

FOOD SERIES **HACCP GUIDELINES**

Tahineh and Halaweh

Hazard Analysis Critical Control Point

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

economy environment employment

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Table of Contents

I. Programme Description:

Food Safety Panel (FSP) is a national scientific committee whose approach is the development, implementation and maintenance of HACCP based systems in all food sectors in Lebanon. In brief, the system on which the FSP is based is essentially a preventive approach to food safety control. The rational is to design a system that has checks throughout the food manufacturing process so that the finished product is in compliance with food safety regulations.

Most companies will find that many of the things required in a HACCP system are already in place and operable in their plants. The HACCP approach takes isolated quality control procedures at various points in the process, and puts them all together as a system. All points interrelate and interlock in a manner that prevents the system from going out of specification and causing a hazard without the information being picked up by the monitoring system. HACCP plans are developed for Tahineh and Halaweh establishments and tailored to its individual product processing and distribution conditions.

II. Programme Fundamentals:

With the FSP approach, the food industry will be responsible for the implementation and monitoring Programmes developed by industry, tailored to its own needs according to well defined parameters. The role of FSP is to define requirements and verify the effectiveness of HACCP in each processing establishment.

The following generic steps are applicable to all commodity groups:

1. Plants are responsible to develop their own HACCP Programme. The Programme includes all details on CCP for each production line along with addressing Programme pre-requisites (see GMP guidelines) to ensure food safety. The Programme for implementation on a production line in a plant will be individually tailored to specific commodity and establishment requirements.

2. FSP can assess these HACCP based Programmes and assist plants to meet requirements during the development and implementation of this Programme in their establishments.
3. Industry plant personnel are responsible for controlling, monitoring and keeping accurate records for each CCP and ensuring that proper procedures and controls have been followed. Plant management reviews plant records to identify deviations and problems and take designated corrective actions.

III. The Implementation Strategy:

To implement HACCP plans, there will be a need for detailed plans associated with the following issues:

1. **Training inspection staff**
2. **Training industry personnel**
3. **Communications**
4. **Consultation and auditing**

Given the high priority status of the food safety development Programme, it is important that the most acceptable and effective Programme and that be implemented as efficiently as possible. Gantt chart could serve as a good guideline for the implementation strategy (Figs. 1 and 2).

IV. Benefits and costs of HACCP:

A. Benefits

***1. To the company**:*

- Production of safer food – lower business risk
- Improved / maintained reputation
- Compliance with legislation
- Staff have clearer ideas of food safety requirements and practices
- Demonstrates company commitment to food safety
- Better staff organization / use of time

- Long term reduction in wastage (in the short term wastage costs may go up due to corrective actions, requiring disposal of food as a result of failure to control CCPs properly).
- Less likely to receive customer complaints
- Possible increase in market access

***2. To customers**:*

- Less risk of illness
- Improved quality of life
- Greater confidence in food

3. To government:

- Facilitating food safety inspections / more efficient food control
- Improved public health / reduced health care costs
- Facilitates international trade

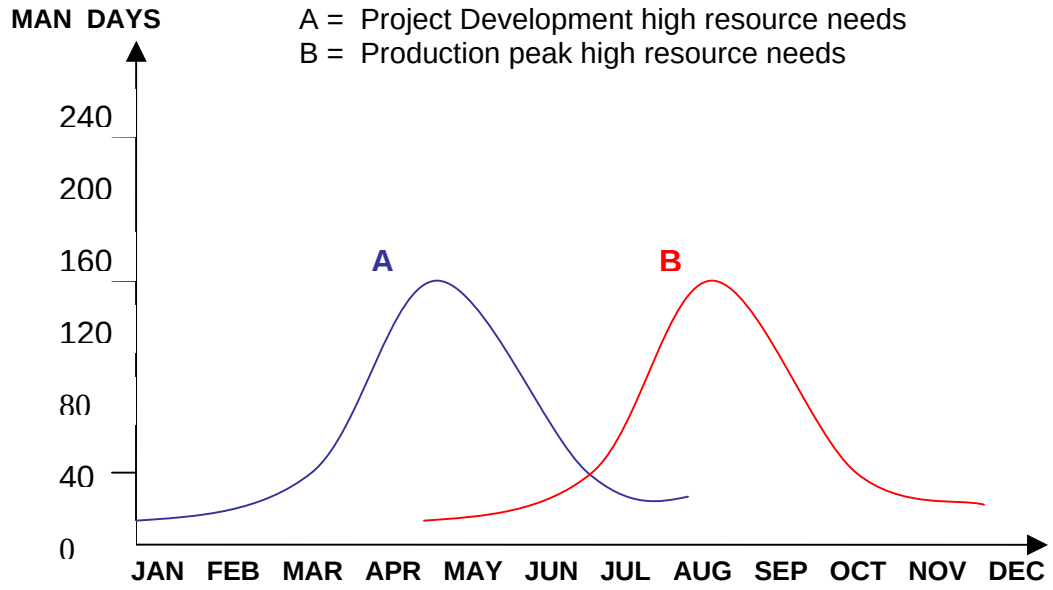


Fig. 2: Resource Commitment Planer

B. Costs associated with implementing HACCP:

1. Initial / start up costs:

- Formal meetings / management costs
- Preparation of background information (e.g. flow charts)
- Staff training
- External consultant fees
- Overtime / pay costs
- Possible equipment costs (e.g. to layout or fabric of the building), in addition to that needed for monitoring and possible design and construction costs
- Increased costs of documentation
- Miscellaneous, e.g. travel costs for training

2. Implementation costs:

- Time spent on monitoring
- Cost of monitoring, e.g. chemical costs – such as ATP bioluminescence monitoring of cleaning
- Time / money spent on better cleaning
- Costs of corrective actions, if this requires disposal of product
- Ongoing staff training
- Increased maintenance costs, e.g. refrigeration equipment for better temperature control
- Time spent on record keeping

Additional time spent on HACCP may not always translate into real or actual costs, e.g. people do more work or substitute HACCP for other work. Overall costs of initiating and implementing HACCP re affordable even by small businesses. This is especially true when considered in relation to failure costs, e.g. food poisoning fines, compensation, loss of reputation, etc.

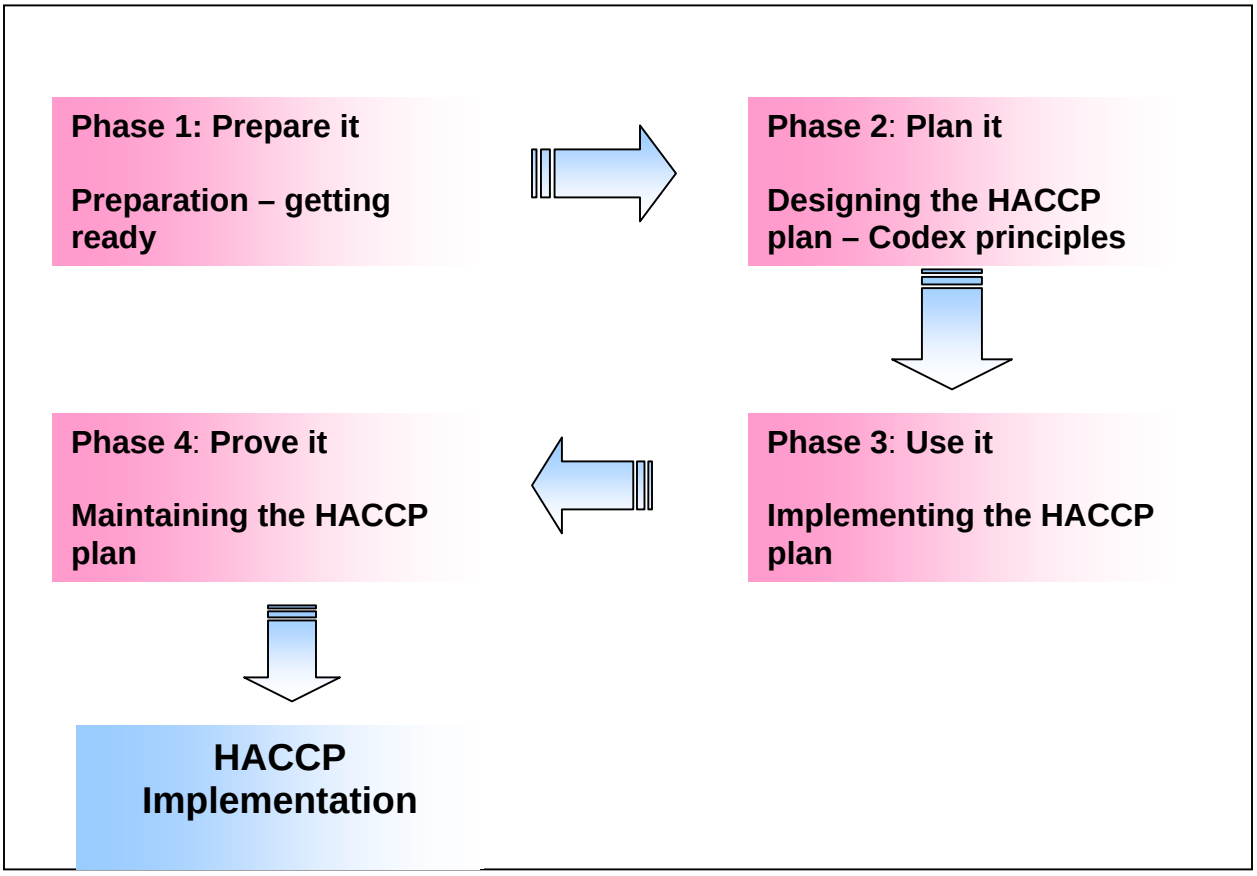
V. Preparing for HACCP:

Introducing HACCP or revising an existing HACCP scheme, “like robbing a bank”, requires care in preparation and planning.

Phase 1 concerns preparation of those activities in advance of sitting down to construct the HACCP plans.

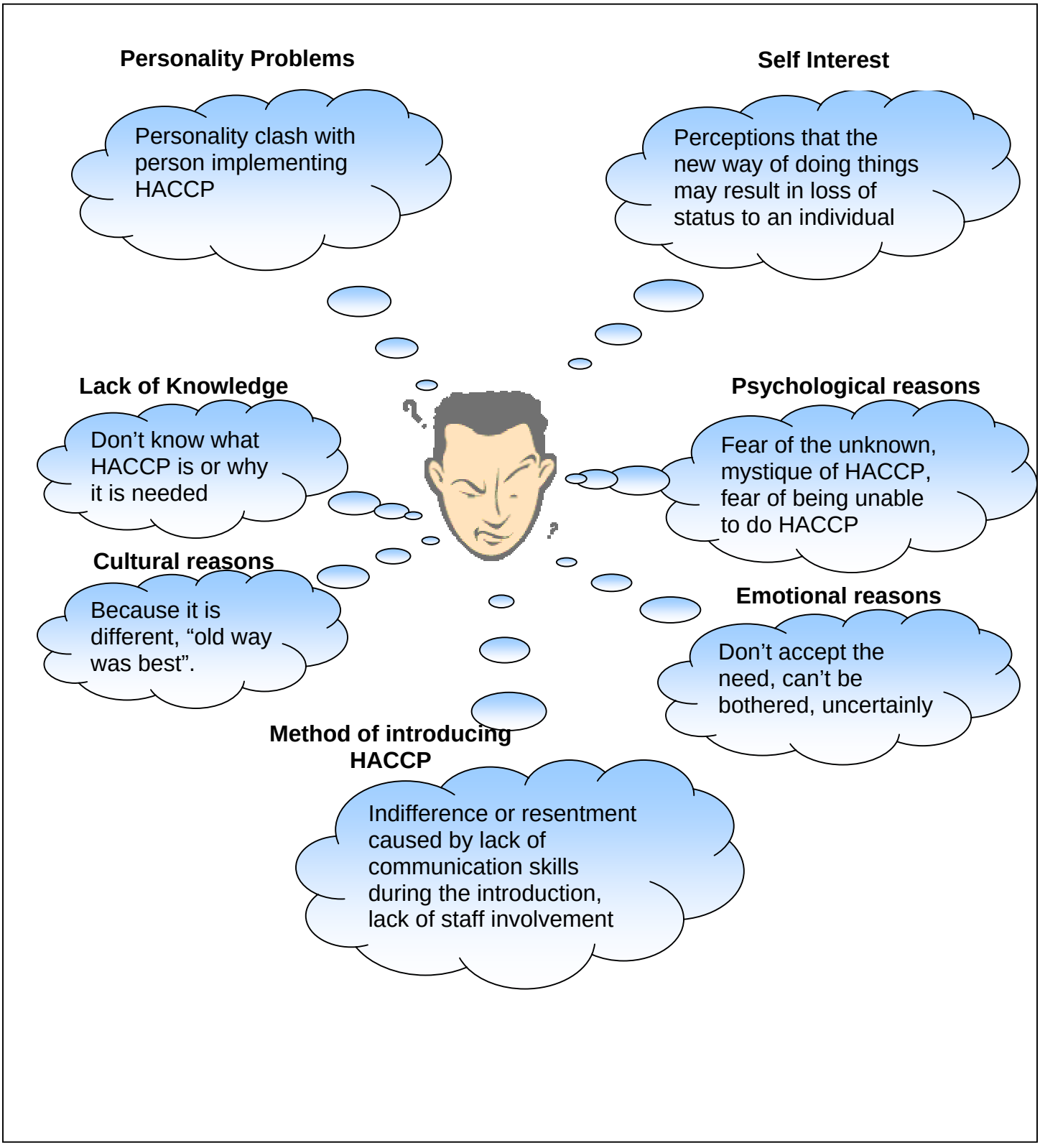
Introducing HACCP into a company for the first time is likely to involve a major change to the way things are managed. How successful this introduction will be is dependent upon the skills of the HACCP project coordinator or team leader. This person requires process and technical skills – process here refers to managerial and interpersonal skills such as ability to lead, manage. Technical skills relate to food safety and product knowledge as well as scheduling, budgeting, etc.

VI. Phases of HACCP Implementation:



The introduction of HACCP in spite of any legislative requirements may be met with resistance or antagonism just because it is different.

VII. Reasons for Resistance to Introduction of HACCP:



VIII. Preparatory Activities:

It is the responsibility of senior management to appoint and support a HACCP Leader. They should select an appropriate trained person with necessary technical and managerial skills, and provide financial and administrative requirements.

A. HACCP plan leader should:

1. Communicate with senior management to provide information on:

- Progress intentions, objectives etc.
- Maintain management commitment to the process

2. Identify skilled personnel:

- Identify in house expertise
- Recommend and identify external consultants if necessary
- Identify information “gaps” and sources of information and any training needs
- Consult training coordinator, personnel department if applicable

3. Verify accuracy of pre-requisite Programmes:

Confirm existence adequacy and implementation of the following:

- Cleaning and sanitation
- Personal hygiene
- Training
- Traceability and recall
- Premises design and construction
- Pest control
- Supplier specification and control
- Raw material control
- Chemical control

4. Prepare for producing HACCP plan:

- Plan meetings
- Produce Gantt chart
- Define PERT analysis, etc
- Ensure relevant data available for team, e.g. physical complaints records
- Decide if HACCP microbiological data software will be needed

5. Obtain required level of staff support e.g. secretarial, administrative:

- Select staff

B. Potential team members / section leaders should:

1. Participate in HACCP team:

- Ensure any necessary training is undertaken
- Communicate with other staff in their section
- Check the PRPs in their section are adequate and implemented
- Check that records are available

2. Maintain Communication:

- Ensure that all staff are informed of what is happening
- Need for HACCP and benefits
- Inform work force (and union if applicable)

Strategies for overcoming any resistance are presented in table 1, although not all of these will be needed on all occasions. Some are more useful than others within specific circumstances.

IX. Commitment of Company Directors:

The owner of the business must be aware of time, money and person days required for the project to be completed. In a small company the owner may be part of the team. Larger companies will require a clear presentation of a simple HACCP development plan.

Collect relevant background information – this information is particularly useful at stage 7 to identify significant hazards.

- Customer complaint data, QC results and specifications.
- Existing product flow diagram.
- Contact local enforcement officers and national agencies for information e.g. food poisoning statistics.
- Contact local trade association for information on particular sector and availability of specialist support if needed.

Table 1. Strategies for overcoming resistance

Education and Training	Essential to convey techniques and benefits of HACCP. Project management / team building training.
Communications	360°C passage of information – from top management to part – time cleaning staff and back upwards. Legislation needs.
Participation and Involvement	May need to set up working groups, task forces, focus groups, quality circles, consultation as well as HACCP team.
Help and Support	Support groups / networking, open atmosphere, use of external consultants, training, generic HACCP plans, and training packs.
Negotiations and Agreement	Important if trade unions became involved. Changed practices may be perceived as more skilled with additional pay. It may be good practices, as part of incentive to make HACCP succeed, to reward training and participation, etc. with financial incentives (increases motivation).
Manipulation / Coercion	May represent confrontation – a final resort which in some cases is necessary. Manipulation is more subtle trying to influence events behind the scene, e.g. if one member maybe problematic (with influence over others) get them to join the HACCP team so they are part of the change. Coercion may involve direct threats if people refuse to participate.

Table 2. Barriers to Implementing HACCP

Lack of finance and resources	Especially in small businesses. Recent studies suggest costs of HACCP whilst proportionally greater for small businesses are affordable. Time may often be more of a problem than direct cash costs.
Lack of government commitment	This likely to become less of a problem in the future. Increasingly HACCP is recognized as the best way to improve food safety.
Lack of customer and business demand	Reports from many countries of tourists (up to 50% in some countries) suffering gastrointestinal infections with grater liability on the travel operators to use “safe” hotels. Greater demand on suppliers by retailers and manufacturers.
Human resource constraints	Lack of skilled workforce. More HACCP courses to an agreed training standard will help to correct this.
Lack of technical support	More books, consultants training packages and information on hazards and risk. Government guides to implementation.
Inadequate support and facilities	Older poorly designed factories are likely to be phased out of economic reasons. Still likely to remain a major problem in some developing countries and some food service establishments.
Inadequate communications	Still major problem for smaller companies / food service and developing countries.
Staff resistance	See table 1
Staff time	Time is an important factor in both designing and maintaining a HACCP plan.

X.

HACCP Plan

Tahineh

Form 1 Product description and intended use

1- Product name:	**Tahineh**
2- Important characteristics of end product	**a. Aw < 0.1** ▪ Organisms can not grow ▪ Super dried product **b. pH < 5.6** ▪ Low acid foods ▪ Favorable for microbial growth **c. Acidity < 0.1%** ▪ Low acidity **d. Fat content > 45%** ▪ Suppress microbial growth
3- How the product is to be used	Ready to eat or used as ingredients in meals. Eaten raw or cooked
4- Packaging	▪ Plastic (propylene) or glass jars ▪ Package size varies (large sizes over 20 Kg, 5 Kg, 1 Kg, 0.5 Kg) ▪ Hand closing (may cause contamination)
5- Shelf life	Two years at normal retail shelf temperature.
6- Where the product will be sold	Retail, institutions, and food services. Could be consumed by high- risk groups (infirm, immune-compromised, elderly, etc)
7- Labeling instructions	None required ensuring the product safety.
8- Special distribution control	No physical damage, excess humidity or temperature extremes.

Form 2 Product ingredients and incoming material

Product name: Tahineh

Raw material	Dry ingredients	Packaging
▪ Sesame seed	▪ Salt	▪ Plastic or glass jars ▪ Plastic or metal covers
Other		
▪ Water (municipal) ▪ Titanium dioxide		

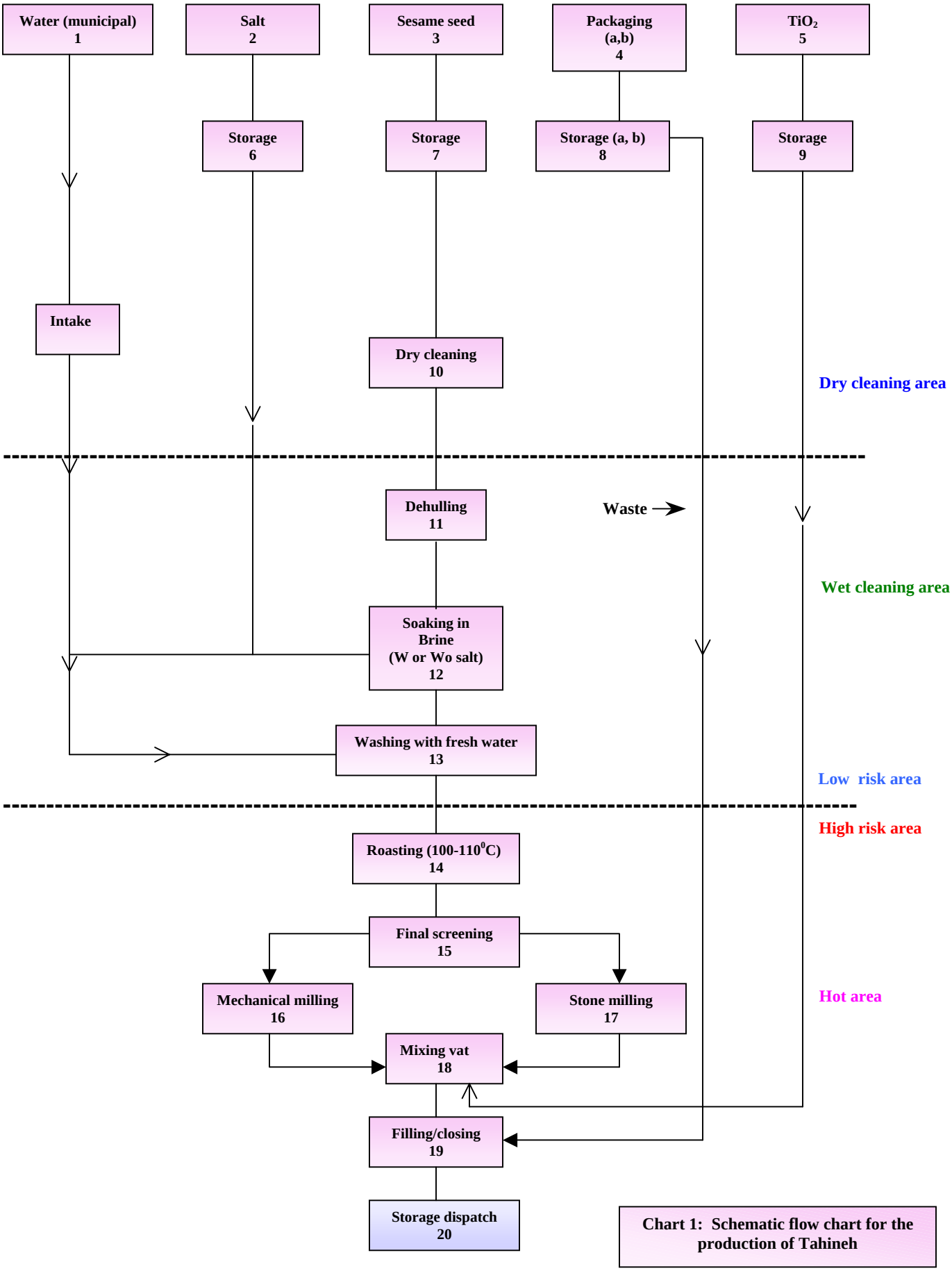


Chart 1: Schematic flow chart for the production of Tahineh

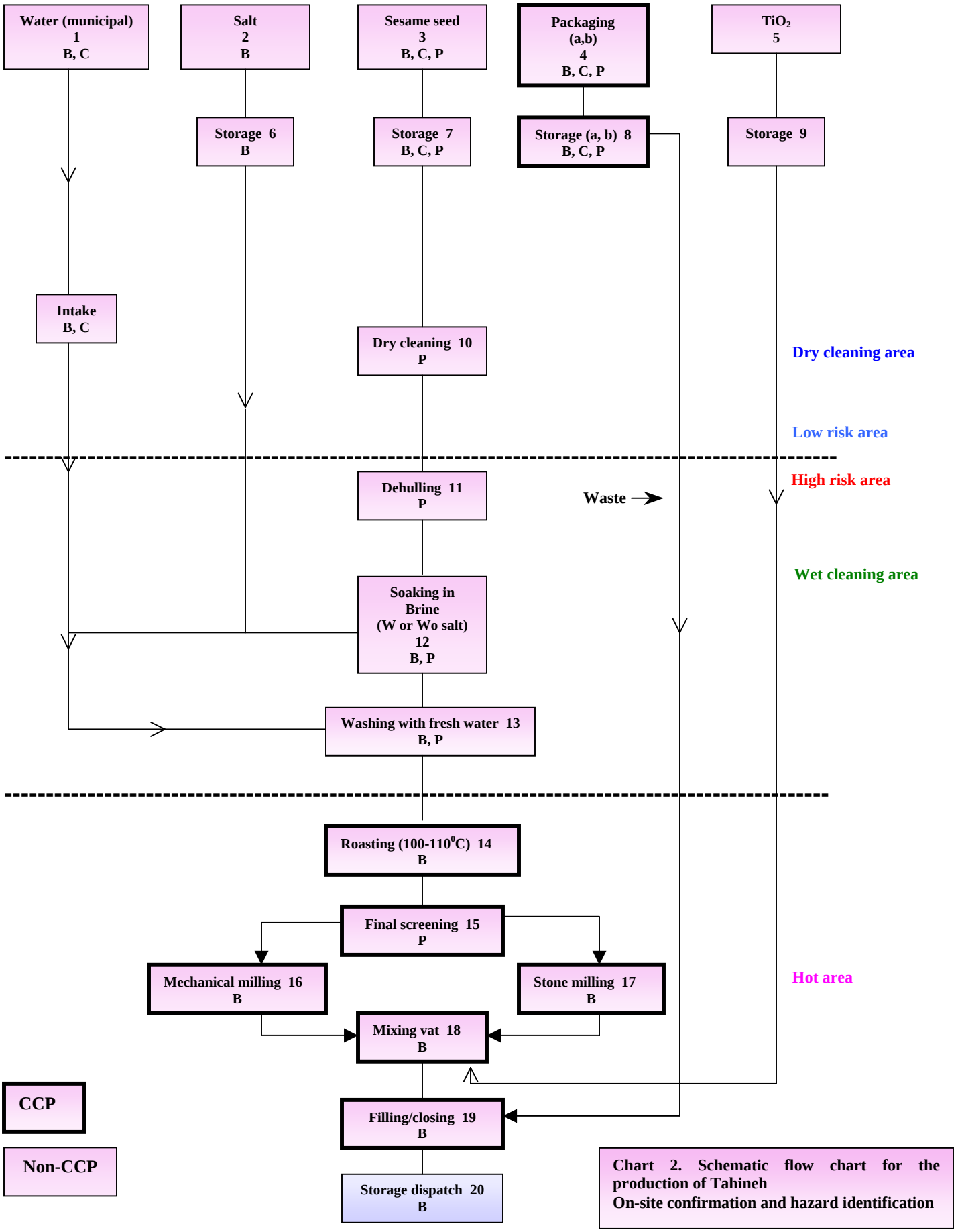


Chart 2. Schematic flow chart for the production of Tahineh
On-site confirmation and hazard identification

Form 3 Hazard identification

Product name: Tahineh

Ingredients	
Sesame seed	**B:** ▪ Molds & Yeast and other possible pathogens. ▪ May include aflatoxins **C:** May include toxic chemicals (pesticides) **P:** Hazardous external materials (Dust, soil, straws etc.)
Salt	**B:** ▪ May include spores (halophilic and osmophilic). ▪ Rodent excrement. **C:** Not expected. **P:** Not expected.
Titanium dioxyde	**B:** Not expected **C:** Not expected. **P:** Not expected.
Packaging (Plastic and glass jars + plastic and metal covers)	**B:** Could arrive with serious defects which could result in post- process contamination. **C:** Could be contaminated with grease, oil or other chemicals. **P:** Could contain plastic fragments.
Water	**B:** Could contain coliforms, spore forming bacteria or other microorganisms. **C:** Could be contaminated with dissolved heavy metals or toxic or toxic substances. **P:** Not expected.

Process Steps	
6- Salt storage	**B:** Could be contaminated with rodent excrement.
7- Sesame seed storage	**B:** Improper storage, temperature and humidity could increase microbial load. **C:** Contamination by chemicals in close proximity. **P:** Inadequate storage could result in the increase of HEM.
8- Packaging materials storage	**B:** ▪ Physical damage could result in serious defects which could result in post process contamination with pathogenic bacteria. ▪ Could be contaminated with rodent excrement. ▪ Improper handling could cause microbial contamination. **C:** Jars and covers could become contaminated with non food chemicals as a result of improper storage. **P:** Inadequate protection against HEM could result in contamination.
10- Dry cleaning	**P:** Improper dry cleaning may result in contamination by HEM.
11- Dehulling	**P:** Improper dehulling may result in contamination by HEM (dust, metal fragments, etc).
12-13- Soaking in Brine and/ or in fresh water	**B:** Improper handling and poor GMP/GHP may result in the increase of the microbial load. **P:** Make sure that the hull is efficiently separated from the seed.
14- Roasting	**B:** Inadequate temperature could result in the increase of microbial growth.
15- Final screening	**P:** Improper screening could result in contamination by HEM.

16- Mechanical milling	**B:** ▪ Poor GMP/GHP may result in microbial contamination. ▪ The drop of temperature could result in microbial contamination.
17- Stone milling	**B:** ▪ Poor GMP/GHP may result in microbial contamination. ▪ Temperature elaborated from stones is not enough to pasteurize the product
18- Mixing vat	**B:** Improper handling and poor GMP/GHP may result in microbial contamination
19- Filling / Closing	**B:** ▪ Improper handling and poor GMP/GHP may result in microbial contamination ▪ Poor personnel hygiene could result in microbial contamination ▪ Overfilling may cause post-contamination.
20- Storage and dispatch	**B:** Improper storage (extreme humidity and temperature) may result in microbial contamination.

Form 4 CCP Determination

Product name: Tahineh

Process step/ Incoming material	Category and identified hazard	Q1	Q2	Q3	Q4	CCP No.
Ingredients						
Sesame seed as delivered	**B:** Pathogens	Yes Heat treatment	-	-	Yes Thermal processing (14)	-
	C: Toxic substances	Yes Control at supplier	-	-	Yes	-
Salt as delivered	**B:** Pathogens	Yes Supplier specifications	-	-	-	-
Packaging as delivered	**B:** Pathogens	Yes Visual	-	-	No	**CCP1 B, C,P**
	C: Grease, oil	Yes Visual	-	-	-	
	P: Plastic fragments	Yes Visual	-	-	-	
Water	**B:** Pathogens	Yes heat	-	-	Yes Thermal processing (14)	-
	C: Heavy metals and other toxic substances	Yes Inspection and testing	-	-	-	GMP
Process Steps						
6- Salt storage	**B:** Rodent excrements	Yes Control of storing conditions and pest control	-	-	-	GMP
7- Sesame seed storage	**B:** Pathogens and rodent excrement	Yes Inspection	-	-	-	GMP
	C: Chemicals	Yes Control storage conditions	-	-	-	GMP

	P: HEM	Yes Screening	-	-	Yes Screening (15)	-
8- Packaging materials storage	**B:** Pathogens	Yes	Yes	-	-	**CCP 2 B**
	C: Non food chemicals	Yes	No	-	-	GMP
	P: HEM	Yes	No	-	-	GMP
10- Dry cleaning	**P:** HEM	Yes Screening	-	-	Yes Screening (15)	-
11- Dehulling	**P:** HEM (Dust,…)	Yes Visual inspection	-	-	Yes Final screening (15)	-
12-13- Soaking in Brine and/ or in fresh water	**B:** Pathogens	Yes Heat treatment	-	-	Yes Heat processing (14)	-
	P: Hull	Yes Screening	-	-	Yes Screening (15)	-
14- Roasting	**B:** Pathogens	Yes	Yes	-	-	**CCP 3 B**
15- Final screening	**P:** HEM	Yes	Yes	-	-	**CCP 4 P**
16- Mechanical milling	**B:** Pathogens	Yes	-	-	No	**CCP 5 B**
17- Stone milling	**B:** Pathogens	Yes	-	-	No	**CCP 6 B**
18- Mixing vat	**B:** Pathogens	Yes	-	-	No	**CCP 7 B**
19- Filling / Closing	**B:** Pathogens Overfilling	Yes	-	-	No	**CCP 8 B**
20- Storage and dispatch	**B:** Pathogens	Yes	-	-	-	GMP

Process step	CCP No.	Hazard description	Critical limit	Monitoring			Corrective action	Records
				Procedure (How)	Frequency (When)	Responsibility (Who)		
Packaging as delivered	CCP 1 **B**	Post process contamination resulting from serious defects of jars and covers	Jar manufacturer's specifications No defects	Visual inspection	Every batch	Jar deppaletizer operator	Put down specifications for the supplier at the site of package production	Deviation and batch numbers report.
	C	Grease and oil	None	Visual inspection	Every batch	Jar deppaletizer operator	Washing (water + detergents)	Deviation and batch numbers report.
	P	HEM	No HEM	Visual inspection	Every batch	Jar deppaletizer operator	Washing	Deviation and batch numbers report.
8- Packaging materials storage	CCP 2 **B**	-Physical damage may result in contamination -Rodent excrement -Improper handling	Comply with specifications	Apply GMP	Every month and when required	Storage supervisor	Verify GMP schedule	-Storage report, -Humidity, temperature record
14- Roasting	CCP 3 **B**	Inadequate temperature may result in the increase of microbial load	Temperature >85 ^{o}C Time >20 min	Temperature control	Continuous	Operator	Adjust temperature and increase roasting time	-Deviation record -Temperature and defects report

Form 5 **HACCP plan**

Product name: Tahineh

15- Final screening	CCP 4 **P**	Improper screening could result in contamination by HEM	No HEM	Visual inspection	Continuous	Operator	Inspect, re-screen and inform QC	Deviation record, time and defects report
16- Mechanical milling	CCP 5 **B**	Poor GMP/ GHP resulting in microbial contamination	Temperature >=100 ^{o}C No contamination	Temperature control	Continuous	Operator	Verify GMP/ GHP Microbial testing, reject if contaminated	QC report on GMP/ GHP Deviation and batch number record
17- Stone milling	CCP 6 **B**	Poor GMP/ GHP resulting in microbial contamination	No contamination	GMP	Continuous	Operator and QC supervision	Verify GMP/ GHP by testing	QC report on GMP/ GHP Deviation and batch number record
18- Mixing vat	CCP 7 **B**	Improper handling and poor GMP/ GHP resulting in microbial contamination	No contamination	GMP	Every batch and when required	Operator and QC supervision	Verify GMP/ GHP by testing	QC report on GMP/ GHP
23- Filling / Closing	CCP 8 **B**	Poor GMP/ GHP resulting in contamination	No contamination	Testing	Every batch and when required	QC personnel	Verify GMP/ GHP	QC report on GMP / GHP
		Overfilling resulting in post contamination	Comply with specifications	Weighing apparatus	Continuous	Operator and QC	-Check weighing apparatus -Change if necessary -Re-fill.	-Deviation records -Time and causes report.

23

Remarks:

- The stone milling (CCP 6) should not be practiced anymore in this process due to difficulties of maintaining the stone hygiene. The stone should be replaced by another mechanical milling and/ or pasteurization should be introduced at the end of the process before filling.

- Even if pasteurization was applied, there is no evidence that scheduled conditions (temperature and time) are enough to eliminate pathogens.

XI.

HACCP Plan

Halaweh

Form 1 Product description and intended use

1- Product name:	**Halaweh- Tahineh**
2- Important characteristics of end product	**a. Aw < 0.1** ▪ Organisms can not grow ▪ Super dried product **b. pH < 5.6** ▪ Low acid foods ▪ Favorable for microbial growth **c. Acidity < 0.1%** ▪ Low acidity **d. Sugar content over 45%** ▪ Add preserving effects by osmosis **e. Additives** Pistachios, chocolate (Possibility of aflatoxins)
3- How the product is to be used	Ready to eat
4- Packaging	▪ Plastic (propylene) ▪ Package size varies (5 Kg, 1 Kg, 0.5 Kg) ▪ Hand closing (may cause contamination)
5- Shelf life	Two years at normal retail shelf temperature
6- Where the product will be sold	Retail, institutions, and food services. Could be consumed by high- risk groups (infirm, immuno-compromised, elderly, etc)
7- Labeling instructions	None required to ensure the product safety
8- Special distribution control	No physical damage, excess humidity or temperature extremes

Form 2 Product ingredients and incoming material

Product name: Halaweh- Tahineh

Raw material	Dry ingredients	Packaging
▪ Saponaria root ▪ Tahineh	▪ Sugar ▪ Citric acid ▪ Other additives (nuts, chocolate, etc)	▪ Plastic tin ▪ Plastic covers
Other		
Water (municipal)		

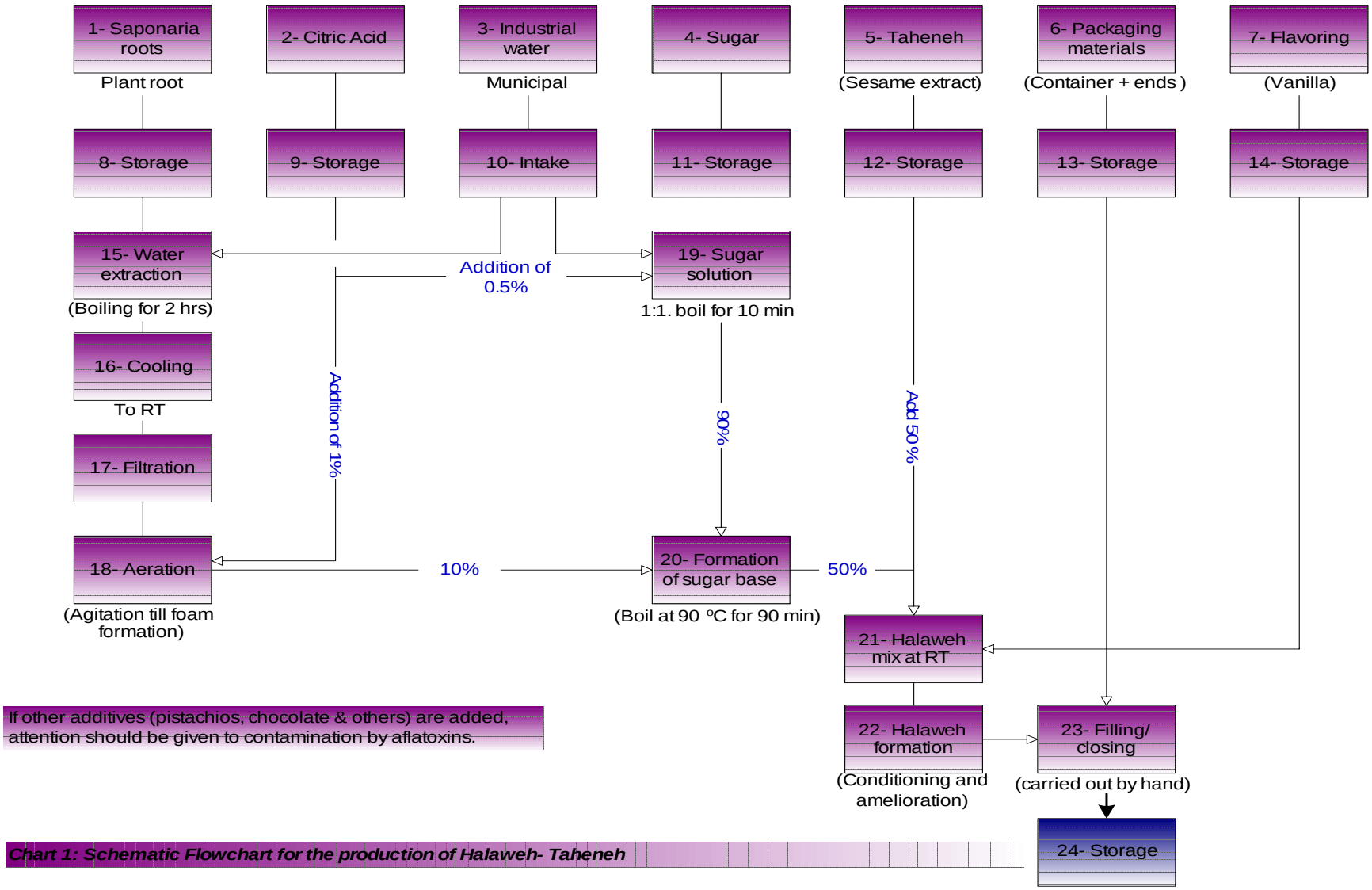


Chart 1: Schematic Flowchart for the production of Halaweh- Taheneh

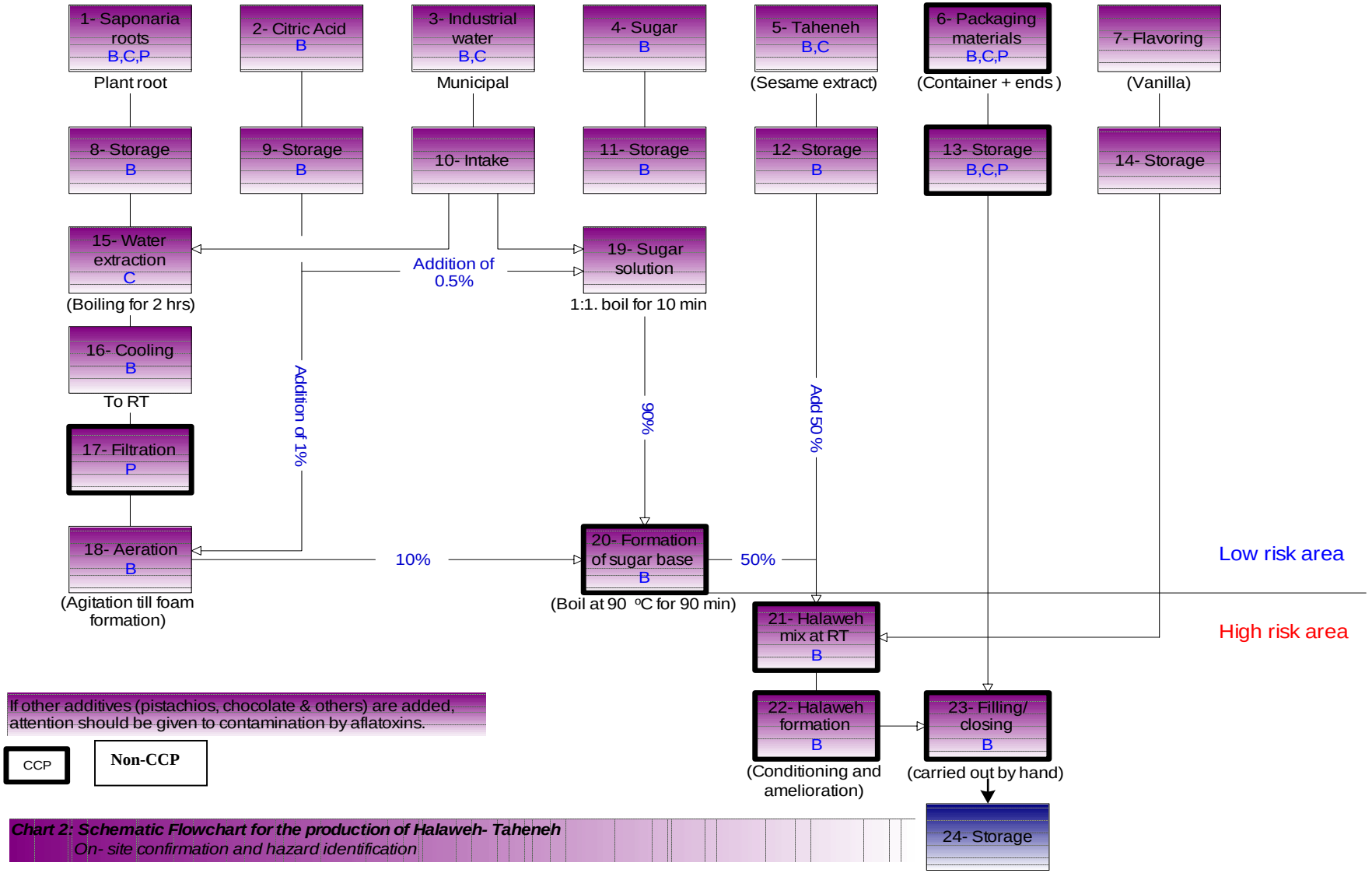


Chart 2: Schematic Flowchart for the production of Halaweh- Taheneh
On- site confirmation and hazard identification

Form 3 Hazard identification

Product name: Halaweh- Tahineh

Ingredients	
Saponaria root	**B:** ▪Molds & Yeast and other possible pathogens. ▪May include aflatoxins **C:** May include toxic chemicals **P:** Hazardous external materials (Dust, soil, straws etc.)
Tahineh	**B:** Pathogens: *Salmonella sp*., *Staph. aureus*, fecal coliforms, *Clostridium* spora and others etc. **C:** TiO_2 **P:** Not expected
Dry ingredients	**B:** ▪ May include spores (halophilic and osmophilic). ▪ Rodent excrement. **C:** Not expected. **P:** Not expected.
Packaging (Plastic tins + plastic covers)	**B:** Could arrive with serious defects which could result in post- process contamination. **C:** Could be contaminated with grease, oil or other chemicals. **P:** Could contain plastic fragments.
Water	**B:** Could contain coliforms, spore forming bacteria or other microorganisms. **C:** Could be contaminated with dissolved heavy metals or toxic or toxic substances. **P:** Not expected.
Process Steps	
8- Saponaria root storage	**B:** Improper storage, temperature and humidity could increase microbial load.
12- Tahineh storage	**B:** Improper storage could lead to post contamination.

9-11-14 Dry ingredient storage	**B:** Could be contaminated with rodent excrement.
13- packaging materials storage	**B:** ▪ Physical damage could result in serious defects which could result in post process contamination with pathogenic bacteria. ▪ Could be contaminated with rodent excrement. ▪ Improper handling could cause microbial contamination. **C:** Tins and covers could become contaminated with non food chemicals as a result of improper storage. **P:** Inadequate protection against HEM could result in contamination.
15- Water extraction of saponaria	**C:** Make sure that no toxic chemicals are extracted
16- Cooling at room temperature	**B:** Improper cooling conditions my result in contamination
17- Filtration	**P:** Improper filtration may result in contamination by HEM.
18- Aeration	**B:** ▪ Improper air incorporation (unclean air) may result in microbial contamination ▪ Foam acts as microbial protector
20- Formation of sugar base	**B:** Inadequate temperature may result in microbial contamination.
21- Halaweh mix	**B:** Improper handling and poor GMP/GHP may result in microbial contamination.
22- Halaweh formation	**B:** Improper handling and poor GMP/GHP may result in microbial contamination
23- Filling/ Closing	**B:** ▪ Improper handling and poor GMP/GHP may result in microbial contamination ▪ Poor personnel hygiene could result in microbial contamination ▪ Overfilling may cause post-contamination.
24- Storage of end products	**B:** Improper storage (extreme humidity and temperature) may result in microbial contamination.

Form 4 CCP Determination

Product name: Halaweh-Tahineh

Process step/ Incoming material	Category and identified hazard	Q1	Q2	Q3	Q4	CCP No.
Ingredients						
Saponaria root as delivered	**B:** Pathogens	Yes Heat treatment	-	-	Yes Thermal processing (15)	-
	C: Natural toxic substances	Yes Decomposed	-	-	Yes	-
Tahineh as delivered	**B:** Pathogens	No Control is at producing site	-	-	-	-
	C: TiO_2	No Control is at producing site	-	-	-	-
Dry ingredients as delivered	**B:** Pathogens	No Control is at producing site	-	-	-	-
Packaging as delivered	**B:** Pathogens	Yes Visual	-	-	No	**CCP 1 B, C, P**
	C: Grease, oil	Yes Visual				
	P: Plastic fragments	Yes Visual				
Water	**B:** Pathogens	Yes heat			Yes Thermal processing (15- 19)	-
	C: Heavy metals and other toxic substances	Yes Inspection and testing				GMP

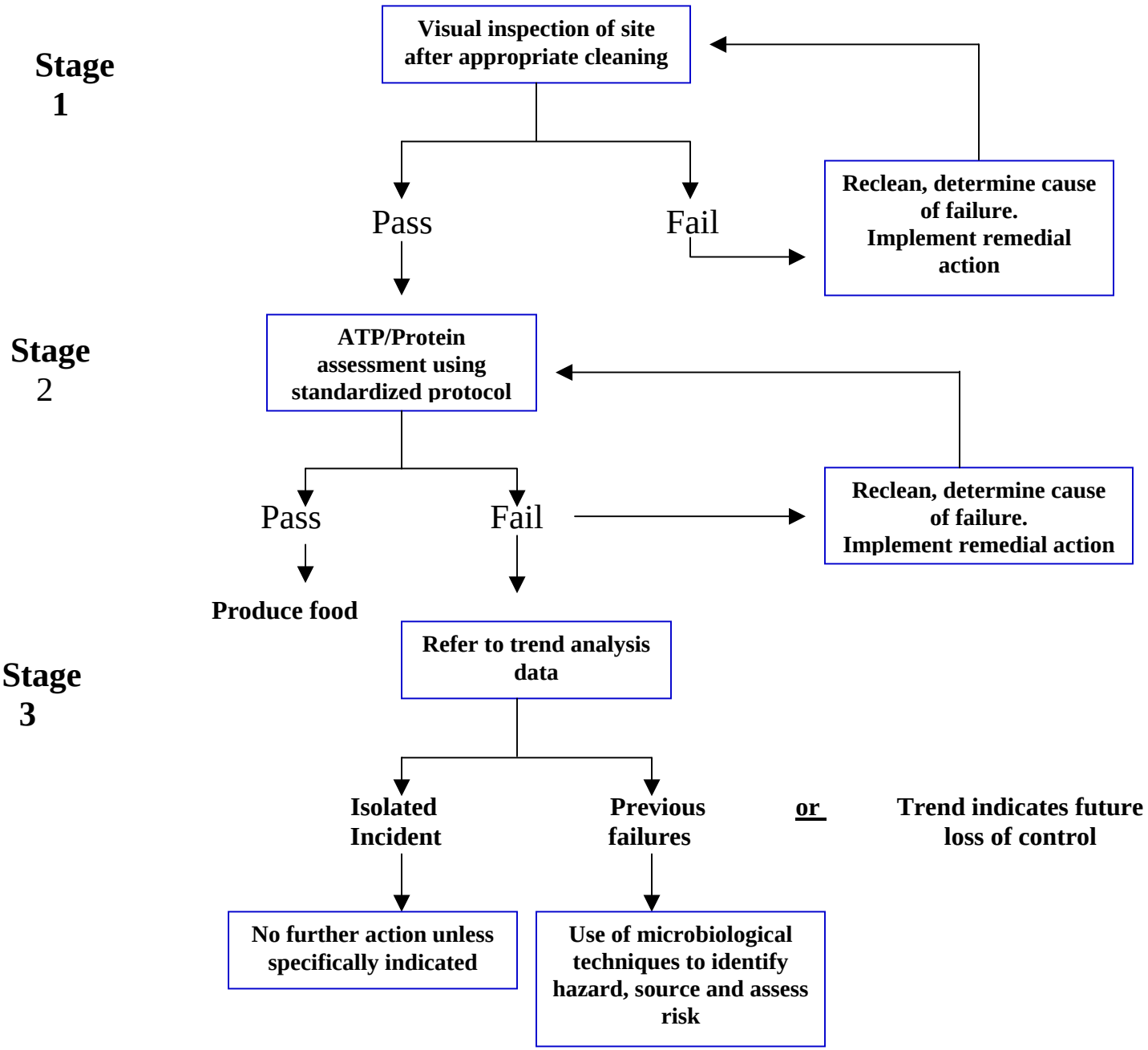
Process Steps						
8-Saponaria storing	**B:** Pathogens	Yes Inspection				GMP
9 -11- 14 Dry ingredients storing	**B:** Pathogens and rodent excrement	Yes Control storage conditions	-	-	-	-
12- Tahineh storage or intake	**B:** Pathogens	Yes Control storage conditions	-	-	-	-
13- Packaging materials storage	**B:** Pathogens	Yes	Yes	-	-	**CCP 2 B**
	C: Non food chemicals	Yes	No	-	-	GMP
	P: HEM	Yes	No	-	-	GMP
15- Water extraction of Saponaria	**C:** Toxic chemicals	Yes Testing	-	-	-	-
16- Cooling to room temperature	**B:** Pathogens	Yes Heat	-	-	Yes Heat processing (20)	-
17- Filtration	**P:** HEM	Yes Visual inspection	Yes	-	-	**CCP 3 P**
18- Aeration	**B:** Pathogens	Yes Heat	-	-	Yes Heat processing (20)	-
20- Formation of sugar base	**B:** Pathogens	Yes	Yes	-	-	**CCP 4 B**
21- Halaweh mix	**B:** Pathogens	Yes	-	-	No	**CCP 5 B**
22- Halaweh formation	**B:** Pathogens	Yes	-	-	No	**CCP 6 B**
23- Filling/ Closing	**B:** Pathogens Overfilling	Yes	-	-	No	**CCP 7 B**
24- Storage of end products	**B:** Pathogens	Yes	-	-	-	GMP

Process step	CCP No.	Hazard description	Critical limit	Monitoring			Corrective action	Records
				Procedure (How)	Frequency (When)	Responsibility (Who)		
Packaging as delivered	CCP 1 **B**	Post process contamination resulting from serious defects of tins and covers	Tin manufacturer's specifications No defects	Visual inspection	Every batch	Tin deppaletizer operator	Put down specifications for the supplier at the site of package production	Deviation and batch numbers report.
	C	Grease and oil	None	Visual inspection	Every batch	Tin deppaletizer operator	Washing (water + detergents)	Deviation and batch numbers report.
	P	HEM	No HEM	Visual inspection	Every batch	Tin deppaletizer operator	Washing	Deviation and batch numbers report.
13- Packaging materials storage	CCP 2 **B**	-Physical damage may result in contamination -Rodent excrement -Improper handling	Comply with specifications	Apply GMP	Every month and when required	Storage supervisor	Verify GMP schedule	-Storage report, -Humidity, temperature record

Form 5 **HACCP plan**

Product name: Halaweh-Tahineh

17- Filtration	CCP 3 **P**	HEM	No HEM	Visual inspection	Continuous	Operator	-Inspect and re-filter -Inform QC	-Deviation record -Time and defects report
20 Formation of sugar base	CCP 4 **B**	Microbial contamination by drop of temperature	No contamination. T^{o}C >=90^{o}C for 90 min	Temperature control	Continuous	Operator and QC supervision	Microbial testing, reject batch if contaminated	Temperature records; QC report
21- Halaweh mix	CCP 5 **B**	Improper handling may result in microbial contamination	No contamination	Testing	Every batch and when required	QC personnel	Verify GMP/ GHP	QC report on GMP / GHP
22- Halaweh formation	CCP 6 **B**	Improper handling may result in microbial contamination	No contamination	Testing	Every batch and when required	QC personnel	Verify GMP/ GHP	QC report on GMP / GHP
23 Filling/ closing	CCP 7 **B**	Poor GMP/ GHP resulting in contamination	No contamination	Testing	Every batch and when required	QC personnel	Verify GMP/ GHP	QC report on GMP / GHP
		Overfilling resulting in post contamination	Comply with specifications	Weighing apparatus	Continuous	Operator and QC	-Check weighing apparatus -Change if necessary -Re-fill.	-Deviation records -Time and causes report.



Appendix 1: Hygiene monitoring system within HACCP

Focal point in Lebanon

Mr. Bassel Al-Khatib
National Consultant in Food Safety

Ms. Mey Salim Jurdy
UNIDO National Expert

Ms. R. El Zein Hossary
UNIDO National Expert

C/o. UNIDO Field Office
Beirut
Lebanon

UNIDO HEADQUARTERS
Vienna, Austria

Mr. A.R. Ben Brahim
Director

Mr. Karl Schebesta
Industrial Development Officer

Agro-Industries and Sectoral Support Branch
Programme Development and Technical
Coopertion Division (PTC/AGR)

Vienna International Centre
P.O. Box 300
A-1400 Vienna, Austria
Tel: +43-1-26026-3490
Fax: +43-1-26026-6849
E-mail: K.Schebesta@unido.org
Internet: www.unido.org

UNIDO Field Office in Lebanon

Riadh Solh Square
P.O. Box 11-8575
Beirut, Lebanon
Telephone: +961 1 989 614 or 981 301
Ext,1610,1611,1602 FAX: +961 1 981 415
E-mail: office.lebanon@unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Agro-Industries and Sectoral Support Branch
Programme Development and Technical Cooperation Division
Vienna International Centre, P.O. Box 300, A-1400 Vienna, Austria
Telephone: (+43 1) 26026-0, Fax: (+43 1) 2692669
E-mail: unido@unido.org **Internet:** http://www.unido.org