain and foster a harmonised framework to support food fraud standards through FAO-WHO Codex Alimentarius.

In 2018, we were honoured to support the Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss, Kansas State University (PHLIL). The goal was to help facilitate a state-of-the-art mycotoxin lab in Nepal, focused on understanding the problem of increased levels of aflatoxin present in breastmilk and blood serum levels. The facility provides a unique opportunity to determine the source of aflatoxin contamination in the food supply chain, helping scientists and food producers develop better detection and early intervention mechanisms.

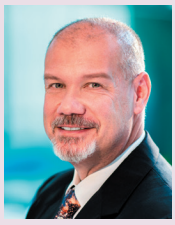
With our partners, we are also developing and delivering food safety education and training in a range of areas, including process control, best hygiene practices, risk assessment, mycotoxin control and management.

Others in industry are doing the same, sharing insights to help raise the bar where they can. None of this would be possible without collaboration or the dedication and commitment of leaders across academia, regulators, non-governmental organisations and partners in industry.

Ensuring safe food for all

Food security is not possible without food safety. Over the past few years, food safety has come a long way, but more needs to be done to overcome new and emerging challenges impacting the global food supply chain. Collaboration is critical, as is the exchange of knowledge and insight, and a focus on research and new technologies. It is encouraging to see a growing spirit of collaboration emerging in the food industry and a willingness among industry, academia, regulators and others to share insights, new approaches and best practice.

As always, there is more to be done, and we all have a vested interest in ensuring safe food for all. Let's make a start today.



Bob Baker

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References

1. http://www.fao.org/food-loss-and-food-waste/en/
2. https://en.wikipedia.org/wiki/2008_Chinese_milk_scandal#cite_note-sick-2
3. Liu et al., 2012. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5876122/#!po=37.5000
4. Cotty et al, 2007