

TeamWork

Product development

LEGISLATION, HYGIENE AND APPLIED MICROBIOLOGY FOR FOOD SAFETY

Applied Microbiology
[Prof. Fasolato]

FOOD Hygiene
[Prof. Balzan]

Group's Units

n groups, 4 People per group divided in 8 products/cases

- Hazards
- HACCP/SOP
- Solving specific problems

Same groups

Same initial idea

Different areas of development

Fasolato: Microbiology

Balzan: Hygiene/Legislation

- Teamworking → active learning + **15pts (Teamwork from 0-15)**

Team work presentation/report

Team Responsibilities: We will provide you one specific case of food product

1.Company Overview:

- Provide a brief description of the company, including its location and the food supply chain involved.

2.Product Description:

- Specify the product name, ingredients, and include a brief recipe or directions for preparation.
- Outline the intended use of the product and consumer categories (e.g., ready-to-eat or raw).



Team work presentation/report

3. Process Description:

- Describe key aspects of the preparation processes, highlighting important steps and principles involved.
- Select and check applicable activities related to food processing, such as curing, custom processing, or smoking for preservation.

4. Food Flow Diagram:

- Create a written flow diagram that outlines the steps from receiving the product to serving it.

5. Shelf Life Analysis:

- Define the maximum storage time for the product based on different methods.
- Discuss factors that affect shelf life, such as pH and water activity.
- Labeling; allergens ecc



Team work presentation/report

7. Hazard Analysis:

- Research and describe the **hazards associated** with the product, identifying the most probable hazards and their impact on safety.
- Identify **potential points Hazards and specify control** measures for critical parameters (e.g., temperature, water activity, pH).
- **How to solve the problem**

8. Considerations on Emerging issues/Predictive Microbiology:

- Discuss emerging issues related to the product, its processing, and economic implications.
- Explore technological advancements and their challenges,
- Ethical aspects, sustainability and communication
- identify predictive microbiology tools that may apply to the product.

After the first active learning session, we will provide you with a specific module and format



Products that needs an update

Product description

Liquid Whole Egg Carton and Shipping Package



Membri di: Liquid Whole Egg (4)

Studente

BERTOLI CHIARA (2178641), c
OMIDI MOHAMMAD (21840
PARVIN MST.SHANAZ (21862
WILLIAMS ERIN MORGAN (2

Problem: S. Typhimurium in eggs intended to be processed
Information

Made from farm fresh eggs

Kosher and Halal certified

Ready to use, easy to store, with easy to pour spout or twist cap

With citric acid to guarantee extended shelf life

Pasteurized and homogenized for food safety and consistency

Store at 1-4°C (34-39°F).

Do not freeze.

Use within 2–3 days of opening.

Refrigerate after opening.

Always check the Best Before date indicated on the carton or case.

Products that needs an update

Product description

Frozen Fully Cooked Chicken Patties

Problem: *Clostridium perfringens* outbreaks (5 human cases in two countries)

Product Details

Tyson® Fully Cooked Chicken Patties are a delicious addition to any meal. These breaded chicken patties are seasoned to perfection. Heat these fully cooked chicken patties in the oven or microwave to create a delicious meal that is ready to eat in less than 30 minutes.

- One 26 oz. package of Chicken Patties
- All-natural, minimally processed chicken raised with no added hormones or steroids
- Breaded and seasoned to perfection
- 0 grams of trans fat per serving
- Fully cooked and ready-to-eat
- Resealable bag for easy storage



Membri di: Chicken Patties (4)

Studente

OMIDVARI SERVA (2194566,
Pavia Capito Nahia (non pr
ROOSTA ZAHRA (2186169, z
SHAHID WAREESHA (219456

Products that needs an update

Product description

Sprouts, organic, broccoli



Problem: *E. coli* SHIGA cases after in-house consumption and preparation (2 human cases – women in two cities)

Broccoli sprouts are full of healthy vitamins and antioxidants. The sprouts have a mild taste and are perfect as a garnish with any kind of dish. Delicious in creamy sauces, soups and salad dishes.

- Weight: 25 g
- Made in the Netherlands

Instructions for use

To grow sprouts, use a sprouting dish. Spread the seeds sparingly over the grid and fill the germination dish with water up to the height of the grid. Top up the water daily if necessary. For best results, place the sprouting dish at room temperature in a fairly well-lit spot. After about two weeks, the sprouts are ready to eat.

Membri di: Sprouts organic (4)

Studente

BAGHBADI ALIREZA (218825)
CECCHETTO LORENZO (218825)
DEGIRMENCI REYHAN EBRU
SCHILLING ANNE (2185994,)

Products that needs an update

Product description Salmon Cold-Smoked

ROYAL GREENLAND
SALMON, COLD-SMOKED
SLICED, VACUUM, 10 X 180G, FROZEN



Problem: *Recall due to positive samples of Clostridium botulinum in product*

PRODUCT

This product belongs to our branded "Starter and Lunch" range of good quality seafood, ready to use for an easy and delicious serving.

Cold-smoked salmon, sliced

PACKAGING

The product is laid out on a foil-coated carton board and vacuum packed in plastic foil.

Solid packaging that preserved the product well

Attractive brand design that stands out on the shelf

INGREDIENTS

Salmon (**fish**), salt, acidity regulator (E262). Smoked

Membri di: Salmon Cold Smoked

Studente

ASADI MUHAMMAD (218823
KANDATHIL SUBRAMANIA SW
LUKA PAULINA (2185995, pa
MINTO ANGELICA (2079918,

Products that needs an update

Product description

Milky Way Chocolate Flavored Spread

Problem: Recall due to positive samples of Salmonella; in product and plant



Ingredients

Fractionated Partially Hydrogenated Palm and Rapeseed Oil, Sugar, Lactose, Skim Milk Powder, Cocoa Powder Processed with Alkali, Less than 2% - Calcium Carbonate, Cocoa Powder, Soy Lecithin, Natural and Artificial Flavors, Magnesium Oxide, Thiamine Mononitrate (Vitamin B1), Alpha-Tocopherol Acetate (Vitamin E), C Gum Acacia, Natural and Artificial Flavors), Riboflavin (Vitamin B2 (Vitamin B12). (Traces: Peanuts).

Membri di: Chocolate Flavored Spread (4)

Studente

ESCOBAR ARIAS TERESA CA
KANEVA ANNA (2184009, a
MUSALLAM JALIL (2185996, J
RIGHETTI MATTEO (2194397,

Products that needs an update



Product description

Semi soft cheese Gorgonzola

Problem Listeria: 3 hospitalization in 2 years- Epidemiological link with the company by sequence of strains collected in official samples

PDO Gorgonzola is a cheese made from cow's milk with a raw and soft paste . Gorgonzola is probably one of the most famous Italian cheeses in...

- **This product is: PGI - PDO - SLOW FOOD**
- **GLUTEN FREE**
- **PRODUCT FOR VEGETARIANS**
- **PERISHABLE**

Membri di: Gorgonzola (5)

Studente

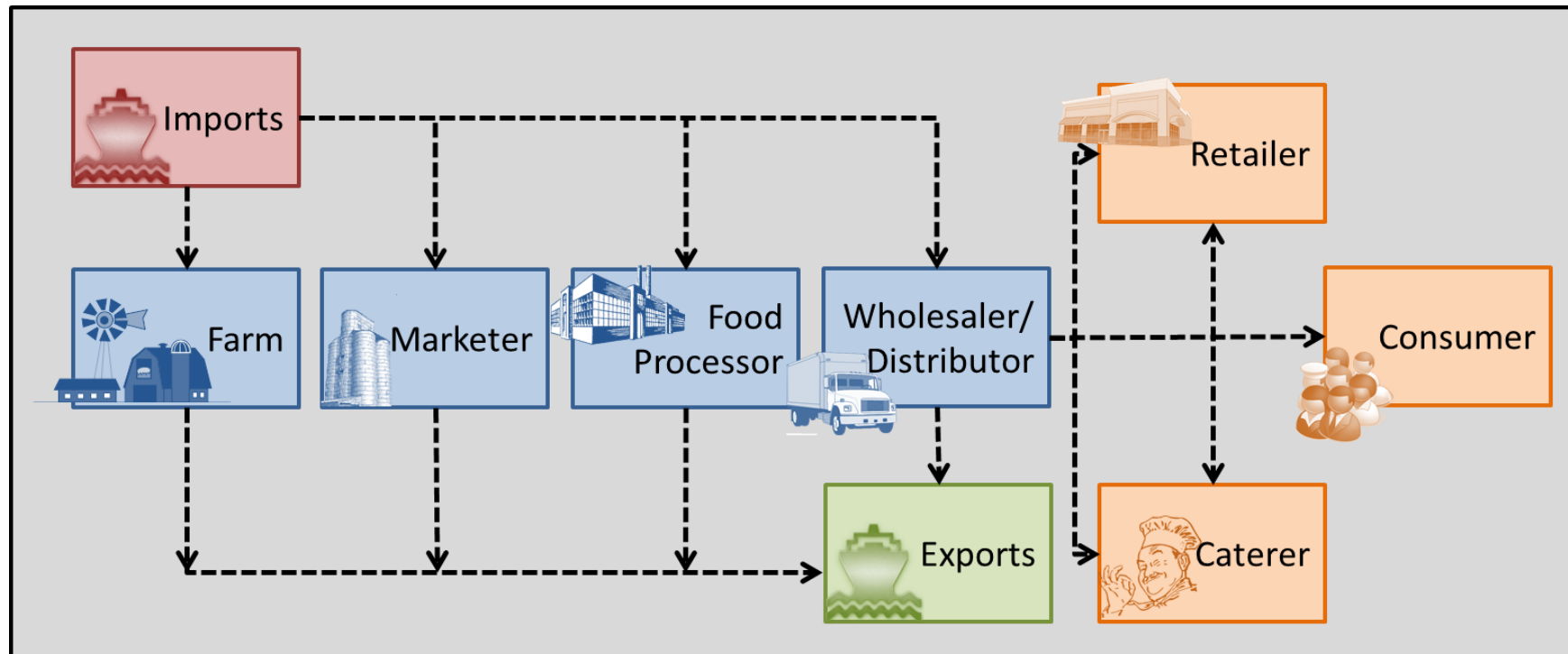
BIDARD ELEONORE LAURE G
HERATH MUDIYANSELAGE N
KAZEMI AMIRALI (2181683, c
PICOLLO FEDERICO CARLO
ROSIN GIULIA (2199759, giul

Food supply chain



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Supply chain: “an integrated system of processes performed by a set of networks, comprised of horizontal and vertical link between connected and interdependent organizations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end consumers”



Complexity of food supply chains



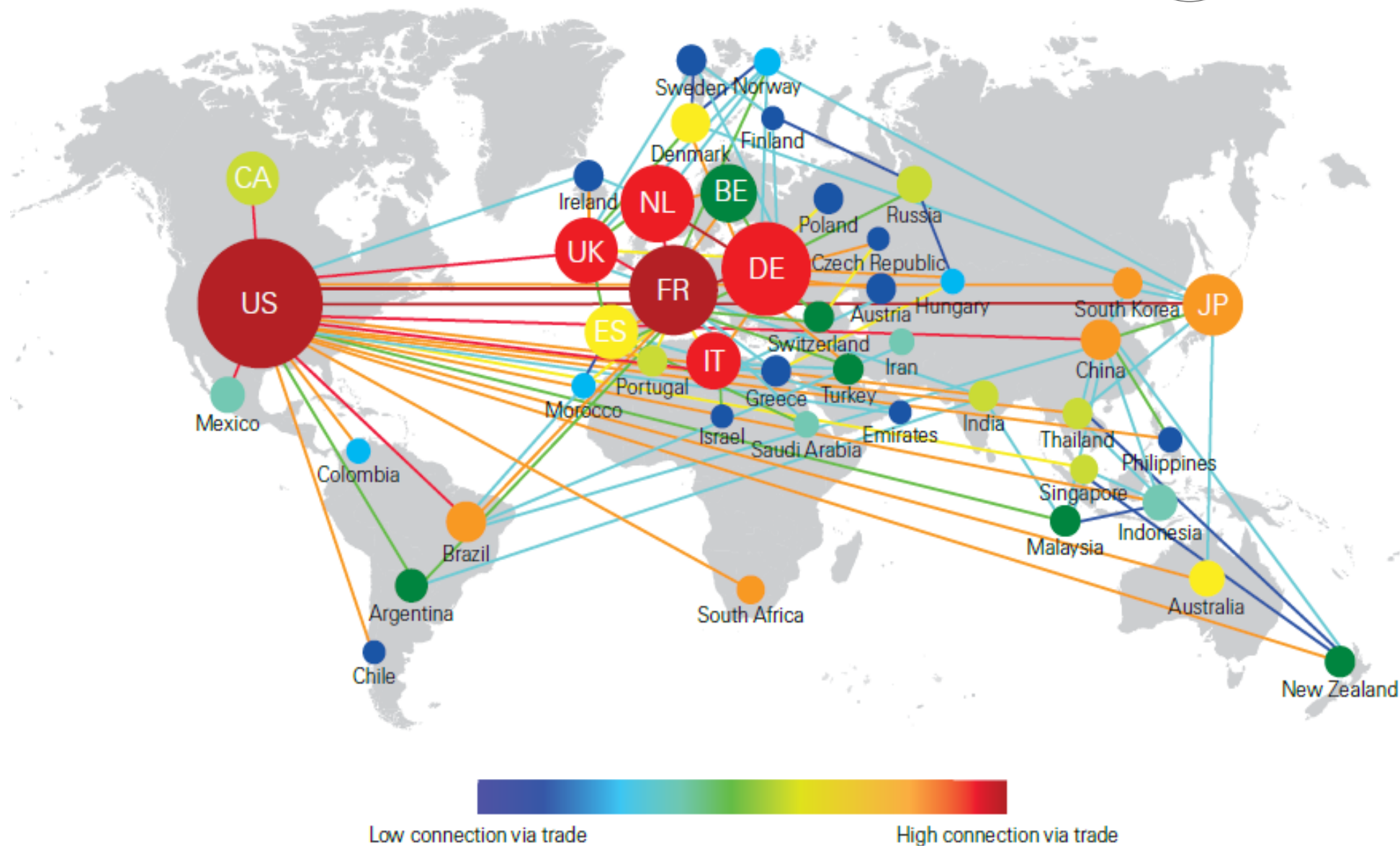
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- 1. Supply chains for fresh agricultural products** (such as fresh vegetables, flowers, and fruit). In general, these chains may comprise growers, auctions, wholesalers, importers and exporters, retailers, and specialty shops and their input and service suppliers. Basically, all of these stages leave the intrinsic characteristics of the product grown or produced in the countryside untouched. The main processes are the handling, conditioned storing, packing, transportation, and especially the trading of these goods.
- 2. Supply chains for processed food products** (such as portioned meats, snacks, desserts, and canned food products). In these chains, agricultural products are used as raw materials for producing consumer products with higher added value. In most cases, conservation and conditioning processes extend the shelf life of the agricultural and consumer products.

Food supply chain: globalization



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Herb
butter:

Salted butter
garlic puree
garlic salt
lemon
parsley
pepper
water

- Ireland
- China, USA, Spain
- China, USA, Spain
- USA
- France, UK
- Indonesia
- Ireland

Chicken
breast:

Chicken

- Ireland, Belgium
UK, France etc.

Batter:

Flour
Water

- Belgium, France
- Ireland

Bread
crumb:

Bread crumb
Rape-seed oil

- Ireland, UK
- EU, Australia
- Eastern Europe

Chicken Kiev



HACCP

Hazard Analysis and Critical Control Point

It is used by applying 7 principles

And 5 preliminary actions

1. Team Creation
2. Description of the food
3. Use and consumers
4. Flowchart
5. Field verification

ACTIVE LEARNING AND
TEAM GROUP





BLUE CHEESE



VINEGAR



MILK



ONION POWDER



SOUR CREAM



GARLIC POWDER



MAYONNAISE

Blue Cheese Dressing

Ingredient Reception: Receive and inspect key ingredients, including blue cheese, mayonnaise, sour cream, vinegar, herbs, spices, and other flavorings. Check ingredients for quality and safety.

Weighing and Measuring: Accurately weigh and measure ingredients according to a standardized recipe.

Mixing: Blend and mix the ingredients together in an industrial mixer or tank until a uniform consistency is achieved.

Addition of Preservatives and Stabilizers: Some manufacturers may add preservatives and stabilizers to enhance the product's shelf life and stability.

Quality Control: Conduct quality control tests on the finished product, including taste, texture, and safety checks.

Packaging: Fill the "Blue Cheese Dressing" into appropriate containers such as plastic bottles or glass jars.

Labeling: Apply product labels with information including ingredients, expiration date, and nutritional facts.

Storage: Store finished products in climate-controlled storage areas.

Distribution: Ship the product to distributors or retail outlets.

Are there any process as pasteurization or sterilization? Are you using organic acids and pH?

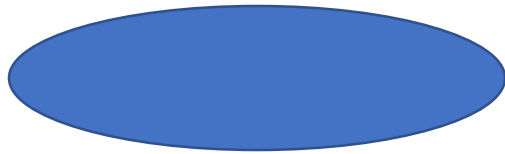
Production
process
description

The processes

The flowchart

- Graphic form of the production system
- Synthetic and must define all the phases

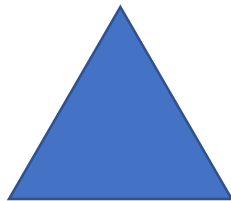
Symbols



- Finished product - raw materials



- Operations / PHASES



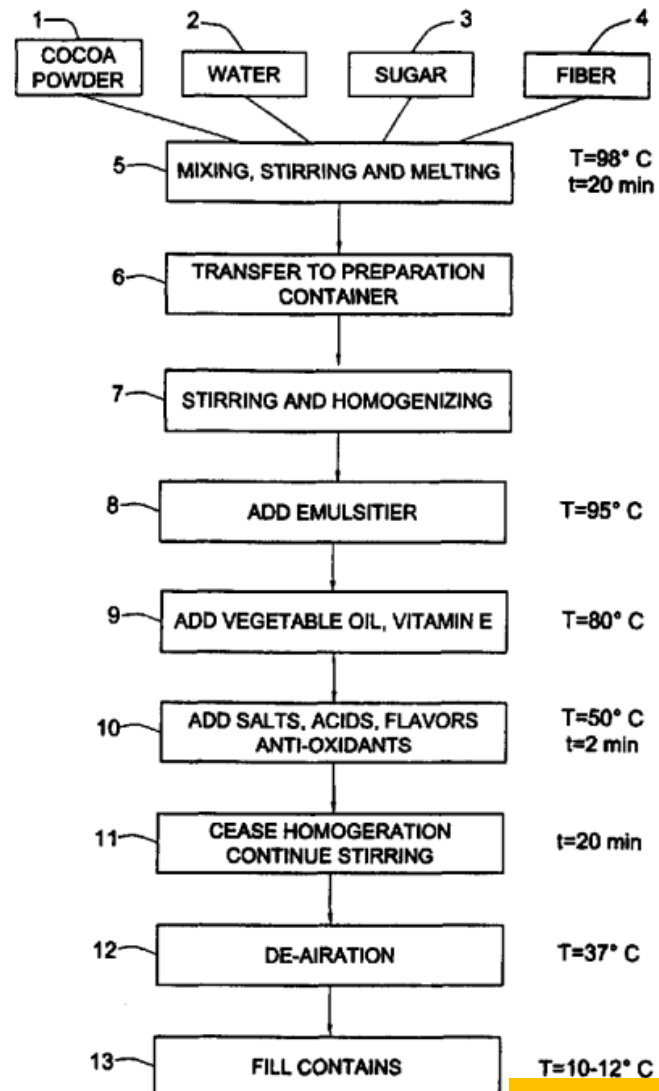
- By-products / waste



- Direction of flows

Process flow-
diagram

(54) Title: CHOCOLATE SPREAD



(57) **Abstract:** The present invention provides low sugar, low fat, and thus, low calorie edible chocolate spreads comprising a chocolate denoting agent, oil, sugar and fiber. Further, the present invention provides a method for the preparation of a low calorie chocolate spread, the method comprising essentially the steps of continuously stirring sugar, fibers and optionally a powdered flavoring denoting agent at a temperature of 90-98°C until sugar and fibers are melted; while continuously stirring the mixture, adding thereto emulsifiers; while continuously stirring and homogenizing, cooling the mixture obtained to a temperature of 50-80°C; adding liquid vegetable oil and optionally an oily paste of a flavor denoting agent to the cooled mixture; while continuously stirring and homogenizing the mixture obtained, further cooling the same to a temperature of 35-40°C; ceasing homogenization while continuing stirring; de-airating the mixture; and cooling the final mixture to a temperature below 25°C.

Chemical hazards? Control of temperature → CCP



This is a real patent for new chocolate spreads

Foreign matter → metal detector

The HACCP

It is a progressive step

PRINCIPLE 1: HAZARD ANALYSIS → legislative aspects?

PRINCIPLE 2: DETERMINATION OF CCPs

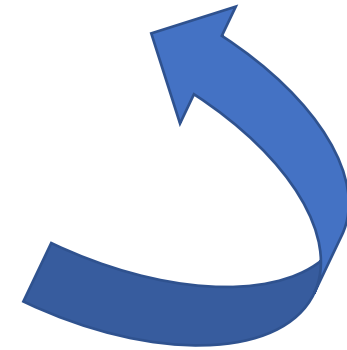
PRINCIPLE 3: DETERMINATION OF THE CRITICAL LIMITS

PRINCIPLE 4: DEFINITION OF CCP MONITORING SYSTEMS

PRINCIPLE 5: DEFINITION OF CORRECTIVE ACTIONS

PRINCIPLE 6: DEFINITION OF THE VERIFICATION PROCEDURES OF
THE HACCP SYSTEM

PRINCIPLE 7: DEFINITION OF DOCUMENTATION AND RECORDS



PRINCIPLE 1: HAZARD ANALYSIS → legislative aspects?

List of possible hazards

Safety and quality Concerns of this Product

- PHYSICAL HAZARDS: inadvertent field matter (stones, metal, insect fragments, etc.); inadvertent processing residues (glass, metal fragments, etc.); intentional materials (employee sabotage) and miscellaneous particulates and fragments.
- CHEMICAL HAZARDS:.....
- BIOLOGICAL HAZARDS:.....
- Evaluate the risk (using risk matrix) and define which hazard could be a significant hazard
- You can also add images video ecc...