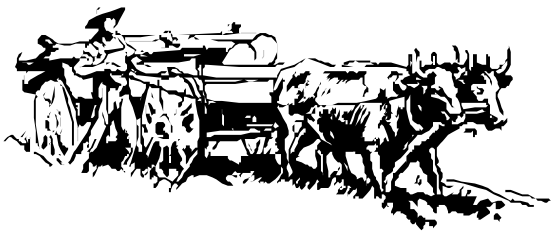
PREVENTING FOOD-BORNE ILLNESS FROM FARM TO PLATE HIGHLIGHTS OF BEST PRACTICE

The Farm, the Beginning of the Food Chain

Most food products such as rice, corn, fruit, vegetables, sugar, meat, milk, etc are either produced directly on farms or based on produce derived from agriculture. Farming uses natural resources, such as solar energy, soil and water to produce food for human and animal consumption.



Over the past fifty years, all governments in Asia have pursued higher yields and increased food production as their major policy goal. With the population of Asia forecast to grow from 3.8 to 4.6 billion during the next 2 decades, this goal will remain high priority. However, greater awareness of environmental issues, shifts in consumer demand, and the introductions of new technologies has shifted consumer expectations, and in turn, the expectations of other stakeholders in the food chain, such as governments, producers, manufacturers, processors and retailers from quantity, to both quality and quantity.

Good farming, handling and storage practices are the main determinants of the quality of raw farm products. Quality of food refers to properties, such as nutritional value, functional properties such as suitability for processing, standards of cleanliness and hygiene, organoleptic (i.e. taste, smell and mouth feel) properties.

Urbanisation together with higher incomes are major driving forces behind demand for quality crops. Town and city dwellers usually look for greater diversity of foods and increased quantities of foods such as fruit, vegetables and animal proteins, than their rural fellow citizens. The quality of produce also determines its success in the export market.

The removal of trade barriers, increasing consumer demand and competition provide strong incentives for farmers to provide top quality farm produce.

Pesticides and Food Safety

Pesticides are an essential tool for most farmers. It is estimated that without pesticides at least 50% of global harvests could be lost.

Most problems with pesticides result from misuse. For example, usage instructions include recommended rest period between treatment and harvest. These rest periods are based on extensive trials, and are intended to ensure residual traces of chemical treatments are either zero or below the levels set as safe for human consumption.

Education of farmers on the proper use of pesticides, establishing maximum permitted pesticide residue levels and regular testing of crops for presence of pesticides residues all provide positive incentives for farmers to follow manufacturer recommendations. In September 1995, for example, the Ministry of Health in China established maximum residue standards for 27 types of pesticide.

Korea, Taiwan and Japan have national monitoring systems based on chemical analysis. The level of samples detected with residue contamination in Korea and Taiwan was 1-2% in 1999, and in Japan in 1996 was only 0.03%. These levels are in compliance with international standards.

Integrated pest management (IPM) also offers the potential to reduce overall pesticide use and to encourage the use of modern pesticides which are designed to break down more quickly. IPM is the combined use of chemical, cultural, and biological methods for acceptable, economic pest control with minimum effect on non-target weeds and insects as well as the natural environment.

In Indonesia, for example, farmers who have adopted IPM practices are reported to have been able to reduce pesticide use substantially.

Although IPM can be quite challenging to implement and requires coordinated action by a large number of farmers, the success of IPM programs in Indonesia and elsewhere in the region are encouraging other countries to progress IPM policies.

Organic Produce

An organic production system avoids the use of synthetic fertilisers, pesticides, growth regulators and livestock feed additives. There is little evidence however, that organically produced food is any safer or more nutritious than it's conventionally produced counterpart.

Biological Pest Control

The use of natural enemies (predators and parasites) is widely accepted, as is the use of insect pheromones and entomopathogenic microbes and fungi, both in traditional and organic agricultural practice.

Also, most recently biotechnology has been used to develop crops which produce their own natural anti-insect protection.

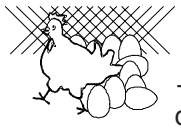
Naturally Occurring Food Safety Risks

There are many naturally occurring harmful toxins in foods we eat, which in normal circumstances do not cause illness either because the amount consumed ordinarily is too small, or because the produce is treated, for example by soaking and washing before consumption to neutralise the naturally occurring toxins. Examples include cyanogens (found in cassava, mango and other fruit kernels) that can be fatal if consumed in large quantities; and goitrogens (in cabbage, broccoli, mustard greens and radish) which act as thyroid antagonists.

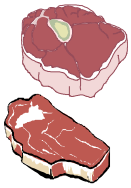
Animal Diseases and the Consumer

Animals may also carry micro-organisms which can cause disease in humans without any evidence of their existence during the animal's life cycle or even after its slaughter. It is not possible to eliminate all pathogens from the current production systems, but producers can do a great deal to minimise the risk through systematic and scrupulous adherence to recommended food hygiene practices and the observance of strict hygienic practices on the farm.

Monitoring and surveillance, along with early intervention in the event of a food safety risk becoming apparent is also essential. For example, in May 1997, a rare influenza virus, previously found only in birds and poultry, crossed the species barrier, infecting some residents of Hong Kong with 'chicken flu' – which in some instances resulted in death. (Please note, that infection of humans was caused, not by consumption of the meat, but by direct contact with live chickens - nevertheless, the health authorities response provides a good example of how effective rapid and concerted response can be). Millions of chickens were destroyed by December 1997. Since then, chicken imports from China have resumed, but birds are inspected and subjected to blood tests prior to import, and tested for avian influenza upon arrival in Hong Kong. A much strengthened monitoring and surveillance system has been established in the wet markets, and a rapid response system to early signs of infection has been developed and implemented on a number of occasions.



BSE (Bovine Spongiform Encephalopathy) or 'Mad Cow Disease" was first recognised in cattle in 1986. Most BSE cases in cattle have been found in Britain, with other European countries also reporting cases. A small number of cases of cattle infected with BSE have also been confirmed in Japan since the latter half of 2001.



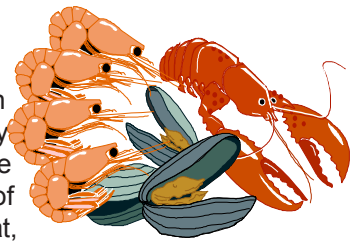
It is thought, although not fully confirmed, that BSE-contaminated meat and bone meal (MBM) is the cause of the fatal disease, nvCJD (new variant Creutzfeld-Jakob Disease) in humans, which was first recognised in 1996. This has resulted in the implementation of more stringent measures to contain the disease and to exclude animal spinal and neural tissues from human consumption. Presently, scientific evidence seems to indicate that preventive measures can control the animal disease and minimise the risk of possible human illness. Import bans on British and European meats are gradually being lifted.

The key to success in handling animal disease epidemics is early detection. If a disease can be detected very early in the phase of epidemic development, the possibility exists that it can be arrested and eliminated before it actually inflicts damage. Early detection pre-supposes that there is a surveillance system in place that will bring infection to light when it is first seen. The country's veterinary authorities are then placed in the position of being able to manage the problem before it becomes uncontrollable, thus protecting the local livestock industry and ensuring food security for those closely dependent upon livestock.

Other concerns with livestock health include the use of antibiotics and hormones in livestock feed:

Antibiotics

Antibiotics are used in the rearing of livestock to prevent infection, as well as enhancing growth. If the recommended period between final dose and slaughter of animals is not observed, residual traces of the antibiotic may remain in the flesh and ultimately be consumed by humans. There is a recognised risk that regular use of antibiotics in animals, particularly those also used to treat humans may result in the development of antibiotic-resistant strains of microbes, causing disease in humans which is difficult to treat.



The European Commission recently imposed a temporary ban on the import of some Chinese and Thai products of animal origin, viz., rabbit, meat, poultry, pet food, honey, and crustaceans, including shrimp and prawns due to concerns over the detection of chloramphenicol, an antibiotic which is not recommended for use in animal feed. As a result Thai and Chinese authorities are reviewing agricultural operating and inspection procedures.

The concerns over antibiotic use, has led to the convening of a number of expert committees to assess the role of antibiotics in livestock. Expert panels' opinion, such as that led by Professor Phillip, of Guys and St Thomas's hospital in the UK conclude that currently - responsible, controlled use of antibiotics is a necessary tool in ensuring food safety in meat production.

Traceability

Traceability systems are record keeping systems that systematically record information about a particular attribute of a food product from creation through marketing. Traceability systems are primarily intended to help keep foods with different attributes separate from one another. However, traceability can help facilitate trace-back for food safety and quality too. A traceability report proves useful when public health officials attempt to identify the source of a food-borne illness outbreak. In the case of some type of food-borne illnesses, for example, such as those caused by *E.coli* 0157:H7, no cure is known, therefore identifying and removing the source of illness is the only means of preventing the spread of disease. The faster the disease-causing bacteria can be detected, the faster investigators can respond to outbreaks.

The Japanese Agriculture Ministry is developing a traceability system to label each pack of beef, to show where the animal was born and the farms where it was raised. The new numerical system is designed to assure the elimination of BSE from national cattle herds, and restore public confidence in beef and national monitoring and surveillance system following the recent BSE scares.

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