Product Category Rules (PCR)

(Approved PCR ID: PA-BF-03)

Vegetables and Fruits

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The Carbon Footprint of Products Calculation and Labeling Pilot Project

(Provisional Translation)

Product Category Rules (PCR) of
"Vegetables and Fruits"
(Approved PCR ID: PA-BF-03)

Foreword
- The contents provided in this PCR may be changed and revised as needed for further refinement, through PCR revision procedures, as a result of continued discussions with relevant stakeholders during the period of the Japanese CFP Pilot Project.
- This PCR will expire at the end of the Project (scheduled until March 31, 2012).
- This English translation of the original Japanese PCR is provided for information purpose.

No.	Items	Contents
1	Scope	This PCR prescribes rules, requirements, and instructions applicable to "vegetables and fruits" under the CFP Pilot Project.
2	Definitions of products	
2-1	Descriptions of product category	In this PCR, - Vegetables are edible herbaceous plants that are used for side dishes without or with less processing. - Fruits are edible fruits borne on trees that are perennial crops. It shall exclude, - mushroom, which is grown under the different cultivation method, - primarily processed product (i.e., peeled, cut, dried, etc.), - products produced under circumstances where light and temperature are fully controlled (e.g., those produced in plant factories, radish sprouts, bean sprouts, etc.), - raw bananas (for eating) so as to avoid duplication with the PCR of "Raw Bananas".
2-2	Components of products	Components are, - product itself, - packaging, - enclosed accessories, and - intermediate packaging materials during distribution.
3	Referred Standards and PCRs	Following PCRs are referred. - PA-BB, Paper containers, packaging and wrapping (intermediate goods) - PA-BC, Plastic containers and packaging
4	Terms and Definitions	(1) Vegetables Edible herbaceous plants that are used for side dishes without or with less processing (2) Fruits Fruits to eat borne on food-producing trees that are perennial crops (3) Standard weight The weight of vegetables and fruits is generally different and varies in some degree in their sales, even if they are the same brand. In this PCR, standard weight is defined as "average shipping weight of vegetable/fruit product (not including packaging materials) in sales unit of product". - If weight specifications are defined, the weight is the standard weight. - If weight specifications are defined with certain ranges, adopt the median value.

		- If weight specifications are defined with certain value (lower limit, etc.), adopt the value. - If weight specifications are not defined, standard weight is the average weight per sales unit (e.g., product sold by piece, by portion, or by unit weight) calculated from total sales weight in the CFP assessment duration. The CFP assessment operator shall prepare evidence ensuring the validity of the value, and verifies its validity during CFP verification. (4) Fertilizer Fertilizer is "elemental fertilizer," "combined fertilizer," "organic fertilizer," and "soil amendment material". 　(a) Elemental fertilizer 　　A fertilizer containing only one component of nitrogen, phosphoric acid, or potassium. In this PCR, silica (waste-soluble silica gel) is added to these components. 　(b) Combined fertilizer 　　A fertilizer containing two or more components among nitrogen, phosphoric acid, or potassium. 　(c) Organic fertilizer 　　A biomass-origin fertilizer containing compost and manure. 　(d) Soil amendment material 　　A material such as lime used to change the type of soil (physical, chemical, biological properties) for plant cultivation. (5) Seeding 　Sowing seeds of crops. (6) Settled planting 　Transplanting a plant from nursery bed or pot for seedling to a settled place to raise it to a final product. (7) Markets transferring 　Commercial activities to transfer products from one market to another, conducted by wholesalers and intermediate wholesalers. (8) Term (period from seeding to the end of cultivation) 　For vegetables with less-than-a-year growth period, one term refers to a period from seeding or settled planting to harvest completion (vegetables whose growth period is longer than one year are excluded; such as asparagus). 　For fruits whose growth period is one year or longer, one term refers to a period from seeding or settled planting to harvest completion for the first term, while from harvest completion of the previous term to harvest completion of the current term for the second term onward.
5	Range of assessment	
5-1	Calculation unit	- Unit shall be per unit weight (per 100g). - CFP value per unit weight shall be converted by using standard weight. - Assessment shall be limited to the product whose sales unit is identified at shipping stage.
5-2	Life cycle stages	Following life cycle stages shall be covered: - raw material acquisition stage - production stage - distribution stage - use and maintenance stage

		- disposal and recycling stage
6	General requirements applied to all stages	
6-1	Life cycle flow chart	See Annex A (normative).
6-2	Range of data collection	Conform to rules applied to each stage.
6-3	Data collection period	- Primary data collection period shall be the most recent one term. - For products such as leafy vegetables that are planted several times a year, data of the same term in the previous year, or average data of the previous year may be used. - When it is difficult to collect most recent data until the sale of the product, primary data of the previous term may be used. - When the harvest was extremely small in the most recent term or the preceding term due to bad weather and such, the average of the primary data in several years before may be used. In the case, the validity of the data shall be verified. - For the amount of waste of packaging materials disposed at household, the data collection period is not required. Weight of product-specific packaging materials can be used. - For the waste amount of inedible portions which will become food residues, the data collection period is not required. A certain rate specified in the waste scenario for inedible portions can be used. - For other cases, not using the most recent one term for the data collecting period, the data validity shall be verified.
6-4	Allocation	- Weight ratio shall be used. - When any other parameter (any physical quantity other than weight such as farm land area, working time, and economic value, etc.) is used, its validity shall be verified.
6-5	Cut-off criteria	When conducting cut-off, the range of cut-off shall be within 5% of the total life cycle GHG emissions, and the range shall be clearly reported. Cut-off shall, however, be conducted, provided that it is difficult to use any scenarios, similar data, and estimated data.
6-6	Others	[Rules related to on-site electricity generation] For on-site electricity generation, the amount of fuels used for the production of the product shall be collected as primary data, and GHG emissions related to the manufacture and combustion of the fuel shall be calculated. [Rules related transport] - The primary data shall be collected as much as possible, either by the fuel consumption method, the fuel cost method, or the ton-kilometer method. See Annex B (normative). [Rules related to wastes] - Wastes discharged from each process shall be included. - When plant residues are landfilled as fertilizer, they shall not be included in "wastes". The CO_2 generated by the biodegradation of landfilled plant resides shall be regarded as carbon-neutral and shall be excluded from data collection. - For "GHG emissions from waste of packaging materials by incineration", the CO_2 emissions derived from biomass are regarded as carbon-neutral

		and may not be calculated.
		- Also, the CO_2 emissions from incineration of food residues are regarded as carbon-neutral and shall be excluded from data collection.
		- For recycled material, the GHG emissions of transport process and from recycling preparation processes shall be included.
		- Indirect effects shall be excluded.
		[Rules related to recycled materials and reused products]
		- When recycled materials and reused products are used as inputs, the GHG emissions associated with the recycling processes up to recycling preparations (e.g., regeneration processing, etc.) and the reuse processes (e.g., collection, cleaning, etc.) shall be included.
		- For items to be recycled, GHG emissions from the transport for recycling to the recycling preparation process shall be included.
7	Requirements for the raw material acquisition stage	
7-1	Range of the processes	The following processes shall be covered. 　- Processes related to the manufacture and transport of: 　　> "seeds and seedlings," 　　> "fertilizers," 　　> "agricultural chemicals," and 　　> "cultivation materials (wooden, plastic, metallic, stone materials, etc.)". 　- Processes related to supply of "fuel" and "electricity"
7-2	Data collection items	The data on the following items shall be collected: <Input> 　Input amount of; 　- "seeds and seedlings," 　- "fertilizers," 　- "agricultural chemicals" and 　- "cultivation materials (wooden, plastic, metallic, stone materials, etc.)" 　When inputs are on-site produced and its fuel and electricity consumption data are collected, it is unnecessary to collect the GHG emissions related to the manufacture and transport input by input. 　GHG emissions related to the manufacture and transport of packing or transport material of procured inputs shall be included. 　Input items to be used for multiple years shall be excluded. <Life cycle GHG emissions> (1) Life cycle GHG emissions related to the manufacture and transport of; 　- "seeds and seedlings", 　- "fertilizers", 　- "agricultural chemicals", 　- "cultivation materials" and 　- "packaging materials and transport materials used when acquiring raw materials" (2) Life cycle GHG emissions related to the supply of "fuel" and "electricity". Note for both (1) and (2): 　Such as "self-produced fertilizers", inputs are produced on the site and the use amount of fuel and electricity at its production is known. In this case, data for individual input amount of GHG emissions related to the

		manufacture and transport of inputs are not required to be collected individually. Life cycle GHG emissions related to the manufacture and transport of packaging materials and transport materials that are used for acquiring inputs from outside shall also be covered in the assessment.
7-3	Primary data collection items	Primary data shall be collected on the following items. <Input> Input amount of; 　- "Seeds and seedlings," 　- "fertilizers," 　- "agricultural chemicals," and 　- "cultivation materials".
7-4	Primary data Collection method and Requirements	There are two methods for measuring primary data: (1) Add up input amount and discharge amount of items, by collecting data of "per operation unit" or "per equipment/facility operation" and "operating hours", "operating area size", or "operating distance". (e.g., Operating time of farm machine of the crop x fuel consumption of farm machine by hour = fuel consumption) 　- When using this method, consistency shall be checked by adding up and calculate the data output by output, regardless of the boundary of the PCR, comparing with it to the site-total output data. 　- The operation unit of equipment/facility (e.g., as operating hours, operating area size, operating distance) may be adopted from such information sources as farming diaries, farming management software, and other farming records. 　- Regarding the consumption amount of fuel and electricity associated with equipment/facility operations except in farm land, such as pumping of well water or in-house production of composts, it shall be included in measurement scope if it is related to cultivations. 　- Life cycle GHG emissions related to manufacture and transport of packaging materials and transport materials shall also be covered in this assessment. (2) Allocating the result by operation period. (e.g., allocate total fuel consumption in a year among crops harvested) 　Follow provisions listed in No.6-4. When it is difficult to exclude the indirect fuel and electricity use, such as air-conditioning and lighting at offices, it can be included in the measurement.
7-5	Scenario	[Transport scenario] Regarding transport from a supplier, primary data about the means of transport, the transport distance, and the loading ratio shall be collected. When it is difficult, scenarios in Annex C (normative).
7-6	Others	[Exceptions when data is collected from multiple suppliers] When raw materials are acquired from multiple suppliers, primary data from all the suppliers shall be collected. However, if there are so many suppliers and the collection of the data are difficult, primary data shall be collected for 50% or more of the total amount. To cover the rest of it, either of the following methods shall be used.

		(1) Use the average of the primary data for the rest of the data
		(2) Use the secondary data for calculation, and add the calculated value to the primary data collected to make it to 100%.
		
		[Exceptions when data is collected from multiple farmers]
		Vegetables and fruits are produced by multiple farmers so that the data collection can be as follows.
		- Collect primary data from the part of the farmers and apply the averaged primary data for the rest of farmers. When this method is used, demonstrate that the primary data collected is unbiased.
		- Demonstration can be,
		    (1) showing the classified sample data fits to distribution of each classification. Classification of the all farmers can be done by farm land area, amount of cultivation, farming efficiency, etc.
		    (2) any other method can be used if the data representativeness is shown and validated at the verification process.

8	Requirements for the production stage	

8-1	Range of the processes	The following processes shall be covered.
		(1) Cultivation related process
		  - Necessary process for cultivation in and around farm land, such as "farm land consolidation," "seedbed preparation," "seeding," "farm land preparation," "settled planting," "cultivation management," "harvesting," and "cleanup".
		(2) Shipping preparation process
		  - Shipping preparation process of vegetables or fruits, including "adjusting," "sorting and selecting," "weighing," "packaging" and "storing."
		(3) Transport process
		  - Transport process to shipping preparation facility etc.
		(4) Composting process
		  - Process that plant residues are buried in the soil as fertilizer. Residues are generated from pruning process, irregular products and after harvesting.
		(5) Waste treatment process
		  - Waste treatment process discharged from each process
		(6) Process related to manufacture and transport of the input to shipping preparation process
		  - Process related to manufacture and transport of "packaging materials" for shipping.
		(7) Temperature control process
		  - Process related to "electricity" used for constant-temperature warehouses and temperature management of products.

8-2	Data collection Items	Data shall be collected for the following items.
		(1) Cultivation related processes
		<Input>
		  - Input amount of "fuel and electricity"
		    > When input amount of fuel and electricity used for on-site production of seeds and seedlings, fertilizers, agricultural chemicals and cultivation materials are included in net amount of fuel and electricity consumption, individual data for each input need not to be collected.

> The amount of agricultural water and well water produced at farming site need not to be collected. Since the amount of agricultural water used is difficult to collect and can be considered as natural water, the GHG emissions cannot be calculated. The amount of fuel and electricity used for pumping up well water need not to be collected, since it is already included in the input amount of fuel and electricity.

\<Output and discharge\>

- Output amount of "vegetables or fruits" (before adjustment)
  This shall be the total harvested amount and there is no need to deduct the self consumption. The GHG emissions per unit harvest amount are calculated.
- Discharge amount of "wastes"
- Generation amount of "nitrous oxide (N_2O)" from nitrogenous fertilizer

\<Other\>

- "Farm land area"

(2) Shipping preparation processes

Items to be used for multiple years shall be excluded from input. If plant residues such as irregular (out of standard size or weight) products are landfilled in the soil for using them as fertilizers, they shall not be included in "wastes". It is assumed as carbon neutral.

\<Input amount of\>

Input amount of "vegetables or fruits (before adjustment)," "fuel and electricity," "tap water" and "packaging materials for shipping (when producer conducts packaging)".

\<Output and discharge\>

- Output amount of "vegetables or fruits (after adjustment)"
- Discharge amount of "wastes"

(3) Transport processes

- Cargo weight
- GHG emissions associated with fuel use

(4) Composting process

- GHG emission from degrading plant residues are assumed as carbon neutral and the collection of data is unnecessary.
- Energy consumption in this process are collected as part of the input amount of "fuel and electricity" in the cultivation related process (No. 8-2, (1)).

(5) Treatment process of wastes discharged from each process

- Discharge amount of wastes
- Life cycle GHG emissions related to the waste treatment and transport
- Amount of wastes to be recycled
- GHG emissions related to the processes of the transport for wastes to be recycled and of the recycling preparation

(6) Processes related to manufacture and transport of the input to shipping preparation process.

- Life cycle GHG emissions related to

		> The production and transport of "packaging materials" for shipping. > Supply of "fuel" and "electricity".
		
		(7) Temperature management process
		  - GHG emissions related to temperature management of crops harvested,
		    > "Electricity" consumptions of constant-temperature warehouses
		  - If this process is implemented, its validity shall be verified.

8-3	Primary data collection items	Primary data shall be collected on the following items.
		(1) Cultivation related process
		<Input>
		  - Input amount of fuel and electricity.
		<Output and discharge>
		  - Output amount of vegetables or fruits (before adjustment)
		  - Discharge amount of wastes
		<Other>
		  - Farm land area
		
		(2) Shipping preparation process
		<Input>
		 Input amount of
		  - vegetables or fruits (before adjustment)
		  - fuel and electricity
		  - tap water
		  - packaging materials for shipping (if agricultural producers conduct packaging)
		<Output and discharge>
		  - Output amount of vegetables or fruits (after adjustment)
		  - Discharge amount of wastes
		
		(3) Transport process
		  - Cargo weight
		  - (In case of fuel consumption method) Amount of fuel used
		  - (In case of fuel cost method) GHG emissions from fuel consumptions per driving distance
		
		(4) Composting process
		Unnecessary to collect the primary data
		
		(5) Wastes treatment process discharged from each process
		  - Discharge amount of wastes
		
		(7) Temperature management process
		  - GHG emissions related to temperature management of crops harvested
		    > Amount of "electricity" used for constant-temperature warehouses
		
		(8) Common items on each process
		Life cycle GHG emissions related to,
		  - The supply and use of "fuel" and "electricity" for on-site production.

		- The ones about which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project (hereafter called the Tentative Database of GHG Emission Factors).
8-4	Primary data Collection method and Requirements	Conforms to "No. 7-4". 　- When biomass energy sources such as firewood, wooden chips, and charcoal are produced on the site, the energy consumption necessary for its production shall be collected in the primary data and the GHG emissions shall be calculated. 　- If the input amount of energy for the production of biomass energy sources is included in the total fuel and electricity input amount on the site, there is no need to collect data separately. 　- CO_2 emissions from the combustion of biomass energy are assumed carbon neutral. Data need not to be collected.
8-5	Scenario	- Primary data shall be collected about the distance, the means of transport, and the loading ratio, regarding transport from agricultural producers to shipping preparation process, as well as acquisition input to shipping preparation process from their agricultural producers. - When this is difficult, use scenario in Annex C.
8-6	Others	[Exceptions when data is collected from multiple farmers] Vegetables and fruits are produced by multiple farmers so that the data collection can be as follows. 　- Collect primary data from the part of the farmers and adopt the averaged primary data for the rest of farmers. When this method is used, demonstrate that the primary data collected is unbiased. 　- Demonstration can be, 　　(1) showing the classified sample data fits to distribution of each classification. Classification of the all farmers can be done by farm land area, amount of cultivation, farming efficiency, etc. 　　(2) any other method can be used if the data representativeness is shown and validated at the verification process. [Exceptions related to calculation method of a product which needs growing season] Fruits take time for growing before coming their harvest seasons. The total amount of GHG emitted in this growing season, necessary for harvests, needs to be reflected to the CFP. Therefore, the amount of emissions of a product which needs growing season shall be treated as the total GHG emissions throughout its growing season divided by the total harvested amount, among the plants with the same settled planting season and in the same cultivating area. 　Emissions of "the product which needs growing season" in the production stage (kg-CO_2e/kg) 　　= GHG emissions throughout its growing season (kg-CO_2) 　　　/ Total harvested amount throughout its growing season (kg) When conducting the calculation, primary data shall be collected. However, in most of all cases, it is expected to be difficult. In such cases, it shall be calculated by using the following data, etc. 　(1) Data in cultivation model for local producer in the area, established

		by regional agricultural cooperatives or local governments (2) Data in published research by national or prefectural research institution. (3) When above data cannot be acquired, use data estimated by public research or supervisor institution, To use these methods, operator shall prepare evidence ensuring the validity of its application, and it shall be verified at CFP verification procedure.
9	Requirements for the distribution stage	

9-1	Range of the processes	The following processes shall be covered.
		(1) Sales preparation process
		  - Sales preparation process of vegetables or fruits by "weighing," "processing," "packaging," and "storing" after "adjusting" and "sorting and selecting."
		(2) Waste treatment process
		  - Process for treating wastes discharged from each process.
		(3) Transport related process
		  - Transport related process from shipping preparation process to delivery to retailing stores of vegetables or fruits. Disinfection is included when it is conducted in the course of transport.
		(4) Process related to manufacture and transport of input to sales preparation process and transport related process
		  - packaging materials for sales
		  - materials for disinfection
		  - supply of fuel and electricity

9-2	Data collection items	The data on the following items shall be collected:
		(1) Sales preparation process
		<Input>
		  Input amount of,
		    - vegetables or fruits (before adjustment)
		    - fuel and electricity
		    - tap water
		    - packaging materials for sales
		  Items to be used for multiple years are excluded from the input.
		<Output>
		  Output amount of vegetables or fruits (after adjustment)
		
		(2) Waste treatment process
		  - Discharge amount of wastes
		  - Life cycle GHG emissions related to waste treatment and transport
		  - Discharge amount of wastes to be recycled
		  - Life cycle GHG emissions related to processes of the recycling preparation for wastes to be recycled.
		
		(3) Transport related process
		  - Cargo weight (vegetables or fruits)
		  - GHG emissions associated with fuel use
		If disinfection is conducted, the following items shall also be collected.
		  Input amount of,
		    - vegetables or fruits disinfected

		- materials used for disinfection
		- fuel and electricity
		
		(4) Process related to manufacture and transport of input to sales preparation process and transport related process. Life cycle GHG emissions related to,
		    - manufacture and transport of "packaging materials for sale"
		    - manufacture and transport of "materials for disinfection"
		    - supply of "fuel," "electricity" and "tap water"

9-3	Primary data collection items	Primary data shall be collected on following items.
		(1) Sales preparation process
		\<Input>
		  Input amount of
		  - vegetables or fruits (before adjustment),
		  - fuel and electricity
		  - tap water
		  - packaging materials for sale."
		\<Output>
		  - Output amount of vegetables or fruits (after adjustment)
		
		(2) Waste treatment process
		  - Discharge amount of wastes
		
		(3) Transport related process
		   - Cargo weight (vegetables or fruits)
		   - Use amount of transport materials
		If disinfection is conducted, the following items shall also be covered for data collection.
		  Input amount of,
		   - "vegetables or fruits disinfected"
		   - "materials used for disinfection"
		   - "fuel and electricity"

9-4	Primary data Collection method and Requirements	[Sales preparation process] - Data collection of "fuel," "electricity," and "tap water" in the sales preparation process shall follow No.8-2, (2). [Transport process] - For transport data collection, see No.6-6. The distance may be actually measured or obtained from navigation software. - Primary data of transport process differ between areas. Therefore, primary data shall basically be collected for all transport routes and all sales sites. When it is impossible, see No.9-5 scenario.

9-5	Scenario	(1) Transport scenario
		Distribution systems are complex: especially for sales via wholesale market, it is difficult to identify a route to reach consumers. Therefore, the following scenario shall be used for calculation.
		  - When transport route is fixed:
		   Collect primary data about the distance, the means and the loading ratio. When difficult, the scenario given in Annex C may be used.
		  - When transport route is fixed but multiple routes exist:

> Primary data on all transport routes shall be collected and then they shall be weight-averaged by the amount of product transported. However, if there are many routes, primary data shall be collected for 50% or more of the total amount of the product transported.

> Regarding a route whose primary data cannot be collected, the average value of the primary data which collected from suppliers shall be used as secondary data.

> In case that primary data cannot be collected, it may calculate by using the scenario given in Annex C to obtain the value which is then weight-averaged by the amount of product transported.

- When transferring between markets is assumed

GHG emissions associated with transferring between markets shall be covered. In case that the amount transferred between markets is unknown, use the scenario given in Annex C. It assumes that transfer is conducted once, with the value obtained by multiplying transfer rate given in Annex F with the total amount of products transferred.

- When it is assumed that transport to consumers with no specific consumption area, apply (e) of C.1 in Annex C.

- For transport via such as produce stands, which is surely within an administrative boundary, apply (a) of C.1 in Annex C.

- For transfer, which may include transport between prefectures, apply (d) of C.1 in Annex C.

- If another scenario is applied.

Operator shall prepare the evidence ensuring the validity of its application. Regarding the secondary data, it shall be verified its validity in the CFP verification procedure.

(2) Transport scenario for input of sales preparation process

Collect primary data about the distance, the means and the loading ratio. If this is difficult, see Annex C.

(3) Transport scenario for waste of packaging materials

Collect primary data about the distance, the means and the loading ratio. If this is difficult see Annex C.

9-6	Other	[Exceptions related to allocation] Physical quantity (weight) shall be used as the basic standard for allocating energy consumption However, if it is difficult to cutout the amount of the objective part, sales amount may be used.
10	Requirements for the use and maintenance stage	
10-1	Range of the processes	The following process shall be covered. (1) electricity consumption during refrigerated storage (2) electricity consumption during cooking (3) fuel consumption during cooking (4) water consumption during cooking (5) waste water discharged during cooking
10-2	Data collection items	The data on the following items shall be collected: <Input> - Input amount of vegetables or fruits Per unit weight of input amount to "use and maintenance stage" shall be collected, not the input amount of vegetables or fruits per cooking.

		- Input amount of fuel, electricity and water
		<Discharge>
		- Discharge amount of wastewater
		<Other>
		Life cycle GHG emissions related to,
		- tap water supply
		- household wastewater treatment
		- supply and use of electricity
		- supply and use of gas
10-3	Primary data collection items	The primary data on the following item shall be collected. - Input amount of vegetables or fruits
10-4	Primary data Collection method and Requirements	Not stipulated.
10-5	Scenario	[Storage scenario] - Storage in refrigerator at home depends on types of vegetables or fruits. In this PCR, electricity consumption is calculated based on a ratio of electricity used for preserving vegetables or fruits that need chilled storage against all food products that need chilled storage. - The items which need chilled storage listed in the scenario of Annex D.1 (informative) are calculated as items to be refrigerated. If any different assumption is applied, its validity shall be verified. - According to the scenario, electricity consumption per kg in refrigerator at home is 0.14kwh/kg (See D.2 of Annex D (informative)) [Use scenario] - Concept and method of scenario setting is in Annex E. - Regarding the rate of edible portions, collect primary data. However, it may be calculated by using the scenario provided in the section No. 11-5. - Use scenario in annex E to determine the necessity of heat for cooking. If other method is applied, its validity shall be verified. Input/output items and amounts are as shown below:

    - Input amount of electricity   0.22 kwh/kg

    - Input amount of city gas(LNG) 2.08×10^3 J/kg

    - Input amount of LPG 2.28×10^3 J/kg

    - Input amount of water   0.023 m^3/kg

    - Discharge amount of wastewater   0.023 m^3/kg

  *1: Electricity, city gas and LPG are only for the vegetables and fruits items with cooking process. Input amount of water and discharge of wastewater are for all items of vegetables and fruits.

  *2: Values of electricity, city gas and LPG are indicated in per kg of input amount of vegetables or fruits (edible portions). Those of water and wastewater are in per kg of input amount of vegetables or fruits (whole).

10-6	Other	Not stipulated.
11	Requirements for the disposal and recycling stage	

11-1	Range of the processes	The following process shall be covered.
		   (1) Transport of waste of packaging materials and food residues from household to waste treatment facilities
		   (2) Incineration of waste of packaging materials and food residues at

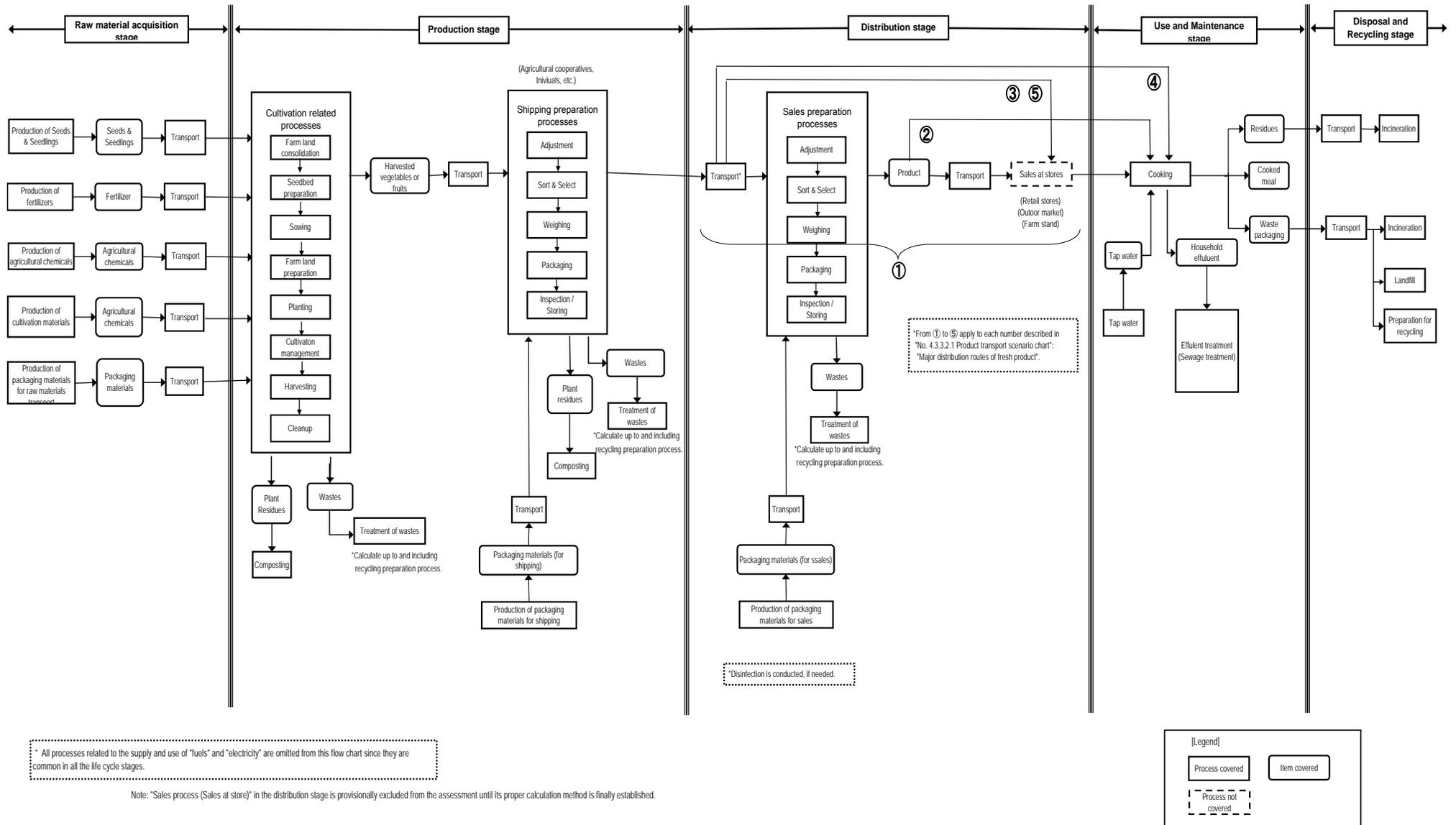|		waste treatment facilities
		(3) Landfill of waste of packaging materials and food residues at waste treatment facilities
		(4) Transport process and recycling preparation process of waste of packaging materials to be recycled and food residues
11-2	Data collection items	The following data shall be collected. <Waste of packaging materials> - Disposal amount of waste of packaging materials at home - Amount of waste of packaging materials incinerated at treatment facilities - Amount of waste of packaging materials landfilled at treatment facilities - GHG emissions related to the "transport of waste of packaging materials to treatment facilities," "incineration at treatment facilities (other than CO_2 emissions from waste of packaging materials,") and "landfill of waste packaging materials at treatment facilities" - GHG emissions deriving from waste of packaging materials by incineration. (CO_2 emissions from incineration of food residues (inedible portions) are regarded as carbon-neutral and not be included in the assessment.) - Amount of waste of packaging materials to be recycled. - GHG emission related to the processes of transport and recycling preparation for waste of packaging materials to be recycled <Food residues> - Disposal amount of "inedible portions of food residues from home" - Amount of food residues (inedible portions) incinerated at treatment facilities - Amount of food residues (inedible portions) landfilled at treatment facilities - GHG emissions related to the "transport for food residues (inedible portions) to treatment facilities," "incineration at treatment facilities (other than CO_2 emissions from food residues (inedible portions)," and "landfill of food residues (inedible portions) at treatment facilities"
11-3	Primary data collection items	Primary data on the following item shall be collected. - Disposal amount of waste packaging materials at home.
11-4	Primary data Collection method and Requirements	- For the amount of waste packaging materials disposed at home, it shall be used the weight of packaging materials as provided in the product specifications, since it is assumed that all of the packaging materials used for the product will be disposed. - Regarding GHG emissions from waste packaging materials by incineration, all carbon contained in the waste packaging materials may be considered to be all emitted as CO_2. Regarding the carbon content in waste packaging materials, the weight ratio of materials in product specifications may be multiplied by the carbon quantity in the materials unit quantity based on the chemical composition. - Locality and seasonality shall not be considered.
11-5	Scenario	(1) Disposal scenario of inedible portions of food residues Regarding the disposal amount of inedible portions of foods from home, it is preferable to collect primary data. However, it may be calculated by using the scenario below:

<table>
<tr><td></td><td></td><td>

-The rate of inedible portions uses the disposal rate specified in the "Standard Tables of Food Composition in Japan: Fifth revised and enlarged edition" (The Ministry of Education, Culture, Sports, Science and Technology).

- If corresponding items are not indicated in the reference above, the following disposal rate is used.

Vegetables: disposal rate (share of inedible portions) 13.4%
    share of inedible portions (yield) 86.6% (reference)
Fruits: disposal rate (share of inedible portions) 26.2%
    share of inedible portions (yield) 73.8% (reference)
[Source] "Food supply-demand table" (2007; definite value) by MAFF
   http://www.maff.go.jp/j/zyukyu/fbs/index.html
   Note: Fruit-like vegetables are included in vegetables.

(2) Waste transport scenario
Regarding the calculation of GHG emissions related to the transport of waste packaging materials and food residues (inedible portions) from home to treatment facilities, it is preferable to collect primary data but the scenario in Annex C may be used instead.

(3) Waste treatment scenario
Regarding the disposal methods for the waste packaging materials and food residues (inedible portions) transported to disposal facilities, it is preferable to collect the primary data but the following scenario may be used. The following assumptions are applied from the current status of disposal of general waste described in the "State of Discharge and Treatment of Municipal Solid Waste in FY 2006" (surveyed by the Ministry of the Environment).
  - 92% of the packaging waste is incinerated.
  - 3% is directly landfilled.
  - 5% is recycled.

</td></tr>
<tr><td>11-6</td><td>Others</td><td>

[Exceptions related to the handling of products at multiple disposal and recycling facilities]
For the cases of handling of products at multiple disposal and recycling facilities, this PCR prescribes the application of secondary data to GHG emissions related to the incineration of wastes at treatment facilities and GHG emissions related to the landfill of wastes at treatment facilities.

[Exceptions related to allocation]
When collecting primary data on "GHG emissions related to the transport of wastes of packaging materials to waste treatment facilities" and "GHG emissions related to the transport of food residues (inedible portions) to waste treatment facilities," GHG emissions of individual routes are obtained as data for the total combined weight with other waste.
As for GHG emissions of individual routes, the total GHG emissions shall be allocated based on the transported weight for each route. Allocate these GHG emissions of individual routes to different types of wastes based on weight allocation, and then combine GHG emissions of applicable types of wastes covered by the assessment: The combined value shall be the GHG

</td></tr>
</table>

		emissions related to the transport of wastes covered by this PCR.
		When collecting primary data on the "amount of waste of packaging materials incinerated at disposal facility", the "amount of waste of packaging materials landfilled at disposal facility," the "amount of food residues (inedible portions) incinerated at treatment facilities," and the "amount of food residues (inedible portions) landfilled at treatment facilities," the ratio between the incinerated amount and the landfilled amount is obtained as data for total weight including other types of waste. The incinerated amount and the landfilled amount of the waste of packaging materials shall be calculated based on allocation by weight, using the total incinerated amount and the total landfilled amount at multiple disposal sites.
12	Items applied secondary data	- The data provided by the "Tentative Database of GHG Emission Factors for the CFP Pilot Project". - When the data is not found in above database, "reference data" will be prepared by the CFP Pilot Project Secretariat.
13	Communication requirements	
13-1	Unit to be displayed on the label	- Use calculation unit (per 100g). - The communication method described in the "Guidelines" and the "Standards of PCR development" may be used, but in this case, its appropriateness shall be discussed on the CFP verification panel.
13-2	Label Position and Size	- Conforms to the "Specifications of CFP Label and Displaying Other Information". - Regarding display of CFP value, "per 100g" of vegetables or fruits shall be stated, and the primary data collection period of the cultivation related processes shall also be indicated. - When the assessment includes the cooking or refrigerator storage process, it shall be stated with "including emissions from cooking" or "including emissions from refrigerator storage". - Regarding CFP label position, in the case of selling packaged products, CFP label may be displayed on the package. The label may also be displayed on POP, brochure, or the Internet. In the case of selling by weight, the label may be displayed on POP, brochure, or the Internet.
13-3	Contents of additional Information	- "Per unit weight" (per 100g) is specified as the unit of this product. Therefore, the total CO_2 emissions for each sales unit of vegetable or fruit shall be disclosed on the website managed by the CFP Pilot Project Secretariat (http://www.cfp-japan.jp/). When displaying weight additionally, relevant laws and regulations shall be taken into consideration. - It may display additional information about the reduction amount in the past year(s) of the same product or of the product considered as similar by the same operator (or the same region or group), or about the reduction amount through the environmentally-sound agricultural activities promoted by the Ministry of Agriculture, Forestry and Fisheries, with verification.. - The value per process or per component or the rate of primary data collection may be stated with verification - Regarding displayed contents of additional information (for example, the display of reduction amount includes GHG emissions before reduction), it

		may be displayed only the contents acknowledged as appropriate by the CFP verification panel.

Annex A (normative): Life cycle flow chart

Raw material acquisition stage | **Production stage** | **Distribution stage** | **Use and Maintenance stage** | **Disposal and Recycling stage**

(Agricultural cooperatives, Inivivuals, etc.)

Raw material acquisition stage:
- Production of Seeds & Seedlings → Seeds & Seedlings → Transport
- Production of fertilizers → Fertilizer → Transport
- Production of agricultural chemicals → Agricultural chemicals → Transport
- Production of cultivation materials → Agricultural chemicals → Transport
- Production of packaging materials for raw materials transport → Packaging materials → Transport

Production stage:

Cultivation related processes:
- Farm land consolidation
- Seedbed preparation
- Sowing
- Farm land preparation
- Planting
- Cultivaton management
- Harvesting
- Cleanup

→ Harvested vegetables or fruits → Transport

Shipping preparation processes:
- Adjustment
- Sort & Select
- Weighing
- Packaging
- Inspection / Storing

Plant Residues → Composting
Wastes → Treatment of wastes
*Calculate up to and including recycling preparation process.

Wastes → Treatment of wastes → Composting
Plant residues
*Calculate up to and including recycling preparation process.

Transport
Packaging materials (for shipping) ← Production of packaging materials for shipping

Distribution stage:

Transport*

Sales preparation processes:
- Adjustment
- Sort & Select
- Weighing
- Packaging
- Inspection / Storing

Wastes → Treatment of wastes
*Calculate up to and including recycling preparation process.

Transport
Packaging materials (for ssales) ← Production of packaging materials for sales

① ② ③ ⑤ ④

Product → Transport → Sales at stores
(Retail stores)
(Outoor market)
(Farm stand)

*From ① to ⑤ apply to each number described in "No. 4.3.3.2.1 Product transport scenario chart": "Major distribution routes of fresh product".

*Disinfection is conducted, if needed.

Use and Maintenance stage:

Cooking
Tap water → Tap water
Household effluulent → Effluent treatment (Sewage treatment)

Residues → Transport → Incineration
Cooked meal
Waste packaging → Transport → Incineration / Landfill / Preparation for recycling

Disposal and Recycling stage

* All processes related to the supply and use of "fuels" and "electricity" are omitted from this flow chart since they are common in all the life cycle stages.

Note: "Sales process (Sales at store)" in the distribution stage is provisionally excluded from the assessment until its proper calculation method is finally established.

[Legend]
Process covered | Item covered
Process not covered

— 18 —

Annex B (normative): Calculation method for GHG emissions associated with fuel consumption during transport

B.1 Fuel consumption method

1）Collect data on fuel consumption [L] for each mean of transport, and convert the fuel unit, "L," to "kg" by using following equation.

Fuel consumption [kg] = Fuel consumption [L] x fuel density "γ" [kg/L]
Fuel density of gasoline: γ = 0.75kg/L
Fuel density of light oil: γ = 0.83kg/L

2）Calculate life cycle GHG emissions [kg-CO_2e] by multiplying fuel consumption [kg] and the "life cycle GHG emissions related to supply and use of fuel" [kg-CO_2e/kg] (secondary data) for each type of fuel.

B.2 Fuel cost method

1）Collect data on fuel cost [km/L] and transport distance for each mean of transport, and calculate fuel consumption [kg] by using the following equation.

Fuel consumption [kg] = transport distance [km] / fuel cost [km/L] x fuel density "γ" [kg/L]

2）Calculate life cycle GHG emissions [kg-CO_2e] by multiplying fuel consumption [kg] and the "life cycle GHG emissions related to supply and use of fuel" [kg-CO_2e/kg] (secondary data) for each type of fuel.

B.3 Improved ton-kilometer method

1）Collect data on loading ratio [%] and transport load (transport ton-kilometer) [t-km] for each mean of transport.
2）If the loading ratio is unknown, assume it to be 62%.
3）Calculate life cycle GHG emissions [kg-CO_2e] by multiplying the transport load (transport ton-kilometer) [t-km] by the "life cycle GHG emissions related to fuel consumption per transport ton-kilometer" [kg-CO_2e/t-km] (secondary data) for different transport loads for each mean of transport.

B.4 Conventional ton-kilometer method

1) Collect data on transport load (transport ton-kilometer) [t-km] for each mean of transport.
2) Calculate life cycle GHG emissions [kg-CO_2e] by multiplying the transport load (transport ton-kilometer) [t-km] by the "life cycle GHG emissions related to fuel consumption per transport ton-kilometer" [kg-CO_2e/t-km] (secondary data) for each means of transport.

Annex C (normative): Transport Scenario

Transport scenarios are set for cases where primary data is not available in the raw material acquisition stage, the production stage, the distribution stage, and the disposal and recycling stage.

Life cycle stage	Scenario

Raw material acquisition stage	(1) Domestic production
	Manufacturer of inputs to the cultivation related processes in the production stage
	    => Producer
	(e.g., Fertilizer manufacturer => Agricultural producer）
	   - Transport distance: 500km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%
	
	(2) When importing raw materials from overseas
	 i. Transport within the country.
	 (Overseas production site => Port)
	   - Transport distance: 500km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%
	 ii. International transport (Port => Port)
	   - Transport distance: The navigation distance between ports
	   - Means of transport: Container ship (4,000TEU or less)
	 iii. Transport within Japan (Port => Agricultural producer)
	   - Transport distance: 500km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%

Production stage	(1) Agricultural producer => Collecting and shipping facility
	 (e.g., Agricultural producer => Collecting and shipping facility)
	   - Transport distance: 20km
	   - Means of transport: 2-ton truck
	   - Loading ratio: 17%
	
	(2) Manufacturers of the shipping preparation process
	  => Operator of shipping preparation process
	 (e.g., Producers of packaging materials for shipping => Collecting and shipping facility)
	   - Transport distance: 500km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%

Distribution stage	(From (1) to (5) below correspond to each number in the chart, "Main distribution routes of fresh products".)
	
	(1) Operator of shipping (agricultural cooperative, individuals, etc.）
	  => Wholesaler => Intermediate wholesaler => Retailer => Consumer
	   - Transport distance: 1,000km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%
	
	(2) Operator of shipping (agricultural cooperative, individuals, etc.）
	  => Wholesaler => Trade participant => Consumer
	   - Transport distance: 1,000 km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%
	
	(3) Operator of shipping (Agricultural cooperative, individuals, etc.）
	  => Retailer => Consumer
	   - Transport distance: 1,000km
	   - Means of transport: 10-ton truck
	   - Loading ratio: 62%
	
	(4) Operator of shipping (agricultural cooperative, individuals, etc.）
	  => Consumer
	   - Transport distance: 1,000km

	- Means of transport: 10-ton truck
	- Loading ratio: 62%
	
	(5) Operator of shipping (agricultural cooperative, individuals, etc.)
	=> Direct selling by producers, outdoor market, farm stand, etc.
	=> Consumer
	  - Transport distance: 20km
	  - Means of transport: 2-ton truck
	  - Loading ratio: 17%
	
	(6) In transport routes via wholesale market, product is assumed to be transferred from one wholesale market to another wholesale market:
	Wholesale market (wholesaler) => Wholesale market (wholesaler)
	  - Transport distance: 500km
	  - Means of transport: 10-ton truck
	  - Loading ratio: 62%
	
	(7) Manufacturer of inputs in sales preparation process
	=> Operator of sales preparation process
	(e.g., Manufacturer of packaging materials for shipping => Distribution center such as mass retailer)
	  - Transport distance: 500km
	  - Means of transport: 10-ton truck
	  - Loading ratio: 62%
	
	(8) Stores => Waste treatment facility
	  - Transport distance: 50km
	  - Means of transport: 10-ton truck
	  - Loading ratio: 62%

Disposal and Recycling stage	(1) Transport from garbage dump place to treatment facility
	  - Transport distance: 50km
	  - Means of transport: 10-ton truck
	  - Loading ratio: 62%

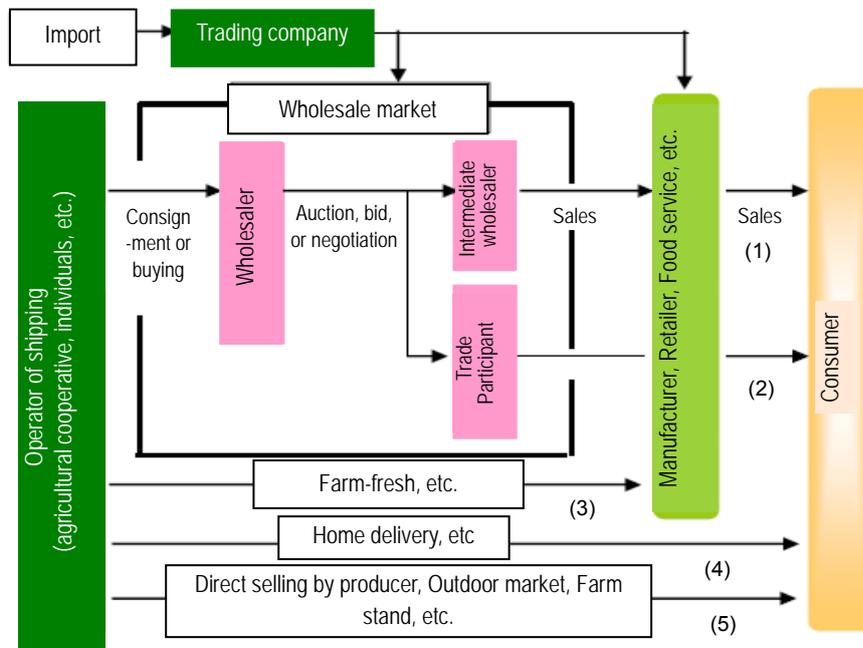- Main distribution routes of fresh products-

Chart: "Main distribution routes of fresh products"
Materials of the first "study group on future direction of wholesale market" (October 16, 2009), by MAFF
(* From (1) to (5) are added to the chart.)

Assumptions for each scenario are as follows.

C.1 Transport Distance
For an incentive to provide primary data collection, the transport distance is set to a little longer than the average at possible.

   (a) Transport within a city, town, or village: 20km

     [Assumption] The distance longer than 14.5km is assumed. 14.5km is the square root of 209.27km^2, the average area size of the cities, towns, and villages in Japan (The value comes from the Investigation by the Geographical Survey Institute, as of April 1, 2009).

   (b) Transport within a city or not across adjacent cities: 50km

     [Assumption] The distance from a prefectural center to a prefectural border is assumed.

   (c) Transport within a prefecture: 100km

     [Assumption] The distance from a prefectural border to another side of the border is assumed.

   (d) Transport possibly across prefectural border to another side of the border is assumed: 500km

     [Assumption] The distance from Tokyo to Osaka is assumed.

   (e) Transport from agricultural producer to consumer (consumption place is not limited within a specific area): 1,000km

     [Assumption] The distance a little longer than half Honshu (the main island of Japan: 1,600km) is assumed.

C.2 Means of transport
Truck transport is basically assumed for an incentive to take CO_2 reduction measures in distribution such as modal shift. Large vehicles were set for distributors and rather small ones for others.

   (a) Transport by distributor: 10-ton truck

   (b) Transport by agricultural producer: 2-ton truck

C.3 Loading ratio
Values to be applied when loading ratio is unknown were taken from the following table in the "Common guideline Ver.3.0 for the calculating method of CO_2 emissions in logistics," a notification by the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism.

Table: Values to be applied when loading ratio is unknown

Vehicle Type	Fuel	Maximum Load (kg)		When loading ratio is unknown	
				Average loading ratio	
			Median	For household	For business
Light, compact and ordinary trucks	Gasoline	Light trucks	350	10%	41%
		1,999 or less	1,000	10%	32%
		2,000 or more	2,000	24%	52%
Compact and ordinary trucks	Light oil	999 or less	500	10%	36%
		from 1,000 to 1,999	1,500	17%	42%
		from 2,000 to 3,999	3,000	39%	58%
		from 4,000 to 5,999	5,000	49%	62%
		from 6,000 to 7,999	7,000		
		from 8,000 to 9,999	9,000		
		from 10,000 to 11,999	11,000		
		from 12,000 to 16,999	14,500		

Annex D (informative): Scenario and method of product preservation

D.1: For scenarios in product preservation stage, vegetables and fruits with or without refrigerated storage process are set as follows.

Categories		Refrigerated storage process
Leafy or stem vegetables	Spinach, Welsh onions, Broccoli, Bean sprouts, and other leafy or stem vegetables (*1)	Yes
	Cabbage, Chinese cabbage, and Head lettuce	No
Root vegetables	Japanese Radish, Carrot, East Indian lotus root, and Bamboo shoot	Yes
	Sweet potato, White potato, Japanese Taro, Edible burdock, Onions, and other root vegetables (*2)	No
Other vegetables	String beans, Pumpkin, Cucumber, Eggplant, Tomato, Green pepper, and other vegetables (*3)	Yes
Fruits	Grapes, Japanese Persimmon, Watermelon, and Strawberry	Yes
	Apple, Mandarin, Grapefruit, Orange, other Citrus, Pear, Peach, Watermelon, and Kiwi	No

Source: MAFF website
 "Consumption and Safety > For Safety and Healthy Dietary Life > Smart Handling of Foods > Handling of Vegetables"
 "Consumption and Safety > For Safety and Healthy Dietary Life > Smart Handling of Foods > Handling of Fruits"
  http://www.maff.go.jp/j/fs/handle_4.html
  http://www.maff.go.jp/j/fs/handle_5.html

*1: "Other leafy or stem vegetables" refer to the following items: Leaf mustard, *Kyona*, *Komatsuna*, Garland Chrysanthemum, Potherb mustard, Qing qin cai, *Hiroshimana*, Water cress, Chicory, Brussels Sprouts, Rocket leaf, Macrophyll leaf, Perilla, Water dropwort, Chinese chive, Leaf onion, Leaf red pepper, *Myoga*, Parsley, *Kaiware* leaf, Domiao, Cauliflower, Flowering cabbage, Asparagus, Rape Blossom, Saltwort, Water shield, *Zuiki*, Royal fern, Japanese butterbur, Bracken, *Kuki-Ninniku*, and Celery.
*2: "Other root vegetables" refer to the following items: Turnip, Japanese yam (*Nagaimo*), *Yamatoimo* (*Ichoimo*), *Tsukuneimo*, Arrowhead, *Iseimo*, Chinese yam, Esharotto, Ginger, Raw scallion, Garlic, *Wasabi* (Root *Wasabi*, Leaf *Wasabi*) and Lily bulb.
*3: "Other vegetables" refer to the following items: Raw corn, Sweet corn, Wax gourd, Oriental pickling melon, Bitter gourd, Bottle gourds (Raw *Kanpyo*), Red pepper, *Taka-no-tsume* (Raw), Okra, Chrysanthemum, and Raw Japanese apricots.[1]

D.2: Electricity consumption of refrigerator for vegetables and fruits per kg. (calculation)

  - Annual electricity consumption per household
    Annual household electricity consumption (*2)
    / Total number of household (*3)
    = 24,937 x 10^{10} kcal/year / 552,325 households
    = 477,000 kcal/household/year
  - Of which, electricity consumption of refrigerator
    477,000 kcal/household/year x 16.1% (*4)
    = 77,000 kcal/household/year
  - Of which, for vegetables and fruits:
    77,000 kcal/household/year x 17.2% (*5) = 13.3 kcal/household/year
  - Electricity consumption of vegetables or fruits per kg
    13.3 kcal/household/year / 108.170 kg/household/year (*5)
    = 122.6 cal/kg = 0.14 kWh/kg

*1: Input amount of vegetables or fruits per kg.
*2: Annual household electricity consumption: 24,937×10^{10} kcal/year
    [Source] ECCJ "EDMC '09 Handbook of Energy & Economy Statistics in Japan": II. Energy demand by final demand sector, 2. Residential sector, (3) Energy consumption amount by energy source in

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[1] Notes by the CFP Pilot Project Secretariat: The English names of vegetables and fruits described in the remarks of *1, *2 and *3, are mainly excerpted from the following Web site and other Japanese government agencies:
"Table 3. Amino acids composition (mg) of edible portion per gram protein," by the Ministry of Education, Culture, Sports, Science and Technology） http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu3/004/shiryo/08012904/001/004.htm

residential sector; 2007
*3: Total number of household: 552,325households
[Source] ECCJ, "EDMC '09 Handbook of Energy & Economy Statistics in Japan": I. Energy and economics, 1. Key economic indicator, (7) 'Population, labor and prices'; 2007
*4: Share of electricity consumption of refrigerator at household power consumption: 16.1%
[Source] ECCJ website: "Household energy consumption"
http://www.eccj.or.jp/qanda/household/qa01.html
*5: Among all food items, weight of purchased fridge-stored items is 396,330g/household/year, of which vegetables and fruits are 108,170g/household/year (17.2%).
[Source] Ministry of Internal Affairs and Communications "Household Expenditure Survey" (for the year 2007; household of two persons or more). However, for weight of purchased fridge-stored items among all food items, 628,339g/household/year is used, the resultant value obtained by adjusting such items with no available data in a ratio of monetary values.

Annex E (informative): Scenario and method of product usage

The amount of energy consumption (input amount of electricity, city gas, and LPG) for cooking is assumed by the following equation: 'share of input amount of electricity and gas for cooking (kitchen) per household' among 'total input amount of electricity and gas per household' x 'share of purchased amount of vegetables and fruits cooked' among 'purchased amount of foods cooked'.
'The resultant value' divided by 'purchased amount of fresh vegetables and fruits (edible portion) cooked per household' is 'input/output amount per kg of product'.

Input/output item	Input/output amount (*1)		Grounds of calculation

Input amount of electricity	0.22	kWh/kg	- Annual electricity consumption for product use per household
			  (Per household in a year) electricity consumption for product use
			    = (Same as above) annual consumption amount for kitchen
			      - (Same as above) consumption amount of refrigerator
			    = 194kcal/household/year (*2) - 77kcal/household/year (*3)
			    = 117kcal/household/year
			- Of which, use amount for cooking vegetables and fruits:
			    117kcal/household/year x 20.7% (*4)
			    = 24.2kcal/household/year
			- Vegetables or fruits (edible portion) per kg
			    24.2kcal/household/year / 145.385kg/household/year (*4)
			    = 192.2kcal/kg = 0.22kWh/kg

Input amount of city gas	2.08×10^3	J/kg	- Annual city gas consumption for product use per household
			    = (per household in a year) annual consumption amount of city gas
			      for kitchen
			    = 303kcal/household/year (*2)
			- Of which, use amount for cooking vegetables and fruits:
			    303kcal/household/year x 20.7% (*4)
			    = 62.7kcal/household/year
			- Vegetables or fruits (edible portion) per kg
			    62.7kcal/household/year / 145.385kg/household/year (*4)
			    = 497.8kcal/kg = 2,083.0J/kg

Input amount of LPG	2.28×10^3	J/kg	- Annual LPG consumption for product use per household
			    = Annual consumption amount of LPG for kitchen (per household in
			      a year)
			    = 331kcal/household/year (*2)
			- Of which, use amount for cooking vegetables and fruits:
			    331kcal/household/year x 20.7% (*4)
			    = 68.5kcal/household/year
			- Vegetables or fruits (edible portion) per kg
			    68.5kcal/household/year / 145.385kg/household/year(*4)
			    = 543.8kcal/kg = 2,275.4J/kg

*1 Input amount of edible portions of vegetables or fruits per kg

*2 Annual electricity consumption used for kitchen per household
    Electricity: 194,000kcal/household, city gas: 303,000kcal/household, LPG: 331,000kcal/household,
    and coal, etc.: 2,000kcal/household
    [Source] ECCJ, "EDMC '09 Handbook of Energy & Economy Statistics in Japan,"
    "II. Energy demand by final demand sector, 2. Residential sector, (5) Energy consumption amount by energy source of each application per household in residential sector (2007; for household of two person or more)"

*3 Electricity consumption of refrigerator
        = 'annual household electricity consumption' / 'number of households'
          x 'share of electricity consumption for refrigerator among household electricity consumption'
        = $24,937 \times 10^{10}$kcal / 552,325households x 16.1%
    [Source]
     -Annual household electricity consumption:
       ECCJ, "EDMC '09 Handbook of Energy & Economy Statistics in Japan,"
       II. Energy demand by final demand sector, 2. Residential sector, (3) Energy consumption amount by energy source in residential sector; 2007
     -Total number of households:

ECCJ, "EDMC '09 Handbook of Energy & Economy Statistics in Japan,"
I. Energy and economics, 1. Key economic indicator, (7) 'Population, labor and prices'; 2007
-Share of electricity consumption for refrigerator among household electricity consumption:
ECCJ website: "Household energy consumption," http://www.eccj.or.jp/qanda/household/qa01.html

*4 Weight of purchased cooking-needed items among food items: 444,051g/household/year,
Vegetables and fruits (purchased weight) among the weight above: 145,385g/household/year
[Source] "Survey on Household Expenditure" (2007; for household of two person or more) by MIC
Share of inedible portion of vegetables: 86.6%
[Source] MAFF website: "Food supply-demand table (2007; definite value)"
Edible portion of vegetables and fruits (weight):
145,385g/household/year x 86.6% = 125,903g/household/year
For weight of purchased cooking-needed items among food items, 608,646g/household/year is used,
the resultant value obtained by adjusting such items with no available data in a ratio of monetary values.

For scenario settings, vegetables and fruits with or without cooking process are set as follows.

Categories		Cooking process
Leafy or stem vegetables	Cabbage, Spinach, Chinese cabbage, Welsh onions, Head lettuce, Broccoli, Bean sprouts, and other leafy or stem vegetables (*1)	Yes
Root vegetables	Sweet potato, White potato, Japanese Taro, Japanese Radish, Carrot, Edible burdock, Onion, East Indian lotus root, Bamboo shoot, and other root vegetables (*2)	Yes
Other vegetables	String beans, Pumpkin, Eggplant, Green pepper, and other vegetables (*3)	Yes
	Cucumber, Tomato	No
Fresh fruits		No

The ones categorized as "Yes" are assumed to be cooked and the ones categorized as "No" are assumed to be not cooked in ordinary times.

*1: "Other leafy or stem vegetables" refer to the following items: Leaf mustard, *Kyona*, *Komatsuna*, Garland Chrysanthemum, Potherb mustard, Qing qin cai, *Hiroshimana*, Water cress, Chicory, Brussels Sprouts, Rocket leaf, Macrophyll leaf, Perilla, Water dropwort, Chinese chive, Leaf onion, Leaf red pepper, *Myoga*, Parsley, *Kaiware* leaf, Domiao, Cauliflower, Flowering cabbage, Asparagus, Rape Blossom, Saltwort, Water shield, *Zuiki*, Royal fern, Japanese butterbur, Bracken, *Kuki-Ninniku*, and Celery.
*2: "Other root vegetables" refer to the following items: Turnip, Japanese yam (*Nagaimo*), *Yamatoimo* (*Ichoimo*), *Tsukuneimo*, Arrowhead, *Iseimo*, Chinese yam, Esharotto, Ginger, Raw scallion, Garlic, *Wasabi* (Root *Wasabi*, Leaf *Wasabi*) and Lily bulb.
*3: "Other vegetables" refer to the following items: Raw corn, Sweet corn, Wax gourd, Oriental pickling melon, Bitter gourd, Bottle gourds (Raw *Kanpyo*), Red pepper, *Taka-no-tsume* (Raw), Okra, Chrysanthemum, and Raw Japanese apricots.[2]

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[2] Notes by the CFP Pilot Project Secretariat: The English names of vegetables and fruits described in the remarks of *1, *2 and *3, are mainly excerpted from the following website and other public Japanese government agencies: "Table 3. Amino acids composition (mg) of edible portion per gram protein," by the Ministry of Education, Culture, Sports, Science and Technology） http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu3/004/shiryo/08012904/001/004.htm

The input amount of tap water for vegetables and fruits shall be assumed by the following equation: 'share of input amount of tap water for cooking per household' among 'input amount of tap water per household' x 'share of purchased amount of vegetables and fruits' among 'purchased amount of foods'.

'The resultant value' divided by 'purchased amount of fresh vegetables and fruits per household (whole, including inedible portion)' is 'input/output amount per kg of product'.

Input/output item	Input/output amount (*1)		Grounds of calculation
Input amount of water	0.023	m^3/kg	-Average number of person per household: 2.67 (National census; 2005) 21.6m^3/3 households/month (*2) x 12 months = 259.2m^3/household -Amount for cooking among the use amount above 259.2m^3/houhold x 23% (*3) = 31.1m^3/household -Consumption amount of vegetables and fruits among the consumption amount above 31.1m^3/household x 18.9% (*4) = 5.87m^3/household -Per kg of vegetables or fruits 5.87m^3/household / 251.721kg/household (*4) = 0.023m^3/kg
Drainage amount of wastewater	0.023	m^3/kg	Drainage amount of wastewater = Input amount of water It is assumed that amount of water remaining in cooking is negligibly small.

*1 Input amount of vegetable or fruits (whole) per kg

*2 Average consumption amount of water in a month for household of three-person
("Survey on daily life water in FY 2006," by Bureau of Waterworks Tokyo Metropolitan Government)

*3 Materials by Water Resources Department, Land and Water Bureau of MLIT
(Survey in FY 2006, by the Bureau of Waterworks Tokyo Metropolitan Government)
[Source] http://www.mlit.go.jp/tochimizushigen/mizsei/c_actual/images/03-03.gif

*4 For input amount of water, rate of vegetables and fruits to use amount of water in kitchen
= 'weight of purchased items of vegetables and fruits'
/ 'weight of all purchased items of foods (excluding eating-out)'
= 251,721g/household/year / 1,333,138g/household/year = 18.9%
-Weight of purchased items of vegetables and fruits: 251,721g/household/year,
-Weight of all purchased items of foods is 807,182g/household/year.
(It is, however, 1,333,138g/household/year is used, the resultant value obtained by adjusting such items with no available data in a ratio of monetary values.)
[Source] "Household Expenditure Survey" (2007; for household of two persons or more) by MIC

Annex F (normative): The rate of transferring fruits and vegetables between markets

If the transfer amount of products between markets is unknown, the following transfer ratio shall be used. The data has not been greatly changed in the most recent three years, the following data shall be used.
[Source] "Report on wholesale market of fruits and vegetables (2007)," edited by Statics department of MAFF

	No.	Rate(%)		No.	Rate(%)
Vegetables total	1	4.9	Fruits total	1	5.1
Root vegetables			Citrus		
Japanese radishes	2	4.3	Mandarins	2	4.4
Turnip	3	5.5	Navel (domestic)	3	6.8
Carrot	4	6.5	*Amanatsumikan*	4	7.7
Edible burdock	5	5.5	*Iyokan*	5	6.7
Bamboo shoot	6	2.9	*Hassaku*	6	5.8
East Indian lotus root	7	4.8	Other citrus	7	5.3
			Apples		
Leafy or stem vegetables			*Tsugaru*	8	3.4
Chinese cabbage	8	4.9	Jona-Gold	9	4.7
Komatsuna	9	3.1	*Ourin*	10	5.0
Other vegetables	10	3.3	*Fuji*	11	4.2
Qing gin cai	11	3.4	Other apples	12	4.2
Cabbage	12	4.8			
Spinach	13	4.1	Japanese pears		
Welsh onions	14	3.9	*Kousui*	13	6.3
Japanese butterbur	15	5.6	*Housui*	14	5.0
Udo	16	6.7	Twenty century	15	3.9
Mitsuba	17	3.1	*Shinkou*	16	6.6
Garland Chrysanthemum	18	3.9	Other pears	17	6.1
Chinese chive	19	4.4			
			European pears	18	4.9
Leafy vegetables					
Celery	20	8.6	Japanese persimmons (Kaki)		
Asparagus (domestic)	21	4.2	Nonastringent	19	4.6
Cauliflower	22	7.7	Astringency (incl. Astringency removed)	20	5.8
Broccoli (domestic)	23	5.8			
Head Lettuce	24	6.3	Loquats	21	6.6
Parsley	25	6.8	Peaches	22	4.2
			Plums	23	5.0
Fruit vegetables			Cherries	24	6.5
Cumcumber	26	4.9	Japanese apricots (Mume)	25	3.5
Pumpkin (domestic)	27	5.9			
Eggplant	28	5.4	Grapes		
Tomato	29	4.3	Delaware	26	5.7
Cherry tomato	30	4.6	*Kyohou*	27	4.3
Green pepper	31	6.4	Other grapes	28	4.7
Sweet green pepper	32	5.4			
Sweet corn	33	4.7	Chestnuts	29	4.9
			Strawberries	30	3.9
Beans					
Sayaingen	34	3.6	Melons		
Sayaendo (domestic)	35	7.1	Greenhouse culture	31	7.2
Sayaendo	36	3.3	Andes	32	8.0
Broad beans	37	4.1	Other melons (incl. Makuwauri)	33	7.6
Edamame	38	3.9			
Tuber and bulb vegetables			Watermelons	34	6.0
Sweet potatoes	39	5.3	Kiwis	35	6.8
White potatoes	40	6.0			
Japanese taro	41	3.2			
Chinese yam	42	4.9			
Onion (domestic)	43	6.0			
Garlic (domestic)	44	8.0			
Ginger (domestic)	45	5.0			

[PCR revision histories]

Approved PCR ID	Release date	Contents revised
PA-BF-02	September 17, 2010	(1) Changed corresponding to the revisions of the basic rules. (2) Adapting the contents to the new PCR draft template. (3) For handling of recycling of the wastes discharged from each stage (other than the disposal and recycling stage), up to and including recycling preparation process shall be calculated. (It applies mutatis mutandis to "No.2-(7): Handling of recycling standards" provided in the "Standards of PCR development".) (4) For handling of the wastes collected for value, up to and including the recycling preparation process shall be calculated. (It applies mutatis mutandis to "No.2-(7): Handling of recycling standards" provided in the "Standards of PCR development".)
PA-BF-03	February 3, 2011	(1) "4. Terms and Definitions": revised descriptions of "standard weight" (2) "13-3. Contents of Additional Information": added additional displays of weight.