GAP AS A BASELINE, TRACEABILITY AS A PIPELINE TO BUILD CONSUMER CONFIDENCE

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ABSTRACT

Assuring food safety and building consumer confidence in foods are quite different issues. The former is associated with things or foods per se, and the latter is associated with information that affects consumers' choices. Gaining considerable attention are good agricultural practices (GAPs) that assure food safety on the farm. Meanwhile, the accepted prerequisite to build consumer confidence and manage risks is the traceability system. If both systems were separately adopted on farm, they would not create the environment where consumers could confidently buy foods that are safe. GAP is a basic system to assure food safety on farm while traceability is an indispensable system to communicate information on food safety to both traders and consumers. The traceability system, therefore, serves as a pipeline of information. Combining these two systems is the only way to establish a food safety chain that can supply safe foods with confidence. This presentation shows the relationship between the two systems.

Key words: food safety, consumer confidence, GAP, EUREPGAP, traceability, third-party audit, food safety chain

INTRODUCTION

Consumers have lost their confidence in the food industry and on the food they eat because of the many safety concerns this dacade. In Japan, the detection of Bovine Spongiform Encephalopathy (BSE) in September 2001 was the most influential incident. BSE has remarkably increased public concern about food safety and extremely decreased beef consumption as a result. We think that this consumer reaction was caused by the insufficiency of BSE information disclosed before the disease was detected.

First of all, we should recognize the difference between safety and confidence. There is no doubt that the primary responsibility of growers to consumers is to supply safer produce. But to gain consumer confidence, growers should properly communicate that they grow produce under safe practices.

As for a safety assurance system, the Hazard Analysis Critical Control Point (HACCP) is well known. However, adopting HACCP on the farm is extremely difficult. Instead, many participants in the food supply chain have been paying attention to the good agricultural practice (GAP) system as an on-farm safety assurance system. Yet even with these systems, they cannot eliminate consumer anxiety on the produce bought if there is no appropriate information at the right time. The system used to communicate this information to consumers and trade partners is the traceability system. This system is a prerequsite to build consumer confidence in which consumers and trade partners can trace a produce back and forward and make sure of its safety through every step of the food supply chain. All participants of the food industry should introduce both the safety assurance and traceability systems to recover consumer confidence in foods. Doing so can make clear their respective responsibilities in the food supply chain.

Beef is not the only source of food-related health risks to humans. Although the outbreak of food-borne illness associated with produce is rare in Japan (Fig. 1), it is nonetheless a very important issue in many countries in terms of preventing microbial contamination.

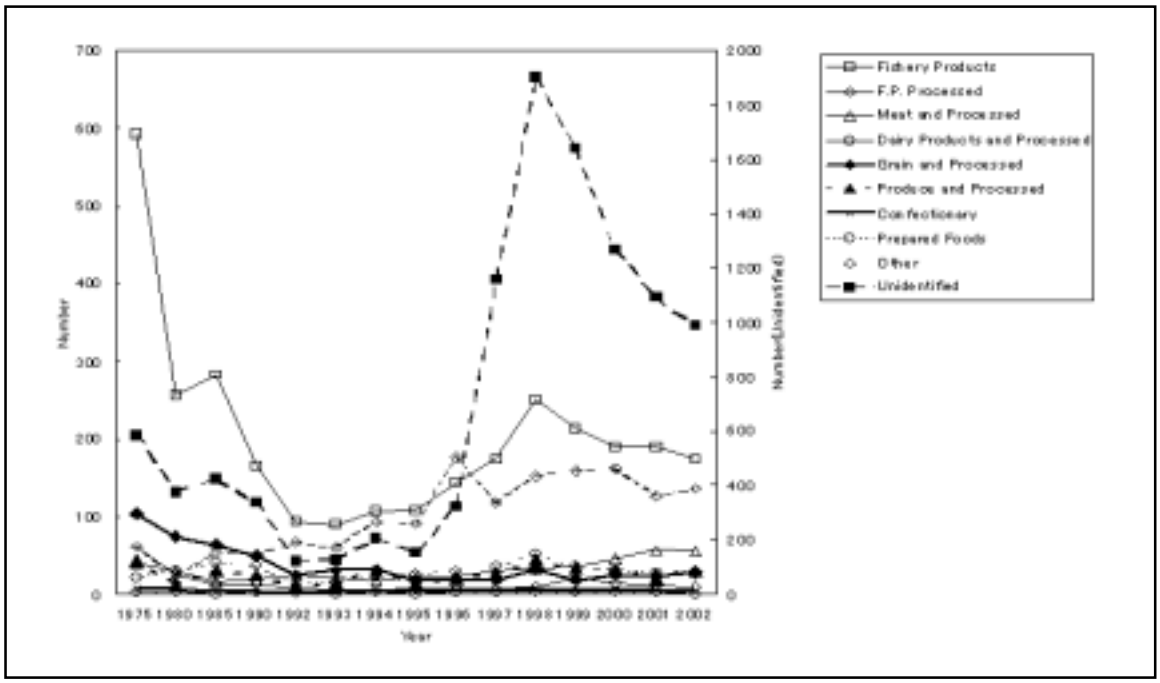

Fig. 1. Food-borne outbreaks by origin in Japan.

FOOD SAFETY AND CONFIDENCE IN FOODS

Safety means the absence of risk (Antle 1995). Of course, zero risk is merely an idea. So for consumers, the term only means that the possibility of a produce to harm their health is vely low as long as they eat it, following common hygienic practice.

Consumer perception of risk level, however, is different among individual consumers (Buzby 2001). It is clear in the case of allergy. For example, egg is a very risky food for a consumer who is allergic to it. Furthermore, perceptions are quite different among countries, even in the same country (Wang 1995). Food safety is just a probablistic concept, and no one defines the threshold of what is safe or risky in figures. Often, people in the food industry recognize that assuring food safety is enough to bring forth consumer confidence. Safety and confidence are quite different issues and we should consider them discriminately.

Food safety is about characteristics or the quality of food depending on biological, physical and chemical problems, which can be confirmed scientifically and assessed objectively. It is merely an issue associated with things. Theoretically, in every stage of the food supply chain, if all parties implemented the same safety assurance system, either HACCP or GAP, and strictly followed the rules, the probability of marketing contaminated foods may become very low. As a result, no consumer would be poisoned or harmed by food consumption.

Many participants in the food supply chain believe that assuring food safety scientifically directly affects consumer confidence. However, this is a misunderstanding. Of course, safety is a prerequisite to build consumer confidence (Fig. 2). However, only assuring the safety of produce is not enough to elicit consumer confidence. They cannot build consumer confidence without appropriate information. Assuring safety and building confidence in the minds of consumers are quite different issues and they need different tools or systems.

To build consumer confidence in foods, information must be provided. Usually, labeling is considered as the best tool to provide information on foods. Consumers, however, have no tool to scientifically and objectively measure and evaluate its reliability. They cannot completely eliminate the possibility of fraud and this issue must also be solved to build up consumer confidence in foods.

Fig. 2. Safety assurance system and traceability system.

Ensuring the credibility of labels attached to food items is also associated with information. In other words, information on the "what" and "how" of food safety should be provided and its credibility must be assured to build consumer confidence (Caswell 1998; Golan 2000). We still do not have enough knowledge about what conditions make consumers feel confident in the food they buy or how much and what kind of information is needed to build consumer confidence. It is rather hard to build consumer confidence in foods than to assure their safety.

ASSURING A SAFETY SYSTEM ON FARM: GAP

The main subject of this seminar, GAP, has lately gained considerable attention. GAP is the internationally accepted tool for assuring safety on farm, and is now aggressively being introduced in many countries. Specifically, I will briefly discuss the two streams of GAP — EUREPGAP and US-GAP.

In Europe, following the food safety scare on BSE, consumer concern about food safety has remarkably increased. Consumers have started asking how their food is produced and seeking reassurance that it is safe. In these conditions, EUREPGAP started as an initiative of a group of leading retailers called Euro Retailer Produce Working Group (EUREP) in 1997. EUREPGAP is driven by the desire to reassure consumers. Its mission is to develop widely accepted standards and procedures for the global certification of good agricultural practices. In this sense, EUREPGAP is not merely a guide for farmers who would like to adopt safer practices but a scheme for certification of global standards. It provides the tools to objectively verify best practices in a systematic and consistent way throughout the world. Today, the EUREPGAP membership has expanded to include retailers, producers/farmers and associate members from the input and service side of agriculture. At present, EUREPGAP is recognized as a global standard in many countries.

In the US, GAP started to develop from a directive by former President Bill Clinton in 1997, when there was a rise in the outbreak of food-borne illness associated with fresh fruits and vegetables. In response to this directive, the US Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA) issued the "Guidance for Industry-Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables" in 1998 (FDA & USDA 1998). This guide is the basis of the US-GAP and it addresses microbial food safety hazards and good agricultural and management practices common to the growing, harvesting, washing, sorting, packing and transporting of fruits and vegetables sold to consumers in unprocessed or minimally processed form. Guides on commodity-specific GAPs are also issued.

Other countries, including Japan, have started to develop and implement GAPs. In Australia, its Department of Agriculture, Fisheries and Forestry issued the "Guidelines for On-farm Food Safety for Fresh Produce" in

1999. The Canadian Horticultural Council issued the "On-farm Guidelines for Fresh Fruit and Vegetables in Canada" in 2004. The Food Safety Authority of Ireland issued the "Code of Practice for Food Safety in the Fresh Produce Supply Chain in Ireland" in 2001. It includes several clauses about good practices on farm. Japan's Ministry of Agriculture, Fisheries and Forestry (MAFF) issued the "GAP for Food Safety –Manual for Developing and Spreading" in 2005. Another trial from the viewpoint of growers to establish GAP in Japan was started by the Japan Good Agriculture Initiative (JGAI).

Similar to HACCP, GAP is based on preventing potential problems before they happen. Usual food safety inspection programs react to problems and correct hazardous conditions after they have occurred. In contrast, the GAP system was designed to anticipate problems before they occur and prevent them. It enables all the trade parties concerned about food safety, such as producers, to identify the foods and processes that will most likely cause food-borne problems.

Growers who adopt GAP can claim safety of their produce if they rigidly operate by the rules. Nevertheless, "safety" in this case does not mean that the produce supplied has no risk at all. Even by adopting GAP, a 100% safety is not possible. GAP can reduce risk but not eliminate it. Particulary considering the possibility of contamination at every stage of the food supply chain, it is better to avoid the misconception that GAP can assure safety at the level of 100%. Even growers following GAPs may still supply contaminated produce because all sources of risks cannot be controlled (Calvin 2004).

The idea that GAP reduces but does not eliminate all risks is widely known in the food industry. In the US, risk is regarded as an issue of probability, and to take or avert the risk is the responsibility of cosumers. If they do not follow the rules of an effective system to assure safety, then the safety of food is merely an idea. In this sense, training and educating growers to foster compliance are critical conditions to assure the safety of their produce.

Developing and adopting GAPs are now a worldwide trend. Naturally, there is a difference among GAPs developed in many countries due to the difference of driving forces and the agricultural policies in each country. GAP is a good system to assert food safety on farm, however, that alone cannot build consumer confidence in the produce. After the information on safety is disclosed and communicated to consumers and trade partners, GAP performs well as part of the system to provide both the safety of produce and confidence in it.

EUREPGAP AND US-GAP

The EUREPGAP has several different points with US-GAP. It sets out a framework for GAPs on farm, defining essential elements for the development of best practices for the global production of horticultural products (e.g. fruits, vegetables, potatoes, salads, cut flowers and nursery stock). In other words, it defines the minimum standard acceptable to the leading retail group in Europe.

EUREP membes commit to respond to consumer concerns in the broad areas of agriculture, which include food safety, animal welfare, environmental protection and worker health. Furthermore, they incorporate integrated pest management (IPM) and integrated crop management (ICM) practices within the framework of commercial agricultural production in the EUREPGAP protocol. They regard the adoption of IPM/ICM as essential for the long-term improvement and sustainability of agricultural production.

Moreover, the EUREPGAP protocol states that "all growers should be able to demonstrate their commitment to a) maintaining consumer confidence in food quality and safety; b) minimizing detrimental impact on the environment while conserving nature and wildlife; c) reducing the use of agrochemicals; d) improving the efficiency of natural resource use; and e) ensuring a responsible attitude toward worker health and safety" (EUREPGAP Protocol ver. Sep. 2001. Rev. 02). EUREPGAP aims not only to assure food safety but also to establish the standard of global GAPs in broad areas of agriculture.

On the other hand, US-GAP's most obvious characteristic is its focus on preventing the microbial contamination of fresh produce. Its guide does not specifically address other areas of concern such as pesticide residues or chemical contaminants in the food supply chain or the environment. The

US-GAP guide has eight principles, all of which are on preventing microbial contamination in produce. It has no reference on the protection of nature and animal welfare. This is the difference between the two GAP systems. Moreover, although it has clauses on hygiene and sanitation, it does not describe the consideration for the health worker but the prevention of contamination from the worker.

The core food safety components of US-GAP and EUREPGAP are very similar but their largest difference is on ensuring safety on environmental quality and animal welfare. This difference reflects the opposition between US and Europe against genetically modified organisms (GMOs), the use of hormones and the basic issue of agricultural trade. For the US, agriculture is its big import industry, so it prefers a less limited trade system. It does not like to add many other conditions except food safety. As for the European Union (EU) and Japan, they prefer to add conditions on supplying safer foods to consumers and to make trade barriers higher to protect domestic agriculture. This situation is the same for the retail industry in which international competition becomes more and more serious.

I cannot unconditionally declare which GAP is better because of the different agricultural conditions in each country. The Japanese GAP manual issued by MAFF follows the US style.

TRACEABILITY SYSTEM AS A PIPELINE OF INFORMATION

As mentioned earlier, to build confidence in consumers' minds is an issue of information. But adopting safer practices like GAPs without communicating food safety, growers cannot bring out confidence in consumers. Thus, the traceability system can be a tool or a pipeline to communicate information on safety. ISO 9000:2000 defines traceability as the "ability to trace the history, application or location of an entity for consideration." And in EU's General Food Law, it defines traceability as the "ability to trace and follow a food or feed, food-producing animal or substance intended to be or expected to be incorporated into a food or feed, through all stages of production, processing and distribution."

EUREPGAP defines traceability as "the ability to retrace the history, use or location of a product (that is the origin of materials and parts, the history of processes applied to the products or the distribution and placement of the product after delivery) by means of recorded identification."

The United States has no official definition but the Perishable Agricultural Commodities Act (PACA) has similar clauses indicating that participants of the supply chain of produce need to record trade partners and keep the record. The US-GAP guide has no definition of traceability but it mentions that "the ability to identify the source of a product can serve as an important complement to good agricultural and management practices intended to minimize liability and prevent the ocurrence of food safety problem."

Both GAP and traceability systems are too complicated to be developed into an integrated system. Thus, both systems need to be developed independently.

The MAFF of Japan issued "Guidelines for Introduction of Food Traceability Systems (Guidelines for Food Traceability Systems and Case Study of Traceability System)" in 2003. Its guidelines state that "foods and their information can be traced forward and back at each stage of the food chain, i.e., production, preparation/processing, distribution and sale." Also, the fundamentals of the traceability system state that "food business operators at each stage of the food chain should at least identify food (products and raw materials) and its suppliers and purchasers, correlate them with each other, and record and store this information." All operators should record and keep the information on the source and destinations of all foods passing through them. The guidelines state that the traceability system has the following purposes: 1) greater reliability of information; 2) contribution to improvement of food safety; and 3) contribution to higher business efficiency. The guidelines improve food safety, stating that "if there occurs an accident related to food safety, traceability systems help trace the cause quickly and easily."

We cannot detect the cause of accident without information on safety at every stage of the food supply chain. In Japan, food business operators are requested not only to record and manage the information on their food sources but also to record information on those they sell to. Just knowing who dealt with the foods,

however, cannot detect the cause of contamination. To detect the source of contamination, we need information on how the food was grown, processed, and dealt with; in other words, we need the information on food safety at every stage of the food supply chain. Compared with the safety assurance system, the traceability system can only provide information on who grew the produce and who dealt with it along the food supply chain. The traceability system neither assures safety nor detects the source of contamination. However, the system is a good system to communicate, but by itself, it never assures safety. So we insist on combining the two systems, the safety assurance system and the traceability system, to create the environment in which consumers can purchase safer foods with confidence.

In Japan nowadays, many growers and growers' associations are developing systems to communicate the history of growing. However, the possibility of contamination is hidden not only on farm but also at every stage of the food supply chain. To assure consumers of food safety, all food supply chain participants should adopt both systems at every stage of the food supply chain. Communicating the growing history of a produce is just part of a measure to construct a traceability system, and is not the system itself.

Contamination in food may occur in every stage of the food supply chain, from the field to the table or from the stable to the table. We always become aware of an incident after it has occurred. Unfortunately in many cases, when consumers show symptoms of illness, the contaminated foods have already been consumed or discarded. It is difficult to exactly pin down where the produce became contaminated in the food supply chain because of the difficulty in testing for microbial contamination. The FDA has a policy on not depending on tests but rather on promoting the adoption of GAPs and good management practices to reduce the incidence of microbial contamination.

The tracing procedure should start where the incident took place, particularly where the contaminated food was consumed. The traceability system enables trade partners and consumers to trace back the contaminated food throughout the food supply chain until the suspicious stage is detected. When the the source of contamination is found, the risky food is then excluded from the food supply chain. The traceability system performs a pilot system that leads toward the source of contamination. But by itself, it cannot identify the source without the information on safety disclosed at each stage of the food supply chain.

Recently, many traceability systems have been developed and tested in Japan but many of them were merely intellectual property IP) systems that communicated the origin of foods to consumers. Of course, identity preservation is a basic interest for consumers, and it is becoming an important issue for a wide range of agricultural products (King 2000). However, consumers also would like to know how these foods were dealt with at every stage in the food supply chain until they reach the dining table (Geiser 2001). If they could not get the information related to food safety at every stage of the food supply chain, they could be truly confident about the food they eat. Consumers become confident only after the necessary information related to safety is disclosed and when they have easy access to the information. The traceability system is a prerequisite to communicate the credibility of information on the origin of the food , its growing method, among other things.

Developing a traceability system has many problems. For one, many food products are changed in form as they go through the supply chain, causing serious problems. At every stage in the food supply chain, a traceability system should be able to identify every food item and its raw materials.

For example, a grower transports lettuce without any pakage to a packing shed. In the packing shed, the lettuce is packed into a carton box. Then, in another plant, the lettuce is cut, repacked and mixed with cut onion and cucumber, among other vegetables, to be marketed as a salad pack, which is then transported to retailers. In this case, the traceability system must be able to identify all these commodities at each stage – lettuce in the carton box, in the salad pack, on the shelf, and so on. In the case of processed foods, the traceability system should be able to identify all the raw materials used to come up with the final product if needed.

In order to know whether a produce is safe to consume or not, consumers must have all the information on how it was grown, transported, stored and what materials were used in growing it. The traceability system serves as a pipeline for information on these apsects. However, the system merely enables consumers to trace information on food items forward and backward throughout the food supply chain. It is only a communication tool and it never assures food safety.

The traceability system should be developed, concentrating on a function to trace back from a table to a field and identify the grower/company that dealt with the food or trace forward through every stage of the food supply chain. In food safety assurance systems like GAP, it is enough to request a traceability status. The traceability system should be developed independently, however.

THIRD-PARTY AUDITS

If all the parties involved in the food supply chain adopted the two systems, safety assurance and traceability, one more issue would remain: how to assure the reliability of information. Growers and related parties in the food industry often claim, by themselves, the credibility of the information they disclose, but consumers have no guarantees. To assure information credibility, a third-party commitment is indispensable. Even if growers worked under the GAP rule rigidly and they communicated it to consumers, consumers do not have the tool to determine the reliability of the information. Only a third party can substantiate the claims of growers. In today's international food supply system, it is impossible for consumers to go and audit every farm on how a produce was grown. It is also impossible for consumers to check how foods were processed and how these were dealt with thoroughout the food supply chain. A third-party audit can assure consumers objectively (Fig. 3).

The aim of EUREPGAP is to establish the global standard of this certification system. If such a movement in the retail industry would spread in earnest, all retailers would request growers to have a third-party audit. Moreover, processors and shippers would also require every grower to have third-party audit to verify the compliance with GAP and traceability systems. In the near future, all parties to the food supply chain would require trade partners to have a third-party audit.

Imperfect and asymmetric information always hinders the efficient function of markets. Market participants try to provide more information on food safety characterisitics of the produce, but, as for microbial contamination, this is extremely difficult since there are often no good tests for it. For growers, using third-party audits to verify their compliance with GAP and adopting a traceability system would be important. Even a successful audit verifying compliance with GAP and traceability principles, however, does not gurantee food safety. We should not forget that in any effective system, we can only reduce but not eliminate all risks. A third-party audit is indispensable in eliciting the confidence of consumers in buying safer foods. Adopting a third-party audit is an important first step in improving food safety.

Fig. 3. Third-party audit.

FOOD SAFETY CHAIN

To establish a food safety chain that enables the assurance of food safety and to draw out consumer confidence, we need to combine the two systems, the safety assurance system such as GAP and HACCP and the traceability system, and implement these at every stage of the food supply chain (Fig. 4). Disclosure of information related to safety, if needed, is a critical factor to make a complete food safety chain. Safety-assuring information and information on how foods were treated in each stage of the food supply chain are prerequisites to building consumer confidence.

Many problems have to be solved to make the food safety chain (Golan 2002). All the concerned parties in the food supply chain should participate in the system; otherwise, the system cannot function well as a traceability system because the missing party prevents tracing the flow of the produce. The tracing procedure breaks down when one party is missing. How to impose the system on all parties is the most important issue. Some supermarket chains have already requested their trade partners to introduce HACCP. They have also requested to provide the information to secure traceability (Woolworths 2000). In many countries, however, the retailers are not powerful enough to force every partner to implement this system. If retailers subscribe to this system, the system would soon spread, and consumers would be more confident about enjoying safer food.

In the United Kingdom, after the enforcement of the Food Safety Law of 1990, retailers were required to proactively ensure that the food they sold was safe. This change ensured the safety of foods (Bredahl 2001.)

Once this safety chain is established, all the concerned parties try to keep every operation and the food safe. If an incident takes place, the consumers can easily understand the cause of the incident. Incidents can directly affect the company's reliability, and soon the company loses its credibility. When consumers lose their reliance on a company, the company's existence or viability is threatened. Another problem is how to avoid fraud and the declaration of false statements. To avoid this problem, the system should be audited by a third party.

Government's support is also necessary. A law to force retailers to take responsibility of food-borne incidents is also imperative. However, governmental regulation is not always the best way to resolve an economic issue (MacDonald 1996.) But government should financially assist in establishing a food safety chain as well as in developing and promoting the procedure.

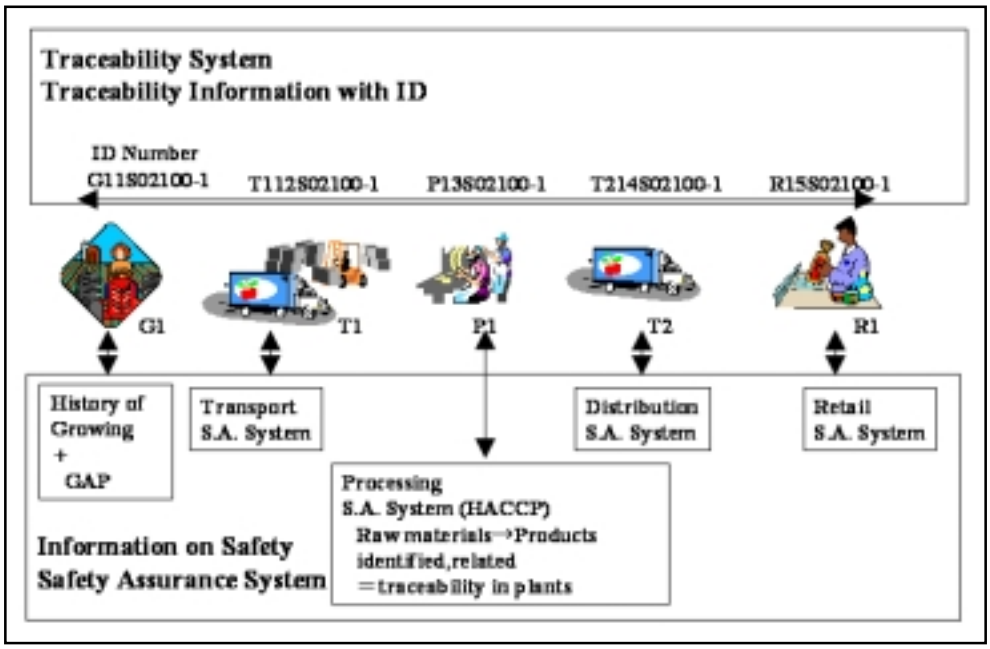

Fig. 4. Food safety chain.

As long as some growers do not adopt safer practices, all growers face the economic consequences of an outbreak. Growers adopting a new production practice expect to receive a higher price for a higher quality good. If a contaminated produce is traced to their operations, their reputation can be damaged. Often, it is only until an outbreak occurs when a grower realizes the effect of an incident to his operation. As a better food safety practice, third-party audits are requested by many retailers as a condition of transaction.

If the price of produce was dependent on its safety, this could be an incentive for growers to provide safer foods. In this sense, consumer responsibility is critical. If consumers evaluated growers' effort in food safety, then the environment for consumer confidence in purchasing safer foods would soon be established. Educating consumers on food safety is critically important for all.

Lastly, I would like to address the necessity of international collaboration. To make a food safety chain in each country, we need the information on internationally traded foods. In Japan, for instance, the food self-sufficiency ratio is only 40%. If imported foods have no safety and traceability information, Japanese consumers may never have confidence in buying these foods.

Food safety is a common concern of consumers around the world. But the many safety assurance systems in the world, including the confusion, duplication and inconsistency among them, create problems for those wanting to implement such a system. Thus, harmonizing these systems is critical. We need to collaborate more closely to establish an environment for supplying safer produce with confidence around the world.

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