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GERAKAN GUNA ULANG Jakarta

JAKARTA SADAR SAMPAH

PRELIMINARY STUDY

OF REUSABLE PACKAGING RISKS IN READY-TO-EAT FOOD

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giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of:

Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

of the Federal Republic of Germany

Jakarta kota kolaborasi

PRELIMINARY STUDY OF REUSABLE PACKAGING RISKS IN READY-TO-EAT FOOD, INDONESIA

Prepared for Collaborative Actions for Single-Use Plastic Prevention in Southeast Asia (CAP SEA) Project

Implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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On behalf of:
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FOREWORD

The global project Export Initiative Environmental Protection, funded by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), aims to create sustainable and favourable conditions for introducing resource-efficient, climate-friendly, and innovative technologies in its target countries. For the regional project "Collaborative Actions for Single-Use Plastic Prevention in Southeast Asia" (CAP SEA), the module aims to reduce disposable plastic waste by focusing on prevention and reuse. To achieve this, CAP SEA provides policy advice to stimulate material circularity, capacity development for key stakeholders, local pilot activities, and support for innovative business models for single-use plastic (SUP) prevention.

Since 2017, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH supports the BMUV initiative by providing advisory services and coordinating activities for the development of framework conditions that enable the introduction of environmental approaches and technologies in partner countries. The project measures are implemented in collaboration with bilateral German technical cooperation projects in seven countries (Egypt, India, Indonesia, Malaysia, Jordan, Thailand, and Ukraine) but also in global modules. Local staff are the point of contact for other ongoing projects carried out by BMUV grant recipients in these countries. This promotes the regular exchange of information and experiences between the projects and creates synergies. In addition, the projects are better embedded in the strategies of the target countries.

The supported measures build up technical and institutional know-how and foster knowledge and technology transfer, raise environmental awareness, and build capacities, thereby contributing to the transition to more circular economies and the achievement of specific sustainable development goals (SDGs).

General information about the project module in Southeast Asia: Indonesia

In Indonesia, CAP SEA aims to contribute to the achievement of targets stated in the National Action Plan on Marine Plastic Debris 2017-2025 (reduction of plastic waste by 70% by 2025 compared to 2017) and the Roadmap to Waste Reduction by Producers (through the Ministry of Environment and Forestry (MoEF) Regulation P.75/2019: reduction of packaging waste from producers by 30% by 2029). In addition to that, CAP SEA actively participates in the Indonesia National Plastic Action Partnership (NPAP), a platform for public-private collaboration to (1) Reduce avoidable plastic use and avoid the consumption of 540,000 tonnes/year of plastics in 2025 (6% of projected plastic waste generation in 2025), through policy and behaviour change and new business models; (2) Substitute 740,000 tonnes/year of plastics with alternative materials (8% of projected plastic waste generation in 2025), and (3) Collect, safely dispose and recycle unavoidable plastics with the goal of making all plastic waste a valuable commodity.

CAP SEA Indonesia is developing four work packages, of which work package 3 is the pilot project of business model implementation that aims at reducing SUP packaging by providing alternative reusable packaging for food (beverage) delivery of ready-to-eat food with one local municipality. The Special Capitol Region of Jakarta (locally named Daerah Khusus Ibukota or DKI Jakarta) is chosen as the local municipality pilot project because DKI Jakarta City hosts 10.5 million people and is by far the biggest agglomeration in Indonesia and its capital. DKI Jakarta Governor has banned SUP bags by issuing the Governor Regulation No. 142 of 2019 on the Obligation to Use Environmentally Friendly Shopping Bags in Shopping Malls, Convenience Stores, and Traditional Markets.

Preliminary Study of Reusable Packaging Risks in Ready-to-eat Food

Single-use packaging has provided convenience for its users but also presents various problems such as environmental problems, social problems, and then also economic problems. Replacing single-use packaging with reusable packaging is seen as a promising solution. However, to implement reusable packaging on a massive scale, it is necessary to implement agreed standards to ensure its use can be accepted without any problems.

One of the uses of single-use packaging that needs to be replaced with reusable packaging is in food packaging, including ready-to-eat processed food. The standard that must be considered in food packaging is food safety. To establish reusable packaging standards for ready-to-eat processed food, the Indonesian Plastic Bag Diet Movement (GIDKP) with support from GIZ within the framework of the CAP SEA program cooperated with the Food and Drug Supervisory Agency (BPOM) of the Republic of Indonesia to make a Preliminary Study on Packaging Risks in Ready-to-eat Food. The production of this document was supported by SEAFAST Center, Bogor Agricultural University, and PR3 (Partnership to Reuse, Refill, Replace Single-Use Plastics).

This document is the first part of a series of studies and preparations carried out to meet food safety standards by using reusable packagi

> *"'Single-use plastic', often referred to as disposable plastic, is usually used for plastic packaging and includes terms that are intended to be used only once before being disposed of or recycled. This includes, among other things, grocery bags, food packaging, bottles, straws, containers, glasses and cutlery" (reference: United Nations Environment Programme, UNEP (2018): Single-use Plastics: A Roadmap for Sustainability)*

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According to research from the University of California, forty per cent of all plastic produced that ultimately becomes waste in landfills and the oceans is packaging (Parker, 2018). Reducing plastic production—through elimination, expanding consumer reuse options, or new delivery models—is the most attractive solution from an environmental, economic, and social perspective (The Pew Charitable Trusts, 2020). However, the application of reusable packaging needs to be accompanied by compliance with related standards. For food packaging, the standards that need to be met are food safety standards including sanitation/hygiene for which many countries in the world including Indonesia refer to the standards and mechanisms established by the Codex Alimentarius Commission (CAC). So, to meet the standard of food safety mechanisms, it is necessary to first understand the system that has been established by CAC and its practices in Indonesia.

Due to **the lack of specific food safety standards for reusable packaging on hygiene or sanitation from CAC**, this study was conducted to identify risks and risk mitigation measures for reusable packaging of ready-to-eat processed food by using a food safety standard approach that applies to non-reusable packaging and/or guidelines for the use of reusable packaging. The standards and/or guidelines in question are shown in the following table.

Indicator	Non-Reusable Packaging	Reusable Packaging
Guideline	The Food and Drug Supervisory Agency (FDA/BPOM) has issued 'Guidelines for Implementing FDA Agency Regulation No. 20/1999 on Food Packaging'	There is a guideline being piloted by the Partnership to Reuse, Refill, Replace Single-Use Plastics (PR3), namely the 'Reusable Packaging System Design Standard'
Standard	There is a standard that refers to the Regulation of the Ministry of Health of the Republic of Indonesia No.1098/MENKES/SKNII/2003 concerning Standards for Sanitary Hygiene Requirements for Eateries and Restaurants	*Not yet available at national or international level (e.g., CAC)*

Field observations show that mitigation efforts to maintain food safety, especially hygiene and sanitation, have been carried out by relevant parties including Allas and catering business services regarding the use of reusable packaging. These mitigation efforts are considered to have met the standards set by the Indonesian Ministry of Health (1098/MENKES/SKNII/2003) and the guidelines that are being piloted by PR3. The risks and mitigation steps for using reusable packaging for ready-to-eat processed food are shown in the following table:

Critical Point	Risk	Mitigation Steps
R1	Food preparation	Food preparation activities should be carried out in another space than storing/filling reusable food packaging.
R2	Food packing	Business actors should be educated about the limitations of packaging so that they can avoid packaging damage due to inappropriate treatment.
R3	Use of cutlery	Consumers should be educated about the limitations of packaging so that they can avoid packaging damage due to inappropriate treatment.
R4	Warming food with microwave	Food packaged in aluminium and stainless steel should not be warmed in the microwave more than the temperature tolerance/maximum.
R5	Return of reusablepackaging	Returns should be carried out using special containers and reusable packaging should not be mixed with other objects.
R6	Washing reusable packaging	Washing should follow the washing standards for each part of the packaging.
R7	Reusable packaging storage	Drying and storing of washed packaging should only be carried out in a place that is kept clean, has good air circulation, and is away from sources of pollutants and organisms or substances that allow contamination.

This is a preliminary study to determine the scope of a more complete risk profile on reusable packaging. Therefore, it is recommended to contact business actors, government agencies, and related parties to jointly continue this preliminary study by compiling a risk profile for each type of reusable packaging (polypropylene (PP), stainless steel, aluminium, silicone rubber, glass/pyrex, and so on) with direct measurements of potential chemical, biological, and physical risks.

The framework of the risk profile that uses the intended CAC standard should include:

- Introduction
- Hazard of food commodity combination with risk profile object
- Hazard identification
- Hazard characterization
- Exposure assessment
- Evaluation of adverse effects on health
- Risk management information
- National and international standards and codes of practice

CHAPTER I
INTRODUCTION

1.1. BACKGROUND

According to research from the University of California, forty per cent of all plastic produced that ultimately becomes waste in landfills and the oceans is packaging (Parker, 2018). In Indonesia, plastic waste amounts to 17%, or about 11.6 million tons(CNN Indonesia, 2021). Reducing plastic production—through elimination, expanding consumer reuse options, or new delivery models—is the most attractive solution from an environmental, economic, and social perspective. It offers the biggest reduction in plastic pollution, often represents a net saving, and provides the highest mitigation opportunity for GHG emissions (The Pew Charitable Trusts, 2020).

Therefore, more and more business players around the world are trying to introduce reusable packaging for various types of products. Ready-to-eat processed food is one of these products. According to Government Regulation of the Republic of Indonesia Number 86 of 2019 concerning Food Safety, ready-to-eat food is food—and/or beverages—that has been processed and is ready to be served directly at the business or outside the business, such as food served at catering services, hotels, restaurants, cafeterias, canteens, street vendors, mobile food outlets (food trucks), and mobile food vendors or similar businesses.

However, the use of reusable packaging needs to comply with relevant standards. For food packaging, these are food safety standards. In many countries in the world including Indonesia 'food safety' refers to the standards and mechanisms established by the Codex Alimentarius Commission (CAC), so that in order to meet the standards of food safety mechanisms, it is necessary to first understand the system that has been established by the CAC and its practices in Indonesia. After that, a comparison can be made between the practice of using reusable packaging in ready-to-eat processed food with existing food safety standards. If there are things that have not been regulated, it is necessary to conduct a risk profile study.

1.2. OBJECTIVE

The objective of this preliminary study is to:

1. Know the mechanism of the applicable food safety system.
2. Identify standards related to reusable packaging in ready-to-eat processed foods.
3. Identify the journey of reusable packaging in ready-to-eat processed foods.
4. Analyse critical points and hazards.
5. Evaluate existing standards and guidelines in maintaining the safety of ready-to-eat processed food.
6. Identify the need for further studies.

1.3. SCOPE

1.3.1. Study Object

The objects of this study are:

- The food safety system that applies in Indonesia
- Current standards of hygiene or cleanliness
- Ready-to-eat processed food business actors
- Types and packaging materials for ready-to-eat processed food
- Consumers of ready-to-eat processed food
- The reusable packaging journey

1.4. METHODOLOGY

The first stage was to identify the types of reusable packaging used by ready-to-eat processed food business actors, scientific studies, and regulations related to food contact materials. This stage was carried out using two methods:

1. Observation
   Observation is an effective method because researchers go directly to the object of research so that researchers can find out the actual state of the object of research, understand the object in more detail, and the data obtained is more accurate because it is directly from the data source. To find out about the existence of the research object (reusable packaging in ready-to-eat processed food), the researchers did two things:
   a. Carrying out searches on search engines in the network (online) by entering certain keywords such as 'Jabodetabek catering services', 'Rantang Jabodetabek', 'Catering Jabodetabek', and others. From the search results, the researchers selected the type of packaging used. Only the type of packaging that is reused by business actors becomes the object of research.
   b. Looking for information on the existence of ready-to-eat processed food business actors who use reusable packaging through minimal waste communities that have members in Jakarta.
2. Literature study
   A literature study was also carried out to identify the types of reusable packaging used by ready-to-eat processed food business actors who are not located in Jakarta and could therefore not be observed.

In the second stage, the researchers identified the journey of reusable packaging by focusing on ready-to-eat processed food business actors who use reusable packaging as identified in the previous stage based on their operational status. At the time this research was conducted, the COVID-19 pandemic brought many business activities to a standstill, including the ready-to-eat processed food business., The researchers conducted interviews and observations with ready-to-eat processed food business actors who meet the requirements in April and May 2022.

The third stage was to carry out an analysis of critical points and hazard risks contained in the process of preparation, delivery, consumption, and post-consumption of processed ready-to-eat food with reusable packaging. This study focuses on critical points that are due to the use of reusable packaging. Therefore, critical points that exist for common processes (including the use of non-reusable packaging) are not taken into account in this risk profile.

The analysis to measure the level of risk used FMEA (Failure Mode and Effect Analysis) which is one of the earliest structured reliability improvement methods and to this day is still a very effective method to reduce the possibility of failure. FMEA is implemented by the following steps:

1. Identify hazardous activities in each stage of the ready-to-eat processed food process with reusable packaging.
2. Determine likelihood and impact values for each risk. Values on a scale of 1 for the smallest value to 10 for the largest value.
3. Determine the risk value. Values on a scale of 1 for the smallest value to 10 for the largest value.
4. Rank the risk value.
5. Develop a critical (important) risk mitigation plan.
6. Evaluate the risk score and RPN (Risk Priority Number) based on the risk response plan.

1.5. OUTPUT

This preliminary study report is one of the three expected outputs related to the design of sanitation/hygiene standards for the use of reusable packaging based on the Codex Alimentarius Commission (CAC) standard. The three outputs are described as follows:

1. Preliminary study report
   The preliminary study report is a paper that contains an explanation of the mechanism of the applicable food safety system, standards related to reusable packaging in ready-to-eat processed food, the journey of reusable packaging in ready-to-eat processed food, an initial analysis of critical points and hazards, and an evaluation of standards as well as existing guidelines for maintaining the safety of ready-to-eat processed foods.
2. Risk profile report
   The risk profile report is a further part of the preliminary study report which consists of a risk list containing information about risk events, risk owners, risk causes, existing risk control activities, and the remaining risk of each action or activity assessed for risk.

3. Policy Brief

The policy brief is a document that is expected to be the basis for future policies of relevant institutions in regulating reusable packaging for ready-to-eat processed food. This document will be issued separately from this paper in several editions according to the relevant regulators:

- The National Food and Drug Supervisory Agency (BPOM or FDA) as supervisor of ready-to-eat processed food including sanitation and hygiene aspects;
- The Ministry of Health of the Republic of Indonesia, as a regulator of ready-to-eat processed food, including aspects of sanitation and hygiene; and
- The Ministry of Industry of the Republic of Indonesia, as the regulator of food packaging standards.

CHAPTER II
FOOD SAFETY SYSTEM

In order to ensure reusable packaging meets food safety standards, it is important to first understand the applicable food safety system, complete with various mechanisms and parties involved in it.

2.1. *CODEX ALIMENTARIUS COMMISION*

Codex Alimentarius Commission (CAC) is an intergovernmental body tasked with implementing the Food and Agriculture Organization (FAO) or World Health Organization (WHO) food standards program. The Codex was formed with the aim of, among others, developing standards, guidelines, and good practices (codes of practice) to:

1. Protect consumers' health
2. Ensure fair practices in the food trade

Membership of the CAC is open to all FAO and/or WHO member countries, but the country must submit its wish to become a member of the Codex to the Director General of FAO or WHO. In 2017, the number of registered Codex members was 188, consisting of 187 countries and one member organization, namely the European Union (EU). Indonesia has been a member of the Codex since 1971.

Codex Alimentarius is a collection of food standards and other advice that has been adopted internationally by the CAC. Codex Alimentarius covers all food standards, both fresh food, semi-processed food and processed food distributed to consumers. Codex Alimentarius also includes general provisions relating to:

1. Food contamination
2. Food additives
3. Food hygiene
4. Inspection and certification
5. Labelling
6. Methods of analysis and sampling
7. Pesticide residue
8. Residues of veterinary drugs

It also includes provisions that are advice in the form of implementation instructions, guidelines, and/or other recommendations. Codex Alimentarius is published so that it can be used as a guide or reference for countries in developing and revising standards or regulations in the food sector, in the context of international harmonization.

Since the function of the CAC is to ensure fair practices in the food trade, the increase in the number of CAC members has a direct impact on increasing international food trade, as shown in Figure 1.

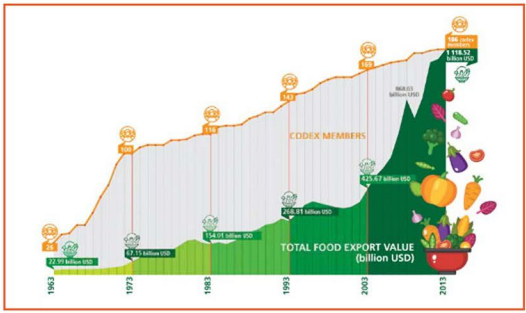

Figure 1. Correlation of increasing number of CAC members with international food trade
Source: Module 1 – Codex Introduction.pdf

If a new standard is needed (e.g., food safety standards related to reusable packaging in food), a standard-setting mechanism can be carried out. Proposals for the development of new standards can come from any member of the Codex. Before entering the Codex step procedure, the Committee first discusses the need for the preparation of this standard. Codex members who want to propose a standard are required to prepare a discussion paper accompanied by a project document for discussion by the Committee. The Committee then asks the relevant international risk assessment agency to conduct a risk assessment. There are several international risk assessment institutions:

- JECFA
  (Joint FAO/WHO Expert Committee on Food Additives)
- JPMR
  (Joint FAO/WHO Meeting on Pesticide Residues)
- JEMRA
  (Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment)
- JEMNU
  (Joint FAO/WHO Expert Meetings on Nutrition)
- Ad hoc expert consultation on problems that arise

The risk assessment agency will then provide scientific advice/opinions (results of the risk assessment) which are then followed up by the Commission through an 8-step process that is communicated to all stakeholders.

First, during Step 1, the Commission decides whether to develop a standard based on a critical review of the project document by the Executive Committee. "Criteria for the Establishment of Work Priorities" exist to assist the Commission or Executive Committee in their decision-making and in selecting the subsidiary body to be responsible for steering the standard through its development. If necessary, a new subsidiary body—usually a specialized task force—may be created. Then, in Step 2, the Secretariat arranges for the preparation of a proposed draft standard (usually through electronic working groups or drafting groups) and circulates it to members and observers for comments: today, this is done through the Codex Online Commenting System (OCS)—a purpose-built, web-based system, designed to facilitate broad and effective participation (Step 3). After that, in Step 4, the relevant subsidiary body considers the comments and may present the text to the Commission as a draft standard(Step 5). The draft may also need to be referred to the Codex committee responsible for labelling, hygiene, additives, contaminants, or methods of analysis for endorsement of any special advice in its area of expertise. Members and observers have another opportunity to comment on the draft standard (Step 6). Following that, during Step 7, their comments are considered by the body that has been assigned the work and final amendments are made. Standards take an average of 4.2 years to develop. Once adopted by the Commission, the standard becomes part of the Codex Alimentarius in the final Step 8.

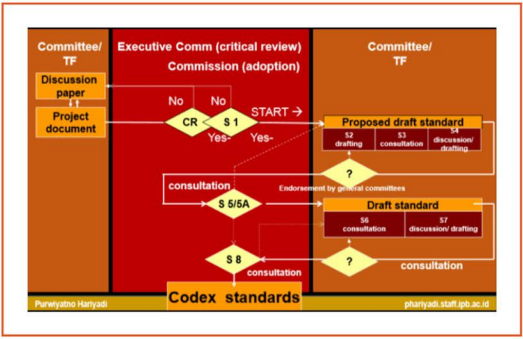

Figure 2. Eight processes under the CAC framework

All activities in the creation of new standards and implementation of existing standards can be grouped into risk assessment, risk management, and risk communication activities. The relationship between these three activities can be described as shown in Figure 3.

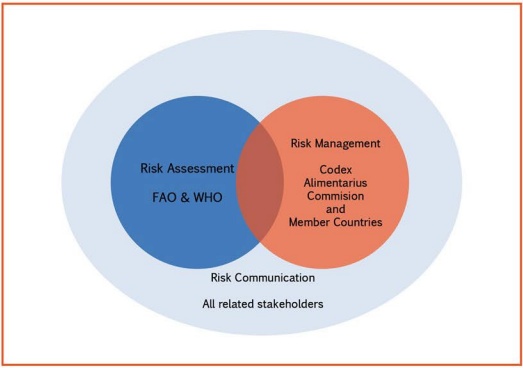

Figure 3. Codex standard development basis

This preliminary study can be seen as a start to encourage new standard proposals from member countries for inclusion in the Codex step procedure.

2.2. CODEX INDONESIA

In Indonesia, as in various CAC member countries, there is an internal government agency that coordinates Codex activities: Codex Indonesia. The Indonesian Codex Organization was formed based on a mutual agreement between government agencies related to food safety and food trade, namely the Ministry of Agriculture, Ministry of Health, Ministry of Industry, Ministry of Trade, Ministry of Maritime Affairs and Fisheries, the Food and Drug Supervisory Agency (BPOM or FDA) and the National Standardization Agency (BSN), as well as involving the Ministry of Foreign Affairs.

The membership of the Codex Indonesia Organization is determined through the Decree of the Head of BSN as the Chairman of the Indonesian Codex National Commission with the following structure:

1. Indonesian Codex National Commission
   The Indonesian Codex National Commission is chaired by the Head of BSN, with the following duties and functions:
   a. Macro policies for handling Codex Indonesia;
   b. Policies in determining Indonesia's position;
   c Policies in determining work programs, including programs for the use of cooperation related to Codex activities and follow-up to the results of the Codex trial;
   d. Policy in the appointment or change of the Mirror Committee Coordinator.

2. ndonesian Codex Working Group
   The Indonesian Codex Working Group is chaired by one of its members who comes from a government agency as a regulator in the food sector and who is elected alternately with a maximum term of two years, with the following duties and functions:
   a. Making a macro plan for handling Codex Indonesia;
   b. Preparing annual work plans and evaluating the results;
   c. Identifying Codex cooperation programs that can be utilized by Indonesia and report to the Indonesian Codex National Commission;
   d. Discussing technical matters related to important issues discussed in the Codex forum including the results of the Codex trial;
   e. Verifying the draft of Indonesia's position for the Codex trial, if necessary;
   f. Reviewing the implementation of the Indonesian Codex Handling Guidelines and reporting the results to the Indonesian Codex National Commission for follow-up.

3. *Mirror Committee*
   The Mirror Committee Coordinator is an Echelon II level official from relevant government agencies like the Ministry of Agriculture, Ministry of Maritime Affairs and Fisheries, Ministry of Industry, Ministry of Trade, Ministry of Health, BPOM and the National Standardization Agency.
   Members consist of representatives of government agencies, research institutions, industry, industry associations in the food sector, consumer institutions, and experts, with a balanced composition.
   The duties and functions of the Mirror Committee Coordinator are:
   a. Carrying out a discussion program in the Mirror Committee Meeting;
   b. Coordinating and organizing technical discussions of substances that will be, are being, and have been discussed in the Codex Session to prepare a draft of Indonesia's position as well as to prepare materials and/or data for the discussion of positions, including supporting data used at the Codex Session;
   c. Disseminating the results of the trial according to the area of the Mirror Committee;

d. Managing the secretariat documentation of the Mirror Committee, especially the Codex Session documents, Indonesia's position in the Codex Session and the related documents resulting from the activities of the Indonesian Codex Organization.
An example is the BPOM (FDA) as coordinator of the Mirror Committee for the Codex Committee on Food Additives (CCFA), Codex Committee on Contaminants in Foods (CCCF), Codex Committee on Food Labeling (CCFL), and Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU) that has the task of preparing Indonesia's position at the above meeting and at the same time being the head of the Indonesian Delegation at the relevant session to convey Indonesia's position.

4. Codex Contact Point (CCP) Secretariat
The Codex Contact Point Secretariat has duties and functions as a liaison between the Codex Secretariat and the Indonesian government as well as coordinating relevant Codex activities in Indonesia.

2.3. INSTITUTIONS AND REGULATION RELATED TO FOOD SAFETY IN INDONESIA

Indonesia has issued Law No. 18 of 2012 concerning Food. This law was later revealed to be several Government Regulations, including:
- Government Regulation Number 17 of 2015 concerning Food Security and Nutrition
- Government Regulation Number 86 of 2019 concerning Food Safety, and
- Draft Government Regulation on Food Labels and Advertisements (not yet published)

In Government Regulation No. 86 of 2019, the types of food that are regulated are:
- Fresh food
- Processed food
- Ready-to-eat processed food
- Food additives
- Irradiated food
- Genetically modified food

In addition, related aspects are also regulated such as:
- Food sanitation
- Food packaging
- Food contamination
- Guarantee food safety and quality
- Halal guarantee of food products

As for the technical provisions of the Good Manufacturing Practice Guidelines, the distribution has been regulated by Government Regulation No. 86 of 2019 as shown in Table 1 below.

Good Method Guideline	Guidelines	Issued By
Fresh Food from Plants and Animals	How to cultivate good plants How to cultivate good livestock Good feed management Good post-harvest handling	Ministry of Agriculture
Fresh Food from Fish	How to hatch good fish How to cultivate good fish Good method of catching fish	Ministry of Marine and Fisheries
Packaged Processed Food	Good method of producing processed food	Ministry of Industry
Certain Processed Foods	Good production methods for certain processed foods (food for certain groups, genetically modified, irradiated food)	BPOM (FDA)
Ready-to-eat Foods	How to produce good ready-to-eat processed food	Ministry of Health
Storage, transportation, distribution, serving	Good method of storage Good method of transporting food Good method of distributing food Good method of selling food	Ministry of Industry

Table 1. Guidelines for Good Method

Meanwhile, government agencies that play a role in food supervision are also regulated by Government Regulation No. 86 of 2019 as shown in Table 2 below.

Program	Activity/ Agriculture/ Farm/ Fishery	Fresh products	Fresh Product Distributor/ Retailer	Food processor		Processed Product Distributor/ Retailer	Fresh foods	Certain processed foods	Ready-to-eat foods
				Medium to large industries	Small and household industries				
Permit/ business license	Local Government	Local Government	Local Government	Ministry of Industry, Ministry of Marine and Fisheries, FDA	Local Government	Ministry of Agriculture, Ministry of Marine and Fisheries, Ministry of Trade	Ministry of Trade	Ministry of Trade	Local Government
Food registration				FDA		FDA	Ministry of Agriculture, Ministry of Marine and Fisheries	FDA	
Supervision (QA, guidelines on pollution)	Ministry of Agriculture, Ministry of Marine and Fisheries	Ministry of Agriculture, Ministry of Marine and Fisheries		Ministry of Industry, Ministry of Marine and Fisheries, FDA	Local Government supervised by FDA	FDA	Ministry of Agriculture, Ministry of Marine and Fisheries	FDA	FDA
Coaching	Ministry of Agriculture, Ministry of Marine and Fisheries	Ministry of Agriculture, Ministry of Marine and Fisheries			Local Government	FDA	Ministry of Agriculture, Ministry of Marine and Fisheries	FDA	Local Government
Evaluation & pre-market approval				FDA	Local Government		Ministry of Agriculture, Ministry of Marine and Fisheries	FDA	Local Government
Inspection/ investigation	FDA	FDA	FDA	FDA	FDA	FDA	Ministry of Agriculture, Ministry of Marine and Fisherie	FDA	Local Government
Report to	Ministry of Agriculture, Ministry of Marine and Fisheries	Ministry of Agriculture, Ministry of Marine and Fisheries	Ministry of Agriculture, Ministry of Marine and Fisheries	Ministry of Industry, FDA	Local Government			FDA	Local Government
Legal action	Local Government	Local Government	Local Government	Ministry of Industry, FDA	Local Government	FDA	Ministry of Agriculture, Ministry of Marine and Fisheries	FDA	Local Government

Tabel 2 Instansi pemerintah yang berperan dalam pengawasan pangan

Based on the division of authority, it can be noted that to discuss safety standards on reusable packaging, including hygiene in processed ready-to-eat food, it is necessary to involve the Regional Government (through related agencies such as the Health Service and the Environment Service), the Ministry of Industry, and the Ministry of Health, in addition to the FDA.

2.4. REGULATION AND STANDARDS REGARDING REUSABLE PACKAGING IN READY-TO-EAT PROCESSED FOOD

To regulate aspects of hygiene and sanitation in restaurants, the Ministry of Health has issued Decree of the Minister of Health of the Republic of Indonesia Number 1098/MENKES/SKNII/2003 concerning Sanitary Hygiene Requirements for Restaurants. This regulation regulates in detail the sanitation hygiene requirements that must be met which include:

a. location and building requirements;
b. sanitation facility requirements;
c. requirements for kitchens, dining rooms, and food warehouses;
d. requirements for foodstuffs and ready-to-eat foods;
e. food processing requirements;
f. requirements for storage of foodstuffs and ready-to-eat foods;
g. requirements for serving prepared food;
h. requirements for the equipment used.

Indonesia and most countries in the world do not yet have regulations governing the reuse system. However, the PR3 (Partnership to Reuse, Refill, and Replace Single-Use Plastic) Program from RESOLVE in collaboration with various parties has come up with Reusable Packaging System Design Standards which include:
Part 1: Collection points
Part 2: Containers
Part 3: Digital
Part 4: Return incentives
Part 5: Labelling & Education
Part 6: Reverse Logistics
Part 7: Washing, Sanitizing, & Handling Tableware

CHAPTER III
OBSERVATION RESULTS OF READY-TO-EAT PROCESSED FOOD WITH REUSABLE PACKAGING

To examine the use of reusable packaging in ready-to-eat processed food and its relevance to food safety standards, this study identified several types of reusable packaging materials used by ready-to-eat processed food business actors including business partners for reuse and observation of their use. This observation was carried out in May 2022. The types and packaging materials are shown in Table 3 below.

No.	Packaging name (common name)	Packaging material	Pictures (from various sources)	Logos on the packaging
1	Collapsible lunch box	Cap: polypropylene (PP) Seal on cap: rubber Body: silicone rubber		
2	Thinwall	Overall: PP		
3	Plastic lunch box (insulated and not insulated)	Overall: PP		
4	Aluminium stacking rack	Overall: aluminium		

No.	Packaging name (common name)	Packaging material	Pictures (from various sources)	Logos on the packaging
5	Stainless steel stacking rack	Overall: stainless steel		
6	Glass container	Cap: PP Also available with silicone rubber lid. Body: glass/pyrex		

Table 3. Types and materials of ready-to-eat processed food packaging for reuse

Logo Description:

Food tare logo, indicating that the packaging is safe for food packaging. It is regulated in the Regulation of the Minister of Industry Number 24/M-IND/PER/2/2010.

The recycling code logo number 5 indicates that the type of plastic raw material used is PP and can be recycled. It is regulated in the Regulation of the Minister of Industry Number 24/M-IND/PER/2/2010.

Freezing safe packaging logo. If this logo is visible on the packaging, it means that consumers can freeze the product without having to open the package first.

Microwave-safe packaging logo. There is another logo with a similar meaning with the addition of the word 'micro' under the wave image.

Dishwasher-safe packaging logo.

For convenience in the study, the type and packaging material is simplified based on the dominant material:

- Silicone rubber
- PP
- Aluminium
- Stainless Steel
- Glass/Pyrex

At FAO, the expert committee responsible for food safety related to packaging is the JECFA (Joint FAO/WHO Expert Committee on Food Additives) because this committee also discusses contaminants in food, including those originating/migrating from packaging materials.

Meanwhile, the operational flow of the ready-to-eat processed food business can be divided into 2 types: food businesses with business partners for reuse (for example, Allas by Enviu) as described in Figure 3 and without partners for reuse as depicted in Figure 4.

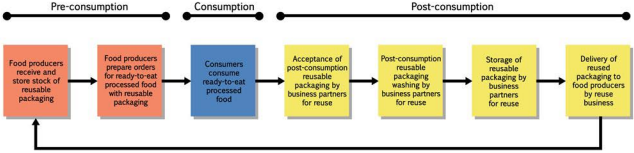

Figure 4. Operational flow of ready-to-eat processed food business with reuse business partners (for example, Allas by Enviu)

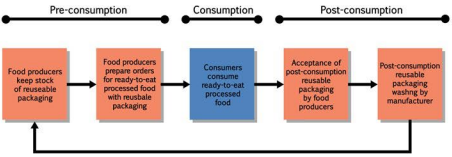

Figure 5. Operational flow of ready-to-eat processed food business without business partners for reuse

The stage of receiving post-consumption reusable packaging generally takes about a few hours after consumption for a ready-to-eat processed food business without a reuse business partner and the container is usually unwashed by the consumer. Meanwhile, for ready-to-eat processed food businesses with reusable business partners (for example, Allas by Enviu), the post-consumption packaging acceptance stage may take longer, a maximum of one week, but the packaging has generally been washed by the consumer. However, business partners for reuse continue to wash packaging to ensure cleanliness.

Various daily catering services and restaurants are ready-to-eat processed food producers who use reusable packaging. Meanwhile, the only reuse business partner identified as operating in Jakarta at the time of this research was Allas by Enviu and during observations, they used silicone rubber and aluminium packaging. We would like to point out that there are also reuse business partners operating outside Jakarta such as ReCIRCLE in Europe, Vytal in Germany-Austria-France, Tapauware in Malaysia, barePack in Singapore, and Pintos in Thailand.

To meet the hygiene requirements, ready-to-eat processed food business actors in Indonesia refer to the Decree of the Minister of Health of the Republic of Indonesia Number 1098/MENKES/SKNII/2003 concerning Sanitary Hygiene Requirements for Restaurants. As for the guidance for implementing the reuse system, PR3's Reusable Packaging System Design Standards include Standards for Containers, Standards for Return Incentives, Standards for Reverse Logistics, and Standards for Washing, Sanitizing & Handling Tableware. The discussion of risks in each stage of the operational flow refers to these two standards.

3.1. RISKS IN THE PREPARATION AND DELIVERY OF READY-TO-EAT PROCESSED FOOD WITH REUSABLE PACKAGING

The food preparation and delivery stages are also known as the pre-consumption stage. At this stage, food is prepared by ready-to-eat processed food producers until the food arrives in the hands of consumers. Food preparation includes various activities, such as: preparing food ingredients, cutting food ingredients, cooking food, as well as putting and arranging food into reusable packaging. Activity details may vary for each type of food. Food delivery can also be carried out in various ways. The most common food delivery mode at the time this research was carried out was motorbikes.

Based on the results of the study, there were 2 critical points in the food preparation and delivery stage, the food preparation process (R1) and the food packaging process (R2). Both risks are described in Table 4.

Risk Identity	Risk Event and activity executor	The consequences based on the findings of observations and interviews
Preparation of ready-to-eat processed food	Food preparation by food handler (R1)	In the food preparation process, activities such as cutting, burning, or other activities can occur that have the potential to damage reusable packaging with certain types of materials. Therefore, in general, these risky food preparation activities are carried out when the food has not been packaged. However, it should also be noted that the reusable packaging may be too close to the stove or torch flame when heating food. Damaged packaging may not protect food or even contaminate food to the detriment of consumer health.
	Food packaging by food handler (R2)	In the process of packaging and arranging food, activities can occur that have the potential to damage reusable packaging with certain types of materials, such as putting food which is too hot or using inappropriate equipment such as too sharp utensils.

Table 4. Risky activities in the preparation and delivery of ready-to-eat processed food with reusable packaging

Based on these risk points, risk measurements were carried out for each type and packaging material. Measurements were made based on observations and interviews. Among other things, the standards that apply according to the Regulation of the Ministry of Health of the Republic of Indonesia No. 1098/MENKES/SKNII/2003 concerning Standards for Sanitary Hygiene Requirements for Restaurants are:

- All food processing activities must be carried out in a way that is protected from direct body contact.
- Direct contact with food is protected by:
  - Plastic gloves.
  - Food tongs.
  - Cutlery and the like.
- Every food handler at work must wear:
  - Apron.
  - Hair cover.
  - Kitchen shoes.
  - Every food handler at work must observe the following:
    - No smoking.
    - No eating or chewing.
    - No jewellery except for an unadorned wedding ring.
    - No use of equipment and facilities that are not fit for that purpose.
    - Always washing hands before work and after leaving the restroom.
    - Always wearing proper work clothes and protective clothing.
    - Always wearing clean work clothes that are not worn outside an eatery or restaurant.

In general, in the stages of preparation and delivery of ready-to-eat processed food, the applicable standards have been met by the implementers of the activity. The results of risk measurement are shown in Table 5.

Risk Identity	Risk Event	Material	Likelihood (L)	Impact (I)	Risk Value (L x I)
Preparation of ready-to-eat processed food	Food preparation (R1)	Silicone rubber	7	9	63
		PP	7	10	70
		Aluminium	7	3	21
		Stainless Steel	7	3	21
		Glass/Pyrex	7	3	21
	Food packaging (R2)	Silicone rubber	7	7	49
		PP	7	5	35
		Aluminium	7	1	7
		Stainless Steel	7	1	7
		Glass/Pyrex	7	1	7

Table 5. Measurement of risk in the preparation and delivery of ready-to-eat processed food with reusable packaging

Based on the results of risk measurement, the risk value is arranged from the largest value to the lowest value as shown in Table 6.

Risky Activities	Risk Value
Food preparation for PP packaging	70
Food preparation for silicone rubber packaging	63
Food packaging for silicone rubber packaging	49
Food packaging for PP packaging	35
Food preparation for aluminium packaging	21
Food preparation for stainless steel packaging	21
Food preparation for glass/pyrex packaging	21
Food packaging for aluminium packaging	7
Food packaging for stainless steel packaging	7
Food packaging for glass/pyrex packaging	7

Table 6. Ranking of activity risk values at the stage of preparation and delivery of ready-to-eat processed food with reusable packaging

Activities related to food preparation and food packaging in silicone rubber and PP packaging are the riskiest activities among other activities in this stage because these materials are less resistant to heat and sharp objects than other materials. The results of studies and observations show that:

a. PP packaging will melt at a temperature of 160 oC, while silicone rubber has no melting point but is deformed and starts to become brittle at 200 oC. Some food producers were found to heat food close to the packaging location so that there is a risk of damaging the packaging. For PP packaging, there is a risk of contaminating food which can harm consumers' health because the melted plastic can be separated and mixed with food.
b. Silicone rubber packaging can be torn by sharp objects. There is a possibility that business actors use sharp cooking utensils and accidentally damage the packaging.

To mitigate these risks, it is advisable to separate the location for storage of reusable packaging and food preparation activities. Thus, the risk of exposing packaging to high temperatures can be avoided. In addition, it is also necessary to educate business actors to know the limitations of packaging so that they can avoid packaging damage due to inappropriate treatment. Observations in the field indicate that mitigation efforts have been implemented.

3.2. RISKS IN THE CONSUMPTION STAGE OF READY-TO-EAT PROCESSED FOOD WITH REUSABLE PACKAGING

The consumption stage is the stage when the food has been received by consumers and consumption activities are carried out. Based on the results of the study, there were 2 critical points in the consumption stage: the use of cutlery (R3) and warming food in a microwave (R4). Both risks are described in table 7 below.

Risk Identity	Risk Event and activity executor	The consequences based on the findings of observations and interview
Consumption of ready-to-eat processed food	Use of tableware (R3) by consumers	In the process of food consumption, activities such as cutting or other activities can occur that have the potential to damage reusable packaging with certain types of material, thereby reducing the ability of packaging to protect the hygiene of food ingredients.
	Warming of food in microwave (R4) by consumers	In the process of warming food, activities can occur that have the potential to damage reusable packaging with certain types of materials and can harm consumer health, such as warming food in a microwave without paying attention to packaging restrictions.

Tabel 7 Kegiatan berisiko pada konsumsi pangan olahan siap saji dengan kemasan guna ulang

Based on these risk points, risk measurements were carried out for each type and packaging material. A greater likelihood or likelihood value is given if the understanding of the risk of the activity is low. A high value is given if the understanding of the risk of the activity is high. For example, the limits on heating food with a microwave are generally known by the public with an average education level of at least high school, so the probability value is 6. The results of the risk measurement are shown in Table 8.

Risk Identity	Risk Event	Material	Likelihood (L)	Impact (I)	Risk Value (L x I)
Consumption of ready-to-eat processed food	Use of cutlery (R3)	Silicone rubber	8	6	48
		PP	8	4	32
		aluminium	8	2	16
		Stainless Steel	8	2	16
		Glass/Pyrex	8	1	8
	Warming food by microwave (R4)	Silicone rubber	6	1	6
		PP	6	1	6
		aluminium	6	10	60
		Stainless Steel	6	10	60
		Glass/Pyrex	6	1	6

Table 8. Measuring the risk of the consumption stage of ready-to-eat processed food with reusable packaging

Based on the results of risk measurement, the risk value is arranged from the largest value to the lowest value as shown in Table 9.

Risky Activities	Risk Value
Microwave food heating in aluminium packaging	60
Microwave food heating in stainless steel packaging	60
Use of cutlery in silicone rubber packaging	48
The use of tableware in PP packaging	32
Use of cutlery in aluminium packaging	16
Use of cutlery in stainless steel packaging	16
Use of cutlery in glass/pyrex packaging	8
Microwave warming food in silicone rubber packaging	6
Microwave food warming in PP packaging	6
Microwave warming food in glass/pyrex packaging	6

Table 9. Ranking of activity risk values at the consumption stage of ready-to-eat processed food ith reusable packaging

Activities related to the heating of food in aluminium and stainless-steel packaging are the riskiest at this stage because of the potential fire hazard when heating these materials in a microwave. The results of studies and observations show that:

a. It is estimated that food heating with a microwave can only reach a maximum temperature of 100 oC so that it does not damage the packaging made of silicone rubber, PP, and glass/pyrex.
b. Silicone rubber packaging can be torn by sharp objects. There is a possibility that consumers use sharp cutlery and accidentally damage the packaging to shreds.

Public education on the dangers of heating aluminium packaging and microwaves has been carried out, including in user manuals and pictures available on microwaves. Meanwhile, to mitigate the risk of damage to silicone rubber packaging, efforts should be made to educate consumers so that they know the limitations of the packaging, including paying attention to the logo on the packaging, to avoid packaging damage due to inappropriate treatment. Education can be done, among others, by utilizing social media managed by ready-to-eat processed food producers and reusable packaging providers.

3.3. RISKS IN THE POST-CONSUMPTION STAGE OF READY-TO-EAT PROCESSED FOOD WITH REUSABLE PACKAGING

The post-consumption stage is the stage when the food has been consumed by the consumer and the packaging is returned to the producer for reuse. The return of packaging can be carried out directly by food producers or by business partners for reuse. Based on the results of the study, there were 3 critical points in the post-consumption stage: return of reusable packaging (R5), washing of reusable packaging (R6), and storage of reusable packaging (R7).

There are several standards mentioned in the Decree of the Minister of Health of the Republic of Indonesia Number 1098/MENKES/SKNII/2003 concerning Sanitary Hygiene Requirements for Eateries and Restaurants related to the post-consumption stage of ready-to-eat processed food with reusable packaging:

- Employees handling and/or filling clean cutlery should wash their hands.
  - Before starting work
  - During food preparation
  - When moving from one food preparation area to another
  - Before putting on or changing gloves
  - After using the restroom
  - After sneezing, coughing, or using a handkerchief or tissue
  - After touching hair, face or, body
  - After touching clothes, shoes, or aprons
  - After smoking, eating, drinking, or chewing gum or tobacco
  - After handling raw meat, poultry, or fish
  - After cleaning activities such as sweeping, mopping, or wiping counters
  - After handling chemicals that may affect food safety

- After touching dirty dishes, dirty utensils, or utensils
- After handling trash
- After handling money
- After a while as hands can become contaminated

- Criteria for washing equipment
  - Made of strong material, safe, not rusty, and easy to clean.
  - Hot water for washing purposes has a temperature of 40°C - 80°C and cold water pressure of 15 psi (1.2 kg/cm2).
  - The equipment washing area is connected to the sewerage.
  - The washing tub consists of at least 3 (three) wash basins/baths, for flushing, soaping, and rinsing.

- Equipment that is in direct contact with food must not emit toxic substances that exceed the threshold so that it endangers the health, including:
  - Tin (Pb)
  - Arsenic (As)
  - Copper (Cu)
  - Zinc (Zn)
  - Cadmium (Cd)
  - Antimony (Sb

- Equipment is not damaged, chipped, or cracked and does not cause food contamination.

- Surfaces in direct contact with food must be conical (or have no dead corners), flat, smooth, and easy to clean.

- Equipment must be clean before use.

- Equipment that is in direct contact with food that is ready to be served must not contain germ numbers that exceed the threshold and must not contain E. coli per cm2 on the surface of the utensil.

- Method to wash equipment must meet the following conditions:
  - Washing equipment must use soap/detergent, cold water, and hot water until clean.
  - Free from pests at least with 50 ppm chlorine solution or 12.5 ppm iodophor, 80 °C hot water, wipe with a cloth.

- Drying equipment must meet the following conditions:
  - Equipment that has been disinfected must be drained on anti-rust shelves to dry by itself with the help of sunlight or artificial light/machine and should not be wiped with a cloth.

- Storage equipment must meet the following conditions:
  - All utensils that come into contact with food must be kept dry and clean.
  - Cups, bowls, glasses, and the like must be inverted.
  - Equipment storage racks are made of anti-rust and are flat and not worn/damaged.
  - Equipment storage drawers are kept clean.
  - Equipment storage space is not damp and is protected from sources of dirt/contamination and destructive animals

Meanwhile, the PR3 Reusable Packaging System Design Guidelines also contain directives related to the post-consumption stage of ready-to-eat processed food with reusable packaging:

- In returning reusable packaging, the date and location of collection must be noted for each container returned. Records should be kept so that they are easily accessible to the reusable packaging provider.
- Each packaging unit is not required to have a unique marker, but each type of packaging must have a packaging identity which can be in the form of an SKU (Stock Keeping Unit) or a certain code. This makes it easier to assess packaging performance.
- One type of incentive that can be used to encourage the return of the packaging is a deposit system. Value for money is paid by the consumer when the packaging is received. The value may be returned in full or in part to the person who returned the packaging.
- Reusable containers are designed to be used at least 10 times with the following criteria:
  - Designed to last
  - Designed for refilling
  - Designed for safety
  - Designed for easy inventory management
  - Designed for easy collection and logistics
  - Designed for easy washing

The risks at the post-consumption stage of ready-to-eat processed food with reusable packaging are described in Table 10.

Risk Identity	Risk Event and activity executor	The consequences based on the findings of observations and interviews
After consumption of ready-to-eat processed food	Return of reusable packaging (R5)	During the process of returning reusable packaging, there is a risk of the packaging being contaminated with various contaminants during transit. Especially if the packaging is returned by the consumer in a dirty condition and/or the courier picks up and delivers the post-consumption packaging using a container mixed with other objects.
	Washing reusable packaging (R6) This stage is carried out by business partners or producers, not by consumers.	Improper washing can result in dirt being left in the packaging. Even greater contamination risk is associated with packaging that has multiple packaging elements, such as some types of packaging caps that have a removable elastomeric rubber seal.
	Storage of reusable packaging (R7)	Packaging that has been washed is then stored for further use. An unclean storage environment can result in the contamination of packaging with bacteria and other contaminants that have the potential to harm consumer health.

Table 10. Risky activities after consumption of ready-to-eat processed food with reusable packagin

Based on these risk points, risk measurements were carried out for each type of packaging material. The results of the risk measurement are shown in Table 11.

Risk Identity	Risk Event	Material	Likelihood (L)	Impact (I)	Risk Value (L x I)
Consumption of ready-to-eat processed food	Return of reusable packaging (R5)	Silicone rubber	6	7	42
		PP	6	6	36
		Aluminium	6	4	24
		Stainless Steel	6	4	24
		Glass/Pyrex	6	3	18
	Washing reusable packaging (R6)	Silicone rubber	6	8	48
		PP	6	8	48
		Aluminium	6	3	18
		Stainless Steel	6	3	18
		Glass/Pyrex	6	3	18
	Storage of reusable packaging (R7)	Silicone rubber	4	6	24
		PP	4	6	24
		Aluminium	4	3	12
		Stainless Steel	4	3	12
		Glass/Pyrex	4	3	12

Table 11. Measuring the risk of the post-consumption stage of ready-to-eat processed food with reusable packaging

Based on the results of risk measurement, the risk value is arranged from the largest value to the lowest value as shown in Table 12.

Risky Activities	Risk Value
Washing reusable packaging in silicone rubber packaging	48
Washing reusable packaging in PP packaging	48
Return of reusable packaging in silicone rubber packaging	42
Return of reusable packaging in PP packaging	36
Return of reusable packaging in aluminium packaging	24
Return of reusable packaging in stainless steel packaging	24
Storage of reusable packaging in silicone rubber packaging	24
Storage of reusable packaging in PP packaging	24
Return of reusable packaging in glass/pyrex packaging	18
Washing reusable packaging in aluminium packaging	18
Washing reusable packaging in stainless steel packaging	18
Washing reusable packaging in glass/pyrex packaging	18
Storage of reusable packaging in aluminium packaging	12
Storage of reusable packaging in stainless steel packaging	12
Storage of reusable packaging in glass/pyrex packaging	12

Table 12. Ranking of activity risk values at the post-consumption stage of ready-to-eat processed food with reusable packaging

Activities related to washing reusable packaging made of silicone rubber are the riskiest at this stage because the results of studies and observations show that:

a. Silicone rubber packaging generally consists of several parts and several types of materials. For example, the lid is made of PP, there is a valve made of silicone rubber, the edge of the cover is made of elastomeric rubber, and the packaging body is made of silicone rubber. Each of these parts is washed separately. There is a possibility that during washing some parts are missed so that they are not washed properly and grease or dirt is left on them.

b. Reuse activities are often carried out by environmental service business actors and there is a plan to collect ready-to-eat processed food packaging for post-consumption reuse in collaboration with garbage collectors or recycled materials collectors. There is a potential for packaging contamination if the container is mixed with other objects during transportation.

c. Packaging that has been washed is usually dried in the sun on an incline so that there is no stagnant water in the packaging. If the drying and storage environment is dirty, there is a possibility that the packaging will become mouldy or contaminated.

To mitigate these risks, washing should be carried out by following washing standards as laid out by Hazard Analysis and Critical Control Points (HACCP) for each part of the packaging and returns should be carried out using special containers that do not mix with other objects. In addition, the place for drying and storing washed packaging should be kept clean and should be away from sources of pollutants and organisms or substances that allow contamination and have good air circulation. Observations in the field indicate that these mitigation efforts have been implemented.

CHAPTER IV
CLOSING

4.1. CONCLUSION

The business of ready-to-eat processed food with reusable packaging is increasingly needed and for that, it is necessary to ensure its safety. The results of the preliminary study show that there are 5 types of materials commonly used in reusable packaging for ready-to-eat processed foods: silicone rubber, PP, aluminium, stainless steel, and glass/pyrex. Meanwhile, ready-to-eat processed food businesses that use reusable packaging are daily catering services and restaurants that deliver. There are also reuse business partners who are providers of reusable packaging. The reuse business partner operating in Jakarta is Allas, while those operating outside Jakarta are ReCIRCLE, Vytal, Tapauware, barePack, and Pintos.

The overall risk points in the ready-to-eat processed food business activities with reusable packaging are shown in Table 13 below.

Critical Point	Risky Activities	Risk Value
R1.1	Food preparation in silicone rubber packaging	63
R1.2	Food preparation in PP packaging	70
R1.3	Food preparation in aluminium packaging	21
R1.4	Food preparation in stainless steel packaging	21
R1.5	Food preparation in glass/pyrex packaging	21
R2.1	Food packaging in silicone rubber packaging	49
R2.2	Food packaging in PP packaging	35
R2.3	Food packaging in aluminium packaging	7
R2.4	Food packaging in stainless steel packaging	7
R2.5	Food packaging in glass/pyrex packaging	7
R3.1	Use of cutlery in silicone rubber packaging	48
R3.2	The use of tableware in PP packaging	32
R3.3	Use of cutlery in aluminium packaging	16
R3.4	Use of cutlery in stainless steel packaging	16
R3.5	Use of cutlery in glass/pyrex packaging	8
R4.1	Microwave warming food in silicone rubber packaging	6
R4.2	Microwave food warming in PP packaging	6
R4.3	Microwave food heating in aluminium packaging	60
R4.4	Microwave food heating in stainless steel packaging	60
R4.5	Microwave warming food in glass/pyrex packaging	6
R5.1	Return of reusable packaging in silicone rubber packaging	42
R5.2	Return of reusable packaging in PP packaging	36
R5.3	Return of reusable packaging in aluminium packaging	24
R5.4	Return of reusable packaging in stainless steel packaging	24
R5.5	Return of reusable packaging in glass/pyrex packaging	18
R6.1	Washing reusable packaging in silicone rubber packaging	48
R6.2	Washing reusable packaging in PP packaging	48
R6.3	Washing reusable packaging in aluminium packaging	18
R6.4	Washing reusable packaging in stainless steel packaging	18
R6.5	Washing reusable packaging in glass/pyrex packaging	18
R7.1	Storage of reusable packaging in silicone rubber packaging	24
R7.2	Storage of reusable packaging in PP packaging	24
R7.3	Storage of reusable packaging in aluminium packaging	12
R7.4	Storage of reusable packaging in stainless steel packaging	12
R7.5	Storage of reusable packaging in glass/pyrex packaging	12

Tabel 13 Titik kritis risiko pangan olahan siap saji dengan kemasan guna ulang

From the measurement results, a ranking can be made based on the risk value as shown in Figure 6.

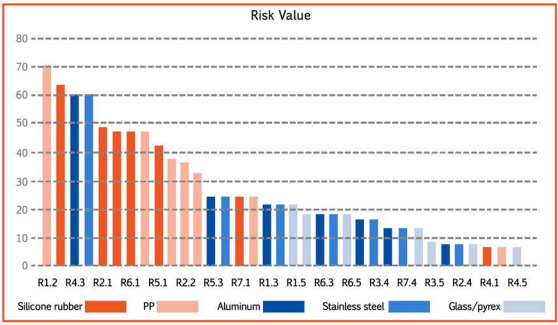

Figure 6. Ranking of risk points by risk value

Based on these critical points, risk mitigation steps can be taken as shown in the table below.

Critical Point	Risky Activity	Mitigation Steps
R1	Food preparation	Food preparation activities should be carried out in another space than storing/filling reusable food packaging.
R2	Food packaging	Business actors should be educated about the limitations of packaging so that they can avoid packaging damage due to inappropriate treatment.
R3	Use of cutlery	Consumers should be educated about the limitations of packaging so that they can avoid packaging damage due to inappropriate treatment.
R4	Microwave food warming	Food packaged in aluminium and stainless steel should not be warmed in the microwave more than the temperature tolerance/maximum.
R5	Return of reusable packaging	Returns should be carried out using special containers and reusable packaging should not be mixed with other objects.
R6	Washing reusable packaging	Washing should follow the washing standards for each part of the packaging.
R7	Reusable packaging storage	Drying and storing of washed packaging should only be carried out in a place that is kept clean, has good air circulation, and is away from sources of pollutants and organisms or substances that allow contamination.

Table 14. Steps to mitigate risk critical points

This risk identification and risk mitigation measure have only assessed the use of reusable packaging for ready-to-eat processed food with a food safety standard approach that applies to non-reusable packaging because there is no food safety standard specifically for reusable packaging from the Codex Alimentarius Commission. By using food safety standards that apply to non-reusable packaging, the mitigation measures previously described are expected to avoid the dangers of food safety risks. Field observations show that the mitigation efforts have been implemented so that the relevant parties, including Allas by Enviu and catering business services with reusable packaging, have met the standards set by the Indonesian Ministry of Health and PR3 guidance pilot testing.

4.2. SUGESSTION

This preliminary study is an initial study to determine the scope of the risk profile more fully. It has not implemented the risk profile rules that use the Codex Alimentarius Commission standard as an advanced stage of the design of food safety standards for reusable packaging. Therefore, it is recommended to contact business actors, government agencies, and related parties to continue compiling risk profiles for each type of reusable packaging (PP, stainless steel, aluminium, silicon rubber, and glass/pyrex) with direct measurements of potential chemical, biological, and physical risks.

The framework of the risk profile using the CAC standard needs to include:

- Introduction
- Hazard of food commodity combination with risk profile object
- Hazard identification
- Hazard characterization
- Exposure rating
- Evaluation of adverse effects on health
- Risk management information
- National and international standards and codes of practice

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ANNEX

Annex 1 Activities during Observation and Interview in April – May 2022

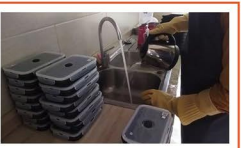
1. Allas staff receive returned packaging

2 stacks of returned packaging delivered by bicycle courier

Allas staff record the receipt of each container in the Allas system

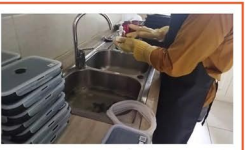
2. Allas staff wash returned packaging

Releasing the rubber lid from the PP cap



Mixing hot water with cool water to prepare water for washing

Mixing warm water with dish washer soap



Washing the valves (the rubber in the centre of the PP cap)

Washing the silicon container

Drying washed containers by putting them in a position which allows all water to evaporate or run off

3. Food preparation by Allas' partners

Receiving order and wearing glove to prepare food

Allas packaging (dark green) medium size compared to similar packaging in larger size

Kitchen of other Allas partner

One employee handles the food preparation and another the order processing

Food handler cooks the food with torch near the silicon packaging

Food handler puts the food into the silicon packaging

4. Reusable packaging used by catering service

Reusable food packaging with compartments, material: PP

Reusable food packaging with compartments, material: PP

Catering service staff shows the reusable food packaging in their warehouse