

Kakashi Ice Cream
Pvt Ltd

HACCP COFFEE ICE CREAM

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Details of HACCP plan

Issue No	Date	Section	Page	Amendment details

Amendments authorized by: Owner, S Jones.....

Food Safety and Quality Statement

1. We are committed to manufacture high quality products which can satisfy the expectations of our customers while continuing to improve.
2. We continually improve our performance by providing training and education to our employees and suppliers through effective communication and achieving set goals relevant to a strategic plan.
 - a. Reviewing customer complaints and narrowing down to the root cause to implement corrective action to prevent future occurrences.
 - b. Recurring analysis of all the unit operations and employees to ensure the protocols of Investigating non-conformances and customer complaints to identify the root causes and take corrective actions to prevent recurrence.
3. We comply with the needs of both internal and external parties by considering their relevant issues as well as applicable legal requirements.
4. Our processes are designed according to the standards provided by authorities and the quality of the process and products are held up to these standards.
5. We understand that many of our consumers have allergies to specific ingredients and we take necessary steps and protocols to make our products safe and clearly include the appropriate labelling.

S Jones

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Managing Director

Terms of Reference

This linear HACCP plan covers the processing and handling of raw and cooked products manufactured by Kakashi Pvt Ltd.

The HACCP plan starts with the approval of all suppliers and ends with the distribution of the products in Kakashi's own temperature-controlled vehicles to customers.

The HACCP will cover final product safety and will look at the following hazards:

Physical	Chicory powder, dust particles/ foreign particles, coffee husks and stems.
Chemical	Cleaning chemicals and pest control substances
Biological	Pathogenic microorganisms (E coli. Listeria spp., Campylobacter)
Allergen	Milk

Regulations & codes of practice the company comply with

The company complies with the following regulations:

1. Regulation (EC) No 852/2004 on the hygiene of foodstuffs.
2. Regulation (EC) No 1169/2011 on provision of food information to customers.
3. Regulation (EC) No 853/2004 on hygiene rules for food of animal origin.
4. Ice Cream (Marketing Standards) Regulations 2019 (UK legislation) Specifies ingredient composition and labelling of ice cream.
5. Trade Description Act 1968 (UK legislation) for prevention of false and misleading information on the label.
6. Regulation (EC) No 625/2017 to ensure the application of food and feed law.
7. Regulation (EC) No 396/2005 for stating maximum residue levels of pesticides in or on food.
8. Regulation (EC) No 1308/2013 for establishing a common organization of the markets in agricultural products.
9. Regulation (EC) No 1333/2008 concerning food additives.
10. Regulation (EC) No 1924/2006 on nutrition and health claims made on foods.
11. Regulation (EC) No 178/2002 for general principles and requirements of food laws.
12. Regulation (EC) No 2023/2006 on Good manufacturing practice for materials and articles intended to come into contact with food.

The following **codes of practice/guidance** documents were used in developing this HACCP plan:

- Codex Alimentarius Food Hygiene 4th Edition
- Food Safety Standards Agency (FSA) Guidelines
- BRCGS Food Safety Issue 9
- ISO 22000: 2018

Prerequisite programmes (PRPs)

Well implemented prerequisite program is one of the essential keys of a factory success and it is built based on our company's needs and regulatory requirements. The role of pre-requisite program is to provide the basic operational and environmental condition to produce safe and legal products.

The company has in place a number of effective prerequisite programmes (PRPs). We have divided these programs into three different categories:

- **Product**
 - Good agricultural practice
 - Supplier approval competence and monitoring.
 - Allergen management
 - Ingredient standardization
 - Chemical control
 - Product traceability and recall procedures.
 - Quality testing and verification
 - Storage and shelf-life management
 - Product specific process controls
 - Dairy quality standards for product use.
- **Premises**
 - Good manufacturing practice
 - Good hygiene design
 - Cleaning schedules using approved cleaning chemicals and safe storage
 - Proper Pest management
 - Cleaning in-place and other equipment cleaning procedures
 - Air ventilation and quality control
 - Maintenance of facility infrastructure.
 - Emergency protocols for incidents
 - Segregation and zoning in the premises
 - Proper waste disposal for product safety
- **Personnel**

- Good hygiene practice
- Documented procedures for personal hygiene
- Training on allergen handling
- Personal protective equipment kit
- Uniform and personal grooming practices
- Employee illness reporting
- Shift rotation policies
- Emergency response training
- Training on chemical handling and Good Manufacturing practices
- Regular medical screening

The HACCP Team

Primary Team

Job Title	Contribution
Production Manager	Knowledge about the process, production line
Technical Manager	Food safety Head looks over all the aspects.
Quality Assurance/Control Manager	Monitors quality standards and aligns HACCP plan with quality control procedure
Documentation specialist	Maintains accurate records and documents
Food scientist	Validating critical limits and identifying potential hazards
Lab technician	Follow and assist procedure for regular lab-based analysis
Trained line staff	To report from every department like packaging, processing, storage and raw material receiving.

Description of finished products

Product name:

Ingredients	Supplier	International accreditations
Milk	Freshways Dairy UK	FSA Hygiene Rating 5
Whipping cream (Milk)	Freshways Dairy UK	FSA Hygiene Rating 5
Sugar	Kent Foods	BRCGS AA
Dermerara sugar	Kent Foods	BRCGS AA
Skimmed milk powder	Dana Dairy	ISO 22000:2005
Coffee	Richfield foods	BRCGS A
Acidity regulator (Lactic acid Allergens are in bold .)	Univrar Solutions	ISO 9001 &14001

Production process

1. Receiving ingredients	All the ingredients are received in the collection area and checked for the appropriate standard as mentioned in the specification document provided to the suppliers.
2. Cold storage	The received ingredients are stored in sealed cold storage till moved to production line for use. Temperature maintained at 4° C.
3. Mixing blending	The proportion of ingredients mentioned in the recipe will be added to the mixer and the ingredients will be mixed uniformly.
4. Pasteurization	Pasteurization for the ice cream mix is done to ensure killing pathogenic microorganisms. The temperature maintained is 65.5° C for 30 minutes.
5. Cooling	The mixture is cooled to 6-7 ° C.
6. Ageing	The mixture is set to rest in ageing tank at 7° C for 5 hours for flavour development and can be kept for maximum of 40 hours.
7. Churning	The aged mixture is churned in churning tank by inbuilt rotators for 30 minutes to prevent large crystal formation.
8. Filtration	A sieve installed in the flow pipes filter out any large particles present in the ice cream mix. The sieve has mesh size of 200 microns, and the pipes are passage between churning tank and freezer.
9. Freezing	The mixture is freezed by a continuous freezer at -7° C.
10. Packaging	The ice cream will be filled in plastic tubs in filling stations and then manually sealed by line workers.
11. Labelling	Contains Milk is mentioned along with details
12. Storage/Shelf Life	The packed product is kept in Freezer at temperature at -22° C for hardening till it is transported for distribution Use by date 18 months from date of production. And should be stored in freezers at retail shops.

Intended use

The coffee ice cream is distributed to independent retail shops and supermrket chains and is safe for consumption by Children of age 12+ and pregnant individuals. Not fit for consumption by children under age 12. Contains low amounts of Caffeine. Contains **Milk** as an allergen

Coffee Ice cream Flow Chart



Hazard Identification and Determination

Those hazards that may reasonably be expected to be present in the products, or develop to a hazardous condition were considered.

To assist in determining the significance of a hazard a scoring tool was used in which only those hazards with a score of **3 or more** were considered to be significant and therefore given further analysis as critical control points (CCPs), where appropriate. Those with a score of less than 3 are managed by prerequisite programmes (PRPs).

The scoring system uses these descriptions:

Hazard analysis Risk Rating			
Likelihood	1	Unlikely	Possibility could occur (unlikely but might)
	2	Occasional	Probably could occur (likely to occur but no history of occurring)
	3	Frequent	Definitely will occur (at some time it is going to happen or has happened in the past)
Severity	1	Minor	Minor injury to customer
	2	Moderate	Consumer in hospital/Serious short-term
	3	Critical	Death of consumer/ Long term illness leading to death

Risk Assessment score =Severity of hazard x Likelihood of hazard

		Severity (S)		
		Minor	Moderate	Critical
Likelihood (L)		1	2	3
Unlikely	1	1	2	3
Occasional	2	2	4	6
Frequent	3	3	6	9

Hazards Circumstances

Hazards were considered in four circumstances:

1. **Presence** in or on the product
2. **Contamination** by the hazard (**introduced** during processing)
3. **Multiplication** of the hazard (especially **growth** of microorganisms that are able to increase)
4. **Survival** of hazard (especially when microorganisms not killed, inactivated or destroyed by a process step designed to do so)

Table 1. Hazard Analysis/Risk Assessment

Step No.	Process step	Hazard Type	Potential Hazards and possible causes	Severity score	Likelihood score	Risk assessment score (severity x likelihood)	Control measures
1	Ingredient Receiving	M	Pathogenic organisms (E. Coli, Listeria spp. and Campylobacter)	3	3	9	Report to supplier and request a new batch
		C	Pesticide residue	3	1	3	Report to supplier and request new batch
		P	Chicory or other adulterants and foreign particles	3	2	6	Report to supplier and request new batch
		A	Presence of allergen (Milk)	2	3	6	Label the received material
2	Cold Storage	M	Presence of pathogenic bacteria	3	2	6	Dispose the ingredient to prevent cross contamination
		C	None				
		P	None				
		A	Presence of allergen (Milk)	2	3	6	
3	Mixing	M	Presence of pathogenic bacteria	3	2	6	Check after Pasteurization
		C	Residual Cleaning liquids	3	2	6	Clean the equipment with caustic soda and rinse with water and check for residues after finishing.
		P	None				
		A	None				

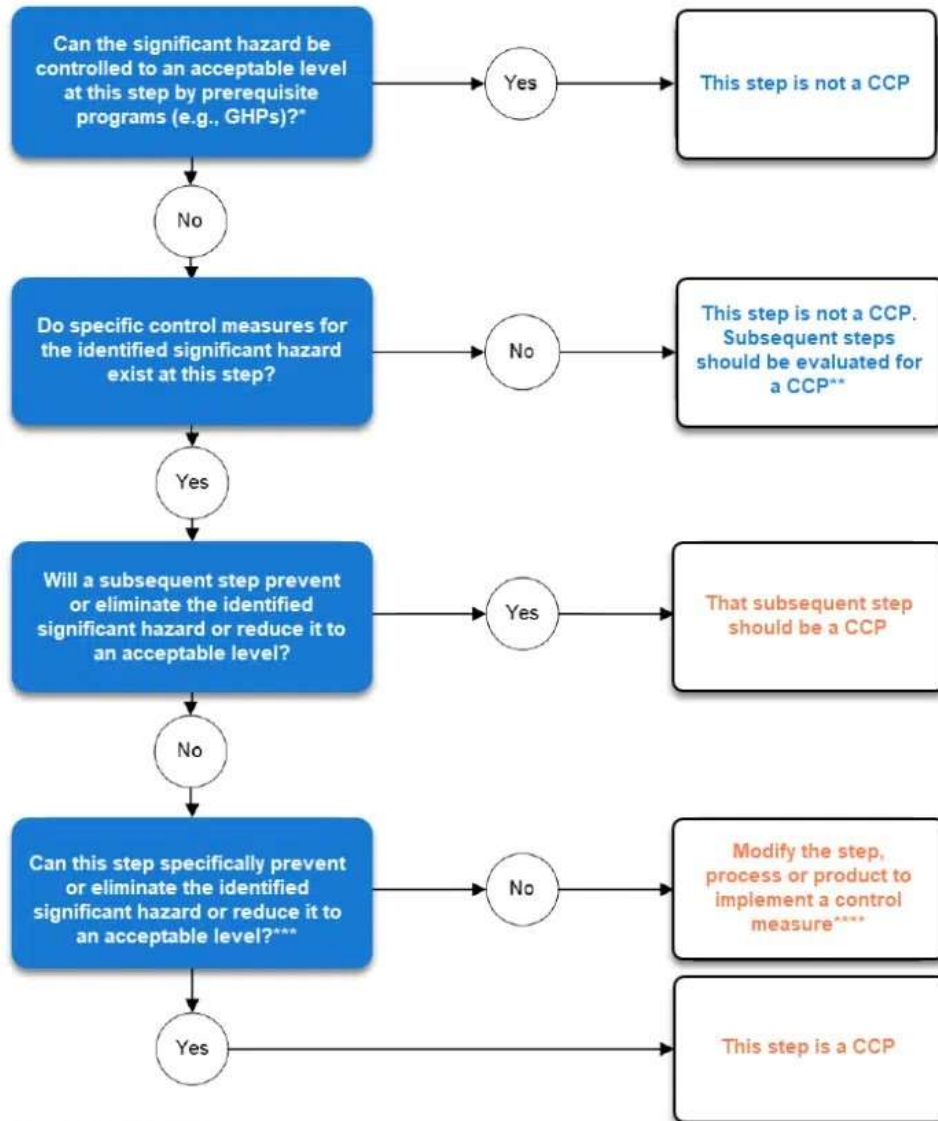
Step No.	Process step	Hazard Type	Potential Hazards and possible causes	Severity score	Likelihood score	Risk assessment score (severity x likelihood)	Control measures
4	Pasteurization	M	Presence of pathogenic bacteria	3	1	3	Re-pasteurization of the mix
		P	None				
		C	None				
		A	None				
5	Cooling	M	None				
		P	None				
		C	None				
		A	None				
6	Ageing	M	Presence and Multiplication of microbiological pathogen due to change in temperature.	3	1	3	Re- pasteurize or dispose according to the bacterial plate count
		P	None				
		C	None				
		A	None				

Step No.	Process step	Hazard Type	Potential Hazards and possible causes	Severity score	Likelihood score	Risk assessment score (severity x likelihood)	Control measures
7	Churning	M	None				
		P	Foreign particles from equipments	3	1	3	Will get removed in filtration process and check after filtration
		C	None				
		A	Presence of allergen (Milk)	3	2	6	Mention in the label
8	Filtration	M	None				
		P	None				
		C	None				
		A	Presence of allergen (Milk)	2	3	6	Mention in the label
9	Freezing	M	None				
		P	None				
		C	None				
		A	Presence of allergen (Milk)	2	3	6	Mention in the label

Step No.	Process step	Hazard Type	Potential Hazards and possible causes	Severity score	Likelihood score	Risk assessment score (severity x likelihood)	Control measures
10	Packaging	M	Growth of pathogens if not sealed completely	3	1	3	Dispose product
		A	Presence of allergen (Milk)	3	2	6	Label in the next step
11	Labelling	A	Presence of allergen (Milk)	2	3	6	Label the product to prevent exposure to allergenic individuals.
12	Storage	M	Growth of Pathogenic bacteria due to delay in hardening and rise in temperature	3	1	3	Dispose the product and conduct microbial analysis for other stored batches.

Critical Control Points Decision Tree (CCPs)

CCP Decision Tree



Formatted by HACCP Mentor

Justifications for choosing Critical Points

Critical Control Points (CCP) have been determined using the CODEX definition which is defined as “points in the process which can either eliminate or reduce hazards to safe levels”. Furthermore, a CCP can only be established if there is a defined critical limit (time, temperature, pH, water activity) which can be monitored regularly in real time.

The unit process steps which meet the above criteria are:

Step No	CCP	Process step	Detail of process	Reasons for considering as CCP
4	CCP1	Pasteurization	Pasteurization is a heat treatment given to the mix to kill the pathogenic micro-organisms present in the product.	It is considered as a CCP because it reduces the total microbial plate count of the product hence reducing the risk of biological hazard
8	CCP2	Filtration	A 200-micron mesh filter is installed in the flow pipes which stops any foreign particle.	It is considered as a CCP as this step is reducing physical contaminants in the product.
11	CCP3	Labelling	The product label contains the information regarding allergen list.	Reducing the risk of hazard caused by allergen by making the consumer aware of the contents of product.

Table 2. Critical Control Points and Control Measures

Step number	Process step	Controls	Critical limit (CCP only)	Monitoring			Corrective Actions
				Responsibility	Procedure and Record	Frequently	
1	Ingredient receiving	PRP		Quality Assurance Manager	Checking the ingredients meet the required standards by conducting relevant tests using rapid test kits. Raw material specifications record.	Daily	Report to supplier and clear out the root cause and order a new batch of ingredients.
2	Cold storage	CP		Food scientist	Check the temperature and hygiene of the storage. Hygiene record	For every batch Daily Daily	Regulate the temperature, check for spoilage, and call cleaners.
3	Mixing	PRP		Production manager and Trained line staff	Proper proportion of ingredients is measured or not. Equipment cleaning record.	Every batch	Stop the production and schedule cleaning.
4	Pasteurization	CCP	65 ± 1°C for 30 mins	Production manager and lab technician	Temperature and time should be followed and noted in the temperature logs. Check the microbial plate count.	Every batch	Re-pasteurize or dispose
5	Cooling	CP		Production manager	Temperature log should be maintained using temperature analysing probe.	Every batch	Regulate the temperature.
6	Ageing	CP		Quality Assurance manager	Batch records should be maintained to ensure ageing time of every batch	Every batch	Check for microbial load and sensory analysis if the product is spoiled then discard.

Step number	Process step	Controls	Critical limit (CCP only)	Monitoring			Corrective Actions
				Responsibility	Procedure and Record	Frequently	
7	Churning	PRP		Trained line staff	The ice cream mix attains a smooth texture, Record in batch logs.	Every batch	Increase the time of churning and maintain the temperature.
8	Filtration	CCP	Foreign particles < 1 µg	Production manager & Trained line staff	Checking and cleaning the filter after every batch to prevent blockage.	Daily	Narrow down the root cause of foreign particle collection and take necessary measures.
9	Freezing	CP		Production manager	Temperature regulation should be according to the processing standards. Temperature logs	Daily	Regulate the temperature.
10	Packaging	PRP		Trained line staff	Ensure Proper sealing and report if any damages observed.	Every batch	Report to production manager
11	Labelling	CCP	100% efficiency in labelling	Documentation specialist	Checking proper labelling is being done and all the information is presented or not.	Daily	Report to Technical manager
12	Storage	CP		Quality Assurance Manager	Checking the batch storage temperature and distribution system.	Daily	Regulate the temperature and supply according to manufacturing date.
13	Quality Control	PRP		Technical manager and Document specialist	Make sure all the rules and regulations are met and the documents are up to date, checking traceability and recall procedures.	Daily	Re check the logs and complete documentation review the plan according to issues.

Records form needs to be completed to prove the HACCP is effective

Records	Frequently
Production logs	Shift wise
Ingredient specifications	Daily
Quality testing records	Every batch
Batch specific records	Every batch
Regulatory compliance records	Weekly
Cleaning records	Weekly
Shipping and distribution records	Daily
Temperature logs	Daily
Water quality and testing records	Daily
Customer feedback	Monthly
Customer complaints	Weekly
Product recall records	Daily
Employee shift allocation records	Daily
Employee Health and safety medical screening records	Daily
Equipment servicing records	Monthly
Packaging and labelling records	Every batch
Emergency plan	Annually
Waste management records	Weekly

HACCP System Verification

- **Review corrective actions.**
- **Internal audits**
- **External audits or certification processes.**
- **Training assessment of employees**
- **Review of documentation**
- **Verification of critical control points through number of errors occurred.**
- **Analysis of customer feedback and complaints.**
- **Traceability checking and mock recalls.**

Reviewing HACCP

- **HACCP plan in Kakashi Ice Cream Company is getting reviewed annually.**
- **In the following situation, our company would review the whole HACCP plan again:**
 - A complaint by a costumer.
 - Change in processing equipments.
 - Change in ingredients.
 - Update in government regulations.
 - Application for new accreditation
 - Change in personnel.
 - Annual reviews
 - Product recall

References:

Am, S., Efa, L. & Sm, D. and Fathi, E. (2013). EVALUATION OF MICROBIOLOGICAL SAFETY OF AN ICE CREAM PRODUCTION LINE AFTER HACCP IMPLEMENTATION. 2192-2203.