Guidelines for Introduction of Food Traceability Systems

(Guidelines for Food Traceability Systems and Case Study of Traceability Systems)

March 2003

Committee on the Guidelines for Introduction of Food Traceability Systems

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Part I. Fundamentals of traceability systems

Part I describes the fundamental matters of traceability systems to provide reference data to the agricultural, forestry and fisheries producers, food manufacturers, distributors, retailers, food service industries, takeout food suppliers and other related industries that now plan to introduce traceability systems as optional mechanisms.

1. Scope

The scope of foods and industries covered by these guidelines are as follows:

1-1. Type of foods covered

- Scope of foods covered:
  All kinds of food

1-2. Type of industries covered

- Scope of industries and others covered:
  Business corporations, organizations and individuals engaged in the production, preparation/processing, distribution and sale of foods.

2. Related laws and other rules

The laws and other rules concerning traceability systems are as follows:

Law for Standardization and Rationalization of Quality Labeling of Agricultural and Forestry Products (JAS Law)
Agricultural Produce Inspection Law
Agricultural Chemicals Regulation Law
Fertilizer Control Law
Pharmaceutical Affairs Law
Feed Safety Law
Slaughterhouse Law
Law for Special Measures for Controlling Bovine Spongiform Encephalopathy
Bill for Special Measures concerning Management and Transmission of Information for Identification of Cattle
Food Sanitation Law
Nutrition Improvement Law
Edible Bird Processing and Inspection Law
Law for Preventing Unjustifiable Lagniappes and Misleading Representation

Product Liability Law
Measurement Law
Unfair Competition Prevention Law
Guidelines for Traceability of Domestic Beef

3. Definitions

All kinds of food

All the substances and products that are intended for consumption by humans as foods or beverages or are reasonably expected to be consumed by humans.

Food traceability

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.

Notes: 1. "Tracking" or "tracing forward" refers to pursuing in the downstream direction, and "tracing" or "tracing back" refers to pursuing in the upstream direction.

2. The measures to track or trace that are taken at part of the stage of the food chain (production, preparation/processing, distribution or sale) are here referred to as the "measures aiming at constructing a traceability system."

<References>

- Definitions of the term traceability: ISO9000/2000:
  "Ability to trace the history, application or location of an entity for consideration."
  For reference: "Traceability of a product" has relations to the following matters:
  - Source of materials and parts
  - History of processing
  - Post-shipment delivery and existence of the product

  Note: ISO8402/1994 was incorporated into ISO9000/2000.

- "EU's General Food Law (Regulation (EC)No.178/2002)

"'traceability' means the ability to trace and follow a food, 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"

Ability to pursue and investigate retroactively food, feed, animal products and the substances intended for use or expected to be used for these products at all of the stages of production, processing and distribution."

- Association francaise de normalisation (AFNOR), "Agriculture et industrie alimentaire – Ligne direcrices pour l'establissement d'une demarche de tracabilite dans les filieres agricole et alimentaires":
  "Traceability in agriculture and the food industry sector is applied mainly to two combinations, i.e., product/process (progress), and product/localization (location). Traceability can be described, as it were, as a combination of the flow of substances and that of information."

Lot

The unit of the food product processed or packaged in a similar condition that is handled at each stage of the food chain. In some cases, the term “lot” is also used to refer to “a mass of products that are the same in such characteristics as type, category, size, package, trademark and place of origin.”

What is regarded as a lot differs according to product item.

Notes: 1. In agriculture, the production (of a crop of the same variety cultivated by the same procedure) per field, plot, producer or producers’ group can be dealt with as a lot. In aquaculture, the production (of the same marine product cultured by the same procedure) per culture waters, fish preserve, producer or producers’ group can be regarded as a lot. In fishing boat fisheries, the production per fishing waters, fishing boat, fisher or fishers’ group can be dealt with as a lot. If a group of producers is used as a unit, there is the need to standardize the production method by, for example, making an agreement on cultivation or aquaculture for the area concerned.

2. As for poultry, the term “lot” is defined as those grown in the same poultry house and given the same feed and water, for which the same vaccine and animal drugs are used.

3. A combination of different lots or products that are repacked in the same condition is called a non-uniform lot.

<Reference>

- Definitions in the JIS:
  A mass of articles of the same kind that are collected for a particular purpose. According to its purpose, a lot is called order lot, purchase lot, production lot, transportation lot, or inspection lot (JIS Z 8141 Production Management Terms).
  A specified quantity of articles produced in the same condition or in a condition considered to be the same (JIS Z 9211 Energy Management Terms (1)).

Data

Recorded information.

Production (cultivation, breeding, aquaculture, catching)

Cultivation and harvesting of farm produce, storage of harvested crops, breeding of animals, milking, egg collection and fattening. Culture of marine products. Catching of animals and fishes, shellfishes and other marine products.

Production

The process of making semi-finished and finished products from raw materials.

Preparation

Such work as removing unnecessary or foreign substances to facilitate processing and cooking.

Processing

Processing raw materials by an artificial method.

Distribution and sale

Moving commodities in a good condition from the producing location to the consuming location or from the supplier to the consumer, or storing them, and supplying them to the consumer and other users.

Process

Procedure and method of production, preparation/processing, distribution and sale.

<For reference>

- Explanation of the term in ISO9000:
  " Set of inter-related resources and activities which transform input into output "

Identification

To identify, by reference numbers, identification (ID) numbers or others, (1) an individual, individual product or lot, (2) food business operators, and (3) place of production. Products are identified by documents with no ID numbers in some cases, but it is desirable for management purposes to give a number to each product.

Identification unit

The unit used for identification. It is individuals, individual products or lots, and may change when the shape or packaging method of food products is changed at any stage of production, preparation, processing, distribution or sale.

Identification mark

The mark used for identification. Reference numbers or ID numbers are used as identification marks in most cases.

Hazard

The state of the biological, chemical or physical substances related to food or the state of food that may have adverse effects on health.

Risk

The function of the probability for adverse effects on health caused by a hazard and the degree of such adverse effects.

<For reference>

- Definition of the term in JIS
  Combination of the probability for an injury and the degree of such injury (JIS B 0134 Industrial Manipulating Robot ? Terms).

Risk management

The process of drafting and evaluating multiple options for policies and measures for reducing risks by consultation with all parties concerned and determining, implementing and improving appropriate policies and measures.

Traceability system

A series of mechanisms for traceability, by which “identification,” “data preparation,” “data collection and storage,” and “data verification” are performed.

The system is composed of an organization and a system, documented procedures, a process, management resources (personnel, financial resources, machinery, equipment, software, technologies and techniques), rules and education and training.

Food business operators

Those engaged in the production, preparation, processing, distribution and sale of food products. Including producers, food industries and food-related trade associations.

4. Purposes of introduction of traceability systems and important considerations

4-1. Purposes

Traceability systems can track and trace food and its information at each stage of the food chain (e.g., production, processing, distribution), and can achieve the following purposes:

(1) Greater reliability of information

1) Traceability systems can secure the transparency of distribution routes.

2) The systems can provide information to the consumer, the customer and the competent government agency quickly and positively.

3) The systems reinforces the verifiability of product labeling by securing the complete agreement between the product managed by an ID number and its label.

4) As a result of the above, the systems help prevent misidentification of labels and information and make transactions fairer.

In particular, the systems enable consumer to get correct information about food and its suppliers, and to make good use of this information when they buy food products and take steps to prevent risks. The systems also enable the customer and the competent government agency to obtain accurate information and to use the information for product and risk management purposes. As a result, the systems help food business operators increase reliability of their products.

(2) Contribution to improvement of food safety

1) If there occurs an accident related to food safety, traceability systems help trace the cause quickly and easily.

2) The systems help collect and remove a problem food product correctly and promptly by zeroing in on the product and tracing it to its destination.

3) In addition, the systems make it easier to collect data about unexpected impact on health and long-term effects and help develop risk management techniques.

4) The systems help define the responsibility of food business operators.

1) and 2) above make it possible to minimize both damage to the consumer and economic loss of the entire food chain.

(3) Contribution to higher business efficiency

Traceability systems help increase the efficiency of product management (e.g., inventory management) and quality control work by managing products by ID numbers and by storing and offering information about the origins and characters of products. This will contribute to cost saving and improvement in quality.

In most cases, the purposes listed in (1) to (3) above will be pursued at the same time, but their priority may be different according to product characteristics, state of the food chain, and consumer

demand. When building up a traceability system, a food business operator concerned should determine on which purpose they place emphasis considering these factors.

4-2. Important considerations

While traceability systems are effective tools, they may have the limitations and problems mentioned below. Thus, sufficient care should be taken when planning their introduction.

(1) Technical problems

1) The scope of application differs according to the character of the product, work or sector. Traceability systems are affected by various factors, such as the nature and state of raw materials, lot size, cargo collection, division and transportation method, production and manufacturing method, packing method, number of stages from production to retailing and scale and number of food business operators.

2) Traceability systems become less efficient in the following cases:
   - The processes (e.g., order placement and receiving procedures) differ among the food business operators concerned.
   - The information is unreliable.
   - Transmission of information between food business operators is difficult to do (or is often interrupted).
   - Lots are non-uniform.

(2) Economic problems include the possibility that attempts to track or trace food and its information more accurately may result in very high costs.

Food business operators should compare the target and effect to be achieved with the costs needed when they build up a traceability system. In particular, small enterprises should devise effective strategies for funds and human resources. Effective methods include to collect as much information about traceability as possible in advance and narrow down the objective and scope, and to save costs by joint efforts with other enterprises.

The main costs needed for introducing and managing a traceability system include the following:

1) Costs for drafting the basic idea and procedures necessary for construction of a traceability system
2) Costs for purchasing necessary equipment (e.g., measuring appratuses, information processing equipment)
3) Costs for managing the system, such as identification, recording, arranging and storing information, education and training
4) Costs for inspection by the third party to secure the system’s reliability

(3) The traceability system is the system for tracking and tracing food and its information, and does not directly perform safety (sanitation) management, quality control and environmental management in the production process. Therefore, separate systems should be introduced to do these management tasks. These management systems have the following world standards.

When a food business operator plans to provide information about product safety and quality and about environmental management by traceability, it should study the possibility of introducing these global standards as well to ensure the reliability of such information.

- Safety (sanitation) management systems: HACCP
- Quality control systems: ISO9000 series
- Environmental management systems: ISO14000 series

It is effective that a food business operator uses its ingenuity in introducing a traceability system.

Thus, a food business operator should strive to take steady action by, for example, employing a step-by-step strategy and compiling a basic plan and a procedure manual in advance to obtain an agreement from those concerned.

(4) In implementing traceability, compliance should be ensured to observe related laws and regulations.

5. Fundamentals of introduction of traceability systems

5-1. Recording and storing of information at each stage

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.

5-2. Mechanism for food identification

The identification management of food (products and raw materials) is the basis for establishing traceability.

This task is composed of the following elements:

a. Determine the unit (identification unit) of the products and raw materials to be traced and manage them by assigning ID numbers to them.

b. Segregate and manage products and raw materials for each identified unit.

c. Correlate the identification unit of products and raw materials with their suppliers and purchasers, and record this information.

d. Correlate the identification unit of raw materials with that of semi-finished and finished products, and record this information.

e. If raw materials or products are combined or divided, correlate the identification unit before the combination or division with that after such work, and record this information.

Further details are as follows:

(1) Determination of the identification unit (a., b.)

Food business operators should determine the identification unit of their products. Properly determined identification units help them trace products efficiently.

Identification units are individual products and lots, and should be specified using identification marks.

Identification units often change according to the stage of the food chain (production and shipment, preparation and processing, distribution and sale).

(2) Meaning and formation of lots (a., b.)

When the identification unit is a lot, it is important to determine the conditions for forming the lot.

The meaning of lots can be considered from the following two sides:

- Risk management: In the event of an accident, the identified lot is used as the basis of recalls or removal of the product and of the investigation of the cause. Thus, whether or not the lot of the product is properly formed affects how effectively the product can be recalled or removed and how effectively the cause can be investigated.

- Provision of labeling and other information: To ensure the correspondence between the description of the label and the product, there should exist a mechanism by which lots are formed according to the information of the label and these lots are segregated and supplied.

In light of the meaning of lots mentioned above, lots are mostly determined considering the following matters:

From the standpoint of risk management, it is necessary to organize the lot within the scope of products produced and processed in the same conditions (e.g., raw materials in the same state, the same date of production). If the lot is small, it is possible to narrow the scope of products to be recalled in the event of an accident, and it is easier to find the cause. But the costs of segregation will be greater.

From the viewpoint of product labeling, the items shown on the label (e.g., product categories, raw materials) should be able to be segregated by the lot. If the number of these items increases, it becomes necessary to make product classification more detailed and to make the lot size smaller, and so the segregation costs grow larger. There is the need to study a balance between consumer demand and needs for business activities.

In addition, when there are the divisions required for transactions, such as the standard for farm produce, it is also needed to give considerations to such divisions.

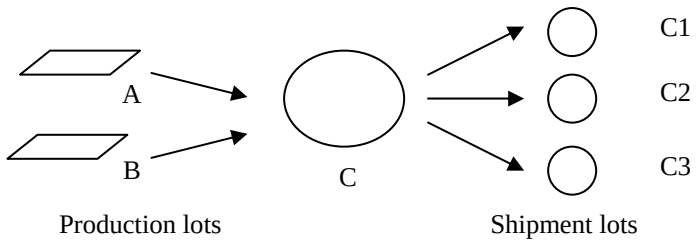
(3) Product identification at each stage (c., d., e.)

1) Production and shipment stages

The system should be established so that the production lot can correspond with the shipment lot.

While the production lot is identified by the place of production or the producer, information about cultivation, breeding or aquaculture, and others, the place of shipment or the shipper, standards, and other shipment information are used in addition to identify the shipment lot. The type of information used for identification should be selected for each system in consideration of the discussion (2) above.

If the production lots of the two producer groups using the same production method are combined and are then divided into three shipment lots with different standards, the correspondence between these lots will be as follows:



In this case, the products composing each lot should be represented by uniform information.

Here, the following confirmation and recording tasks are necessary:

i. At the time of production

- Give a lot number to each production lot.
- Input or record the information needed for identification.
- Confirm and transmit the information (production lot number, label and invoice).

ii. At the time of shipment

- Confirm the information (production lot number, label and invoice).
- Collate the production lot number with the shipment lot number and record them.
- Input or record the information needed for identification.
- Confirm and transmit the information (shipment lot number, label and invoice).

2) A Preparation, processing, distribution and sale stages

What is needed is that “it is possible to track and trace the history of food, such as processing and distribution.”

The history of food includes the information that helps identify the food business operator that owns the food, the date, the place and the lot.

In a traceability system, the history of food is managed and retrieved by the lot number.

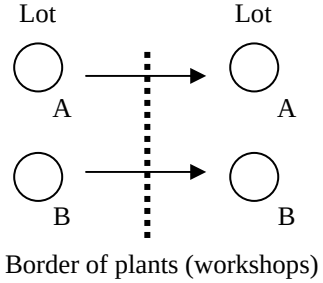
Some food business operators may want to add various other data (e.g., ingredients, temperature, date of preparation, pesticide residues and other inspection records) as production process information, according to the characteristics of the food. Food business operators determine the additional information considering its usefulness and the costs involved. In this case, businesses should organize the lot of products so that it may correspond with such additional information, and should also distinguish these products from other products. The products composing the lot should be represented by uniform information.

i. Formation, movement, integration and division of lots

Food business operators should build up their in-house system so that the correspondence between the lot before and after movement or other work may be clearly known (so that the correlation between the incoming shipment lot and the outgoing shipment lot and between the lot before work and the lot after work may be known).

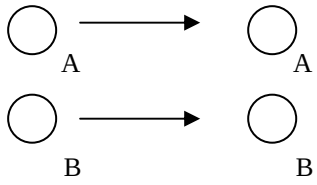
The formation and movement of lots can be organized by any of the following six patterns in the process of any food business operators:

a. Receipt of the shipment lot (movement between food business operators)



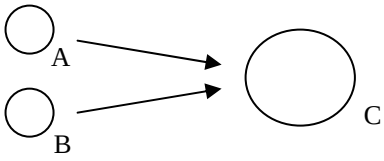
- Check the incoming shipment lot and its information (identification number, label and invoice).
- Collate the incoming shipment lot number with the supplier, and record them.
- Input or record the information on the label of the lot or in the invoice.
- According to the type of work expected in the future, prepare an in-house invoice (in the case of b. above) or a work instruction (c., d., e.) and attach it to the lot.

b. In-house movement and storage by lot (no change in the products composing the lot)



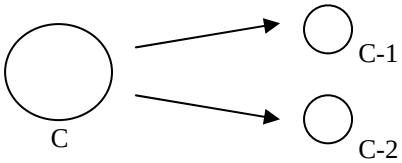
- Check the lot and its information (identification number, label and in-house invoice).
- Input or record the information.

c. Integration of lots (e.g., integration of two lots into a new lot)



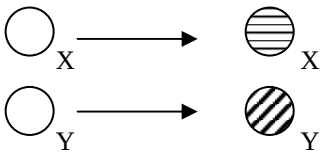
- Check the pre-integration lot and its information (lot number, label and invoice or work instruction), and record the information.
- Assign a new lot number to the integrated lot.
- Correlate the pre-integration lot number with the post-integration lot number, and record the information.
- Input or record information about integration work needed for identification, if any.
  This information includes the date of integration, the weight of the integrated lot, and other information about the state of integration work.
- Prepare the label and invoice of the integrated lot and attach them to the lot.

d. Division of a lot (e.g., division of a lot into two or more lots)



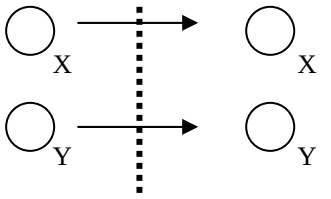
- Check the pre-division lot and its information (lot number, label and invoice or work instruction), and record the information.
- Assign a new lot number to the divided lot.
- Correlate the pre-division lot number with the post-division lot number, and record the information.
- Input or record information about division work needed for identification, if any.
  This information includes the date of division, the weight of the divided lots, and other information about the state of division work.
- Prepare the label and invoice of the divided lots and attach them to the lots.

e. Heating, freezing, drying or other processing involving no lot integration or division



- Check the pre-processing lot and its information (lot number, label and invoice or work instruction), and record the information.
- Input or record information about processing work needed for identification, if any.
  This information includes the date of processing, the weight of the processed lot, and other information about the state of processing work.
- Prepare the label and invoice of the processed lot and attach them to the lot.

f. Shipment of a lot (movement between food business operators)

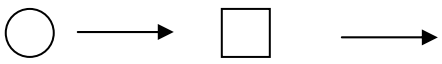


- Check the shipment lot and its information (identification number, label and invoice), and record the information.
- Check the shipment lot number and the supplier, and record them.

Food business operators should establish a mechanism in which different lots may not get mixed with each other in any of the above-mentioned cases.

ii. Use of in-house identification numbers

When in-house identification numbers are used at the preparation and processing and distribution and sale stages, the incoming and outgoing shipment lot numbers and the in-house identification numbers should be correlated with each other and recorded.



Incoming shipment lot number	In-house identification number	Outgoing shipment lot number

5-3. Internal inspection

Internal inspection is important in securing the reliability and increasing the function of a traceability system.

In internal inspection, it is desirable to:

- Check whether the work is performed according to the predetermined procedures.
- Check that food and its information can be tracked and traced.
- Check changes in the weight and quantity of food during the work.

In addition to internal inspection, the food business operators with traceability systems may mutually inspect their products.

(1) Documented internal inspection procedures

The procedures for tracking or tracing the food and its information of a particular lot number and for checking changes in the weight and quantity of food during the work should be established and made into written in-house inspection procedures.

(2) Inspection according to the in-house inspection procedures

Inspection should be implemented according to the inspection schedule and its results should be

recorded.

To make good use of inspection results, inspection should be carried out by the PDCA (plan-do-check-action) cycle. For this purpose, the organization and system should be established, the inspection standard should be created, and inspection plans and records as well as audit records should be developed.

In addition, to minimize the burden of internal inspection, it will be effective to compile manuals of information inputting and recording and to give periodical training to personnel and employees.

5-4. Third-party inspection

The inspection of food business operators and others by a proper third-party organization specializing in audit and inspection is an effective method for keeping the function of the traceability system on a high level, identifying and solving the problems of an internal system through use of external know-how, and gaining greater consumer trust.

Third-party inspection will require a certain amount of costs, and so how to implement this inspection should be studied in overall consideration of the service provided by the third-party inspection organization.

5-5. Provision of information to the consumer

In general, there are two methods of providing information to the consumer: (1) to provide information only about the fact that a traceability system is introduced; and (2) to provide history information.

(1) Case where information only about the fact that a traceability system is introduced is provided:

The information provided should include the fact that a traceability system is introduced, and the identification numbers and points of contact. The points of contact are the food business operators and individuals who sell food or offer food service to the consumer.

When an inquiry is received from the consumer, if the history information is stored in a commonly used center (that is managed by a group of food business operators), the history information is collected and arranged by accessing the center and then is provided to the consumer. If the history information is owned by individual food business operators, such information must be collected from each of the enterprises. Thus, the parties concerned should agree in advance on the enterprise in charge of this task and on the method of the task.

(2) Case where history information is provided:

In this case, the history information is provided mainly at the store or on Internet homepages. A prior agreement should be got about common rules to guarantee consumer convenience (information easy to understand, easy access) and reliability of information and to protect private information.

Food business operators should always provide the consumer with information positively and by a consumer-friendly method. If a food-related accident occurs, more detailed information should be disclosed.

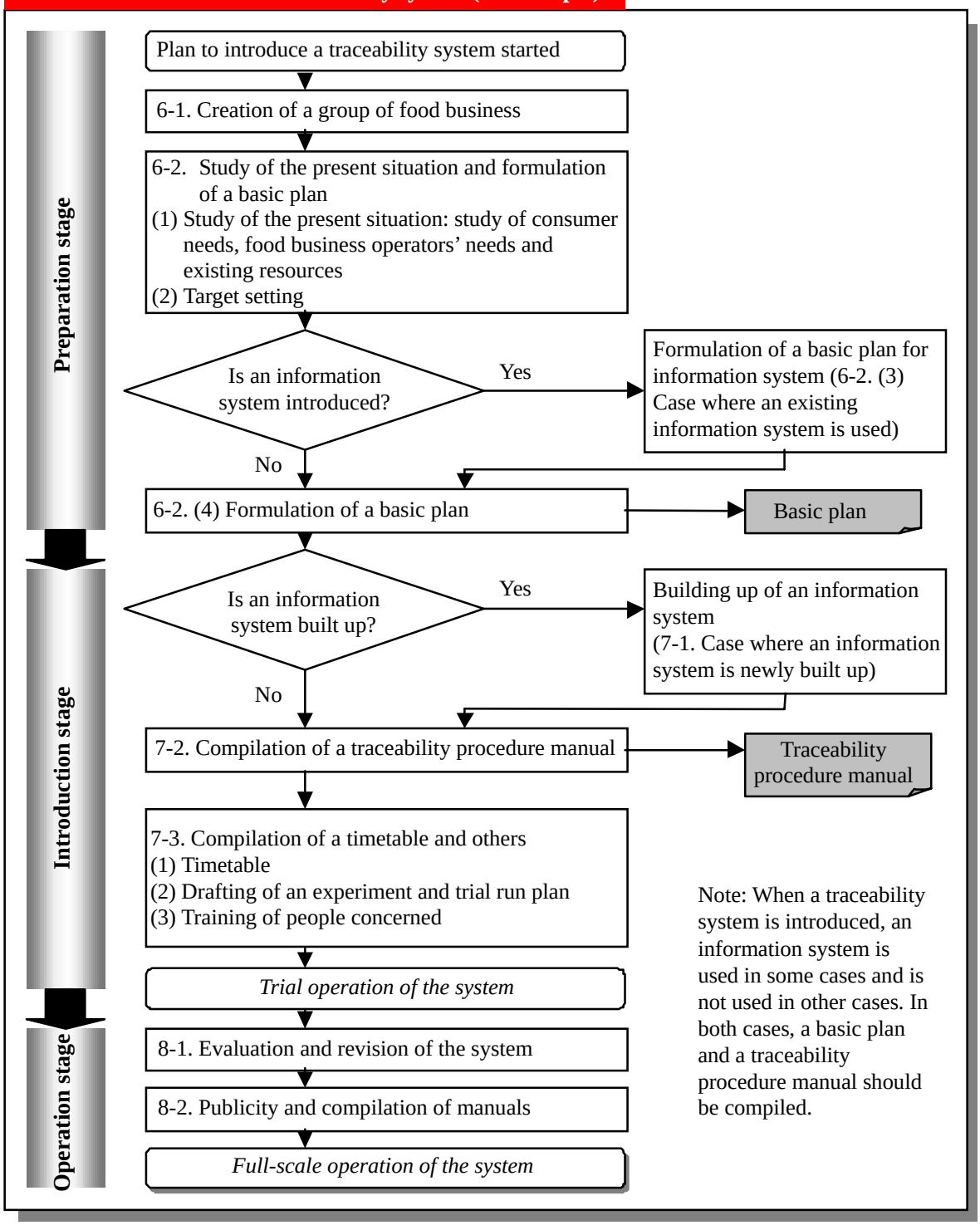
It is especially effective to promptly disclose facts and future action to the consumer. In this case, there is the need to determine the principles of disclosure beforehand. If the traceability system covers two or more food business operators, the rules of disclosure, such as timing, content and method, should be agreed between these enterprises. Because disclosing information via the mass media and on the Internet is effective, it is desirable to decide the method of this disclosure in advance.

Part II. How to introduce a traceability system

The following is only an example of how to introduce a traceability system. Thus, the food business operators that plan to introduce a traceability system should select the method suited to them considering the degree of needs, products handled, trading situations and scales, and other related factors.

The chart below shows the sample flow of introduction of a traceability system.

Flow of introduction of a traceability system (an example)



6. First stage of introduction of a traceability system

6-1. Creation of a group of food business operators

To introduce a traceability system into the food chain, it is important to create a group of food business operators anew or a special body in an existing group of food business operators for the purpose of building up the system. This is because unless related enterprises have an agreement in advance on the definition of identification units and lots, the format of identification numbers, the method of transmitting information (means to transmit, format of labels and invoices, bar codes and electronic information) and other matters, products and lots and their information cannot be transmitted efficiently from enterprises to enterprises.

As for the product items having many stakeholders in the process from production to sale, and those with complex processing or distribution procedures before reaching the consumer, it is especially important to secure the vertical coordination between enterprises at the stage of production, preparation and processing, and distribution and sale as well as the horizontal coordination at the same stage. In the case of small food business operators or in the sector having many small enterprises, joint efforts through a group of enterprises make information collection easier and help save costs.

What is desirable is to create a body or process for laying down common rules about the policy of the entire business world for introducing a traceability system into the food concerned, the strategy for activities until establishment of traceability and the method for data transmission.

In some cases, even after a group of enterprises has been established, considerable time is needed for reaching an agreement on common rules because there are many stakeholders in the process from production to sale. In such a case, it will be realistic to phase in a traceability system. For example, traceability can be realized at the processing to sale stages at first, and can then be extended to the production to processing stages, securing continuity and based on the result of the first step.

If much time is required in creating a group of food business operators, or if it is difficult to secure coordination between the existing information systems of enterprises concerned, it may be effective that respective enterprises collect and store records of the suppliers of raw materials, buyers of food and other matters internally and in cooperation with the enterprises immediately before and after them (“measures aiming at constructing a traceability system”) and then gradually expand this task to other enterprises. Therefore, this strategy should be considered.

In the case mentioned above, it is needed that the enterprises concerned disclose to other enterprises concerned the scope of the measures aiming at constructing a traceability system and the details of the system (e.g., method of transmitting information) so that enterprises may find the partners with whom they can connect the system easily. But the enterprises at this stage must not advertise that they are implementing traceability throughout the food chain.

To facilitate such connection of the systems of respective enterprises and to make these efforts extend into traceability all through the food chain, it is effective that a trade association, cooperative association or any other organization of the product concerned compiles and distributes guides and guidelines for traceability of the product, such as the method of identification and that of

transmission of information.

Also effective is to establish a database of enterprises that are positive toward introduction of traceability and to encourage proper enterprises based on such database to join with each other in traceability.

6-2. Study of the present situation and formulation of a basic plan

(1) Study of the present situation

1) Study of consumer needs

Consumer needs (e.g., expectations for the product, product information they want to know, how to get such information) should be studied.

2) Process of the product and study of food business operators' needs

The flow of the product should be clearly shown, and the raw materials and product information food business operators want to know and the media they want to have should be studied.

3) Study of existing resources

The resources needed for developing a traceability system that the food business operator, the individual or the organization to which the enterprise or individual belongs owns should be studied:

- Awareness and understanding of interested parties of traceability
- Policy for coping with the risk of food-related accidents
- ISO and HACCP certifications obtained
- Present state of information technology introduced (hardware, software)
- External information collected (e.g., technical manuals, standards, related laws and ordinances)

(2) Target setting

1) Target setting

The target of the traceability system should be set according to "(1) Study of the present situation" above. The items of the target are "basic idea," "roles," "expected effects," and "basic specifications of the system."

i. Basic ideas: Background and need of introduction of a traceability system, basic stance of building up the system

ii. Roles: The roles of the system should be defined referring to 4-1. above.

iii. Expected effects

iv. Basic specifications of the system:

a. Scope

- Which items and categories should be covered?
- Which customers should be covered?
- Which of the upstream to downstream stages should be covered?
- Definition of identification units and lots

b. Determination of the type of information to be transmitted and exchanged

- What kind of information should be transmitted and exchanged?
- What type of media should be used? (Two or more media may be used)

c. Kind of information recorded

- What type of information should be recorded?
- What degree of accuracy is required for the information?

d. Internal inspections

- Main inspection points
- Inspection items and method

2) Checking of the possibility for extending the existing business method and the possibility for coordination of food business operators

Whether the above-mentioned target can be attained by making a minor change in the documents (e.g., invoices, delivery slips) and in the order placement and receiving system that are now used should be checked.

Also, whether information can be exchanged between food business operators efficiently should also be checked.

3) Review and final determination of the target

If as a result of checking of 2) above, it is considered desirable to change the target set, the target should be reviewed and the final target should be established.

(3) Case where an existing information system is used

If it was decided in the basic specifications of the system to use an existing information system, a basic idea for the information system should be devised by examining the following matters and, the result should be included in the basic plan.

1) Basic direction of the information system for establishing traceability

Several information systems should be compared with each other to find a system suited to establishment of the traceability system in operation, and efforts should be made to secure harmonization of the code and communication systems used at each stage.

- Use and coordination of information systems in operation
- Possibility of establishing a joint-use information center
- Comparison of existing information systems
- Code system adopted
- Communication system adopted

2) Basic direction of the structure for promoting an information system

On the basis of the “basic direction of the information system for establishing traceability” discussed above, an ideal way of the structure for promoting the system should be examined.

- Structure for building up the information system
- Structure for operating the information system
- Establishment of a structure and point of contact for providing information to the consumer

3) Formulation of a basic plan for information system

By arranging the results of examination above, a “basic plan for information system for establishing a traceability system” should be drawn up, and an agreement on the plan should be obtained from stakeholders. Because it is desirable to introduce the information system step by step in most cases, priority tasks should clearly be distinguished from future tasks in the timetable. If possible, the role of members should be determined and the costs involved should be estimated at this stage.

- Target of the system (basic specifications of the system)
- Basic direction of the system (code and communication systems)
- Promotion structures (structures for building up and operating the system, structure for providing information)
- Promotion timetable

(4) Formulation of a basic plan

Based on the results of the above examination, a basic plan should be formulated and documented, which should contain the basic ideas, roles, expected effects and basic specifications of the system. Copies of this basic plan should be distributed to people in charge and customers to help them share the recognition of traceability.

7. Second stage of introduction of a traceability system

7-1. Case where an information system is newly built up

In the case where an information system is newly built up to establish traceability, the following matters should be studied to build up the system:

(1) Job analysis for carrying out the basic design of the information system

- Definition of identification units and lots
- Analysis of incoming and outgoing shipment jobs
- Situation of computer use (e.g., databases, code system)

(2) Arrangement of specifications for basic design of information system

- Database specifications
- Input/output specifications
- External communication specifications
- Hardware composition of the system (including the possibility of establishing a joint-use database center)

<The method of developing an information system includes development by the food business operator itself, development by outsourcing, and use of an ASP (application service provider who rents application software to the customer on the Internet). Which of these is desirable should be determined by comparing the performance and costs.>

<Case where the development of an information system is outsourced>

- Preparations for outsourcing the development of the information system
- Determination of the subcontractor
- Management of the subcontractor

<Case where the development of an information system is carried out by the food business operator itself>

- Basic design of the information system
  Attention should be paid to the data backup method and the security system as well.
- Design for operation of the information system
  In determining the code system, attention should be paid to harmony with the existing system.
- Development of the information system

7-2. Compilation of a traceability procedure manual

A manual for operating and managing the traceability system should be compiled on the basis of the basic plan.

(1) Preparations for manual compilation

Before the manual compilation work, the characteristics of the product concerned should be checked

and arranged from the following viewpoints:

1) Study the handling unit of the product and its raw materials and the production and distribution flows of the product (e.g., integration, storage, movement). This task also includes the study of the method of handling the product itself and that of information and product management. This provides basic materials for setting up an identification system.

2) Study what kind of hazards and risks to sanitation, safety and the environment exist in the flows of the product, and what countermeasures are taken.

3) Define the work necessary for compliance at each stage, including observance of provisions of related laws about sanitary requirements and labeling items.

(2) Compilation of a procedure manual

A procedure manual should clearly define when and where the work should be carried out, who should carry out the work and the type of work to be carried out. The description of work should include a series of work for product identification, information items to be recorded, recording and storing method, storing period, and other matters.

If the food business operator has already obtained certification of the quality control ISO9000 series, sanitation management HACCP, environment management ISO14000 series and other certification systems and plans to offer this management information by a traceability system, harmonization between the management information and the traceability system should be secured.

7-3. Compilation of a timetable and others

After the procedure manual has been compiled, the compilation of a timetable and other documents for activities according to the manual and other related work should be carried out.

More specifically, (1) a timetable and (2) an experiment and trial run plan should be drafted, and (3) the training of people concerned should be conducted.

(1) Timetable

A timetable of the period of education and training and that of experiments and trial runs should be drafted.

(2) Drafting of an experiment and trial run plan

To confirm the effectiveness of the system, it is desirable to conduct experiments and trial runs.

It is effective to specify checking items in the experiment and trial run plan and to record checking results and use them for system improvement purposes.

(3) Training of people concerned

In some cases, it will be possible to establish a special section for operation of a traceability system. But in general, those in charge of purchase of food, shipment of products or distribution will have to perform tasks for the system in addition to their usual duties. Thus, consideration should be given

not merely to personnel assignment but to work efficiency as well.

Traceability systems are not very familiar to most people. Therefore, to avoid confusion at the initial stage, it is effective to give training to them so that they may acquire the ability to quickly and accurately input data and perform such other tasks as collation and recording.

Before experiments and trial runs, training programs should be given to those concerned with the traceability system so that they may be given explanations about the procedure manual, the nature of tasks, the method of receiving and providing information and other matters.

After these training programs, the experiments and trial runs of the system should be conducted.

8. Important considerations after introduction of a traceability system

8-1. Evaluation and revision of the system

Based on the result of experiments and trial runs of the traceability system, the system should be evaluated and revised as is necessary.

8-2. Publicity and compilation of manuals

(1) Internal and external publicity

This publicity aims at declaring the determination to begin activities for realizing traceability or at informing the consumer of the fact that traceability has been realized in an attempt to have their understanding. It is effective to create a structure for listening to the consumer's opinions, instead of one-sided publicity.

(2) Compilation of manuals

While structures and systems for a full-scale operation of the traceability system should be created, manuals (system, database, operation, and security manuals) should be compiled incorporating a large stock of know-how.

It is also effective to determine rules and regulations among those concerned as required.

Then the system should be operated on a full scale.

8-3. Renewal of the system

(1) Periodical evaluation of the system

A system evaluation plan (evaluation items, evaluation standard, evaluation period, evaluation system) should be drawn up, and system evaluation should be conducted according to the plan.

If internal or third-party inspections are conducted, the result of these inspections should be evaluated.

(2) Renewal of the system

The renewal of the system will be effective in the following cases:

- If as a result of a periodical evaluation of the system, it is concluded that a renewal is necessary.
- If the process of production/shipment, preparation/processing, distribution or sale is changed.
- If related laws/regulations are amended.
- If the related environment, such as trading terms or product items, changes.
- If a new applicable technology is developed.
- If there is a great change in consumption behavior.

If a system renewal results in a change in the exchange of information, care should be taken in cooperation with the customer to avoid any inefficiency.

9. Method of information transmission used in the traceability system

9-1. Media for information transmission

Typical examples of the media used for transmitting the data compiled, stored and collated in the traceability system are listed below. But it should be noted that the media described below are only examples and that as a result of progress of information technology, new media for data transmission are developed day after day.

Each of these media has its own technical limitations and its economic costs related to the product differ from each other. Thus, the food business operators that are considering introducing a traceability system should select the type of media suited to their food products in building up such system.

For example, it will be possible to secure traceability even by using handwritten documents as media and storing these documents.

There are also cases where it is effective to adopt a mechanism capable of using two or more media types or to establish a joint-use database center for data management by the computer.

(1) Paper documents

This is the method by which data is entered in sheets of paper (e.g., forms) to exchange information.

Paper documents have two types: “those used together with the product (e.g., labels, packing materials)” and “those attached to the product (e.g., certificates, invoices, bills, delivery slips).”

The identification method of paper documents include the method by which ID numbers or other symbols are entered for identification purposes, and the method by which identification is made by documents themselves, such as certificates, invoices and labels.

Paper documents may be managed by, for example, recording them in the ledger or by the computer.

(2) Bar codes

This is the method by which symbols composed of many short vertical lines with different thicknesses and intervals (bar codes) are used for exchanging information.

Bar codes are printed on or attached to food packages and other places.

(Characteristics)

- High scanning efficiency
- Scanning is possible without touching the product.
- Inexpensive because the material is paper.

(3) Two-dimensional codes

This is the method by which symbols composed of the black and white dots and lines combined vertically and horizontally in a complicated way are used for exchanging information.

Because information is recorded both vertically and horizontally, two-dimensional codes can contain

more information in a smaller space than bar codes.

Two-dimensional codes have two types: the stack type in which bar codes of reduced sizes are arranged vertically in many stacks, and the matrix type in which black and white dots and lines are arranged in a grid pattern.

(Characteristics)

- Can contain a large volume of information.
- High scanning efficiency
- Scanning is possible without touching the product.
- Inexpensive because the material is paper.
- The reader is more expensive than a bar code reader

(4) Electronic tags (IC tags)

This is the method by which portable data media capable of reading or writing data without touching the product are used for exchanging information.

This method is also known as RFID (Radio Frequency Identification).

(Characteristics)

- Can contain a large volume of information.
- High scanning efficiency
- Scanning is possible without touching the product.
- Can also read through transparent materials.
- Rewriteable
- High security
- The media is a memory and expensive.

	Paper documents	Bar codes	Two-dimensional codes	ID tags
Input/ reading errors	Dependent on the operator's ability	Rarely occur	Rarely occur	Rarely occur
Data storage capacity	Some limitations	Some limitations (maximum of about scores of characters)	Some limitations (maximum of 2,000-3,000 characters)	Some limitations (greater capacity than two-dimensional codes)
Information storage/ management (e.g., volume, period)	Apt to be damaged	Only a few restrictions	Only a few restrictions	Only a few restrictions
Information processing/ retrieval	Slow	Speedy	Speedy	Speedy
System maintenance	Not much needed	Needed	Needed	Needed
Security	Dependent on how to store and manage	Great	Great	Great
Training on operation	Not much needed	Needed	Needed	Needed
Data rewriting	Rewritable	Non-rewritable	Non-rewritable	Rewritable
Reading through transparent materials	Impossible	Impossible	Impossible	Possible

9-2. Code systems

It is important to an efficient data processing to use a common code system for exchanging information in a traceability system.

But care should also be taken to harmonization with the existing code systems already used by each of the food business operators.

Food-related code systems include the following:

(Examples)

(1) The Organization of Food-Marketing Structure Improvement manages codes for vegetables and fruits, meat and marine products.

Standard product name code: Standard product names are expressed by 13-digit codes beginning with 4922.

Product	Outline	Basic code and standard
Vegetables and fruits	The merchandise type of vegetables and fruits is identified by variety (seeds and seedlings) or other factors.	Uniform vegetable and fruit name code (“Vegefru” code)
Meat	The merchandise type of meat is identified by a combination of animal type, parts and dressed meat. Animal type code: information needed for all merchandise forms. Parts cord: Basic information item as the name of dressed carcasses, cut meat and dressed meat. Dressed meat code: item showing the use and portion (cut specifications) of dressed meat.	Beef: Japan Meat Trading Center’s commercial standards Pork: Japan Meat Grading Association’s pork dressed carcass trading standards Chicken: Japan Chicken Association’s chicken retail standards Variety meat: Japan Livestock By-product Association’s classification standards
Marine products	The merchandise type of marine products is identified by biological species, commercial value and other factors.	None

Standard merchandise attribute code items: code items, in addition to product names, for specifying merchandise.

Product	Attribute item
Vegetables and fruits	Quality standard (grade), size standard (class), place of origin, cultivation method, biological classification, sugar content
Meat	Condition, product type, sex, age in month, grade, breeding method, place of origin
Marine products	Condition, shape and parts, processing method, sex, etc., catching method, killing method, standard (size), place of origin

(2) The Distribution Systems Research Institute manages the JAN (Japanese Article Number) Code.

○ This code is a common merchandise code used in distribution and information systems in Japan, and its international name is the EAN (European Article Number).

○ This code is shown on merchandise and other articles as bar codes, and is used in POS (Point of Sales) systems, order receiving and placement systems, inventory systems and inventory control systems.

○ The JAN Code has two types: standard 13-digit type (a JAN maker code is used either for the first 7 digits or the first 9 digits) and short 8-dgit type.

(3) The Distribution Systems Research Institute manages the GLN (Global Location Number) Code.

○ This is the international standard code for transactions between businesses established by the International EAN Association for EDI (electronic data interchange).

○ This code is a 13-digit numeral fixed-length identification code: the first 2 digits show country number (49 or 45 for Japan), next 10 digits are assigned by each country's code center, and the last digit is a check digit.

○ This code has compatibility with the GLN assigned by each country's code center, and enables businesses and food business operators all over the world to identify their customer by only one unique symbol.

○ This code system can use the existing codes in Japan already in use (e.g., JAN Code).

There also exists the following catalog registration service using the code system:

■ The National Food Research Institute and the Organization of Food-Marketing Structure Improvement offer a catalog publication system for vegetables and fruits ("SEIKA").

○ This system enables the user to register and read on the Web information about products, producers and shipment for each product item.

○ This system manages individual merchandise by catalog number and Web address and discloses related information.

○ About 1,700 items of vegetables and fruits are registered.

○ Public database with free access.

○ The system enables the consumer to check information about the merchandise on the Web (A cellular phone can also be used for access, too).

○ The system is compatible with the Internet and the world standards (XML/SOAP).

References

The references used for compiling these guidelines are as follows:

(1) Laws

(1) Regulation(EC)No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

(2) Regulation(EC)No 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation(EC)No 820/97

(3) Commission Regulation(EC)No 1825/2000 of 25 August 2000 laying down detailed rules for the plication of Regulation(EC)No 1760/2000 of the European Parliament and of the Council as regards the labelling of beef and beef products

(3) Proposal for a Regulation of the European Parliament and of the Council concerning traceability and labelling of genetically modified organisms and traceability of food and feed products produced from genetically modified organisms and amending Directive2001/18/EC, Brussels, 25. 7. 2001, COM(2001)182final

(2) Government ordinances and the like

(1) France: Government ordinance on April 2, 1999: “Government Ordinance No. 99-260 of April 2, 1999 concerning Labeling and Traceability of Beef” (Textes generaux, Ministere de l’economic, des finances ed de l’industrie, Decret no 99-260 du avril 1999 relatif a l’etiquetage et a la tracabilite des viandes bovines, NOR: AGRG9502099D)

(3) Trade agreements and ministerial ordinances authorizing these agreements

(1) France: Agreement on February 17, 1998: “Trade Agreement on Representation Obligated to be Made as for the Labels and Sales Promotion of Beef” (Association nationale interprofessionnelle du betail et des viands, 17 Fevrier 1998, Accord interprofessionnel relatif aux mentions devant figurer obligatoirement en matiere d’etiquetage et de promotion de la viande boine)

(2) France: Ministerial ordinance on October 19, 1998: “Ministerial Ordinance on October 19, 1998 Providing for Extension in the Trade Agreement concerning Representation of Beef Concluded by the Association national interprofessionnelle du betail et des viandes (National Trade Association of Animals and Meat)” (NOR:AGRG9801855A)

(4) Standards and guidelines

(1) France: AFNOR (Association francaise de normalisation): “prFD V 01-020 Agriculture and the Food Industry - Guidelines for Establishment of Traceability in the Agriculture and the Food Industry” prFD V01-020:Agriculture et industrie alimentaire - Lignes directrices pour l’établissement d’une démarche de traçabilité dans les filières agricoles et alimentaires, le 13

août 2001.

(2) France: AFNOR (Association francaise de normalisation): “NF V46-007 Grown Cattle, Traceability of Identified Meat, Slaughterhouse” (AFNOR, Gros bovins, Traçabilité des viandes identifiées, Abattoirs, Février1997)

(3) France: AFNOR (Association francaise de normalisation): “NF V46-010 Grown Cattle, Traceability of Identified Meat, Dressing Factories, Boning Work, Processing, Packing and Sale” (AFNOR, Gros bovins, Tracabilité des viandes identifiées, Ateliers de découpe, désossage, travail de la viande, conditionnement et vente, Septembre 1998)

(4) France: INTERBEV (Association national interprofessionnelle du betail et des viandes): “Standard, Procedures and Inspection Plan of French Beef” (INTERBEV, Viande bovine francaise Cahier des charges,Procédures et Plan de contrôle, Réf.:CTVBF01B. doc-Rév.-1-18 mai 1998)

(5) France: INTERBEV (Association national interprofessionnelle du betail et des viandes): “Additional Clauses to the Standard of French Beef - Concerning Clear Representation of Places of Origin (Including Countries of Origin), Races and Maturity” (INTERBEV, Avenant au cahier des charges viande bovine francaise, Portant sur la precision de l’origine, (origine “pays” inclue), de la race, et de la maturation, Réf.:AVVBF02A. doc-Rév.1-16 septembre 2000)

(6) France: ACTA-ACTIA: “Traceability: Practical Guide for Agriculture and the Food Industry” (ACTA-ACTIA, TRÇABILITÉ Guide pratique pour l’agriculture & l’industrie alimentaire, 1998)

(7) France: INTERBEV (Association national interprofessionnelle du betail et des viandes): “CABV01F.doc - 5th edition, May 15, 2001, Standard of Beef Cattle Meat Commercialized at Large- and Middle-Scale Mass Merchandisers” (EU Regulations, (EC)No1760/2000, Specifications concerning Voluntary Representation) (INTERBEV, Cahier des charges Viande de gros bovins issue du troupeau allaitant et commercialisée en grande et moyenne surface, Ref:CABVP01F. doc-Révision5-15mai 2001)

(8) Germany: Nordrhein-Westfalen State Government: “Practice of Beef Representation,” 1st edition, 2002 (Landesamt für Ernährungswirtschaft und Jagd NRW, Praxis Rindfleischetikettierung)

(9) Canada: Office of Food Safety and Recall, Canadian Food Inspection Agency: “Development and Implementation of Food Recall Programs” (May 15, 2001)

(10) U.S.: Directive of the Food Safety and Inspection Service, Department of Agriculture No. 8080.1 (3rd edition): “Guidelines for Product Recall for Businesses”

(5) Documents under discussion

(1) Codex: Codex Food Labeling Sub-committee (May 2 - 10, 2002, at Halifax, Canada)

(2) Codex Alimentarius Commission, Food labelling and traceability, Background paper prepared by CANADA, CL2002/24-FL, June 2002

(3) Draft European Community Comments for the Codex Committee on General Principles, Paris, France, 23-27 April 2001- CX 01/2 Agenda item: Matters Referrd by the Codex Alimentarius Commission and other Cordex Committees -comments on traceability.

(4) Codex Alimentarius Commission, Codex ad hoc Intergoverrmental Task Force on Foods Derived from Biotechnology Second Session Chiba, Japan, 25-29 March 2001,Discussion Paper on Traceability, CX/FBT 01/6 February 2001

(5) Comments Relating to the Discussion Paper on the Traceability,Comments provided by the United States.

(6) Working Draft Traceability system in the agriculture food chain – General principles for design and development, Annes to Doc. ISO/TC 34 N1077

Part III. Case study of traceability system development

In connection with 6-2., (4) above, some cases of development of traceability systems are reported in this part.

[Items reported for each system developed]

(1) Organization that developed and conducted demonstrative tests for the system

(2) System name

(3) Participants in demonstrative tests

(4) Outline and characteristics of the system

(5) Products covered

(6) Method of transmitting information

(7) Lot

(8) Recorded data

(9) Flow of products and information

(10) Costs of building up and operating the system (*)

(11) Benefits to the organizations (that introduce the system)

(12) Method of securing reliability of information

(13) Method of providing information to the consumer

(14) Contact address

(*) “Costs” reported here are the rough costs based on demonstrative tests, and may differ from the costs at the stage of full-scale system operation.

Case study of traceability system development (1)

(1) Organization that developed and conducted demonstrative tests for the system

International Fair Trade Promotion Association (specified nonprofit activities corporation)

(2) System name

Traceability system "Dynamic-TRACE"®

(3) Participants in demonstrative tests

<Raw materials providers>	<Food processor>	<Retailers>
Sankyo Shokuzai (concentrated juice)	Kyushu Milk	OK Co.'s "Fresh Market,"
Sun Daiko (vitamin C)		Takasaki and Shinkawa Stores
Nagaoka Koryo (flavors)		

(4) Outline and characteristics of the system

The system was built up by expanding and restructuring the production control database (DB) system, which was created for realizing proper inventory management and preventing erroneous inputting, as a traceability system. It has the following characteristics:

1. A chain of information is recorded in the DB of a third party (or in the company's own DB).
   1) It is difficult to alter or disguise information.
   2) Tracking and tracing are easy to do.
   3) Physical management at the plant is taken into consideration.
2. Information is recorded and stored at the DB - while the minimum information is recorded in the code attached to the product, all the information is recorded and stored in the DB, which is retrieved as required.
   → Inexpensive equipment can deal with information in the field.
3. 12-digit numeral trace codes are printed on products, and the consumer can read the product information via the Internet by inputting numerals in the personal computer.
   <The system and equipment are described later>

(5) Products covered

Fruit juice - Not only fruit juice products themselves but also other items can easily be handled.

(6) Method of transmitting information

1) The bar code (trace code) assigned by the center DB upon delivery is attached to the raw materials.
2) Each process is recorded in the center DB, and the DB assigns new trace codes each time.
3) At the printing stage, a 12-digit numeral trace code for the consumer is printed on the product.
4) The bar code correlated with the product trace code is attached to the shipment package (case, pallet).

(7) Lot

Described later.

(8) Recorded data

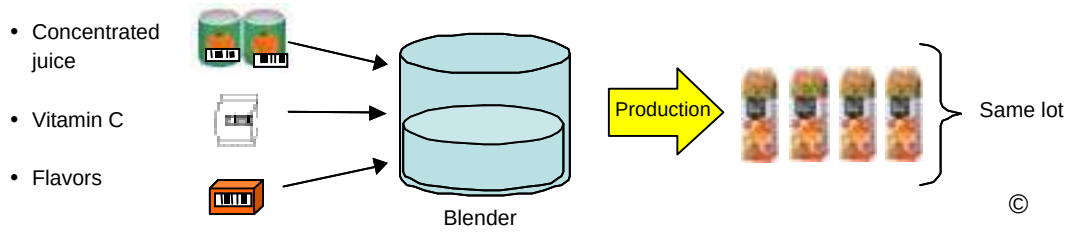
See the figure in the section, “Flow of products and information.”

Bar code (code 39) used at the time of delivery

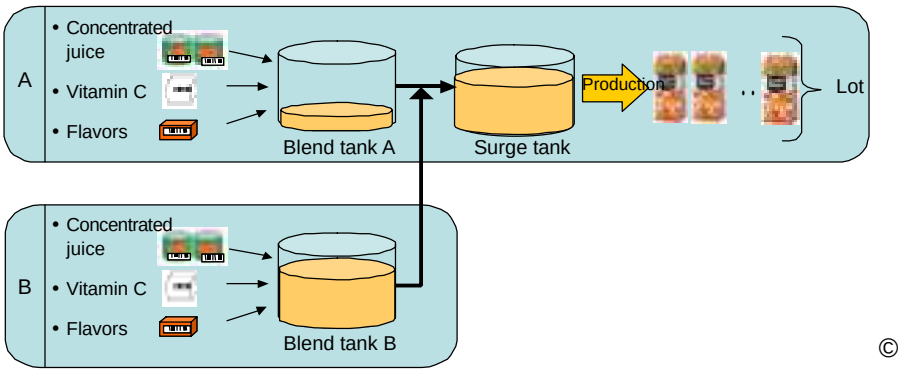
12-digit trace code printed

(7) Concept of lot

In the demonstrative tests, a group of the product made from a mixture of raw materials (concentrated juice, vitamin C and flavors) in the same conditions was defined as a “lot.” In the case where the tank and others are cleansed and sterilized for each mixture, the concept of the lot of the liquid product is as shown in the figure below:

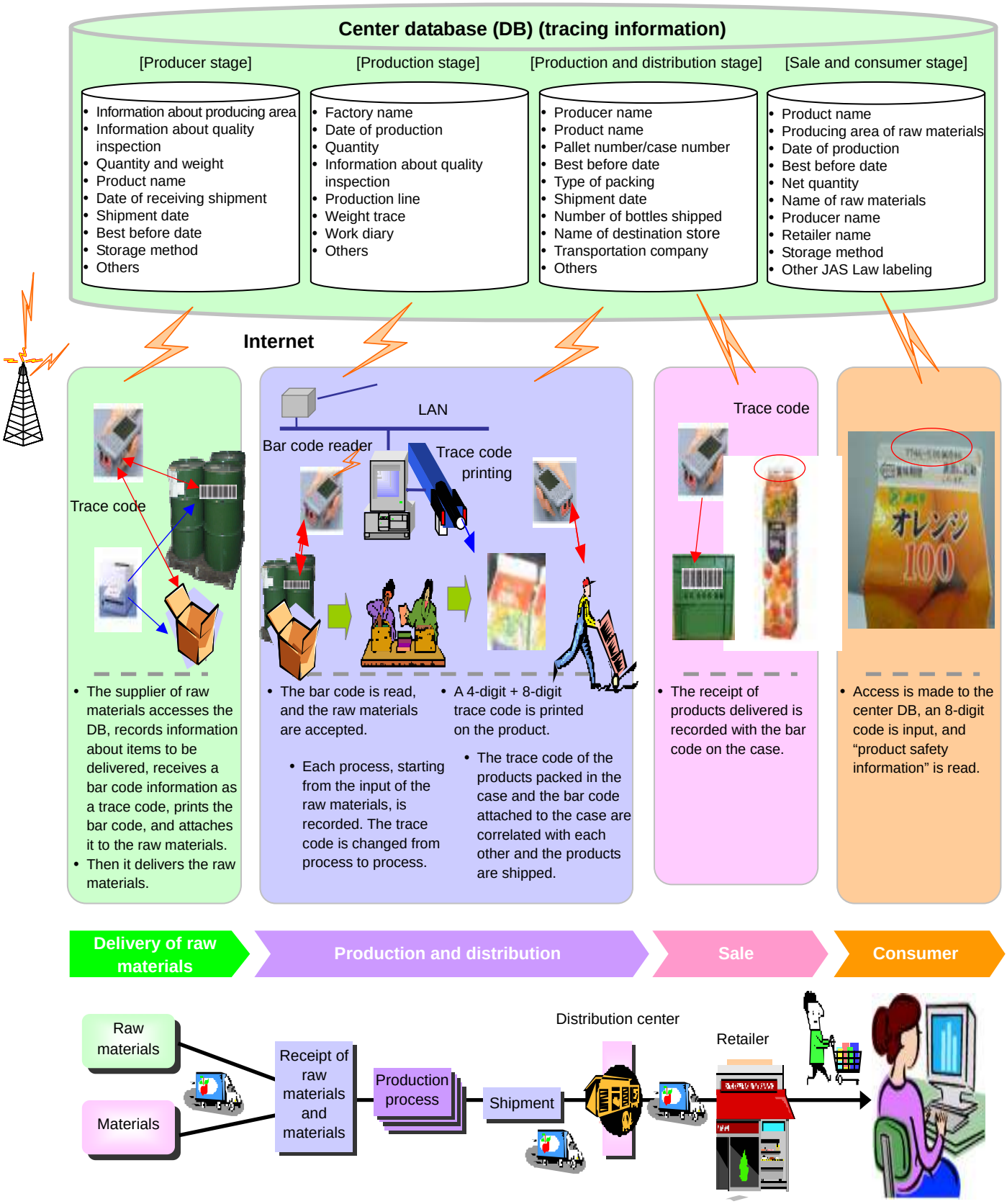


In an exceptional case as shown below where “B” is mixed in the production line of Lot “A,” it is desirable to record the time when the mixture is made and to treat the product as “A/B lot.”



- By recording in the center DB all the product flow processes from the delivery of raw materials to product shipment, it becomes possible to see each of the processes recorded as a lot (e.g., delivery lot, inventory lot, production time lot, production line lot, packing lot, shipment lot).

(9) Flow of products and information (10) Work procedures



List of apparatuses and software used for demonstrative tests

(Communication environment with the center DB via the Internet)

	Apparatuses
Raw materials producer	Cradle bar code reader
	Bar code printer
Food processor	Bar code reader
	Bar code printer
	Ink-jet printer
	Server (PC)
Retailer	PC (for consumer retrieval)
	Handy terminal
Application software	
• Bar code input screen, two-way interface	
• Tracking and tracing software	
• Web public screen	

(11) Costs of demonstrative tests

If the participants in the demonstrative tests purchase the above-mentioned apparatuses and share software-related costs with each other, their costs are estimated as shown in the table below. These figures exclude the development costs of the software for the basic DB and the costs for the center DB, which was provisionally established for the tests.

Participating enterprise	Costs of introduction	Yearly depreciation (5-year depreciation)	Monthly costs
Raw materials producer (1)	¥970,000	¥194,000	¥16,000
Food processor (1)	¥7,110,000	¥1,422,000	¥118,000
Retailer (1)	¥700,000	¥140,000	¥11,000

The amount of investment differs according to the scale of the enterprise and the number of products covered, and it is difficult to standardize the composition of apparatuses.

(12) Benefits to the organizations

The demonstrative tests amply proved that the traceability system would reduce the investigation time of inquiries from the customer and the consumer. There is also the possibility that the system will help decrease consumer inquiries by telephone, and the time of answering inquiries may be reduced.

The tests did not cover problems of work improvement due to the limited costs and time available, but a combination of the system and BPR (business process reengineering) will bring about substantial cost saving.

(13) Method of securing reliability of information

(1) Basic principle: Use of the DB protected by a third-party-managed advanced security system
The management of “incoming” and “outgoing” information is subcontracted to a third party, which makes any alteration and disguise of information by the parties concerned difficult.
Subcontracting the DB management will also be safer and less costly than in-house DB management.

(2) Prevention of alteration and disguise of tracing data
The trace code printed on the merchandise purchased by the consumer is composed of 12 digits, which are a “4-digit encrypted code” and an “8-digit identification code.” The consumer inputs the 8-digit identification code on the Web. If the encrypted code displayed as a result of the input agrees with the identification code, the consumer can know that no alteration or disguise has been made to the information.
<Prevention of disguise of labels>
By inquiring of the DB center about the trace code printed on the product, the consumer can confirm the genuineness of the product (existence of the code) and its attribute information, such as raw materials. Because a disguised label does not exist in the DB, an error message is issued when such label is received and read.

(14) Method of providing information to the consumer

(1) A 4-digit + 8-digit numeral trace code is printed on each product.
(2) The consumer can access the center DB using their PC and inputs the 8-digit part of the trace code.
(3) The 4-digit encrypted code is shown on the screen together with the eight digits inputted, which proves that the product is genuine.
(4) Because the name of the retailer to which the product was shipped is also shown, the product is proved to be the one that has passed through a regular distribution route.
(5) The consumer can read information not shown on the package, such as information about raw materials.

Demonstration at a store

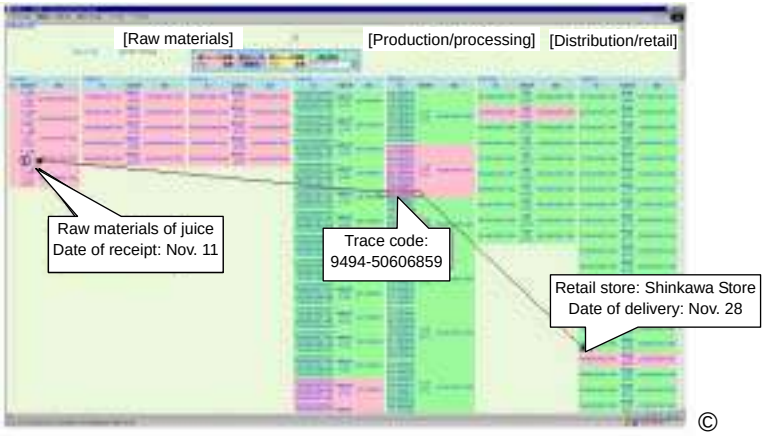
A sample of “product safety information” pages

Tracking and tracing

On-screen confirmation by the DB manager

Software for showing information about raw materials at each process of the trace code (e.g., 9494-50606859) in the same color.

Tracing: The product sold at a store is traced back to the process of its distribution, production and raw materials.



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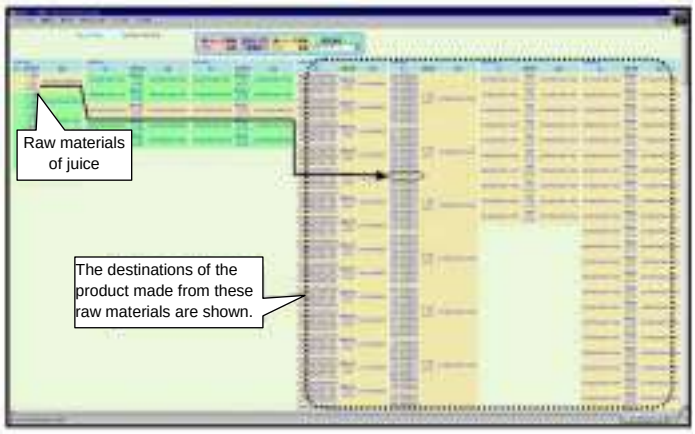
Tracking: The distribution route of the product to the retail store is tracked.



©

The tracing and tracking can be made instantly, and the consumer can check information about the raw materials of the problem product and information about its production (correlation of production lots) as well as information about the destinations of the product.

Contact address

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Case study of traceability system development (2)

(1) Organization that developed and conducted demonstrative tests for the system

Japan Food Industry Center

(2) System name

Fish meat sausage traceability system

(3) Participants in demonstrative tests

Food processors, wholesalers and retailers

(4) Outline and characteristics of the system

Background

Processed foods have various types and producers, and a tracking system for these products must have the terms and means to transmit information common to related industries, such as the food industry and the distribution industry.

The basic principle is that each stage (raw materials production, processed food production, distribution and retail stores) takes responsibility for storage and management of history information at the stage, and two-dimensional codes are used as the identification marks that supercede each of history information.

Advanced system

This traceability system is no precedent in that it transmits information about raw materials in the management of the traditional production process and records collected by the HACCP technique and other means to the next process using two-dimensional codes and thus manages and controls the entire history information.

The use of two-dimensional codes enables an instant conversion of information about raw materials and production into electronic data. In addition, the system needs no one-dimensional bar codes and numeral codes and can read ordinary text. Thus, it can be used before these codes are established.

The person who obtains the product can know the history information in the prior process using two-dimensional codes of the processes from the receipt of raw materials to the delivery of the product to the store. Also, the information stored by the two-dimensional codes can immediately be obtained at any place equipped with a reader.

Characteristics

The centralized management by attaching two-dimensional code labels at the factory in the process from the receipt of raw materials to shipment of finished products helps prevent errors in production and enables a quick retrieval of necessary information when needed.

If retail stores put up a printed notice of two-dimensional code information on their window or display such information on a monitor in the store, the consumer can know some of the history information without accessing the Internet.

System composition

The system is composed of two-dimensional code labels and handy terminals (e.g., data input/output function, two-dimensional code reading function).

Compared to one-dimensional bar codes, two-dimensional codes have a larger storage capacity, and

can be read by the correction function even when they have some problems, such as stains.

(5) Products covered

Fish meat sausage

(6) Method of providing information to the consumer

Two-dimensional code labels

(7) Lot

Production stage: one pallet = one lot

(8) Recorded data

Production stage: Information about raw materials, receipt of raw materials, input of raw materials, CCP (critical control point) management, production, time of product packaging (time of loading on the pallet) and shipment.

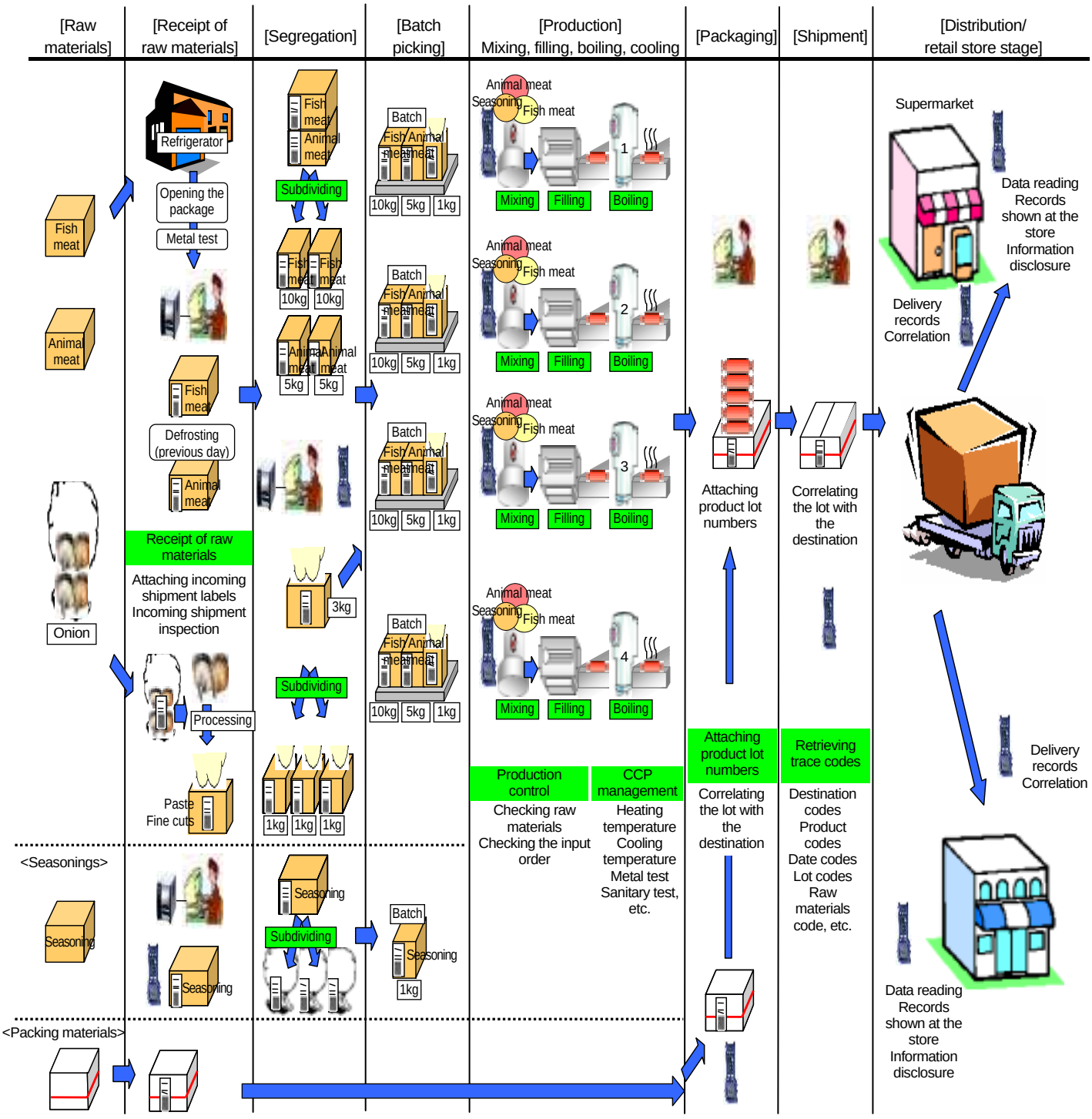
Distribution stage: Information about incoming shipment (product name, lot number, time of receipt) and outgoing shipment (product name, lot number, destination, shipment time).

Retail store stage: Information about incoming shipment (product name, lot number, supplier)

A sample of two-dimensional code labels:

(9) Flow of products and information

At the production stage, incoming raw materials are subdivided according to the production plan, two-dimensional code labels are attached to each subdivision, and the labels are read when the subdivision is inputted to record the performance of the input. While the mixing work of subdivided raw materials is managed by batch, the finished product is not classified by batch because the raw materials are fed to the subsequent production processes continuously. Thus, time data is managed at each of the subsequent processes, and this data is used to check the history of the product in the production process and that of the raw materials used.



Outline of the fish meat sausage traceability system

(10) Work procedures

Roles of participants in demonstrative tests

- Roles of participants

  Japan Food Industry Center: Development of the computer system and conduct of demonstrative tests at each stage

  Fish meat sausage factories: Cooperation in the development of the computer system, installment of hardware, and joint conduct of demonstrative tests at the production stage

  Wholesalers: Cooperation in demonstrative tests at the distribution stage

  Large retailers: Cooperation in demonstrative tests at the retail store stage

- Better role sharing in the future

  In the demonstrative tests, the computer system and handy terminals were introduced at the production stage only, and the data at the production process is stored at the servers of the participating food processors. The demonstrative tests at the wholesalers and retail stores were conducted using PCs and handy terminals.

  To store data at the server of all the enterprises at each of the raw materials production, processed food production, distribution and retail store stages and to verify the history checking system (for checking in the event of an accident and for answering consumer inquiries), enterprises at each stage should share the role and cooperate with each other in making data common to them and prepare their own computer system.

  Demonstrative tests on processed foods cannot be conducted as for part of the product only; full cooperation of all the parties concerned from processors to retail stores is essential. This cooperation is such a large-scale one that it is not easy to conduct demonstrative tests successfully if the efforts are insufficient.

(11) Costs of building up and operating the system (provided only as reference data)

While the costs will greatly differ according to the scale and structure of the factory, the work environment and other factors, the demonstrative tests needed about ¥20 million for software and about ¥25 million for hardware.

(12) Benefits to the organizations (that introduce the system)

Reduction in time needed for product history investigation
Prevention of production errors
Improvement in brand image due to greater customer satisfaction (e.g., reduction in time needed and accuracy for answering inquiries, addressing complaints, recalling defective products and other related activities)
Reduction in time needed for investigating the cause of an accident

(13) Method of securing reliability of information

In-house auditing using the system that basically prevents data alteration.

(14) Method of providing information to the consumer

The person in charge at the retail store reads the information of the two-dimensional code labels attached to the delivered products and puts up a notice of such information at the store.
If the consumer wants to get some additional information, they can call the customer consultation

section of the food producer. The producer retrieves the information stored by this system and gives an answer to the consumer.

(15) Contact address

Information and Technical Cooperation Department, Japan Food Industry Center
Tel: 03-3224-2385

Case study of traceability system development (3)

(1) Organization that developed and conducted demonstrative tests for the system

Food Marketing Research and Information Center

(2) System name

Traceability system for oysters produced in Miyagi Prefecture

(3) Participants in demonstrative tests

- The following four organizations took part in the demonstrative tests: the Shizugawa Fisheries Cooperative and the Miyagi Prefectural Federation of Fisheries Cooperatives (producers' organizations), Suzuko Fisheries (broker and packer), and the Miyagi Cooperative Association (retailer).

- In the next fiscal year when the system will enter the commercial use stage, solicitation for participation will be made to other oyster-producing fisheries cooperatives in Miyagi Prefecture, brokers/packers and their customers.

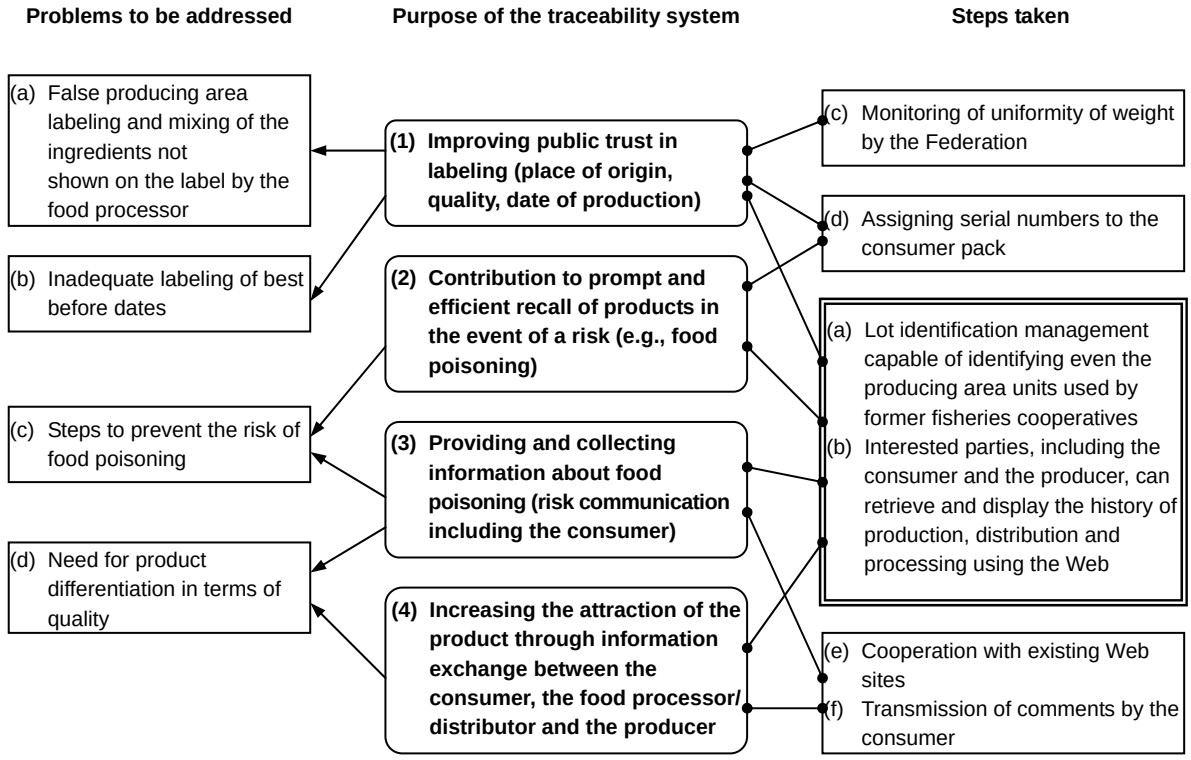
(4) Outline and characteristics of the system

<Background>

- Need to regain public trust in labeling (e.g., producing area labeling)
  It was revealed that some brokers and packers illegally sold South Korean oysters as Miyagi Prefecture's products or with no producing area labeling. As a result, there arose the need to regain public trust in the labeling of producing areas. In addition, a more proper labeling is required as for the distinction between oysters for eating raw and those for cooking and best before dates.

- Need for risk prevention measures supplementary to sanitary inspections
  As a step to prevent the risk of food poisoning, sanitary inspections are now conducted by the sampling method, and the suspension of shipment and other measures are taken as required. But because these inspections are sampling ones, they are unable to avoid damage totally. If, in the event of an accident, it is possible to check when the damage-causing product was made, the area where the oysters used for the product were produced and to whom the product was sold, it will become easier to investigate the cause and to determine the product to be recalled, which will help prevent spread of damage and recurrence of similar accidents.

<Problems and the purpose of, and the steps taken by, the traceability system>



(5) Products covered

Oysters (raw and shucked)

(6) Method of providing information to the consumer

- Shipment slips pasted on shipment cases (existing slips are used; the possibility of introducing bar codes beginning in the next fiscal year is studied)
- Pack numbers printed on consumer packs
- Internet

(7) Lot

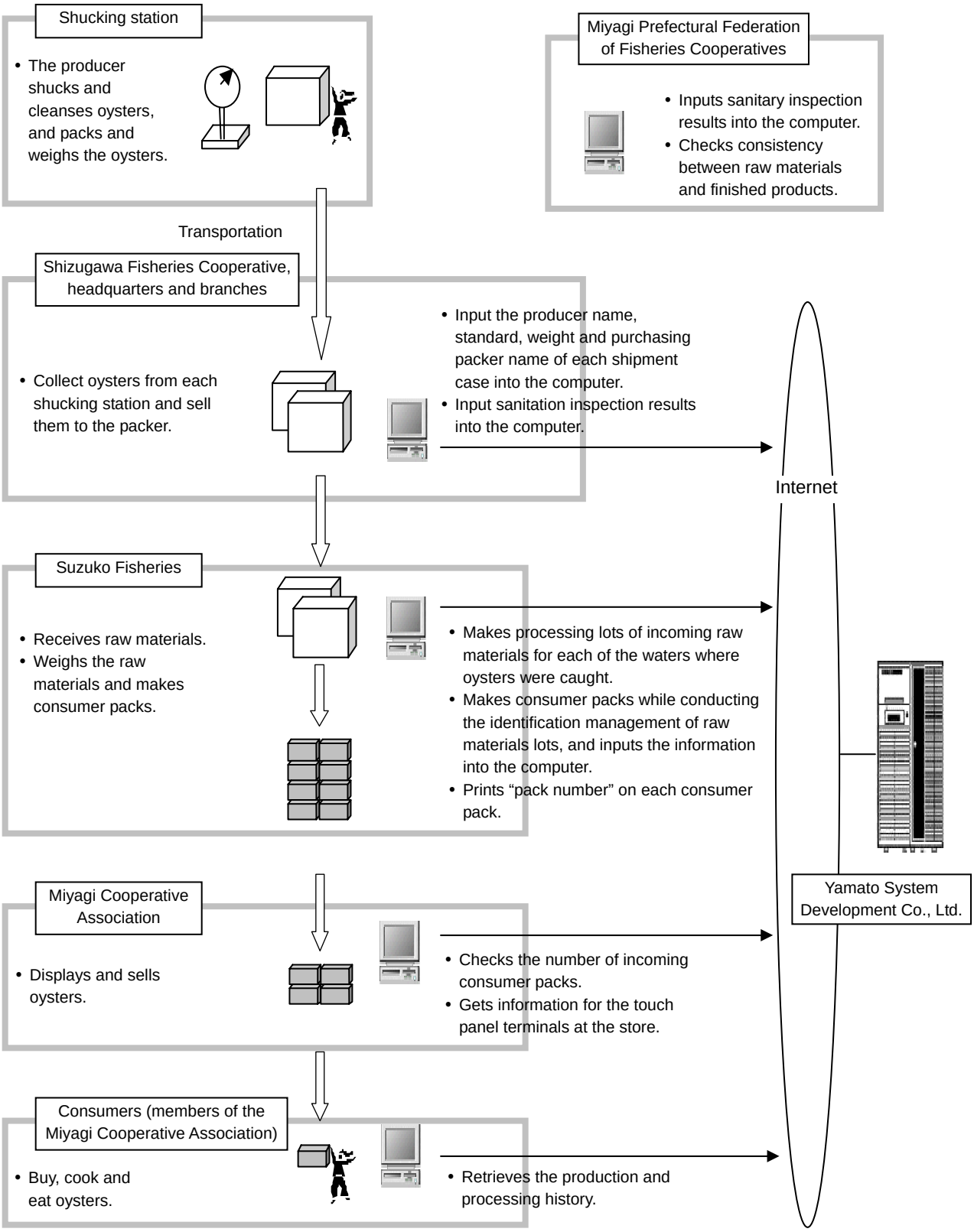
The following three types of lots are adopted:

- **Shipment cases**: Cases of shucked oysters used by the producer for shipment. Fixed weight: 10kg. Oysters are distributed by these cases to the processor. The producer and the date of shipment (date of shucking) can be identified from these cases.
- **Processing lot**: The identification unit for the packer newly created for the introduction of the traceability system. The packer can make processing lots from the shipment case that arrives on the same day and from the same waters, and can continuously input these lots into the production line.
- **Consumer pack**: The packs of oysters the consumer purchases. The packer makes consumer packs, recording the processing lots of raw materials.

(8) Recorded data

- Data recorded by the fisheries cooperative
  For each shipment case: Shipment case ID, producer name, weight, waters where oysters were caught, shucking station, date of shucking, name of the packer who bought shucked oysters, edible raw or not, sanitation inspection results.
- Data recorded by the packer
  For each shipment case: Processing lot ID, date of making processing lots.
  For each processing lot: Packer name, processing lot ID, date of making processing lots.
  For each consumer pack (a group of consumer packs): processing lots used as raw materials, date of making processing lots, consumer pack IDs (first and last ones), pack item name, pack weight, brine concentration, number of packs per item, destination, number of packs per destination.
- Data recorded by the Federation
  For each processing lot: monitoring results of uniformity of weight.

(9) Flow of products and information (10) Work procedures



(11) Costs of building up and operating the system

<Initial costs> (Cost items in the subsidized project budget only; excluding the costs borne by the participating organizations and personnel expenses)

- Costs needed for the entire system
  Costs of developing the system and subcontracting its operation: about ¥8,400,000 (including the costs of the demonstrative tests and the helpdesk)
- Costs paid by the packer
  Costs of changing printer controllers only: about ¥200,000/unit (including installation costs)
- Costs paid by the retailer
  Touch panel terminals at the store: about ¥250,000/unit

<Operation costs>

- Costs of the fisheries cooperative
  The cooperative was able to operate the system without any additional time to the time of traditional shipment tasks.
- Costs of the packer
  The costs per product were estimated by measuring the time of the system's operation that arose in addition to the time of traditional task and based on the average number of products covered by the demonstrative tests.

Cost items	Amount	Time	Unit cost
(1) Work for changing raw materials lots in the production line	¥610	20 minutes	¥1,830/hour
(2) Handling of oysters remaining in the production line when raw materials lots are changed	¥233		
(3) Work of setting pack printing and recording printed results at the processing station	¥305	10 minutes	¥1,830/hour
(4) Data inputting work	¥305	10 minutes	¥1,830/hour
Total of (1) to (4)	¥1,453		
Costs per product	¥0.807/product		

* These costs are greatly affected by lot size and the number of products ordered per item. Because the lot size and the number of products ordered per item used for the demonstrative tests were both large, it is considered that the system could be operated at relatively small costs.

- Charge for the information system
  The charge for using the information system was estimated based on the ASP (application service provider) service charge system (offered by ASPs; the situation as of September of last fiscal year) to be introduced in next fiscal year, on the following assumptions. The result was ¥0.15 per product.
- In addition to the costs mentioned above, the costs of checking delivered products by the retailer, providing helpdesks by the system manager, and monitoring the consistency of weight (e.g., costs of on-site inspections conducted if any inconsistency in weight is detected).
- If the costs that can be estimated (costs of the packer, charge for the information system) are summed up, the costs become ¥0.95 per product.

(12) Benefits to the organizations (that introduced the system)

* Benefits to the Shizugawa Fisheries Cooperative
  - The introduction of the system helped the Cooperative improve its producing area brand.
  - Because the producer name was disclosed, the producer's sense of responsibility for quality increased.

* Benefits to Suzuko Fisheries
  - The Company's sales to the Miyagi Cooperative Association increased compared to those in last fiscal year.
  - The Company now can electronically get detailed shipment information from the Fisheries Cooperative via the traceability system, and can use the data for checking the shipment received, conducting inventory management, and giving production instructions.
  - Until last fiscal year, the Company had started packing work at midnight to make the "date of processing" on the pack as a recent one as possible. But it has been able to disclose the date of shucking oysters since this fiscal year. Thus, with the consent of the Miyagi Cooperative Association, the Company decided to begin the packing work at 6 p.m. As a result, the Company has no longer to do midnight work.

* Benefits to the Miyagi Cooperative Association
  - Although the year was just after the false labeling incident was revealed, the Association's sales of raw oysters were 100.7% of the previous year in monetary terms.
  - In the event of a food poisoning incident, the Association can now identify the waters and producer quicker than before.

(13) Method of securing reliability of information

- Compilation of manuals and registers by each participant to prevent input errors and data losses.
- When the packer finds any input error by the Fisheries Cooperative at the stage of checking the shipment received, the packer can contact with the Cooperative by telephone or any other means and have it check and correct the error.
- Monitoring of consistency of weight per processing lot by the Miyagi Prefectural Federation.

(14) Method of providing information to the consumer

- Internet (accessible from the Miyagi Cooperative's homepage)
- The number of accesses is estimated at 0.35% of product purchasers. Although the accesses were fewer than expected, it can be supposed from the results of the questionnaire and other data that accessibility to the product information has led to the consumer's sense of security.
- Touch panel terminals installed at all the stores of the Miyagi Cooperative
  The Miyagi Cooperative developed a unique system for disclosing production history by touch panel terminals at the store. The product data was automatically supplied to the Cooperative by e-mail every morning, and was disclosed to the consumer.

(15) Contact address

Food Marketing Research and Information Center
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Homepage: http://www.fmric.or.jp

Case study of traceability system development (4)

(1) Organization that developed and conducted demonstrative tests for the system

Council for EDI on Vegetables and Fruits

(2) System name

Individual disclosure system of traceability information about perishable foods using IT

<Traceability system for vegetables and fruits ("Trace-navi")>

(3) Participants in demonstrative tests

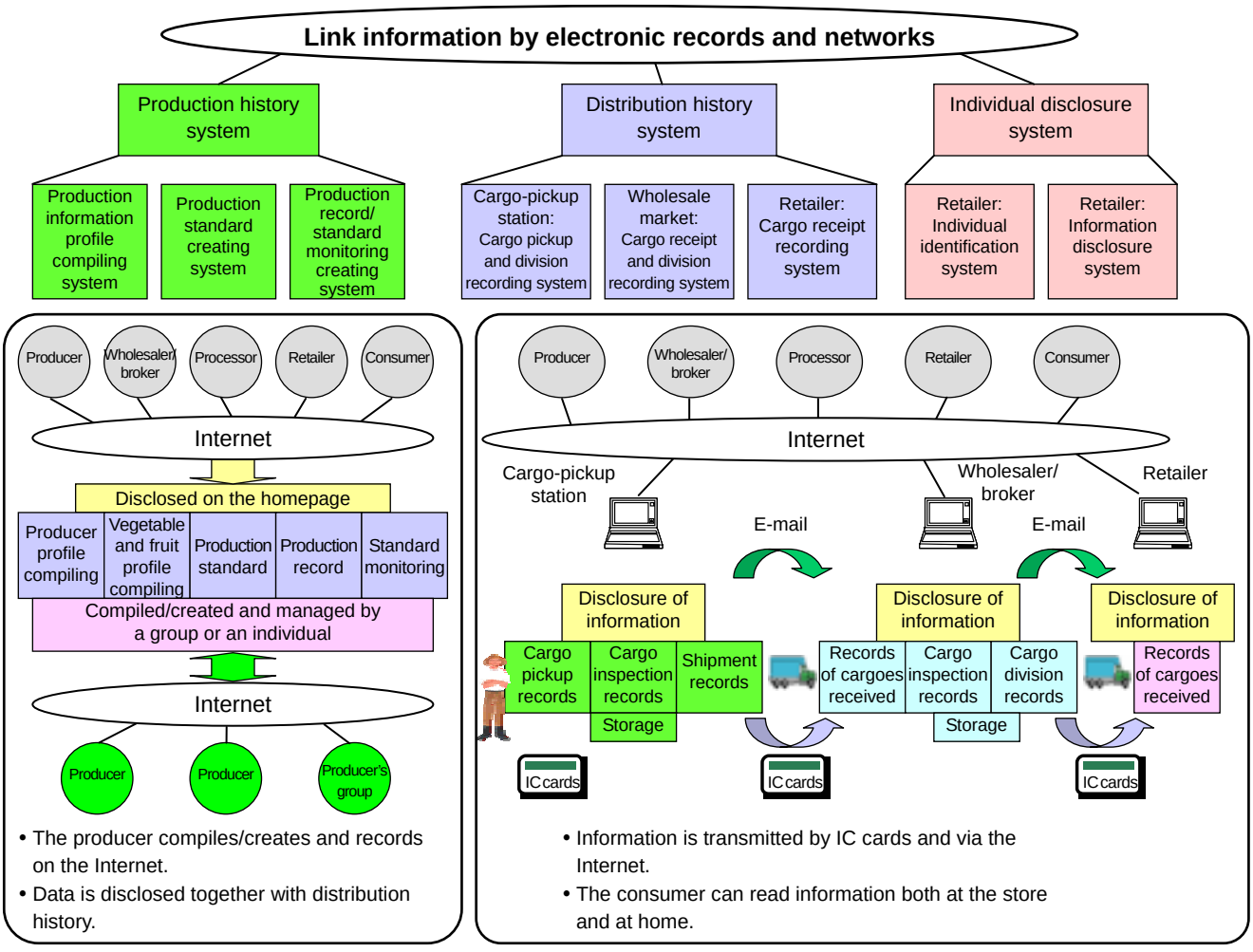
Producers, producers' organizations, wholesale markets, brokers, retailers, systems producers

(4) Outline and characteristics of the system

<Purpose, aim and target>

To build up a traceability system capable of handling transactions through the wholesale market, where large quantities of vegetables and fruits are distributed and distribution routes are complex, for the purpose of providing the consumer with information about safe products they can eat without anxiety through production, distribution and sale of vegetables and fruits and for securing reduction in risks and costs and higher value added to those concerned.

<Rough system structure>



- The producer compiles/creates and records on the Internet.
- Data is disclosed together with distribution history.

- Information is transmitted by IC cards and via the Internet.
- The consumer can read information both at the store and at home.

- The traceability system is composed of a production history, distribution history and individual disclosure subsystems, which are independent of each other.
- Information is transmitted by IC cards and via the Internet. Therefore, if an agreement exists between the producer, the distributor and the retailer, each of them can individually introduce the traceability system.
- The traceability system can also be used as a production history system.

<The system's versatility, advanced characteristics, extensibility and compatibility with existing systems>

- Versatility
  - The system can handle distribution through the wholesale market and the broker. It can also deal with vegetables and fruits directly sent to the consumer from the producer.
  - As a selling method at the producing area, the system can handle not only vegetables and fruits selected and sold by individual producers but also those jointly sold and those jointly selected and sold.
  - It can build up a production history system out of the booking mechanism.
  - The system is constructed according to the stage of transaction of vegetables and fruits (cargo receipt, inspection, cargo division, shipment, delivery, slip preparation).

- Advanced characteristics
  - The distribution and combination of information are realized by a new concept using IC cards, the Internet and distributed servers. The system enables the user to read and store detailed information about other enterprises.
  - The system was developed by combining and condensing advanced IT and IT equipment technology, such as Web technology, IC cards, PDAs (personal digital assistants), cellular phones, the Internet, e-mail transmission, databases, IC card readers, WindowsCE, barcode readers and barcode printers. As a result, the system has realized a lower-cost, easier-to-use information processing method.
  - Construction of an information transmission system by Internet mails.

- Extensibility
  - The system is applicable not merely to vegetables and fruits but also to other perishable foods.
  - By adding a processing tracing function, it can be used to a traceability system covering all kinds of foods.
  - The system can be extended to a supply management system as a food chain of perishable foods (e.g., paperless slip system, inventory management covering entire distribution of vegetables and fruits, management of truck transportation, freshness management).
  - Extendable to HACCP, ISO14000, ISO9000 and the like.
  - Extendable to a remote authorization traceability system.
  - Extendable to a sale management system for the retailer.
  - Extendable to individual product management using such interfaces other than IC cards as bar codes, two-dimensional codes and individual IC chips.

- Compatibility with existing systems
  - Such interfaces as production history and net catalogs can be used.
  - The system can be connected with other information systems by developing system

interfaces.
- It can partly be used in combination with existing systems.
- Traditional management methods and the like can partly be used.

(5) Products covered

All types of vegetables and fruits

(6) Method of providing information to the consumer

- Transmit information together with vegetables and fruits by writing information about the producer and vegetables and fruits on IC cards.
- Cellular phones can be used instead of IC cards.
- Similar information can be transmitted by an Internet mail in advance of an IC card. This enables prior preparations for shipment and cargo division, and alteration can be prevented by collating the information on the IC card with that in the Internet mail.

(7) Lot

Producer stage: lot based on a product item, a unit of slips (cases), a fruit sorting unit, time, a group, etc.
Distribution stage: lot based on a slip unit and a unit of case.
Retail stage: lot based on a unit of case, bag or individual.

(8) Recorded data

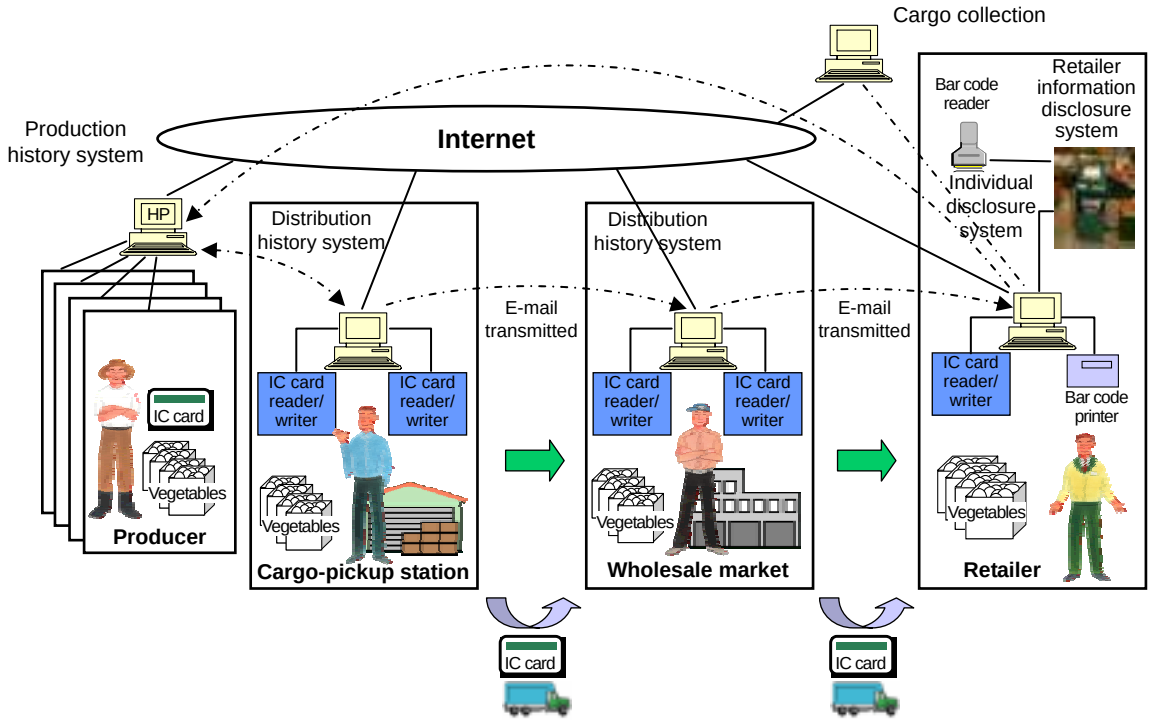
❑ Production history system
- Producer information (profile), vegetable and fruit information (profile)
- Production standard (e.g., limit to the frequency of pesticide application)
- Production history data (e.g., agricultural chemicals, manuring records, work records)

❑ Distribution history system
- Producer IC card: producer name, product name, class and grade, homepage address for production history, producer's mail address, etc.
- Cargo-pickup station system: producer information, vegetable and fruit information, cargo-pickup station name, time of cargo arrival, shipment time, product inspection information, quantity of inventory, destination information, shipment quantity, delivery information, mail address of cargo-pickup station, etc.
- Truck IC card: driver name, truck code, departure time, cargo information, destination information, etc.
- Wholesale and brokerage market systems: producer information, vegetable and fruit information, cargo-pickup station name, time of cargo arrival and shipment time at cargo-pickup station, truck information, wholesale market name, time of cargo arrival and shipment time at wholesale market, product inspection information, quantity of inventory, information about destinations of divided cargoes, quantity of shipment, delivery information, mail addresses of wholesale and brokerage markets, etc.
- Truck IC: driver name, truck code, departure time, cargo information, destination information, etc.
- Retailer: producer information, vegetable and fruit information, cargo-pickup station name, time of cargo arrival and shipment time at cargo-pickup station, truck information, wholesale

and brokerage market names, time of cargo arrival and shipment time at wholesale and brokerage markets, delivery information, mail addresses of wholesale and brokerage markets, truck information, time of cargo arrival at retailer.

- Retailer information disclosure system: producer information, vegetable and fruit information, production history information, distribution route information, recipe information, etc.

(9) Flow of products and information



Flow of vegetables and fruits and information

- The producer records production history in the production history system.
- The producer records information about the vegetables and fruits they deliver by passing an IC card over the terminal at the cargo-pickup station.
- At the cargo-pickup station, the information recorded by the producer is used to inspect the vegetables and fruits, and shipment and delivery work to the wholesale market is performed.
  (Lot numbers are assigned to the vegetables and fruits collected according to arrival time, cargo group and other factors, and the vegetables and fruits are divided according to destination.)
- The driver writes information about the vegetables and fruits they transport in an IC card, and deliver the information to the wholesale market together with the cargo.
  (The information about various types of vegetables and fruits loaded on a truck is recorded in an IC card, and then the vegetables and fruits are transported to the wholesale market.)
- At the wholesale and brokerage markets, product inspection, division and delivery work is carried out as at the cargo-pickup station.
  (The cargo received is divided according to product type, and information is transmitted for each divided mass of products.)
- The driver writes information about the vegetables and fruits they transport in an IC card, and deliver the information to the retailer together with the cargo.

(The information about various types of vegetables and fruits loaded on a truck, which are divided according to destination, is recorded in an IC card, and then the vegetables and fruits are transported to the retailer. If an IC card cannot store all the information, two or more IC cards are used.)

- The retailer inspects the merchandise received, attaches bar codes to them so that they may be identified individually, and displays them at the store.
  (The information stored in the IC card and that on the bar code are correlated with each other.)
- The consumer can read the distribution route, production history and other data of vegetables and fruits on the information disclosure panel at the store by passing the bar code reader attached to the panel over the bar code pasted to the products.
- The consumer can also get the same information as at the store at home by accessing the retailer's system via the Internet.
  (Distribution and production history can be traced using bar code information.)

(10) Work procedures

❑ Producer stage:

■ Introduction stage:
Systems producer: Explanation to the producer, on-site investigation, systems installation and adjustment, training programs

■ Operation stage:
Producer:
- Production history system
  - Records production history (keeps a cultivation diary)
- Distribution history system
  - Uses an IC card to record information about vegetables and fruits at the cargo-pickup station.

❑ Cargo-pickup station:

■ Introduction stage:
Council for EDI on Vegetables and Fruits: Explanation of an outline by the Demonstration and Examination Committee, exchange of opinions, determination of distribution routes and product types
Systems producer: Briefing sessions for JA (Japan Agricultural Cooperatives) and the producer, on-site investigation, systems installation, explanation of how to operate, training programs

■ Operation stage:
Persons in charge at JA:
- Production history system
  - Registration of a master of production materials, such as agricultural chemicals, creation of production standard, etc.
  - Issuance of producer's IC cards
- Distribution history system
  - Inspection of cargo received, shipment work, delivery instructions

Driver:
- At the cargo-pickup station
  - Registration of delivery data in an IC card
- At the wholesale market
  - Registration of delivery data in the incoming cargo terminal at the wholesale market

- ❑ Wholesale market
  - ■ Introduction stage:
    Council for EDI on Vegetables and Fruits: Explanation of an outline by the Demonstration and Examination Committee, exchange of opinions, determination of distribution routes and product types
    Systems producer: On-site investigation, systems installation, explanation of how to operate, training programs
    Wholesale market: In-house briefing sessions
  - ■ Operation stage
    Persons in charge of wholesaling: Inspection of cargo received, cargo division work, shipment work

- ❑ Brokerage market
  - ■ Introduction stage
    Council for EDI on Vegetables and Fruits: Explanation of an outline by the Demonstration and Examination Committee, exchange of opinions, determination of distribution routes and product types
    Systems producer: On-site investigation, systems installation, explanation of how to operate, training programs
    Brokerage market: In-house briefing sessions
  - ■ Operation stage
    Brokerage market: Inspection of cargo received, cargo division work, delivery instructions
    Driver:
    - At the wholesale market
      - Registration of delivery data in an IC card
    - At the retailer
      - Registration of delivery data in the incoming cargo terminal at the retailer

- ❑ Retailer
  - ■ Introduction stage
    Council for EDI on Vegetables and Fruits: Explanation of an outline by the Demonstration and Examination Committee, exchange of opinions, determination of distribution routes and product types
    Systems producer: On-site investigation, systems installation, explanation of how to operate, training programs
  - ■ Operation stage
    Retailer
    - Inspection of cargo received
      - Issuance of bar codes and attaching the codes to vegetables and fruits and displaying the products at the store

- ❑ Consumer
  - Reading vegetable and fruit information with an information disclosure terminal at the store (using bar codes)
  - Access at home to the retailer's system via the Internet and input of a bar code number to get product information

(11) Costs of building up and operating the system (provided only as reference data)

- Because the system is for distribution through the wholesale market and covers a broad range,

i.e., producers, the wholesale market, the brokerage market and retailers, costs, amount of products handled and other factors are very complicated. Therefore, it is now impossible to estimate the costs per unit price of the entire system.

- Costs of building up the system (actual costs of the demonstrated system: excluding software costs)

Producer stage:	Costs of hardware and its installation: personal computer × 1, IC card reader/writer × 1, installation, adjustment and others: ¥600,000 per producer.
Wholesale market:	Costs of hardware and its installation: personal computer × 1, card reader/writer × 2, installation, adjustment and others: ¥700,000 per market.
Brokerage market:	Costs of hardware and its installation: personal computer × 1, card reader/writer × 2, installation, adjustment and others: ¥700,000 per market.
Retailer:	Costs of hardware and its installation: IC card reader/writer × 1, bar code reader × 2, bar code printer × 1, installation, adjustment and others: ¥700,000 per retailer. <Retailers used existing PCs and equipment>
IC card:	About ¥5,000 to ¥10,000 per card, including data setting costs.

The above costs do not include the costs of meetings, briefing sessions, training programs, technical guidance, consulting and other activities for the demonstrative tests. The tests were conducted on the minimum scale. The above costs were estimated on the supposition that all the participating business establishments would purchase PCs and other equipment. In an actual situation, the costs will differ according to the scale of the system and the circumstance of each stage.

Operation costs:

- Actual work hours:
  - Reading/writing time of IC card: Within 1 minute per card
  - Shipment, cargo division and other work: Within 10 minutes per product (hours differ according to the number of destinations (divided cargoes))
- Possibility of cost reduction
  - As the quantity of vegetables and fruits handled increases, the costs of IC cards, IC card readers and writers and other equipment will come down.

(12) Benefits to the organizations (that introduced the system)

Producer:	Risk reduction, proved safety, stable supply of vegetables and fruits, greater consumer and retailer trust and better communication with the consumer and the retailer.
Cargo-pickup station:	Risk reduction, proved safety, continued and stable business, better sales efficiency, reduction in office work, sales promotion, greater customer trust.
Wholesale and brokerage markets:	Risk reduction, proved safety, continued and stable business, better sales efficiency, reduction in office work, sales promotion, greater customer trust, smaller merchandise loss.
Retailer:	Greater consumer trust, improvement in the store brand, better consumer service, sales promotion, higher efficiency of office work.

(13) Method of securing reliability of information

The systems manager makes each distribution stage independent, incorporates product inspection work into the system, records data changes, collates Internet information with those of IC cards, reinforces the security of IC cards and takes other steps.

(14) Method of providing information to the consumer

Information disclosure at the store by bar codes and touch panels.
Provision of information about purchased vegetables to the consumer, who can see the information on the screen of their PC via the Internet.

(15) Contact address

Council for EDI on Vegetables and Fruits
Tel: 03-3486-2151
Fax/Tel: 03-3486-2155
Persons in charge: Watanabe (watanabe-tsutomu@jp.yamatake.com) and
Oshima (oshima-yumiko@jp.yamatake.com)
Homepage: http://www.seika-edi.net

Case study of traceability system development (5)

(1) Organization that developed and conducted demonstrative tests for the system

Central Union of Agricultural Cooperatives (JA Zenchu)

(2) System name

Relational Traceability System (tentative name)

(3) Participants in demonstrative tests

JA Akita Hokuo, JA Zenno (National Federation of Agricultural Co-operative Associations), Zenno Pearl Rice East Japan Co., monitor consumers.

(4) Outline and characteristics of the system

This system is composed of three interlocking subsystems: (1) production information DB system, (2) segregated management DB system, and (3) information exchange system. Each subsystem can perform its functions independently of the others. (1) The production information DB system is a database system for storing, keeping in custody and retrieving production information from the producer's diaries and records, and the JA inputs the information of production diaries it collected into the system. To save the labor of input work, OCR systems are also used. (2) The segregated management DB system is a system for managing the receiving and shipping the farm produce collected by the JA and inventories using bar codes, and can identify the merchandise after shipment in relation with the production information DB system. In addition, by building up a JA network system ("JA Extra-Net"), it becomes possible to unify the management of inputting work and information at each JA office. In the future, the system will be able to serve as a basis not merely for traceability but for improvement in work at the JA, which is rapidly expanding, as well. (3) The information exchange system is a homepage on which the consumer can read product information using the label issued by the segregated management DB system, and the JA Zenchu plans to improve this system as a means of communication between the producer and the consumer (Fig. 1).

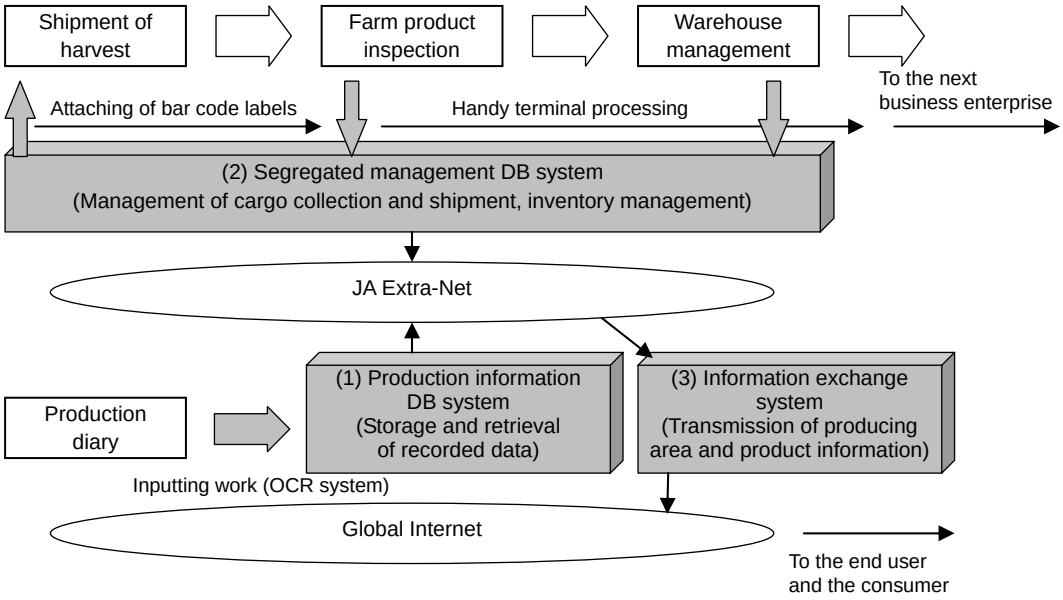


Fig. 1. Composition of the system

(5) Products covered

The system was developed for rice, but is also applicable to other crops (e.g., grains, vegetables, fruits).

(6) Method of providing information to the consumer

Each business enterprise establishes its own segregated management DB and transmits data by attaching a label showing the location of data to each merchandise and invoice (Fig. 2). At the stage of brown rice, a brown rice label (Fig. 3), which has a “harvest code” showing that the product has the same production method, etc., is attached to each bag of brown rice to manage the JA’s incoming and outgoing cargoes and the rice mill’s incoming cargoes. After polished rice is packed into the consumer bag, a polished rice label (Fig. 4), which has a “product code” showing that the product has the same milling process, is attached to each of merchandise, in addition to a “harvest code” to transmit the information to the end user. The end user can get the information using the URL specified on the polished rice label. On the invoice label, which is pasted on the invoice, a “trace code” showing the movement of merchandise between business enterprises is shown in addition to a “harvest code” and a “product code,” and the distribution route without any change in packing style can be traced using this trace code.

Fig. 2. Transmission of labels between business enterprises

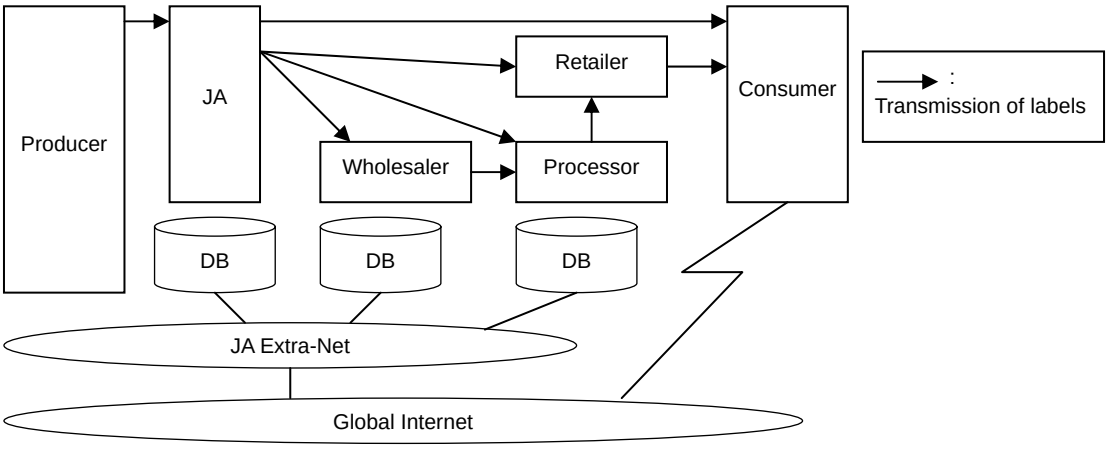
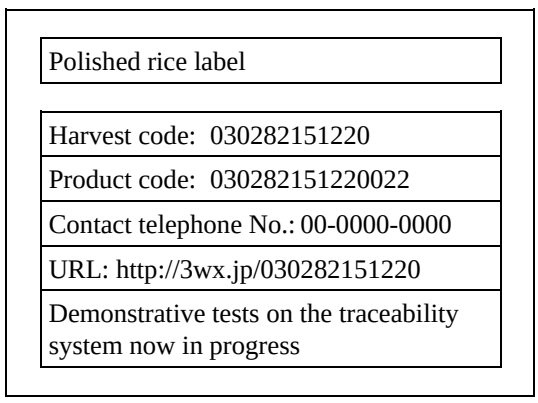


Fig. 3. A sample of brown rice labels

Fig. 4. A sample of polished rice labels



(7) Lot

(1) Cargo collection stage: “Unit for which a farm product inspection is conducted”
(2) Warehouse management stage: The lots of (1) are combined into “farm products with the same inspection results, production method, stored warehouse, etc.”
(3) Stage of shipment from the JA: The lot of (2) is divided into the “unit of the JA shipment slip (destination, shipment date).”
(4) Stage of packing polished rice in a bag: The lot of (3) is divided into the “feeding unit of brown rice into the polishing line.”
(5) Stage of shipment from a rice mill: The lot of (4) is divided into the “unit of the shipment slip (destination, shipment date).”

(8) Recorded data

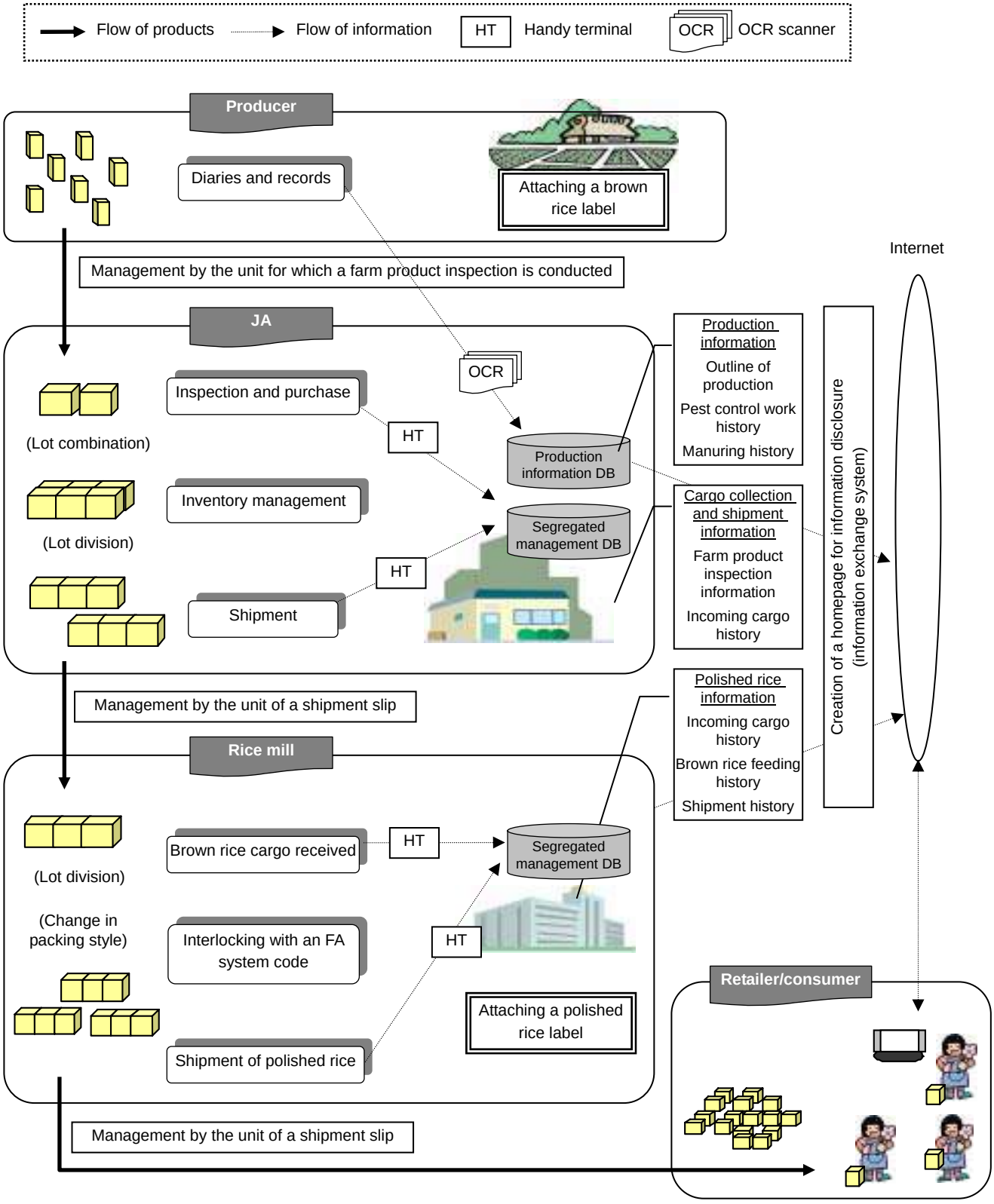
Production information: Outline of production (e.g., producer name, collecting organization, producing area, production process, such as transplanting date and harvesting date), pest control work history (e.g., pesticide name, application date), manuring history (e.g., fertilizer name, application date, quantity of application), etc.

Cargo collection and shipment information: Farm product inspection information (e.g., year of production, brand, grade, inspection site), cargo collection history (e.g., cargo collection date, type of cargo collected, producer of cargo collected, storage site, quantity of cargo collected), shipment history (e.g., shipment date, type of cargo shipped, storage site, destination, quantity of shipment), etc.

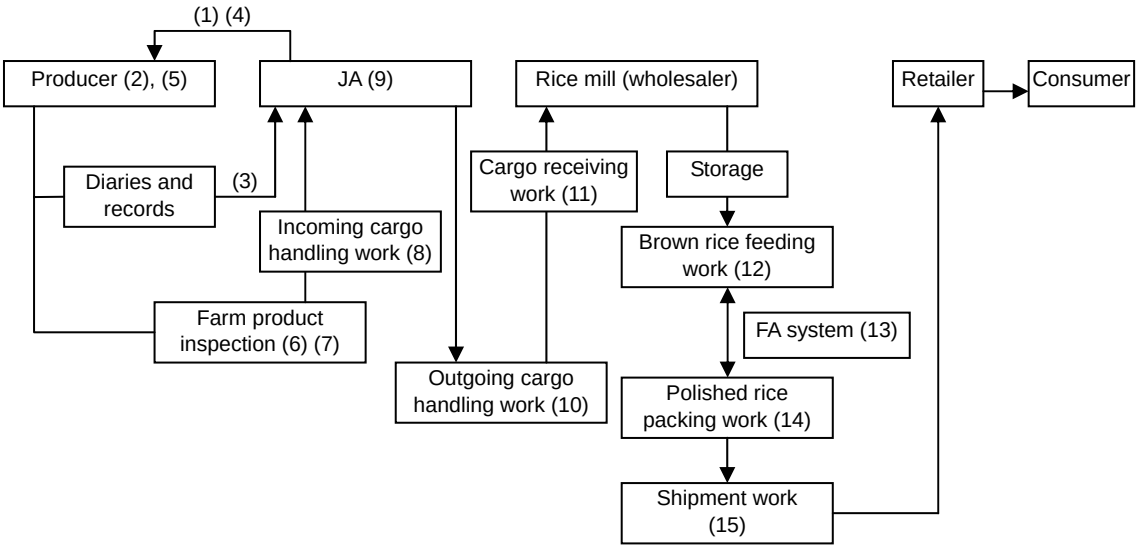
Polished rice information: incoming cargo history (e.g., date of shipment receipt, type of shipment received, shipper, storage site, quantity of incoming cargo), brown rice feeding history (e.g., feeding date, type of brown rice fed, storage site, feeding hopper, quantity of brown rice fed), shipment history (e.g., shipment date, type of shipment, feeding hopper, destination, quantity of shipment), etc.

(9) Flow of products and information

Fig. 3. Flow of products and information (basic concept)



(10) Work procedures



(1) Production diaries/ID code issuance
(2) Keeping of production diaries
(3) Collection and inputting of production diaries
(4) Issuance and distribution of brown rice labels
(5) Attaching brown rice labels to 30kg brown rice bags
(6) Farm product inspection
(7) Inputting farm product inspection information
(8) Storing in the JA warehouse/inventory management
(9) Inventory management
(10) Shipment from the JA
(11) Incoming cargo work at the rice mill
(12) Brown rice feeding work
(13) Correlating FA system codes
(14) Issuance and attaching of polished rice labels
(15) Shipment work

The system's input work and problems

Inputting production diaries: The result of the actual cases of input work shows that there is the need for input labor for inputting the data of about 30 to 50 paddy fields per day, although the figure will vary according to the number of input items and the operator. By introducing an OCR, it is possible to input the data of about 20 fields per minute, but guidance should be given to the producers who keep diaries to raise the reading rate.

Attaching brown rice labels: At first, it was supposed that brown rice labels would be attached at the time of the farm product inspection. But it was found later that it is too troublesome to do this work during the cargo collection and shipment work (the required labor: about 100 labels per 15 minutes). Thus the system was changed so that individual producers would attach brown rice labels to brown rice bags when collecting cargoes.

Incoming cargo and shipment/brown rice feeding work: Each lot is handled by reading with a handy terminal and by numerals (about 15 seconds/lot). At present, some data requires the same work twice

(this work and inputting into the farm product inspection system), but if this function can be incorporated into this system, the labor will be greatly saved. Correlating of codes is needed for interlocking with the FA system, but if it is possible to introduce a common code system (to standardize the code system), it will become very easy to interlock this system with other systems.

(11) Costs of building up and operating the system

In the demonstrative tests, the Zenno's "Production Management DB System" was used as a production information DB, Osameya Net System's "Electronic Highway," as a segregated management DB, and the Zenno's "Security System HP," for information disclosure purposes. The fees, function development costs and improvement costs needed for realizing traceability by the cooperation of these three systems were about ¥8 million. If a business enterprise builds up a similar system from scratch, it will need an investment of at least ¥40 million to ¥50 million and so it will be difficult to spread traceability widely. To cut the costs for traceability introduction, either "two or more business enterprises should share a system" or "the system should be standardized." In the future, we will pursue the former strategy further for the "Production Management DB System", and will make a substantial reduction in the fees for the system. Also, according to the latter strategy, we plan to utilize the outcome of the demonstrative tests and to commercialize the system. In commercializing the system, we will minimize the system's price itself as much as possible by, for example, adopting Linux as the basic OS for the DB, and will also prevent excessive investment by phasing in the system by properly combining the subsystems. We want to keep down the costs of introducing a full set (Steps 1-5 below) on the supposition that the system will be jointly used by the three participating organizations to ¥2,500,000 or less. The idea of phasing in the system and estimated costs are as follows:

Step 1: If it becomes difficult to manage production diaries, introduce the **Production Information DB System**.
(Costs of a PC and software: ¥200,000 to ¥300,000)

Step 2: If it becomes difficult to input diary information, introduce an **OCR system**.
(Costs of a scanner and software: ¥500,000 to ¥1,000,000)

Step 3: To correlate information from multiple business enterprises, introduce a **JA network system**.
(Costs of a server: about ¥500,000; costs of a terminal PC and software: ¥200,000 to ¥300,000)

Step 4: If it become difficult to perform segregated management, introduce a **segregated management system**.
(Costs of a handy terminal and software: ¥100,000 to ¥200,000)

Step 5: If it is possible to convey label information to the final user, introduce an **information disclosure system**.
(registration fee system)

(12) Benefits to the organizations (that introduced the system)

Short-term benefits:

(1) It becomes possible to arrange and file data of many production diaries, which will help promote a diary keeping campaign to the producer.

(2) Work instructions about cargo collection and shipment involving two or more business enterprises are facilitated by the unified and real-time inventory management.

(3) Attaching the URL and code to the merchandise package helps emphasize the product characteristics directly to the consumer.

(4) The system helps publicize the positive stance of the producer and other parties toward food safety and security to the community and the consumer.

Medium-to-long term benefits:

(5) Storing and analyzing diary information bring about improvement in technology and level-raising effects, making it possible to anticipate an increase in yield and quality.
(6) The system enables information transmission to the consumer and speedy claim settlement, and can be used in the product development and sales strategy areas.
(7) The system can be a means to win the trust of the consumer and the final user, to take proper initial action in a food poisoning incident, and to cope with harmful rumors.
(8) The system promotes IT introduction into the production site, and helps improve work and increase work efficiency even in other areas than traceability.

(13) Method of securing reliability of information

In the demonstrative tests, the system was examined using the merchandise from the producing districts and rice mills that obtained a third-party certification according to the “Zenno Security System” (“Zenno Security System-certified merchandise”). The JA group is also conducting for all producers the “production process management and recording campaign” for the following basic purposes: (1) documentation of production standards, (2) diary keeping, (3) segregated shipment and (4) information disclosure. We would like to strengthen internal inspections so that this campaign may be supported by the consumer as well.

(14) Method of providing information to the consumer

A label, on which the product code, point of contact and URL are printed, is attached to each of the merchandise. The consumer can get information about the merchandise they bought on the Internet homepage. In the demonstrative tests, we opened a Web questionnaire and Internet meeting room where we investigated evaluation of the merchandise and traceability. The following is an outline:

(1) Opinions about product labels include “Labels should be more conspicuous,” “The URL is difficult to input,” “More ingenuity should be used for the location of the label attached” and “Some explanation should be provided as to the type of information obtainable from the HP.”
(2) As for the HP, while some said that “The HP has an atmosphere of realities of production and gives me a sense of security,” many others commented that “Although the HP was very enlightening, it gave me no sense of security.”
(3) The type of information that the consumer saw most at the store was product type, brand, producing district, year of production, price and date of polishing. Safety information, such as one about the rice produced with reduced pesticides, was difficult to understand for the consumer, and there were few people who checked the other side of the rice bag where most safety information was shown.
(4) Despite the investigation using the Internet, many respondents, especially housewives, answered they wanted paper media (e.g., leaflets, brochures, cards) as a means to get information. The type of information they wanted to have was mostly storing methods, cooking method and recipes.
(5) While the term “traceability” had a low awareness, the respondents said that “building up a traceability system is good” when they were given adequate explanation. But they were reluctant to bear their costs; this is similar to the fact that many consumers do not select “organic farm products” and “specially cultivated rice” because of higher prices.
(6) What the respondents expected from “traceability” most was prevention of false labeling, which may suggests that in general, “reliability” has a greater appeal than “safety.”

(7) The strategy like the Internet meeting room created in the demonstrative tests was very effective in building up “trust” between the consumer and the producer, but the costs remains a major problem to be solved.

(15) Contact address

Food Safety and Security Measures Section,
Farming and Regional Development Department,
JA Zenchu (persons in charge: Maeda and Higashino)
JA Bldg., 8-3, Otemachi 1-chome, Chiyoda-ku, Tokyo, 100-0004
Tel: 03-3245-7966
Fax: 03-5255-7358

Case study of traceability system development (6)

(1) Organizations that developed and conducted demonstrative tests for the system

Organization for Urban-Rural Interchange Revitalization and Perishable Food History Information Co., Ltd.

(2) System name

Comprehensive traceability system with the function of preventing unfair practice

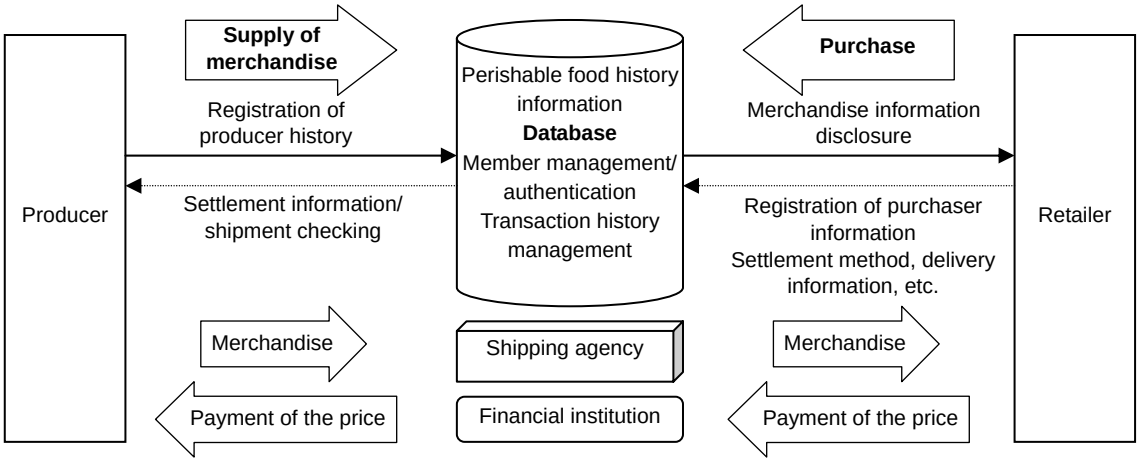
(3) Participants in demonstrative tests

Producers: JA Hagano and JA Utsunomiya (Tochigi Prefecture), JA Uwa Vegetables and Fruits (Ehime Prefecture), Takahashi Farm (Saitama Prefecture), Katayama Apple Orchard (Aomori Prefecture) and Araki Co. (Saitama Prefecture)
Distributors: I Y Foods, Superrex Sugito, Maruyu Unso, and others
Retailer: YorkMart
Equipment manufacturers: NEC Corp. (PCs), Teraoka Seiko (labelers), Denso Wave (bar code scanners)
Information system designing and instructions (data registration center): Organization for Urban-Rural Interchange Revitalization and Perishable Food History Information Co., Ltd.

(4) Outline and characteristics of the system

In recent years, there have been several events that caused uneasiness about food safety to the consumer, including the BSE issues, pesticide residue and false labeling. In such a circumstance, this system aims at providing the consumer with history information about the production, distribution and sale of food products, thereby winning back consumer trust in food safety and contributing to a speedier detection of causes of food accidents.

Rough structure of the system



The system's versatility, advanced characteristics, extensibility and compatibility with existing systems

This system basically takes account of four main types of perishable foods, and so it naturally has versatility. It is an advanced system in that it includes the function of preventing unfair practice. As already stated, the system also takes other fields into consideration, which means that it has extensibility. Compatibility with existing systems is secured by adapting the system to the order receipt and placement system, which follows the JCA procedures used in distribution and retail business. If this system is incompatible with existing systems, no traceability systems will be possible.

(5) Products covered

Potato (produced in Hokkaido), *komatsuna* (a kind of Chinese cabbage; Ibaraki Prefecture), leek, *Chrysanthemum coronarium*, egg plant and strawberry (Tochigi Prefecture), long onion, cucumber and broccoli (Saitama Prefecture), citrus (Ehime Prefecture) and green pepper (Miyazaki Prefecture)

(6) Method of providing information to the consumer

Disclosure of information by the retailer using two-dimensional bar codes
Disclosure of information on the Internet

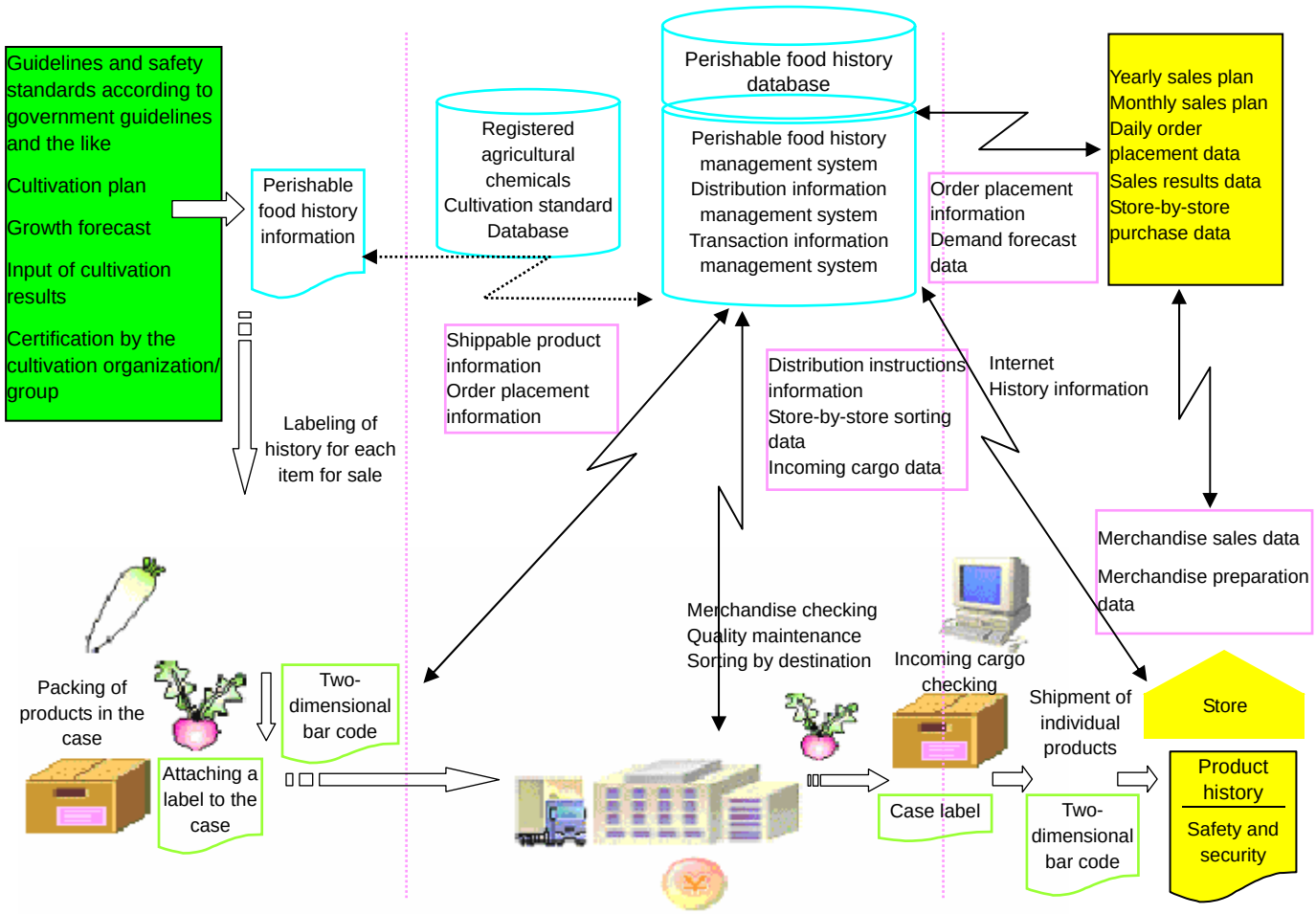
(7) Lot

For the same product from the same producer and the same field:
A two-dimensional bar code for each selling unit, and a shipment bar code label for each shipment case.

(8) Recorded data

Producer:	All private information concerning the producer: All work plans for the product, shipment standard and cultivation standard; All work schedules for production work and actual work performed, and comparison of them
Distributor:	Shipment time, shipment quantity, shipping agency, driver name, designated delivery temperature, arrival time and sorting and shipment time
Retailer:	All data concerning selling data (e.g., sales in amount and volume, purchaser name and living environment)

(9) Flow of products and information

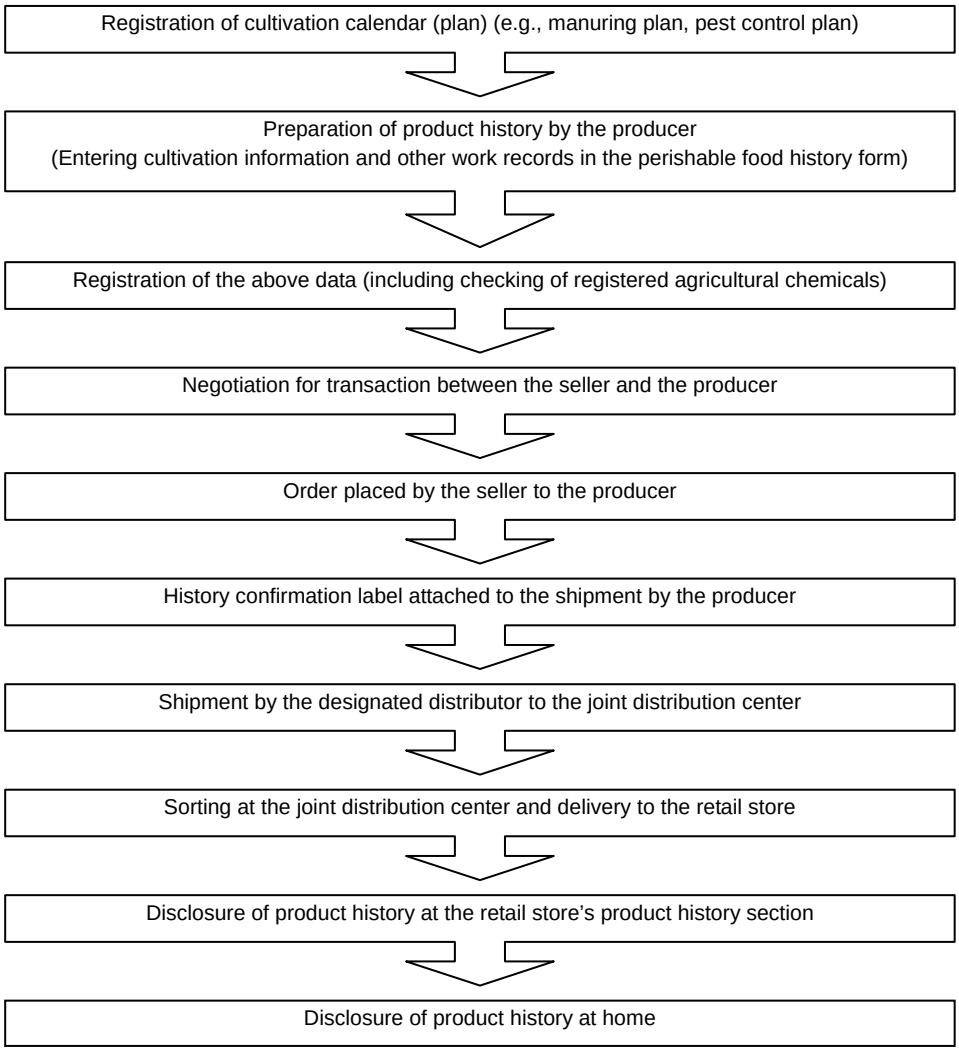


System flowchart

Order for merchandise placed → Shipment of merchandise (attaching a two-dimensional code) → Distribution → Retail store

There is no change in lot from the shipment of merchandise to its arrival at the retail store.

(10) Work procedures



(11) Costs of building up and operating the system (provided only as reference data)

The producer's work costs for traceability are, for example: ¥1.25 per pack of vegetables
¥1.43 per pack of fruits

Costs for creating two-dimensional bar codes:

- Label printer: about ¥300,000 per unit; labels: ¥0.30 per label
- PC for order acceptance and registration: ¥150,000 per unit (No PCs are needed in some cases.)
- Registration software: ¥50,000 (No software is needed in some cases.)

The retailer's costs:

- PC with touch panel: ¥480,000 per unit
- Two-dimensional bar code scanner: ¥150,000 per unit
- Printer: ¥150,000 per unit

The resources used for system construction were all new ones.
Depending on how to use the system, there may be cases where no hardware is needed, but the costs of equipment when needed were estimated above.
Costs may be reduced as a result of increasing participants.

(12) Benefits to the organizations (that introduced the system)

The producer's benefits:

- The producer's net proceeds increased although the amount was not so large because this was only tests.
- Because the producer became more careful about product quality, some of them got orders for their own product specifying their names.

The retailer's benefits:

- The merchandise became popular among the consumer because it had good quality and its history was disclosed.
- The need to dispose of and reduce the price of merchandise decreased, contributing to smaller losses and higher profits.

(13) Method of securing reliability of information

Using the government and prefectural standards as criteria for comparison, production factors were always checked, and unfair practice during distribution was totally eliminated.
In the registration work, in-house managers checked the condition of the work.
The system is directly connected with retail stores, and so the agreement with the retail store is suspended instantly if any false information is detected, by notifying the store of such fact via the Internet.

(14) Method of providing information to the consumer

Disclosure of product history at the store (that can be printed), and the product name and producer name and URL shown on the two-dimensional bar code, which enable the consumer having an Internet environment to see history information at home.

(15) Contact address

Information Interchange Promotion Department,
The Organization for Urban-Rural Interchange Revitalization
8th fl., Fuji Bldg., 5-3, Yaesu 1-chome, Chuo-ku, Tokyo 103-0028

URL: http://www.kouryu.or.jp
Perishable Food History Information Co., Ltd.
4th fl., Sakaeya-shimizu Bldg., 14-33, Akasaka 2-chome, Minato-ku, Tokyo 107-0052
URL: http://seisenrireki.com/

For reference:

Label with two-dimensional bar code attached to the merchandise

JA Hagano
(Tochigi Prefecture)
Chrysanthemum coronarium
Tadao Nagumo
Perishable Food History Information Co., Ltd.
seisenrireki.com

History of information provided at the store and at home

Perishable food history information system　　My cultivation history

(Cultivation history)

Producer	Tadao Nagumo
	
Merchandise name	Satoakira
	Cultivation information
Cultivated area	30a
(Product name)	*Chrysanthemum coronarium*
(Variety name)	Satoakira
Characteristics	Thick leaves, soft stalks, dark green and good for health. JA Hagano's new promising vegetable item.
Cultivation period	200 days
Harvest period	150 days
Harvest/10a	4,000kg
Estimated harvest	12,000kg
Shipment yield	80%
Estimated shipment	9,600kg
Cultivation method	Greenhouse cultivation
Basis for starting cultivation	Starts from the date of permanent planting

	Cultivation plan
Cultivation started	August 15, 2002 -
Cultivation ended	May 14, 2003
Harvest started	October 15, 2002 -
Harvest ended	May 14, 2003
Shipment started	October 20, 2002 -
Shipment ended	May 19, 2003
Cultivation characteristics	Throughout the cultivation period, efforts are made to keep the cultivation environment suitable to *Chrysanthemum coronarium*.
	Safety standard
Manuring method	Cultivation standard of the *Chrysanthemum Coronarium* Department of the JA Hagano, Tochigi Prefecture
Pest control method	Pest Control Standard of the *Chrysanthemum Coronarium* Department of the JA Hagano, Tochigi Prefecture

戻る

Return

(Work records) Producer: Tadao Nagumo

Date of work	Work (15 digits)	Materials used (15 digits)	Quantity applied	Dilution multiple	Description (20 digits)
Aug. 29, 2002	Basal dressing	Compost	2,000kg		Apply good-quality compost to the soil for soil preparation
Sep. 8, 2002	Preparations for sowing	Bed soil (Genkikun No.2)			Culture seedlings in the cell tray
Sep. 9, 2002	Sowing				
Sep. 26, 2002	Basal dressing	Fertilizer exclusive to *Chrysanthemum coronarium*	200kg		Apply the fertilizer prepared for *Chrysanthemum coronarium*
Oct. 1, 2002	Pest control	Water soluble powder “Pestguard”	9kg		Control leaf miner flies
Oct. 2, 2002	Pest control	Sticky smoked liquid agent	100L	100	Control aphids
Oct. 6-7, 2002	Permanent planting				4,500 plants/50m greenhouse
Oct. 8, 2002	Pest control	Wettable powder “Sandofan C”	100L	1,000	Prevent downy mildew
Oct 20, 2002	Pest control	Emulsifiable concentrate “Affirm”	150L	2,000	Control leaf miner flies
Oct. 25, 2002	Covering the greenhouse with plastic sheets	Plastic sheets			Keep the temperature in the greenhouse on a proper level
Nov. 2-3, 2002	Inside curtains hanging	Plastic sheets			Keep the temperature in the greenhouse on a proper level (water curtains)
Nov. 4, 2002 -	Harvest started				Harvest work continued until May
Dec. 28, 2002	Pest control	Emulsifiable concentrate “Affirm”	150L	2,000	Control of leaf miner flies

(Important point of work)

To harvest in winter and spring

Case study of traceability system development (7)

Organization that developed and conducted demonstrative tests for the system:

Japan Frozen Foods Inspection Corporation (JFFIC)
(Cooperator: Federation of Cooperative Associations, You Coop Federation)

System name:

Traceability system of chicken and chicken products

Participants in demonstrative tests:

Meat preparing station	: Jumonji Ninohe Foods
Meat processing station	: Seya Factory, Coop Foods
Distribution center	: Seya Center, Coop Foods
Retail store	: Higashitotsuka Store, Coop Kanagawa

Outline and characteristics of the system:

<Outline>

(1) The information at each stage is inputted with portable terminals (personal digital assistances (PDAs)) and personal computers (PCs). The function for preventing any dishonest changes is added to the inputted information.
(2) The inputted information correlates “products” with “information” and is stored in the database using identification codes composed of numerals and symbols.
(3) The transmission of information is conducted by Web communication on a real time basis.
(4) The information in the database that the consumer needs is disclosed on the monitor at the store and on the Internet homepage.

<Characteristics>

(1) The system that even small businesses can introduce
It is important that the developed system is widely introduced in the entire food industry. To realize this, the system should be such that even small businesses, which now make up 98% of food companies in Japan, can afford to introduce. More specifically, the system should be inexpensive both in hardware and software aspects, and even no computer specialists can operate the system. The system’s maintenance should also be easy to do.
(2) Verification of the system’s reliability and the consumer’s sense of security about it
The developed traceability system should offer the user reliability about its functions. “Safety” can be proved scientifically, but because the “sense of security” depends on each consumer’s opinions, “safety” is not always equivalent to the “sense of security.” This consumer’s “sense of security” can be guaranteed if a third party checks and monitors the effectiveness of the system on behalf of the consumer.
This system stores not only information about raw materials and manufacturing and distribution processes but also the data of this third-party monitoring, which is the system’s important requisite, in its database.
(3) Real-time provision of information to the consumer
Information about “safety and the sense of security” should promptly be provided to the consumer whenever needed. This system enables the consumer to get the information they need on a real time basis on the homepage or on the monitor at the store.

<Main equipment of the system>

Server for system management	:	One unit (installed at the Federation of Cooperative Associations, You Coop Federation)
Information input terminals (PDAs)	:	One unit each at the meat preparing station, at the meet processing station (center), and the store
Information input terminals (notebook PCs)	:	One unit each at the meat preparing station, at the meet processing station (center), and the store
Storefront equipment for information service (touch panel monitor)	:	One unit (Higashitotsuka Store, Coop Kanagawa)
Storefront equipment for information service (desktop PC)	:	One unit (Higashitotsuka Store, Coop Kanagawa)

Products covered:

Chicken and chicken products

Method of transmitting information:

Information using identification codes is inputted into the server via Web communication with PDAs and PCs.

Concept of lot:

Meat preparing station	:	Chicken meat made of chickens of the same species bred by the same farmer using the same feed and water is divided into three periods of preparation time on the same preparation day: morning, afternoon and midnight, which is defined as a lot.
Meat processing station, distribution center	:	In addition to the lot defined at the meat preparing station, the chicken divided for the meat processing station and the distribution center is defined as a lot.
Code system	:	2 09 23 0 A B C Year Month Day Time Variety No. of the meat processing station No. of the distribution center

(1) Carrying-in and inspection of live chickens

(2) Identification management in the production line

(3) Labeling of an identification number on a product carton

(4) Labeling of an identification number on each commodity

Flow of products and information:

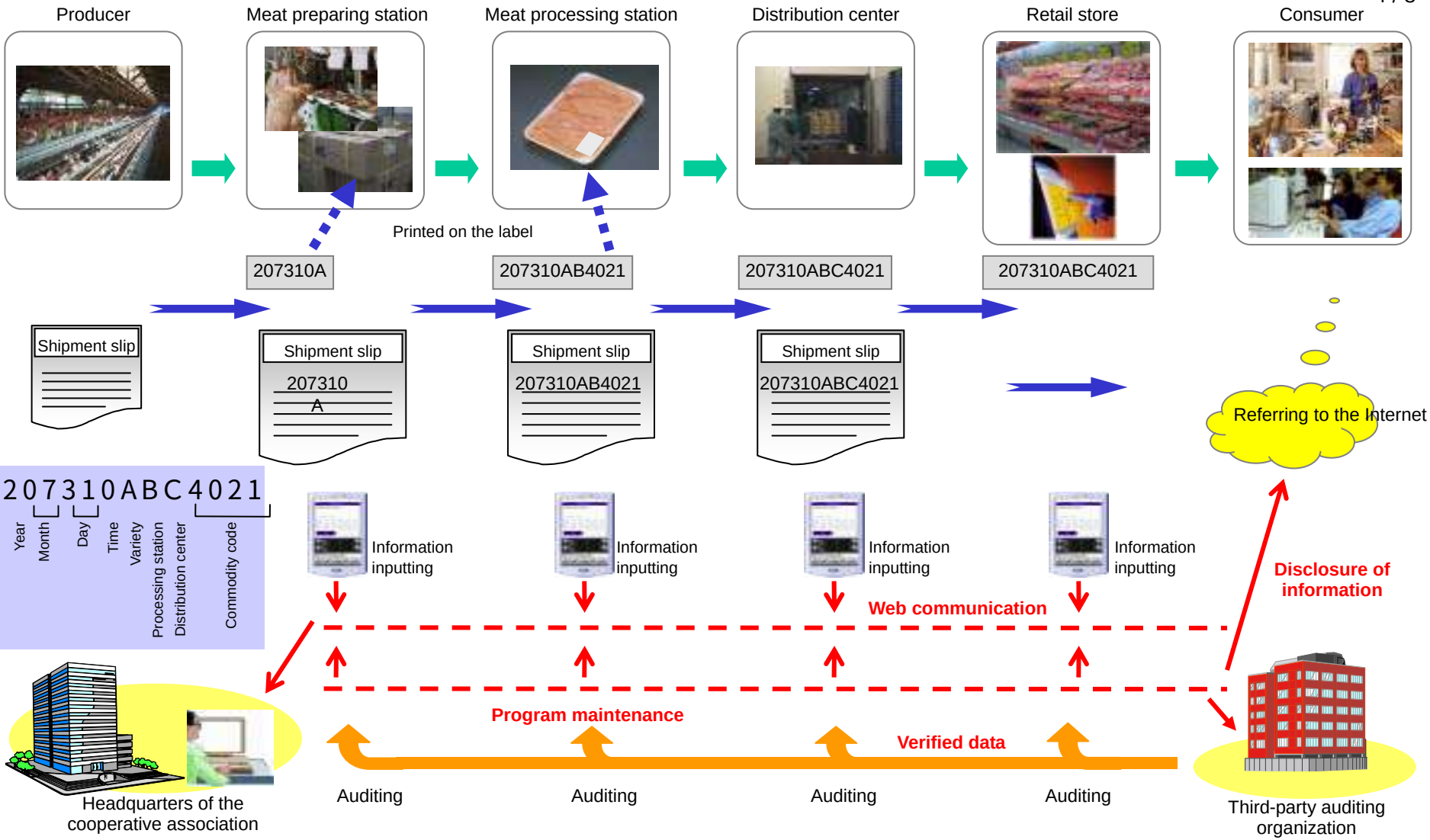
(1) Method of correlating products with information: Product management data is correlated with identification codes.

(2) Data inputting method: Data is inputted into the server of the system manager with PDAs (portable terminals) and with desktop PCs.

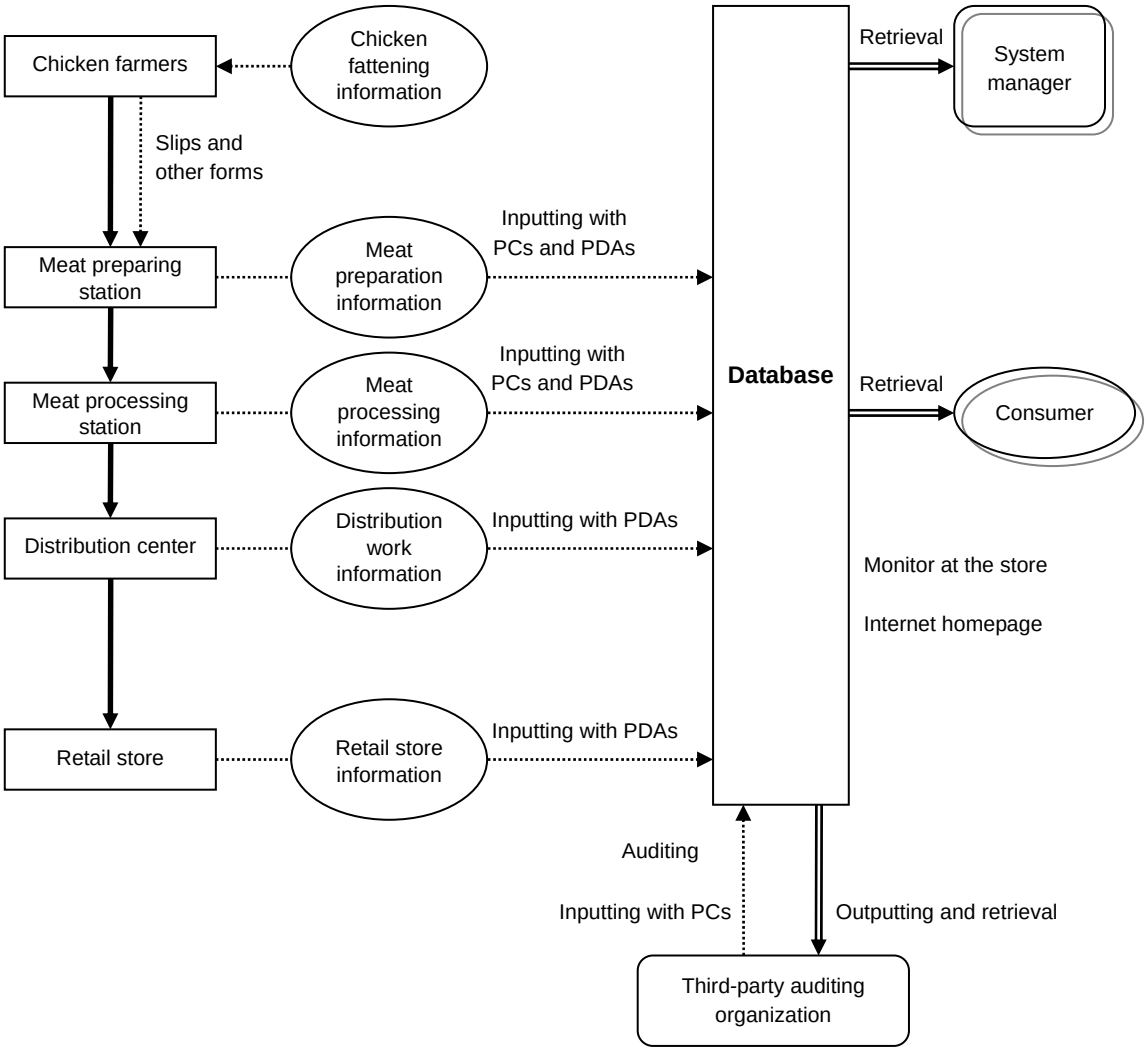
(3) Program maintenance: The system manager performs any changes via Web communication, and each participant does not need to do system maintenance.

(4) Securing system reliability: A third party conducts on-the-spot auditing of the businesses that have introduced the system to secure its reliability.

(5) Provision of information to the consumer: The consumer can get commodity information using the identification number shown on the commodity. This information is offered on the homepage and on the monitor at the store.


Producer
Meat preparing station
Meat processing station
Distribution center
Retail store
Consumer
Printed on the label
207310A
207310AB4021
207310ABC4021
207310ABC4021
Shipment slip
Shipment slip
207310
A
Shipment slip
207310AB4021
Shipment slip
207310ABC4021
Referring to the Internet
207310ABC4021
Year
Month
Day
Time
Variety
Processing station
Distribution center
Commodity code
Information inputting
Information inputting
Information inputting
Information inputting
Web communication
Disclosure of information
Program maintenance
Verified data
Auditing
Auditing
Auditing
Auditing
Headquarters of the cooperative association
Third-party auditing organization

Work procedures:



Recorded data:

Meat preparing station
(1) Raw materials acceptance and management data
(2) Poultry inspection data
(3) Preparing process management data
(4) Product inspection data
(5) Shipment data

Meat processing station:
(1) Raw materials acceptance and management data
(2) Processing process management data
(3) Product inspection data
(4) Shipment data

Distribution center:
(1) Storage management data
(2) Shipment data

Retail store
(1) In-store management data

Costs of building up and operating the sytem:

<Costs of system construction>

(1) Equipment
Data inputting: PDAs (portable terminals), ¥60,000/unit; wireless LAN, ¥50,000/unit; PCs, ¥160,000/unit
Data management: Server, ¥260,000/unit; SQL server software (for homepage), ¥600,000
Information service: Monitor for the store (including a PC), ¥170,000/unit
(2) Program development
Basic software development: ¥5 million

<Costs of system management>

Because the number of samples used in the demonstrative tests was so few that it was impossible to make a quantitative estimate of system management costs. Thus, cost factors are listed here qualitatively.

(1) Meat preparing station
- Data inputting work: About one hour per day
- Pasting of identification code labels: Labels, ¥0.20/case; pasting work has almost no workload.

(2) Meat processing station
- Data inputting work: About 30 minutes per day
- Pasting of identification code labels: Labels, ¥0.20/pack
- Pasting of labels: Loss of time due to suspension of the packing line when changing lots, about 2 minutes per lot changing

<Possibility of cost reduction>

This system has already reached the stage of practical use and the following measures are taken to reduce its costs:

(1) Data management costs

At present, the JFFIC is working to found an “Information Management Center” in cooperation with NTT Data Corp, and in September and after, the participants will need no servers. (As a result, they will need management subcontract costs only, and will not have to buy any data management equipment.)

(2) Pasting of identification code labels
By changing the pasting of identification code labels into direct printing of the codes on product packs with an inkjet printer, labels will become unnecessary.

(3) Data inputting work
By replacing the slips and other paper forms now used in the production process with data inputting with a PC, data inputting time will be shortened. (The use of PDAs for data inputting will be minimized.)

Benefits to the organizations (that introduce the system):

(1) In the event of a food-related accident, the system enables the organization to recall the product and to find the causes quickly and correctly.
(2) Third-party auditing of traceability ensures the system’s effectiveness, which in turn helps gain a greater consumer trust.
(3) The system enables the organization to promptly provide the consumer with necessary information about “safety and the sense of security” whenever needed.
(4) By reviewing the management items and methods at the time of system construction, the organization can review its quality guarantee system.
(5) Work is improved at the time of system construction, making it possible to raise the work efficiency and to cut the total costs.

Method of securing reliability of information:

(1) To secure the reliability of system operation, a third party audits the system’s effectiveness and data to check their reliability.
(2) To secure product reliability, raw materials, products in process and finished products are inspected and verified.
(3) The data inputted into the server can be revised only by the system manager (server management user), which serves as the measure to prevent any dishonest act and to ensure the reliability of input data.
(4) To change the product name, standard, production standard and the like, program maintenance should be made. Only the system manager can perform these changes by Web communication and no changes can be made at each stage, which prevents any dishonest act.

Method of providing information to the consumer:

Information is disclosed to the consumer on the Internet homepage or on the monitor at the store.

Types of information provided to the consumer

Product information:	Chicken species, feed, existence of antibiotics, synthetic antibacterial agents, etc. in feed
Producer information:	Producer’s name, photo, address and comments
Meat processing station information:	The station’s name, photo, address and comments
Meat processing station information:	The station’s name, photo, address and comments
Third-party verification information:	Comments on the system verification completed

Contact address:

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Persons in charge:	Kazuhiro Shingu (chief person in charge), Seiji Nakasha (person in charge)