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BOOKLET

Food Waste Recycling – A Green Future Solution

Dự án hợp tác với Đại sứ quán Đan Mạch tại Việt Nam
và Cục Thú y & Thực phẩm Đan mạch

In cooperation with the Embassy of Denmark in Vietnam and the Danish Veterinary and Food Administration

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Acknowledgement

The handbook “Guide to Recycling Food Waste – Solutions towards a Green Future” was compiled by the Vietnam Food Bank Network in collaboration with the Danish Veterinary and Food Administration (DVFA) and the Embassy of Denmark in Vietnam, with valuable contributions from experts, partners and many stakeholders. The handbook visually presents the steps that partners, businesses, organizations, schools, centers, and shelters for vulnerable groups, and individuals and households can apply in the process of classifying and treating food waste.

We would like to thank all the organizations that contributed insights and support to the development of this handbook.

Best regards,
Food Bank Vietnam
(The Vietnam Foodbanking Network)

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Chương 1 - Introduction

1.1. PURPOSE AND TARGET AUDIENCE

The booklet “Food Waste Recycling – A Green Future Solution” aims to provide practical, clear, and adaptable guidance on how surplus food and food waste can be sorted, repurposed, and recycled in ways that are safe, effective, and sustainable.

Its purpose is to:

- Raise awareness about the value of surplus food and the importance of proper waste separation.
- Encourage action by offering simple, flexible methods that can be applied in various settings.
- Foster collaboration among households, schools, businesses, and organizations to reduce food loss and waste.

Target audience:

- **Households and communities:** Practical tips to reduce waste, save costs, and make better use of food at home.
- **Schools and educational institutions:** Activities and resources to integrate food waste management into learning and community projects.
- **Businesses, canteens, and large kitchens:** Guidance, documentation, and training to improve waste classification and recycling at scale.

Some sections in this booklet are designed for specific groups. This flexible approach allows each reader to apply the practices most relevant to their own situation.

1.2. GENERAL OVERVIEW: CHALLENGES AND OPPORTUNITIES FROM SURPLUS FOOD

Food waste is one of the most alarming environmental, economic and social challenges facing the world. The Food and Agriculture Organization of the United Nations (FAO) estimates that about one-third of global food production is lost or wasted each year, equivalent to 1.3 billion tons. This represents not only the amount of food that is wasted, but also the enormous waste of resources that go into producing it.

The situation of food waste in Vietnam is also becoming increasingly urgent. With rapid urbanization, the development of large cities, and changing consumption habits, the amount of food waste generated from households, markets, restaurants, hotels, and processing facilities is increasing significantly. Although there are no full official statistics, estimates show that tons of food are still discarded every day, especially in large cities. This not only puts great pressure on the waste treatment system but also reflects the lack of awareness and sustainable consumption habits of the community.

Key challenges arising from food surplus:

- **Severe economic impact:** It causes huge loss of resources and costs in production, transportation, processing, and disposal. Valuable resources such as land, water, energy, and labor are completely wasted when food is not used for its intended purpose.
- **Social challenges and food security:** While vast amounts of food are thrown away, millions of people around the world and within their own countries continue to suffer from hunger and food insecurity. This waste exacerbates inequality in access to food and raises major questions about social responsibility.
- **Unforeseeable environmental consequences:** When food is buried in landfills, the anaerobic decomposition process produces a large amount of methane (CH4). This is a very strong greenhouse gas, with a global warming potential many times higher than carbon dioxide (CO2), directly contributing to climate change. In addition, improper disposal of leftover food also pollutes soil, water sources, and depletes natural resources due to the need for continuous production to compensate for wasted food.

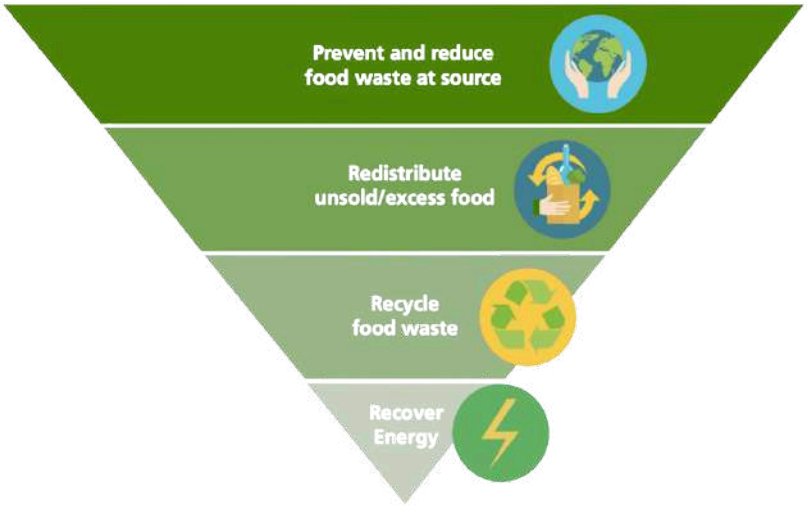
The importance of promoting responsibility for effective food waste separation and recycling is urgent. This is not only a matter for organizations or governments but also the responsibility of individuals, families, and businesses. Separating waste at source, especially food waste, is the first and most important step to facilitate effective recycling. When food is properly separated, it can be easily converted into valuable products such as organic fertilizer, animal feed, or bioenergy, instead of becoming a burden on the environment.

What opportunities are there for surplus food?

Despite the challenges, food surplus also opens up strategic opportunities to create new value and promote sustainable development such as:

- **Circular economy opportunities:** Recycling food waste helps reduce landfill waste, reduce pressure on natural resources, and create resource-efficient cycles, contributing to the development of a circular economy.
- **Food security opportunities:** Salvage and redistribute usable food, directly addressing the problem of hunger.
- **Innovation & technology opportunities:** Promote research and development of new technological solutions in food preservation and recycling.
- **Opportunity to raise public awareness:** Educate and encourage the public to change their consumption habits and manage food more responsibly.

Illustration 1: Food Waste Management Hierarchy (Refer to NEA)



In the context of increasingly severe climate change and depleted natural resources, reducing and recycling food waste is no longer an option but a mandatory requirement for a sustainable future. This handbook was created not only to raise awareness but also to provide specific knowledge and guidance for parties, partners, and the public to refer to and apply in their practical operations, contributing with Food Bank Vietnam to build a green, clean Vietnam and fight food waste.

1.3. INTRODUCTION TO FOOD BANK VIETNAM (FBVN)

Food Bank Vietnam (FBVN) is a pioneering organization in Vietnam on the mission of reducing food waste and addressing food security. Founded with the vision of building a sustainable community where everyone has enough food, we act as an essential bridge between surplus food sources and those in need.

We believe that no safe, usable food should go to waste. Instead, it should be transformed into something that nourishes people and helps protect the environment. Food Bank Vietnam is more than just distributing food; We also educate communities about the value of food, encourage innovative recycling solutions, and build strong partnerships with businesses, social organizations, and local governments. In addition to emergency relief, we invest in research and implementation of many projects aimed at circular agriculture, reducing food waste, and educating about nutrition and food safety.

Through specific action programs such as collecting, sorting, preserving and distributing surplus food from manufacturers, supermarkets, restaurants, to charity kitchens, social protection centers and people in difficult circumstances, Food Bank Vietnam is gradually realizing the goal of reducing waste, increasing nutrition and promoting sustainable development.

Chương 2 - Classification of surplus food and food waste

Sorting surplus food is an important and decisive first step in optimizing the efficiency of subsequent recycling processes. Not all surplus food/food waste can be treated in the same way; clearly identifying its characteristics will help us apply the most appropriate method, minimize cross-contamination and increase the value of the resource.

2.1. EDIBLE SURPLUS FOOD

In this handbook, edible surplus food refers to food that is still safe and suitable for human consumption but, for various reasons (e.g. near expiry date, minor packaging defects, surplus products from production, returned goods, or simply surplus after events), they are no longer intended for sale in the commercial market. This includes products approaching their “best before” date, items with minor packaging defects, surplus from production runs, returned goods, or leftover but untouched food from events.

> **Note:** Edible surplus food is not considered “food waste.” If not redistributed in time, however, it may eventually become waste.

Sources	• Retail outlets (supermarkets, convenience stores) • Restaurants, hotels, and catering services • Food processing and manufacturing facilities • arms and agricultural cooperatives • Households (only when meeting all food safety requirements)
Identification features	• **Safe for consumption:** Free from rancidity, mold, off-odors, or any signs of spoilage harmful to human health. • **Nutritional integrity maintained:** Retains its essential nutritional value. • **Product forms:** May include fresh produce, meat, fish, eggs, dairy, bread, canned or dry goods, or cooked but unserved meals. • **Compliance with storage standards:** Proper temperature control and hygienic handling are ensured to maintain quality. • **Traceability:** Accompanied by available origin or handling information where possible.

Food safety control:

All surplus food must undergo visual and sensory inspection (appearance, smell, texture) before redistribution.

Redistribution must comply with national regulations on food safety, shelf life, and labeling.

Food Safety Considerations for Surplus Food: Food safety is the foundation of all food redistribution and recycling activities.

Shelf-life and expiry date:

- In Vietnam, food labels generally indicate only one expiry date ("Hạn sử dụng").
- FBVN strictly follows this rule: any food past the expiry date will not be redistributed.
- Products that are still within their expiry date but close to expiration are prioritized for rapid distribution to ensure safe and timely use.

> **Note:** Unlike the EU, where "use by" and "best before" are separate indicators, Vietnam applies only one expiry date on packaging. FBVN therefore uses this single-date control system.

Sensory evaluation:

In addition to checking the expiry date, FBVN applies basic sensory evaluation to ensure food quality and safety:

- Appearance: Free from mold, discoloration, or visible damage.
- Smell: No rancid or abnormal odors.
- Texture/consistency: Product retains expected firmness, freshness, and quality.

Hygiene and handling requirements:

- Donated products must be stored and transported under appropriate hygienic and temperature conditions.
- Staff and volunteers handling food must comply with hygiene practices, including:

a. Handwashing and personal hygiene.
b. Use of protective clothing and gloves.
c. Cleaning and sanitizing of vehicles, storage areas, and containers.

Traceability and accountability:

- The origin of donated products.
- Expiry dates and storage details.
- Distribution channels.

Processing priority: Edible surplus food is always a top priority in the Food Bank Vietnam value chain. It is collected, carefully inspected, properly preserved and quickly distributed to those in need such as the homeless, the poor, social protection centers, shelters, and families in need. This not only reduces the problem of waste but also directly contributes to ensuring food security and reducing hunger, and is a timely food source to respond to emergency relief situations such as natural disasters or epidemics.

2.2. RECYCLABLE OR UPCYCLABLE FOOD AND BY-PRODUCTS

This category includes food resources that are no longer suitable for direct human consumption but can still be repurposed to create new value through recycling or upcycling. Examples include fruit and vegetable by-products, food residues, or materials that can be safely transformed into animal feed, compost, or new products.

Examples of recyclable and upcyclable resources	• **By-products for upcycling:** Fruit peels, seeds, or pulp that can be dried, powdered, or processed into new edible products (e.g., lemon peel powder). • **Animal feed ingredients:** Food of plant origin (vegetables, fruits, bread, grains) that meets safety standards for feed use. • **Composting materials:** Food residues, kitchen scraps, and organic waste suitable for processing into organic fertilizer.
Identification features	• Unsafe or unfit for human consumption and showing obvious signs of deterioration such as mold, decomposition, unpleasant odors, or inedible parts of food (e.g. fruit peels, vegetable stems, bones, coffee grounds, tea grounds). • Contains a lot of organic matter, providing rich nutrition for plants or animals, or has the potential to generate energy. • Products often come from households, collective kitchens, restaurants, markets, and agricultural production facilities.

Processing priority: Instead of going to landfill and creating greenhouse gases, this food group will be converted through recycling methods such as:

- Upcycling - Repurposing into new products with added value.
- Animal feed - Use in livestock or aquaculture, following safety regulations.
- Composting - Processing into organic fertilizer for agricultural use.

Recycling and upcycling food resources reduce the burden on landfills, minimize greenhouse gas emissions, and contribute to the circular economy. This approach not only prevents waste but also creates economic and environmental value from resources that would otherwise be discarded.

2.3. NON-RECYCLABLE FOOD

This is a group of surplus foods that are no longer fit for human or animal consumption, or cannot be converted into other useful products through Food Bank Vietnam's conventional recycling methods. Identifying and separating this group is important to avoid contaminating recyclable waste streams and optimizing treatment costs.

Identification features:

- Food contaminated with toxic substances, chemicals, industrial grease, or non-biodegradable/recyclable materials (such as broken glass, metal, hard plastics that are mixed together and cannot be separated).
- The food has deteriorated to the point where it cannot be recovered or used for any other purpose, and processing it for recycling would cost more than it is worth.
- Non-recyclable packaging such as foam boxes and non-biodegradable plastic bags adhere to food and cannot be separated.

Treatment direction: Food in this category must be disposed of as general waste according to local regulations. This is considered a last resort, but proper sorting helps reduce the contamination of recyclables and ensures the efficiency of the food waste management process.

- **Household surplus food:**
  In principle, surplus food from households is more difficult to redistribute due to challenges in ensuring safety and traceability.

  However, FBVN does accept donations from households if the products remain intact in their original packaging, are within their expiry date, and pass Food Bank safety inspection. This approach not only guarantees food safety but also encourages families to join the "Stop Food Waste" campaign, connecting them with broader initiatives such as food waste recycling and green lifestyle practices.
- **Business and institutional surplus food:**

  By contrast, surplus food from businesses, schools, restaurants, and producers is more readily redistributable, as these sources follow structured procedures in storage, labeling, and handling.

Diagram 1: Food waste classification process

Step 1: Collect

- Leftover food and discarded food are collected from many sources: restaurants, supermarkets, markets, households, businesses, and kitchens.
- Separate food from waste such as plastic, glass, and metal at the source (if possible)

Step 2: Preliminary inspection and assessment

- Check the expiration date.
- Evaluate the product surface (damage, mold, strange odor, etc.)
- Consider packaging and hygiene conditions

Step 3: Detailed classification

- Check the expiration date.
- Evaluate the product surface (damage, mold, strange odor, etc.)
- Consider packaging and hygiene conditions

Group 1

Edible food

Group 2

Food that is no longer edible but can be reused

Group 3

Non-reusable food

CHECKLIST

1 - Equipment needed for food classification activities

	Personal protective equipment
☐	Disposable rubber gloves/nylon gloves
☐	Medical mask/cloth mask
☐	Waterproof apron
☐	Anti-slip boots/shoes
	Classification and storage tools
☐	Color-sorted bins: The color scheme for food waste classification bins may vary depending on the internal regulations of organizations, schools, or households. However, the most important principle is to maintain consistency and standardization of colors throughout the process in order to avoid confusion and ensure effective waste sorting and recycling. *For example:* • *G*reen: Food that is still edible • Blue: Organic recycled food • Red: Non-recyclable food (Discard)
☐	Labels / Classification Boards
☐	Stainless steel trays/plastic food trays in the receiving and processing stages
☐	Special organic waste bags
☐	Quality Assessment Checklist (annex)

2 - Arrangement of classification areas (applicable to households, schools, small and medium enterprises)

Location	Must-have items
Food collection area	Bin with lid, sorting reminder board
Classification area	Divider trays, color bins, labels, protective gear
Hand washing area	Soap, hand sanitizer, clean hand towels
Temporary storage area	Ice box or cool storage (if the food is still usable)

Chapter 3 - Forms of reusing and recycling leftover food and food waste

Once food waste has been properly sorted, the next step is to apply appropriate recycling methods to turn food waste into a valuable resource. This guide focuses on three main forms of recycling, each with its own benefits and contribution to a circular economy.

3. 1. PROCESSING INTO NEW PRODUCTS

Recycling into new products, also known as conversion, is the process of converting materials or products that are no longer used into new products that have higher value, better quality, or have a different purpose than the original product. For food waste, conversion solutions focus on utilizing leftover food parts to create new products with economic and nutritional value.

How it works: Instead of being thrown away, potential ingredients in food waste are extracted, processed or combined to create entirely new products. This is a method that requires creativity and sometimes intensive processing technology.

Instructions for implementation (example):

Food safety notes for fruit peels:

Criteria	Do (✓)	Don't (✗)
Source	Certified or trusted suppliers; home-grown fruit	Unknown origin; heavily waxed fruit
Chemicals & Pesticides		Using peels suspected of chemical contamination or excessive pesticide residues
Pre-treatment	Wash under running water; use produce brush; optional soak with baking soda; blanch briefly	Using moldy, bruised, or unwashed peels
Processing	Dry completely before grinding; cook after blanching	Grinding peels while still moist; skipping blanching
Storage	Airtight containers, cool & dry place; label batch/date	Leaving in humid place; unlabeled
Sensory check	Natural aroma, no mold, crisp texture	Off-odor, clumping, discoloration

Fruit peels for jam/spice powder (Example):

- Ingredients: Clean orange, lemon, grapefruit peel (remove bitter white pith).
- How to make jam: Wash, slice, boil briefly to reduce bitterness, then simmer with sugar.
- How to make spice powder: Wash, chop, dry completely (can use oven or food dehydrator) then grind into fine powder. Use as a spice for dishes or to mix drinks.

Coffee grounds as exfoliating/deodorizing scrub:

- Ingredients: Clean coffee grounds after brewing.
- How to make a body scrub: Mix coffee grounds with coconut oil or olive oil, a little sugar/salt. Use as a body scrub.
- How to deodorize: Place dry coffee grounds in the refrigerator, closet, or shoes to absorb moisture and deodorize.

"Ugly" vegetables used to make juice/smoothie/soup:

- Ingredients: Vegetables and fruits that do not meet appearance standards but are still fresh and safe.
- How to make: Wash, cut off damaged parts (if any), then squeeze to get the juice, puree or cook soup. This is a very effective way to take advantage of nutrients and reduce waste.

3.2. ANIMAL FEED

Some types of surplus food, after going through strict processing and inspection, can become a source of supplementary or alternative feed for livestock, especially in agriculture. This is an effective solution to create a closed cycle in circular agriculture.

How it works: Leftover feed is collected, sorted, then goes through steps such as sterilization, drying, grinding or fermentation to eliminate pathogens and increase digestibility before being mixed into the animal's diet.

Types of food suitable for animal feed:

- Leftover/slightly spoiled fruits and vegetables.
- Food waste during processing (soybean pulp, beer residue, discarded fruit).
- Cooked food (leftover rice, bread, instant noodles, unused food from restaurants, community kitchens) – must be thoroughly heat treated. In EU/DK, cooked surplus food from households is classified as catering waste and cannot be used as feed for food-producing animals (only for non-food-producing animals). Even when reused, it must be kept separate from animal-origin food, and heat treatment cannot fully eliminate disease risks. In Vietnam, households and small farms may reuse cooked surplus food with caution, but should prioritize plant-based food. Food that is no longer edible must not be used as feed.

- Expired cereal and candy products that are still safe (after checking and removing packaging). In EU law, these belong to the category “former foodstuff”, meaning food products originally made for people, but no longer intended for human consumption (e.g. expired cereal, candy, bread). Unlike “catering waste” (leftovers from kitchens or restaurants), former foodstuff can still, in some cases, be used as feed for food-producing animals.[1]

Basic guide to using food waste as animal feed (advice from an agricultural expert is required):

1. **Strict sorting process:** Use only clean food, free of chemicals, pesticides or other toxic substances. Remove all packaging.
2. **Heat treatment (sterilization):** Although heat treatment (boiling, steaming) can reduce the risk of bacterial contamination, it does not completely eliminate the risk of serious zoonotic diseases in foods of animal origin (e.g. meat, fish, milk, eggs). For this reason, animal waste from household or community kitchens should not be used as animal feed. Furthermore, traceability is an essential principle. The origin of food waste must be clearly identified to ensure safety. If the origin cannot be verified, the food should not be reused as animal feed. Therefore, in household and community activities, priority should be given to using plant-based food waste as animal feed to ensure safety and ease of management.

1. **Grind and mix well:** Grind food into a form that is easily digestible for pets. Can be mixed with bran, corn flour or other by-products to balance nutrition.
2. **Humidity control and storage:** Ensure food does not get moldy. Can be dried or pickled for longer storage.
3. **Expert advice:** The solutions in this section are recommended for small-scale livestock farming at the household level only. Large-scale livestock farming for commercial purposes must comply with the requirements and regulations set out in the relevant legislation. Consult an animal nutritionist or extension officer to ensure a suitable and safe diet for each species.

Some types of animal feed that can be made from food waste:

- **For dogs, cats, pigs:** leftover rice, cooked vegetables, bread, cold porridge
- **For chicken and duck:** rice bran, chopped vegetables, leftover rice, soft fruit
- **For fish:** pureed green vegetables, cold rice, bean dregs. Small amounts of by-products (e.g. small fish heads, bones) can be used with caution, but avoid feeding the same animal protein to the same species (e.g. feeding fish to each other). Plant-based foods are always safer and are recommended.
- **For goats/cows:** fruit peels (watermelon, banana), vegetable stems, clean vegetable scraps.

[1] Commission Regulation (EU) No. 142/2011 (Annex X, Chapter 10).

3. 3. COMPOSTING ORGANIC FERTILIZERS

When composting organic waste, particular care must be taken if food of animal origin (e.g. meat, fish, dairy, eggs) is included, as these materials may carry risks of spreading infectious diseases.

In Denmark and Europe, *composting is divided into two types:*

- **Composting plant** (commercial scale): Large-scale facility that processes animal by-products, must be approved and comply with strict microbiological criteria before compost can be marketed.
- **Composting at home or in small communities:** Allowed without government approval, but subject to conditions such as: avoiding contact with animals, using only locally sourced compost, and not applying it to agricultural land.

In the context of Vietnam:

- Composting solutions at household and community levels are increasingly encouraged, especially in schools, residential areas and the Green Hero program of the Vietnam Food Bank Network.
- In Vietnam, the Vietnam Food Bank Network recommends the following safe composting practices:

  a. Prioritize using plant-based food waste (vegetables, fruits, rice, coffee grounds, tea leaves, etc.) for composting.
  b. Avoid using meat, fish, dairy or oily foods in simple home or school compost bins as they decompose slowly and may attract pests or spread pathogens.
  c. Use the finished compost in your own home, garden or school project, not for large-scale agricultural use.
  d. Always maintain good hygiene, avoid contact with pets or livestock, and keep your compost bin covered to minimize the risk of disease.
  e. Home composting should only be applied to organic materials of plant origin. Do not mix animal carcasses, medical waste, or chemicals into compost. Do not compost on a commercial or large scale, as these activities require the facility to have a Certificate of Eligibility for Fertilizer Production and comply with environmental impact assessment (EIA) procedures or environmental protection commitments as prescribed by specialized laws. In addition, only use fully decomposed compost for plants; do not use partially decomposed compost in commercial agricultural areas.

Composting is the biological process of breaking down organic waste (including food waste) into a nutrient-rich fertilizer for plants, called compost. It is a natural, environmentally friendly way to replenish soil nutrients and significantly reduce landfill waste.

Working principle: This process relies on the activity of microorganisms (bacteria, fungi) in conditions of oxygen, moisture and suitable temperature. They decompose complex organic substances into simpler compounds, creating the final product of nutrient-rich humus with a natural earthy smell.

Foods suitable for composting:

- **"Green organic matter" (rich in nitrogen):** Vegetable peels, leaves, stems, coffee grounds, tea grounds, spoiled fruit, wilted vegetables. Cooked food (limit oil, meat, fish to avoid odors and insects).
- **"Brown organic matter"** (rich in carbon): Dry leaves, small twigs, sawdust, newspaper (colorless, no glossy ink), shredded cardboard.

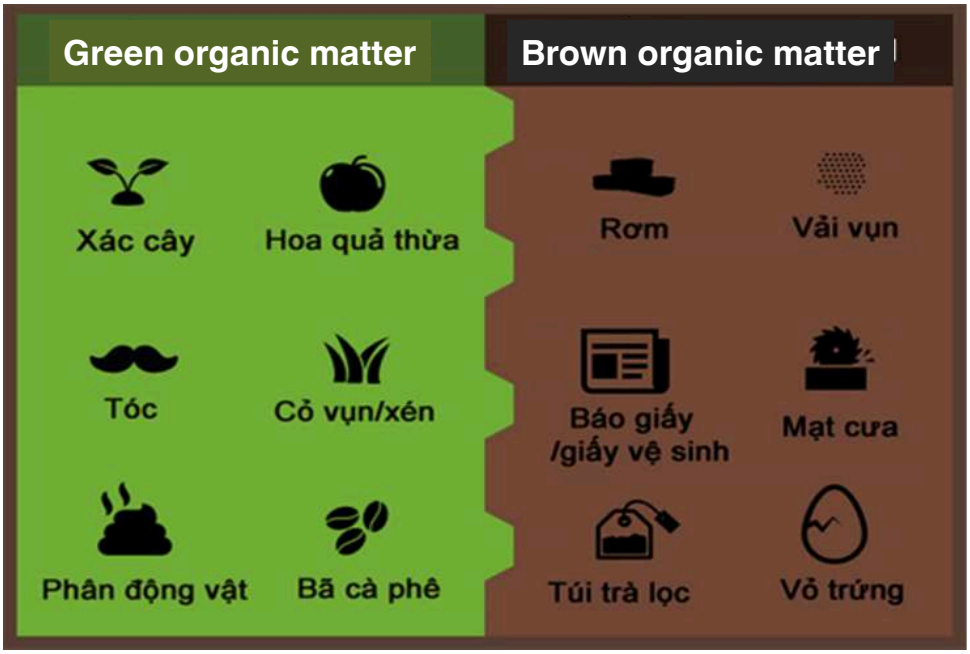


Illustration 2 (Source: Farmers Vietnam)

Instructions for composting at home or on a small scale:

- **Choose a location and composting tools:** Choose a shady place, away from direct sunlight. You can use a specialized compost bin, a perforated plastic bin or build a compost pit. The compost pit should have a lid to keep out animals and insects.
- **Prepare ingredients:** Collect and sort food waste (remove plastic, metal, large bones, excess meat and fat). Cut large foods into small pieces to speed up the decomposition process.
- **Create a compost layer:**

a. Bottom layer: Spread a layer of coarse material (small branches, gravel) for drainage and ventilation.

b. "Brown" organic layer: Spread a layer of carbon-rich material (dry leaves, wood chips, straw).

c. Green organic layer: Spread a layer of nitrogen-rich materials (food scraps, vegetable peels).

d. Repeat: Continue alternating layers of "brown" and "green", ideally 2 parts "brown" to 1 part "green" (2:1 ratio).

- **Maintain moisture:** Make sure the compost pile is at the right moisture level. Water it if it gets too dry.
- **Turning:** Turn the compost pile periodically (once a week, or several times a month) to provide oxygen, helping the decomposition process to take place faster and more evenly. When turning, the organic matter will be mixed evenly and the temperature inside the compost pile will increase, killing pathogens.
- **Harvest:** After about 1-3 months (depending on the type of raw material and conditions), the compost will be dark brown, smell of soil, and loose. You can use it directly for plants and vegetable gardens.

CASE STUDY

Community Foodbank Garden project of Food Bank Vietnam

Food Bank Vietnam has actively implemented the organic fertilizer collection and composting model in many projects. **"Community Foodbank Garden"** and program **"Green Hero"** in schools and communities.

- **At school:** FBVN guides students and teachers to collect food waste after lunch and from cooking activities. Students learn how to sort and compost in specially designed compost bins. The finished compost is used to fertilize the school's vegetable garden or is donated to FBVN for use in the Community Food Bank Garden model, helping students directly experience the cycle of "turning waste into fresh vegetables". This not only has educational significance about the environment but also about nutrition and the value of labor.

Illustration 3: Students of Ho Chi Minh City National University dormitory classify used food and make organic fertilizer in the activity "Student Kitchen - Shared Kitchen".

- **In residential communities:** Food Bank Vietnam has set up food waste collection points and organized composting training sessions for residents. Many households have started composting at home or joined the community composting centers. Typically, in some apartment buildings or new residential areas, food waste has been significantly reduced, while creating a free source of fertilizer for urban trees and spontaneous community vegetable gardens.

Illustration 4: The project's organic waste bins are also placed in shops, supermarkets, restaurants, apartments, etc. to encourage people to classify waste, aiming at the goal of waste treatment and reducing carbon emissions in the community.

Chapter 4 - Practical model: How has FBVN implemented it?

Food Bank Vietnam not only works on theory but also implements practical projects that create measurable impacts in reducing food waste and promoting sustainable communities. Over the years, FBVN has partnered with various stakeholders, from restaurant and HORECA chains, to large-scale international F&B exhibitions, and community-driven initiatives. These collaborations have enabled the recovery and recycling of significant volumes of surplus food and organic by-products, transforming them into valuable resources.

One notable case is the partnership between Starbucks Vietnam and Food Bank Vietnam, where coffee grounds and tea leaves are collected and processed into organic fertilizer. Alongside Starbucks, FBVN is also working with many other café chains to collect coffee grounds, expanding the reach and impact of this circular economy model in Vietnam.

4.1. STARBUCKS VIETNAM & FOOD BANK VIETNAM: PROJECT TO TURN COFFEE GROUNDS AND TEA GROUNDS INTO ORGANIC FERTILIZER

The collaboration between Starbucks Vietnam and FBVN is a typical example of applying the circular economy model in the F&B sector, turning organic waste into valuable resources. Starbucks, with a huge amount of coffee grounds and tea leaves every day, found a strategic partner in Food Bank Vietnam to implement a sustainable solution.

Photo 5: FBVN and Starbucks Vietnam cooperate to collect and recycle coffee grounds weekly into organic fertilizer for Community Food gardens.

Uses and benefits of fertilizers:

Use for community garden projects: Organic fertilizer from coffee grounds and tea grounds is prioritized for use in "Green Community Garden" projects of the Vietnam Food Bank Network, school gardens or distributed to households and farmers in need.

Multidimensional benefits:

- **Reduce waste:** Tons of coffee grounds and tea leaves no longer end up in landfills, helping to reduce the burden on the environment.
- **Create resources:** Turn waste into valuable fertilizer, reducing the need for chemical fertilizers.
- **Promoting a circular economy:** Contribute to creating a closed loop, in which the output waste of one industry becomes the input material of another industry.
- **Raising public awareness:** This is a concrete example of how partnerships between businesses and nonprofits can have a huge positive impact, encouraging others to join in.

4.2. AGRICULTURE - FOOD BANK GARDEN: FOOD GARDEN INTEGRATING RECYCLING AND EDUCATION

Nong Lam - Food Bank Garden is a unique model, jointly implemented by Food Bank Vietnam at Ho Chi Minh City University of Agriculture and Forestry. This is not only a food garden but also a center for learning, research and practical experience in sustainable agriculture and food waste recycling.

Main fields and activities:

1. Specialized composting area:

- At Nong Lam - Food Bank Garden, a spacious area is dedicated to implementing different composting methods, from traditional composting to using improved compost bins and vermicomposting.
- Compost materials are collected from the school's own activities (canteen, food laboratory) and from Food Bank Vietnam's partners.
- This is where students majoring in agriculture, environment, and food technology can directly practice and research composting techniques, evaluate compost quality, and care for plants.

2. Nurseries and food gardens using organic fertilizers:

- Organic fertilizers produced from the compost area are used directly to fertilize vegetable beds and fruit trees in the Nong Lam - Food Bank Garden.
- The nursery is where seedlings are cared for with natural fertilizers, allowing students to observe and evaluate the impact of organic fertilizers on plant growth.
- Vegetables and fruits are grown organically, ensuring safety and productivity, serving part of the activities of Food Bank Vietnam or sharing within the school community.

3. Model of learning, experience and scientific practice:

- The Food Bank Garden has become a vibrant hands-on space for students, where they are involved in the entire cycle: from collecting and sorting food waste, conducting composting experiments, caring for plants, to harvesting and analyzing results.
- This is a great opportunity for students to apply theoretical knowledge into practice, developing skills in organic farming, waste management and scientific research.
- Workshops and field trips are regularly held here, attracting not only students but also the community interested in clean agriculture and sustainable lifestyles.

Benefits and impacts:

This model helps bring about great benefits and impacts, not only in terms of the environment but also in terms of education and the community. In terms of education, it creates a practical learning environment, helping students and lecturers to further research on recycling solutions and sustainable agriculture, thereby training a generation of highly conscious and professional human resources. At the same time, Nong Lam - Food Bank Garden directly reduces waste by processing organic waste from the school and neighboring communities, while increasing clean agricultural production through the use of organic fertilizers. Moreover, this model also helps spread knowledge and becomes a model, encouraging other schools and communities to replicate and apply similar initiatives. Thereby, the project is considered a step forward to strengthen the cooperative relationship between Food Bank Vietnam and educational institutions, enhancing the role of society in solving environmental issues and promoting sustainable development.

4.3. "FARM TO FOOD BANK" PROJECT: RESCUE SURPLUS AGRICULTURAL PRODUCTS AND RECYCLE AGRICULTURAL BY-PRODUCTS

The "Farm to Food Bank" project is a key initiative that demonstrates the collaboration between the Vietnam Food Bank Network and farms, cooperatives and agricultural partners to build a circular food system. The project focuses on processing surplus and by-products after harvest, converting them into nutritious food or sustainable resources.

- **Saving surplus produce:** For example, during Operation Orange Rescue, tons of unsold surplus oranges were collected and processed into juice. The juice was distributed to shelters and social protection centers, ensuring that the drink was safe and nutritious.

- **Recycling agricultural by-products:** Fruit peels and agricultural waste are processed into organic fertilizer, which is then used at the Food Bank Garden to grow new crops.

- **Closing the loop:** Finished organic fertilizers are shared with corporate partners who demand sustainable farming inputs, reinforcing a circular economy that links farms, businesses, and communities.

Chapter 5 - Simple guide & Documents for community engagement

Reducing and recycling food waste is not the sole responsibility of any one organization or government, but rather a collective action that requires the cooperation of the whole society. This chapter provides simple, practical documentation and instructions so that every individual, family, school and business can easily participate in this sustainable cycle.

5.1. IN THE FAMILY

Every household plays a role in reducing food waste. Small, everyday habits can make a big difference.

👉 **Prepare and shop smart:**

- **Meal planning:** Before you go grocery shopping, make a grocery list for the week and only buy the ingredients you need. This will help you avoid unnecessary purchases and reduce the risk of buying leftovers or expired food.
- **Shop smart:** Buy only what you need, and prioritize seasonal and local foods. Check expiration dates. Don't be afraid to buy "ugly" but still delicious fruits and vegetables, as these are often overlooked but have the same nutritional value.
- **Proper storage:** Learn how to store each type of food (refrigerator, freezer, pantry, cool dry place). Use airtight containers and zip-lock bags to keep food fresh longer and avoid mixing odors.

👉 **Cooking and creative use:**

- **Prioritize use:** Consider cooking and eating what you have before buying more. If you have leftovers, store them properly for later use or to prepare new dishes.
- **Make the most of:**

a. Vegetable peels and cores: Can be used to make broth (vegetable water) instead of being thrown away.

b. Leftover food: Process into new dishes (for example, cold rice into fried rice, stale bread into toast).

c. Foods that are about to spoil: Best used immediately or frozen for longer storage (for example, overripe bananas can be used in smoothies or cakes).

- **Portion control:** Cook just enough food for the number of people to avoid waste.

👉 Classification and treatment of food waste at home:

- **Prepare a sorting bin:** Have at least two covered bins in the kitchen: one for organic waste (leftover food) and one for inorganic waste (plastic, glass, paper...).

- **Clear classification:**

a. *Food that is still edible*: If you have food that is still usable but not used up (e.g. gifts, overcooked food), please share it with neighbors, friends or contact the Vietnam Food Bank Network if the quantity is large.

b. *Inedible but recyclable* (degradable) food: Vegetable peels, leaves, tea/coffee grounds, eggshells, spoiled fruit. Collect separately in organic waste bin.

c. *Non-recyclable food* (very small): Food that is severely damaged, contaminated with chemicals or contains non-biodegradable impurities. Dispose of as normal household waste.

- **Practice composting at home (if possible):** For families with space (balcony, garden), composting using a compost bin or styrofoam box is an effective way to turn kitchen waste into fertilizer for ornamental plants or a small vegetable garden. (Refer to the Composting Guide in Chapter 3).

Food Hero Challenge Program:

Families can take part in the Food Hero Challenge to practice responsible consumption and reduce food waste at home. Each week, family members set small, achievable goals, such as:

- Cook and eat all the food in the fridge before buying new food.
- Use leftover rice, bread or vegetables creatively to make new dishes.
- Sort food waste properly for recycling or composting.
- Share excess edible food with neighbors or local Food Bank Network food collection points.

By turning these actions into a family challenge, everyone from children to adults becomes more actively involved in efforts to save food, protect the environment, and support the community.

Photo 6: Poster encourages community participation in combating food waste and promotes recycling of organic food waste at home.

5.2. IN SCHOOLS AND BUSINESSES

Organizations, especially those with communal kitchens, restaurants and canteens, have great potential to reduce and recycle food waste.

👉 **Assessment and planning:**

- **Food waste audit:** Conduct periodic assessments to identify the largest sources and amounts of food waste (e.g., from processing, from student/staff leftovers, buffets).
- **Set goals:** Set specific and measurable goals to reduce and recycle food waste.
- **Develop internal policies:** Issue kitchen/canteen regulations and clear instructions on food management from purchasing, processing, serving to waste disposal.

👉 **Implement classification and recycling process:**

- **Create clear classification points:** Arrange separate, easily identifiable food waste bins (with clear colors, symbols, and instructions) in kitchen areas, canteens, dining rooms, and meal tray return areas.
- **Training and awareness raising:**

a. *For staff/students:* Organize training sessions on the importance of waste reduction and how to properly sort food waste.

b. *Continuous communication:* Use posters, infographics, billboards, internal announcements, social media to promote and encourage people to participate.

- **Cooperate with the Vietnam Food Bank Network (or professional collection units):**

a. *For edible food:* Contact the Vietnam Food Bank Network to safely collect leftovers (e.g., packaged food within its expiry date, unopened meals) for distribution to those in need. This is especially suitable for hotels, restaurants and large supermarkets.

b. *Inedible but recyclable food* (e.g. coffee grounds, bulk vegetable peels): Work with recyclers or the Vietnam Food Bank Network to collect and process it using methods such as industrial composting and animal feed processing.

- **Technology investment (if possible):** Consider installing on-site food processing equipment such as small capacity composters, food waste processors, etc. to reduce volume and facilitate transportation and recycling.

5.3. SUPPORTING DOCUMENTS FOR CLASSIFICATION OF WASTE FOOD

For food waste separation to be implemented effectively and consistently, adequate supporting materials and tools are needed, especially for establishments and organizations with large amounts of waste. These tools not only provide the means but also help to raise awareness and behavior of participants.

Specialized containers for sorting and collecting food waste

Providing suitable containers is fundamental to ensuring that source separation is convenient and efficient.

- **Suitable design and materials:**

a. *Variety of sizes:* There should be a variety of trash cans of different capacities, from small trash cans for kitchens or offices to larger trash cans for canteens, restaurants or centralized garbage collection areas.

b. *Durable, easy-to-clean materials:* Prioritize trash cans made from high-quality recycled plastic, stainless steel, or materials that are easy to clean and disinfect. This helps prevent the buildup of bacteria, mold, and odors.

c. *Tight lids:* All food waste containers must have tight lids to prevent odors from escaping, to avoid attracting insects (flies, mosquitoes) and rodents, and to keep the surrounding area clean.

d. *Drainage system (optional):* For large containers or where high moisture waste is generated, it may be considered to install a filter or drain hole at the bottom to reduce weight and prevent leachate accumulation.

- **Color and identification symbols:**

a. *Clear distinction:* Use standardized colors (e.g., green for organic waste, brown for food waste) or clear, easy-to-understand symbols and labels to distinguish each type of waste. This makes it easy for users to recognize and handle the correct type of waste the first time.

b. *Instructional labels:* Add visual labels that illustrate which foods can and cannot go in the trash, e.g., “Only fruit and vegetable peels, coffee grounds” and “No plastic bottles, glass, large bones.”

- **Box location:** Place bins in strategic locations where food waste is most likely to be generated, such as food preparation areas, dishwashing areas, food counters, or near on-site convenience stores.

Illustration 7 (FBVN)

Educational materials with clear instructions:

- **Design attractive and easy-to-understand documents:**

a. *Simple, familiar language:* Avoid using complex technical terms. Focus on the core information the reader needs to know to take action.

b. *Images and infographics:* Use visual and animated images, charts, graphs to illustrate the classification steps, suitable and unsuitable foods. Images can convey messages many times more effectively than words.

c. *Summary:* Documents should be of moderate length so that the reader does not feel overloaded with information.

- **Detailed instructions:**

a. "Dos" and "Don'ts": Clearly list what should and shouldn't be put in your organic food waste bin.

b. Benefits of Segregation: Briefly explain the positive impact of waste segregation on the environment (reducing methane), saving costs and creating other useful resources.

c. Specific procedures: Provide step-by-step instructions on how to collect, classify and process food waste at the source, suitable for each target group (family, school, business).

d. Frequently Asked Questions (FAQ): Answers to frequently asked questions when starting to implement the classification.

- **Diverse communication channels:**

a. *Printed materials:* Flyers, posters and manuals are distributed in public places, schools and businesses.

b. *Digital platform:* Post on the Vietnam Food Bank Network website, fanpage and partner media channels. Develop short instructional videos on YouTube and TikTok.

c. *Direct Training:* Organize workshops and hands-on training in communities and schools to provide detailed instructions and answer questions directly.

Clear signage at food waste collection points

Signs play an important role in reminding and guiding users when disposing of waste.

- **Suitable and visible location:**

a. *Hang or post right on/near the trash can:* Ensure users can see the instructions right before throwing away the trash.

b. *Suitable height:* Place at eye level, easy to read for all audiences.

- **Vivid and engaging visual design:**

a. *Use international icons and images:* Illustrate specific food items (e.g., images of banana peels, coffee grounds, and wilted vegetables for organic bins; images of plastic bottles and plastic bags for other bins) so that users do not need to read the text to get the message.

b. *Contrasting colors:* Make the sign stand out and easy to read from a distance.

c. *Large, easy-to-read font:* Ensure important information is presented clearly.

- **Short and easy to understand content:**

Examples: "Organic waste bin"; "Plant waste"; "Please pour out water before disposal", "Do not put packaging in food waste bin".

Illustration 8 (Internet)

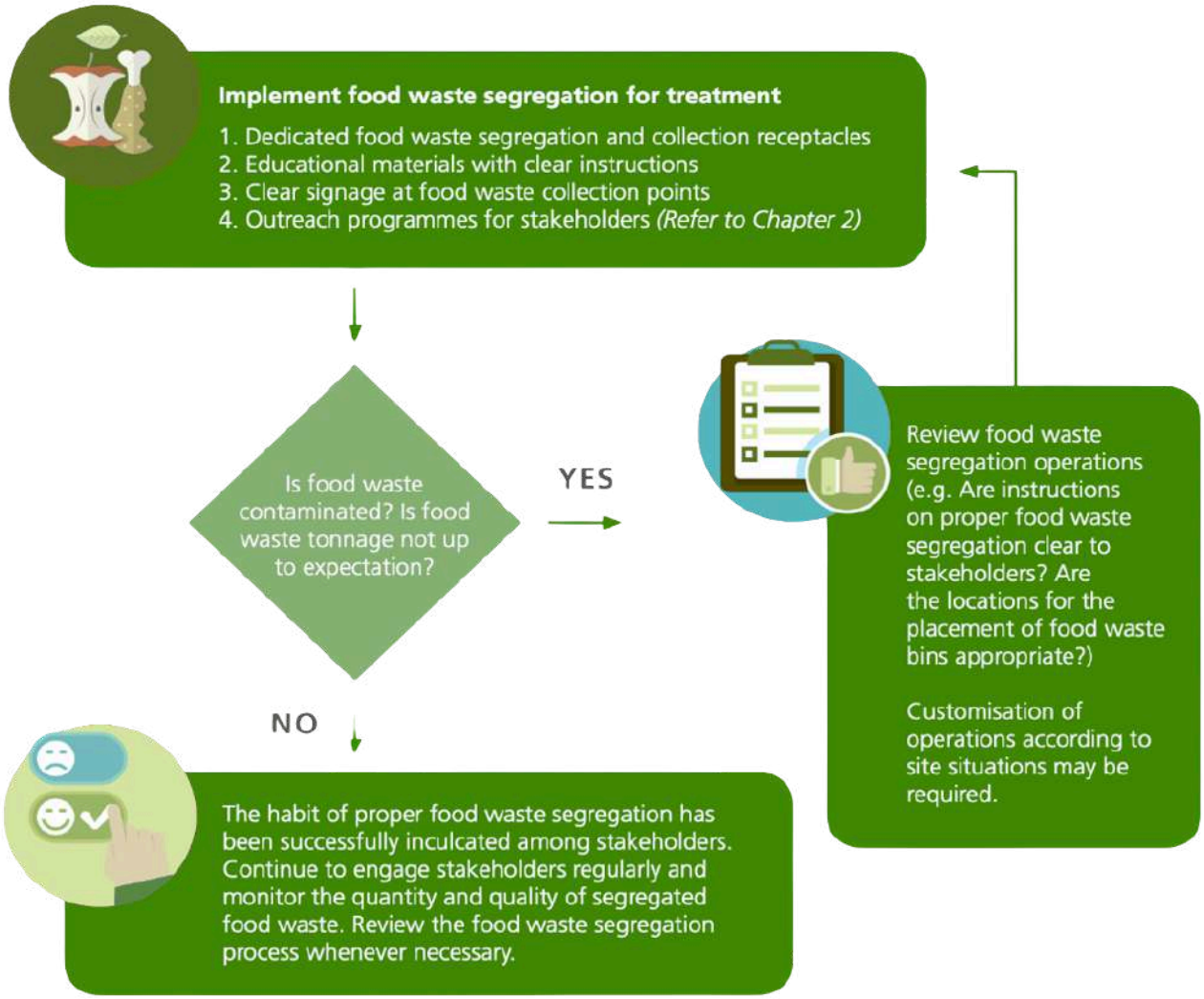


Diagram 2: Food waste classification process (refer to NEA)

Conclude

This booklet is designed to support individuals, households, schools and businesses in implementing effective food waste separation and disposal processes. By providing basic knowledge about separation, advanced forms of recycling, and practical guidance, we aim to equip you with the necessary tools to participate in the effort to reduce food waste.

With proper sorting and recycling practices, food waste can be diverted into valuable resources, rather than being sent to landfills or incineration plants. This not only significantly reduces the amount of waste that needs to be disposed of, but also directly reduces the pressure on the country's waste treatment infrastructure. Specifically, reducing organic waste in landfills will significantly limit methane (CH4) emissions – a powerful greenhouse gas, directly contributing to the fight against climate change.

Furthermore, sorting food waste for recycling also brings many other practical benefits such as minimizing odors and the risk of pests in facilities, as well as reducing the rate of impurities contaminating other types of recyclable waste (such as plastic, paper, metal). More importantly, excess food will be transformed into useful resources or products of higher value, from nutritious organic fertilizers, animal feed to innovative upcycled products, thereby maximizing the ability to recover and reuse resources.

These efforts in food waste classification and recycling are expected to be widely replicated by individuals, communities and partners working together, which is an important step towards the goal of sustainable development in Vietnam. This not only contributes to improving the living environment, but also builds a responsible consumer society where all resources are respected and not wasted.

Reference

1 - National Environment Agency (NEA). *Food Waste Segregation and Treatment Guidebook*. Singapore, May 2020.

2 - Clean & Green Singapore. *Food Waste Reduction and Recycling Resource Kit*. Singapore.

3 - FAO, IFAD, UNICEF, WFP and WHO. 2021. *The State of Food Security and Nutrition in the World 2021: Transforming food systems for food security, improved nutrition and affordable healthy diets for all*. Rome, FAO.

4 - Shenzhen One Planet Foundation & Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. *Food Waste Reduction Practical Guide.*

5 - European Commission. *Commission Regulation (EU) No 142/2011 (Annex X, Chapter 10).*

6 - Farmers Vietnam – Official website: https://farmersvietnam.vn

7 - Food Bank Vietnam – Official website: https://foodbankvietnam.com

Annex

Quality Assessment Checklist

Criteria	What to Check	Acceptable (✓)	Not Acceptable (✗)
Expiry Date	Still within the printed expiry date (note: in Vietnam, only one expiry date is indicated).	✓ Within expiry date	✗ Expired
Packaging	Packaging intact, sealed, no damage or leakage.	✓ No tears, no swelling	✗ Torn, leaking, swollen
Appearance	No mold, no unusual discoloration, no insect contamination.	✓ Normal color, fresh look	✗ Mold, dark spots, insects
Smell	Natural smell of the product, no rancid or sour odors.	✓ Fresh smell	✗ Rancid, sour, abnormal smell
Texture/ Consistency	Product retains expected firmness and freshness.	✓ Firm, crisp, or normal texture	✗ Slimy, mushy, dried out
Storage Condition	Stored at correct temperature and hygiene standards (cold chain, dry storage).	✓ Proper storage confirmed	✗ Improper or unknown storage
Hygiene of Handling	Transport and handling followed hygiene requirements (gloves, clean containers, no cross-contamination).	✓ Hygienic handling confirmed	✗ Unsanitary handling

“FROM WASTE TO RESOURCE”

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