

Food safety and the food industry

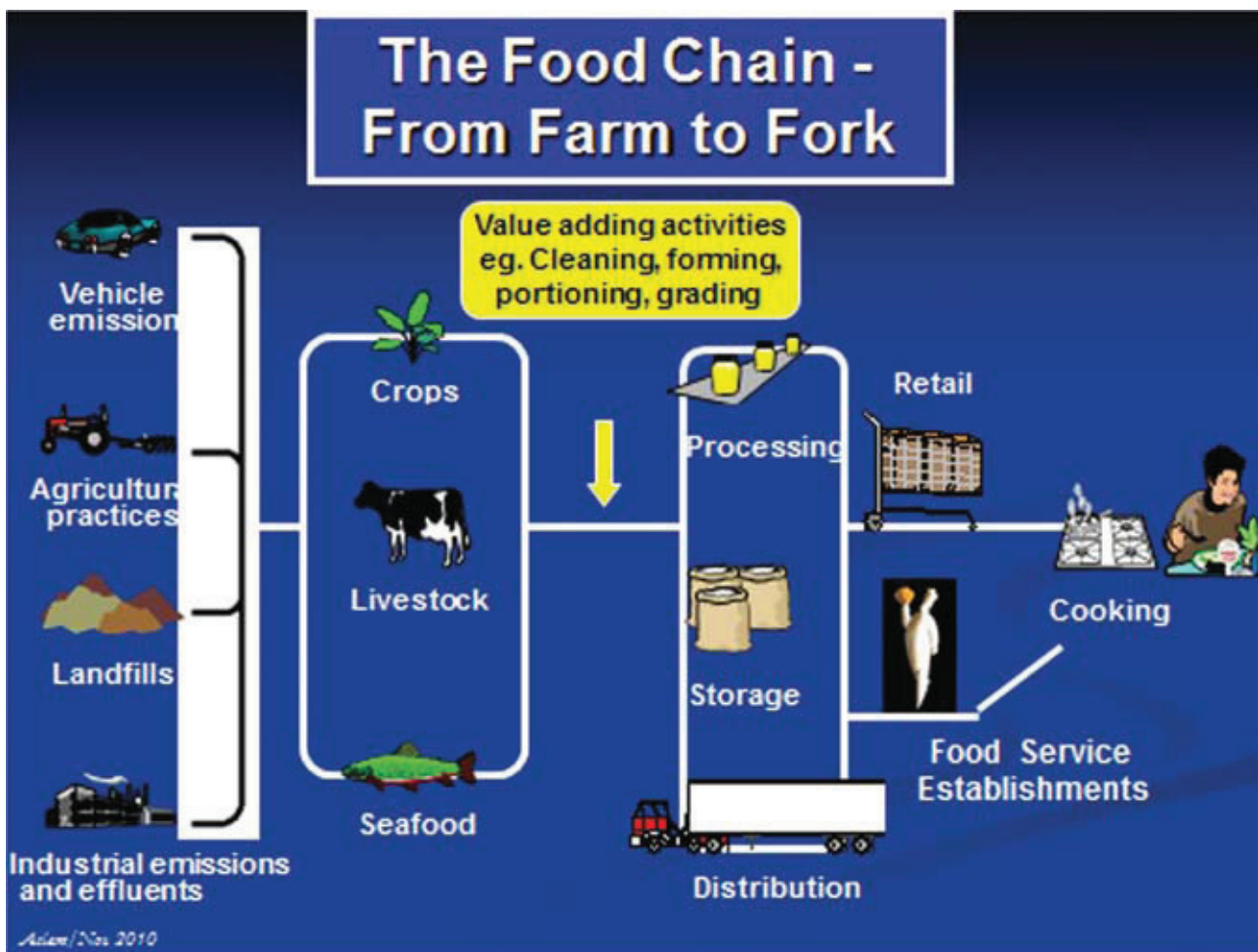
The food industry is an industry in which everybody is a customer several times a day, every day. What forces ensure safety and drive developments in this massive industry?

By A.C. Lam

Food, Glorious Food! Most of us take for granted that food will always be available as and when we need it. But behind this convenience, there are often long processes involved in bringing food to our dining table. These processes, collectively making up the food chain, have gone through tremendous changes over the last few decades.

The food chain starts with production of crops, livestock and seafood. These 'primary' products may be converted into food directly or they may first be put through various treatment processes.

Before the Industrial Revolution, food processing was done in rural areas using



Managing food safety hazards throughout the food chain.

simple tools, and cooking was done mostly by housewives or maids in home kitchens. The Industrial Revolution that began in the 1700s brought changes to the organization of agriculture through farm mechanization, which enabled farms to get bigger. Small farms were gradually replaced by big farms.

More and more of the food processing work that had been carried out in home kitchens was increasingly taken up by salaried workers in factories; backyard operations evolved into well-organized central kitchens. Franchised national and international food service chains emerged to compete strongly with independent local eateries.

Farm yields were greatly boosted by advances in agronomic technology coupled with genetic improvements in crop plants and livestock. Consequently, the percentage of the human population employed in primary food production has declined from year to year. However, the proportion of people involved in the food service industries is greater than ever, to serve the urban masses. By the end of the 20th Century, the urban population had exceeded the rural population worldwide.

Who are the key players in the modern food industry and business? They include:

- i. The primary food producers, *viz.* the crop producers, the live-stock farmers, and the marine products players in the cropping, fishing and aquaculture industries.
- ii. The traders who bring the primary products to the various markets.
- iii. The processors of semi-finished and minimally-processed food such as peeled garlic, destalked dry chillies, curry paste, fruit concentrates and other ready-to-use food ingredients.
- iv. The manufacturers who produce branded finished food products such as cheese, chocolate, coffee, biscuits, noodles, canned meat, canned marine products, fruit juices, and so on.
- v. The food service sector, which includes hotels, restaurants, food courts, catering services (for airlines, home delivery, etc), international supermarket chains, local *kopitiam*s, canteens, sundry shops, and open markets (*pasar pagi* and *pasar malam*).
- vi. The supporting industries including the cold chain operators, warehouse and cold room operators, transporters, building contractors, cleaning and sanitation providers, suppliers of chemical products and packaging materials. The list can be extended to include institutions of higher learning, professional training institutions, consultants in food safety and quality, and certifying bodies, such as SIRIM and JAKIM (for halal status).
- vii. The consumers themselves, who are increasingly more demanding, more discerning, and better educated. They exercise choice and are more and more concerned over the health benefits and hazards in foods.

The food industry has to adapt continuously to new circumstances. These circumstances include changing consumer preferences and habits, the increasing participation of women in the work force, the rise of international travel for business, conferences, education and tourism, and the increasing numbers of migrants in the population. For the food industry and food businesses to prosper, or at least to survive, there are three key success factors:

1. The food must be safe to consume.

Whether one is in primary production, food processing, or food services, food safety is the number one priority. Without exception, multinational food industries have put food safety at the top of their agendas. To ensure safety, they require their suppliers to be certified according to acceptable standards. For example, when a food company like Nestle buys food ingredients from suppliers, Nestle will demand that the suppliers are properly certified. In practice, a food processor or supplier may go for (a) Food Safety Management System based on ISO 22000:2005, or (b) HACCP (Hazard Analysis of Critical Control Points) based on Malaysian Standard MS 1480:2007, or both. In order to meet the requirements of all customers, a supplier would normally go for both, and most certifying bodies, such as SIRIM and SGS can provide both certificates with a single audit.

What is Food Safety and how to produce foods that are safe for human consumption? In simple terms, safe food means the food is free of food safety hazards, which are:

- harmful bacteria or food pathogens,

- toxic chemicals such as pesticides, veterinary drugs, excessive chemical preservatives, and cleaning chemicals,
- physical or foreign matters including choking hazards.

In addition, the food should be free of allergens that have not been declared on the label. These allergens include common ones such as milk, eggs, wheat, shell fish (crabs, lobsters), peanuts, and other nuts.

To produce safe foods, a food processor must establish control measures that can prevent, eliminate, or minimize food safety hazards all the way from the collection of raw materials and their packaging, through processing and storage, to delivery. Whether going for certification or not, a food processor involved in any food preparation must observe the basics of safe food production. These standards are well elaborated in ISO 22000:2005 and Malaysian Standards MS 1480:2007.

Expressed simply, a food processor would implement Pre-requisite Programs (PRP's) that cover:

- a well-designed premise or manufacturing facility in line with Good Manufacturing Practices,
- a well-trained work force,
- a source of good quality water,
- equipment with food contact surfaces of food grade quality, maintained and correctly calibrated for measuring equipment,
- correctly designed & effective cleaning facilities,

- good storage facilities including chillers and freezers maintained at correct temperatures.

The next step is to focus on each food processing step, from collection and packaging of raw materials, to storage and delivery to the customers. Through systematic hazard analysis, the manufacturer or food processor would identify which critical steps have to be controlled with established monitoring systems so that food hazards are eliminated, prevented or minimized. Equipment for monitoring pH and temperatures, metal detectors, and sieves must be well-maintained, and measurements must be recorded and kept for reference. This program is called Hazard Analysis of Critical Control Points, or HACCP.

The Pre-requisite Programs (PRP's) and the Hazard Analysis of Critical Control Points (HACCP) Programs are twin pillars to ensure that safe foods are produced consistently. Both programs require management commitment to provide the necessary resources including internal audits and management reviews.

2. **The food must comply with regulatory requirements—those of the domestic market, and those of the export markets if these foods are exported.**

In Malaysia, the custodian of processed foods is the Division for Health and Food Quality (*Bahagian Keselamatan Dan Kualiti Makanan*) of the Ministry of Health. For primary produce, the custodian

is the Ministry of Agriculture and Agro-based industry, through its Department of Agriculture, (DOA), Department for Veterinary Services (DVS), Department of Fisheries, and other associated departments. Central to the processed foods is the Food Act 1983, and Food Regulations 1985. All food processors would be familiar with these regulations, especially in terms of labelling, nutritional labelling, claims, the correct product designation of ingredients, food additives, etc. The food industries are also familiar with the penalties for non-compliance with the regulations and other requirements in the Food Act. The food regulations are being updated regularly by the Ministry of Health at the request of the food industries themselves, or by the Ministry, in order to be relevant and in line with international practice. For example, a fruit juice producer can label its product as fruit juice. On the other hand, if the product does not comply with the composition of a fruit juice, it will have to be labelled as a fruit juice drink or fruit drink, which is grouped under soft drinks. This to conform to fair trade practices.

3. **The foods must meet the expectations of the customers and consumers.**

Customers and consumers are kings where food is concerned. Without consumer support, it is unlikely that a particular food industry or company will survive even if the first two criteria are met. Consumer insights are part of the strategic approach in maintaining consumer loyalty. Quality elements would include product sensory profiles, packaging, (which protects what is

sold, and sells what it protects in terms of convenience, presentation, etc.), nutrition and health, costs, and other factors.

Product innovations and renovations are part and parcel of a strategic approach to maintain existing customers, and win new consumers. Many food industries invest strongly in R&D to maintain and increase market share. Halal-certified food products and food service outlets are pre-requisites for Muslim consumers in Malaysia and in export markets. In the food business today, no one would expect food to cause harm, and consumers are increasingly demanding on the type of food they select. To succeed in the market, one must have the products that appeal to the consumers—products that enjoy repeat purchases. To win, one should establish a brand. Products with established and trusted brand names enjoy good market share.

Food safety will remain the biggest challenge to food businesses in view of the length and

complexity of food chains, the large variety of players involved, and the large number of people in the work-force.

The work force is also subject to continuous change, e.g. many food manufacturing and food service establishments and related food businesses, especially SME's, are being staffed and even managed by migrant workers!

Water rationing in some states can have a negative influence on the cleaning and sanitation programs so important to the food industry.

Other issues revolve around genetically-modified organisms (GMO's), certification of organic foods, gamma radiation, contaminants in the form of pesticide residues, heavy metals, dioxins and melamine (as in the China milk scandal, 2008). As consumers, we have to be vigilant. The ethics of responsible farming and other value-adding operations will remain the cornerstone of future food business.

Mr. A.C. Lam, Principal Consultant, ACLAM Enterprise, was formerly the Group Quality Assurance Manager of Nestle Foods (M) Sdn. Bhd. From 2000 to 2009., he was appointed by Nestle to be the Principal Mentor for the Nestle-SME Food Mentoring Program. A total of 3500

participants benefited from this program throughout Malaysia. Mr. Lam can be contacted at No. 18, Jalan SS2/78, Petaling Jaya. Email : achyelam@yahoo.com, mobile: +6019-358 2373).