



Daffodil
International
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**Production and Quality Assurance of products in Nestle
Bangladesh Ltd.**

**An Internship Report By
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Submitted to the Department of Nutrition and Food
Engineering in the partial fulfillment of B.Sc. in
Nutrition and Food Engineering.

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APPROVAL

This Project titled “**Production and Quality Assurance of products in Nestle Bangladesh Ltd**”, submitted by Erina Afrin to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the Partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents.

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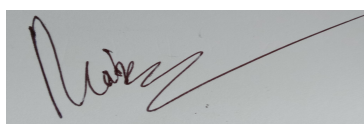
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DECLARATION

This Dissertation entitled “**Production and Quality Assurance of products in Nestle Bangladesh Ltd**” is being submitted to the Department of Nutrition and Food Engineering, Faculty of Allied Health Sciences, Daffodil International University, Bangladesh as a part of partial fulfillment of the requirements for the degree of Bachelor of Science in Nutrition of Food Engineering. The entire report based on the knowledge and skills that I have acquired in my internship period and did not submit before in support or an application for another degree or qualification of this university or any other institution.

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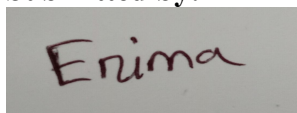
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CHAPTER 1

Introduction

1.1 About Nestle:

Established in Vevey, Vaud, Switzerland, Nestlé S.A. is a multinational food and beverage processing conglomerate firm. Nestle has been in business since 1966. According to revenue and other indicators, it has been the largest publicly traded food company since 2014. Over the course of 150 years, Nestle, one of the biggest food and beverage companies in the world, has improved people's quality of life and that of their families in 191 different countries. Nestle Bangladesh, which promotes "Good Food, Good Life," keeps innovating across all of its product lines to improve people's quality of life and contribute to a healthier Bangladesh in the future.

Nestle constantly explore and push the boundaries of what is possible with foods, beverages and nutritional health solutions to enhance quality of life and contribute to a healthier future.

1.2 Nestle In Bangladesh-

Nestle has been working with people in Bangladesh for 25 years, and they are now assuring a healthy future for them. Nestlé Bangladesh Ltd. was established in 1992 as a joint venture between Transcom Ltd. and Nestle S.A. Switzerland. It began conducting business in 1994 with the opening of its first factory at Sreepur. In 1998, Nestlé Bangladesh became a wholly-owned subsidiary of Nestle S.A.

Nestle Bangladesh has provided a variety of goods and services for individuals at all phases of life, enabling them to better look after their families and themselves.

1.3 Nestle Products-



Figure 1 : picture of Nestle products

Nestle's product includes baby foods(Lactogen, Cerelac, Nido), medical food, bottled food, breakfast cereals, coffee and tea, confectionery, dairy products, frozen foods, snacks and ice-cream.

1.4 Nestle General Principles-

- Nestle is more focused on people and products than it is on systems. Systems are important and helpful, but they should never be the end in and of themselves.
- Nestle is dedicated to maximizing shareholder value. Nestle does not, however, support maximizing short-term profit and shareholder value at the price of long-term profitable business growth. But Nestle continues to be aware of the need to make a respectable profit every year.
- Nestle is dedicated to the idea of constant development in its operations.

CHAPTER 2

Quality Assurance

Quality assurance is a proactive strategy and a collection of tasks for guaranteeing quality in the procedures used to create products. Quality assurance is to make testing and development processes better so that errors don't appear throughout the product's development. Because prevention is always preferable to treatment, Nestle places a higher priority on quality assurance than quality control.

Nestle's name is a pledge to the buyer that the product has the greatest possible quality and safety everywhere in the world. Consumer quality and safety are Nestle's main priorities.

In line with the Good Food, Good Life Company Nestle Unleash the power of food to improve everyone's quality of life now and for future generations. The Quality Assurance department at Nestle Bangladesh Ltd. in Sreepur is one of the most promising departments. Their aim is to guarantee client pleasure as well as good production or output quality. Every Nestle employee is committed to upholding high standards of quality for clients and consumers. The company's goal is for everyone at Nestlé to achieve Zero Defects and No Waste. To assure their commitment, Nestle has various quality policies. People choose Nestlé products to meet their everyday needs for nutrition, health, and well-being needs because of Nestle's reputation for continuously producing high-quality goods.

2.1 Nestle Quality Policy-

For Nestle to achieve their quality goals, cooperation, involvement, ownership, and support from everyone are essential. Nestle's Quality Policy basically consists of four components-

1. **Product safety and full compliance:** Nestle guarantees product safety and full compliance by respecting their policy, principles and standards with full transparency.
2. **Preference and consistency:** Nestle ensures and enhances preferences and consistency to delight individual and families by valuing what they value and by offering products and services that always meet or exceed their expectations.
3. **Zero defects, No waste:** strives for Zero defects, No waste by constantly looking for opportunities to apply their continuously improvement approach to deliver competitive advantage.
4. **Everyone's Commitment:** Engage everyone's commitment across Nestle's complete value chain and at all levels of their organization to build the Nestle Quality mind-set.

Each and every one of them has the power to influence the Quality and trust through their dedication, leadership and passion.

2.2 Good Manufacturing Practice (GMP)-

Nestle uses good manufacturing practices to guarantee the quality and safety of its products. Standard operating procedures, human resource management, training, equipment maintenance, and material handling are all covered by GMP in the manufacturing industry. Nestle's GMP focuses on a few categories:

- 1) **People:** Human resources are the cornerstone of any successful GMP program. The people working on the factory floor cannot implement process and procedure correctly or efficiently if they are not adequately taught. Each and every employee at the Nestle Bangladesh Ltd. Sreepur factory who is in charge of operating the machinery is thoroughly trained, and their training is evaluated on a time-by-time basis.
- 2) **Sanitation & Hygiene:** Without sufficient sanitation and hygienic procedures, process execution or good manufacturing are pointless. Regular cleaning of all machinery and manufacturing areas is essential to maintaining proper hygiene.
- 3) **Equipment** - Validation and calibration are required for all machinery and equipment. For cleaning and maintenance, there should be processes, timetables, and records in place.
- 4) **Documentation** - The GMP process refers to the records that demonstrate that protocols are followed. Audits will examine the documentation to confirm that GMP processes are effectively followed.

2.3 Food Safety-

At Nestle, they apply data management approaches to assess and address Potential Hazards. To control Food Safety and for hazard control Nestle establish some category such as-

1. **Zoning-** Nestle Divided their production area into 3 types of areas such as-
 - High Hygiene maintain zone(IF- Infant Formula plant, cereal plant, coffee plant, ppp plant)
 - Medium Hygiene maintain zone (Noodles plant, Soup plant)
 - Basic Hygiene maintain zone (corridor area)

In the high hygiene zone area air pressure is higher than other zone areas which is 10 millibar. This is done for maintaining positive pressure in this particular area so that no bad air can center in that zone.

2. **Pathogen Monitoring-**
3. **Cleaning and Cleanliness-**

4. Good House Keeping-

5. **Pest management-** To control pest In Nestle Bangladesh Sreepur factory , they divided total factory area in 3 lines-

- ✓ **1st line** - basically refers to the outside of the production plant. In outside area to maintain pest, food safety management establish 2 kind of traps which is Rat traps & Snake traps(in snake trap carbolic acid is used)
- ✓ **2nd line-** it refers to the corridor area of the production plant. In this area food safety responsible person establish RBS (Roda box station)and sometimes do spray on some corners for kill insects like cockroaches, fly, spiders etc)
- ✓ **3rd line-** it refers to the production line. In this area on some specific corners there are GB (Glue Board), P.F.(pest flasher), F.C. (Fly catcher) and P.T. (pramon trap).

2.4 HACCP (Hazard Analysis Critical Control Point) -

HACCP is a methodical, preventive approach to food safety that guards against various production-related risks that could make the final product dangerous. The entire production process is covered, from raw materials to distribution and consumption. External certification agencies check Nestle's HACCP plans and processes against ISO 22000. Building HACCP plans is a collaborative effort between the departments of engineering, quality assurance, research and development, and production. There are seven steps in HACCP -

- Hazard Analysis
- Identifications of Critical Control Point (CCP)
- Establishment of Critical limits
- Monitoring procedure
- Corrective actions
- Verification procedure
- Documentation & record keeping

2.4.1 Five types of hazard would be identify during manufacturing which is-

- I. **Physical Hazard** (parts of machine, hair, any kind of foreign body)
- II. **Chemical Hazard** (cleaning agent, heavy metals etc)
- III. **Microbial Hazard** (different microorganism from air. Water or human body)
- IV. **Pathogen**
- V. **Nutritional Hazard** (Different allergenic substance)

2.5 Quality Monitoring Scheme (QMS)

The majority of the quality control program is based on Nestle internal guidelines. Indeed, every product is subject to a framework of quality control. Quality planning is how the Quality Monitoring System is defined by ISO 9001. Nestle To access the product, determine who will use it, where it will be used, and how, a quality monitoring document is required. Nestle's Quality Monitoring Scheme is used to ensure that the company's products comply with all applicable laws and standards as well as to take corrective action when there are issues with the products. There are primarily three types of quality monitoring programs at Nestle, including:

- Process QMS
- Raw Material QMS
- Finish product QMS

During engaged with QA, I was assigned with QA laboratory. The lab has accreditation from different governing bodies such as - BAB(Bangladesh Accreditation Board), Nestle Internal Body NQAC (Nestle Quality Assurance Center).

CHAPTER 3

Quality Assurance Laboratory

3.1 About Laboratory-

The Official name of the QA lab is Nestle Sreepur QA lab. Nestle Sreepur QA lab performs analysis on finished products manufactured by Nestle sreepur factory and also raw material packaging those are used for manufacturing of the products. Nestle Sreepur QA lab also do microbiological analysis and environmental sample which is taken from the production area.

Nestle Sreepur QA lab Quality management system is process based. Each procedure has an owner responsible for implementing and monitoring. **Nestle Sreepur QA lab has 2 sections** for analysis which is Chemical & Microbiology. Nestle Sreepur QA lab management considers its staff as its most important asset. All equipment of Nestle Sreepur QA lab is calibrated and all method are validated. The Lab has robust documentation and data management system.

3.1.1 Main Functions Of Nestle Sreepur QA lab-

- ✓ **3.1.1.1 Analytical service:** Analytical services are also provided to other supporting units of Nestle Bangladesh Ltd which is Application group, production group, supply chain, vendor development etc.

- ✓ **3.1.1.2 Expert Service:** To provide expert services to customers on food safety and Quality.

3.2 Scope Of Testing & Matrix:

Baby Cereals, Drinks—Instant Coffee, Powdered Beverages, Culinary Products—Noodles, Soup, Taste Maker, Seasoning Mix, Dairy Products, Water, Raw Materials, etc.—are the key areas of examination for Nestle Sreepur's QA lab.

For successful analysis, the Nestle Sreepur QA lab has a variety of contemporary tools, including a potentiometer, digital water bath, centrifuge, muffle furnace, balance machine, NIR machine, and atomic absorption Spectrophotometer (AAS).

A number of lab rooms, including the Chemical lab, Microbiology lab, Sensory lab, Packaging lab, and Waste Water lab, make up the Nestle Sreepur QA lab. Analysts are obeyed and keep local and international standards up to date. Nestle created a paper called LI (laboratory Instruction) to make sure their analysts could understand all of the criteria by using simple language.

3.3 Chemical Laboratory:

Various analysis such as protein, Ash, Vitamin-c, iron, Fat, moisture, Calcium etc are analyzed in the chemical lab. In Chemical lab there are several room which is used in different work. Rooms are-

- ✓ **Oven Room-** In this room there are 4 working oven and 1 refrigerator.
- ✓ **Data entry and sample reception room-** used for update their daily or time to time analysis record in SAP(System Application Program).
- ✓ **Fume Hood-** In Fume Hood room samples are prepared for different analysis. Hume Hood basically helps to prevent hazardous substance and exhausting chemical odours.
- ✓ **Mineral Analysis lab-** In this room, responsible analyst do iron test & fat test by AAS machine (Atomic Absorption Spectrophotometer) and NIR (Near Infrared Spectrometer).

3.4 Microbiology Laboratory:

Microorganisms will grow very rapidly under optimum internal and external conditions of food products which results in food spoilage and degradation of foods. Since Nestle considers their Customer as a top priority they do several type of microbial tests on their finish products so that they can ensure highest level of food safety.

In the Microbiological lab, there are several different rooms for different works. There are Incubator room, Media preparation and storage room, decontamination room, microbiology analysis room and data entry room. In Microbiology lab analyst do below-

TPC - Total plate Count

TYMC - Total Yeast mold Count

E.Coli - Coli form

Staphylococcus- S. Aureus

EB - Enterobacteriaceae

Bacillus cereus

Lacto Bacillus

3.4.1 Incubator Room- 5 controllable incubators are there for microbial growth of 37°C.

3.4.2 Microbiology Analysis Room and Data Entry Room- In this room, there are Laminar air flow, Bio-safety cabinet, weighing hood and refrigerator. In weighing hood responsible analyst weight the testing sample then prepare the sample in laminar air flow. Laminar air flow is provided to prevent decontamination. Bio-safety Cabinet creates inflow and down-flow of air that provides protection of sample from cross contamination.

3.4.3 Media preparation & storage Room- Microbiological waste are treated here. Medium is prepared under 121°C for 15 min at 15 psi.

3.4.4 Decontamination Room- After media preparation is done. Treatment wastage is not releases in nature.

3.5 Sensory Lab:

In the Sensory lab, they arrange a testing session on a daily basis. Some approved panelists have the right to check the product and they are trained product wise. Panelists are done sensory testing on three types of products such as- Raw material, HULL (Intermediate Products) and Finished products. They mainly check products color, texture, odors, taste, appearance.

Minimum of 4 persons from selected panelists must check products from a specific batch. 80% approved are needed for the release of that product.

3.5.1 Rules for panelist: Some Rules are need to follow by panelist before they do sensory test-

- The use of perfumes, strong smelling shower soaps, lipsticks and aftershave should be avoided.
- Taster should notify sensory coordinator if they fell sick or unable to attend the session. Food allergy can be developed by time. It is their responsibilities to inform sensory coordinator if they amplify any allergy.
- Panelist should avoid smoking before testing session or not to drink any tea or coffee, spicy foods or any kind of chewing gum. It might affect their sensory organ.

Keeping Quality also checked. After 6 months of a product being tested, end of shelf behavior and extension of shelf behavior is also checked.

3.5.2 For Raw material Testing the below flow chart is followed-

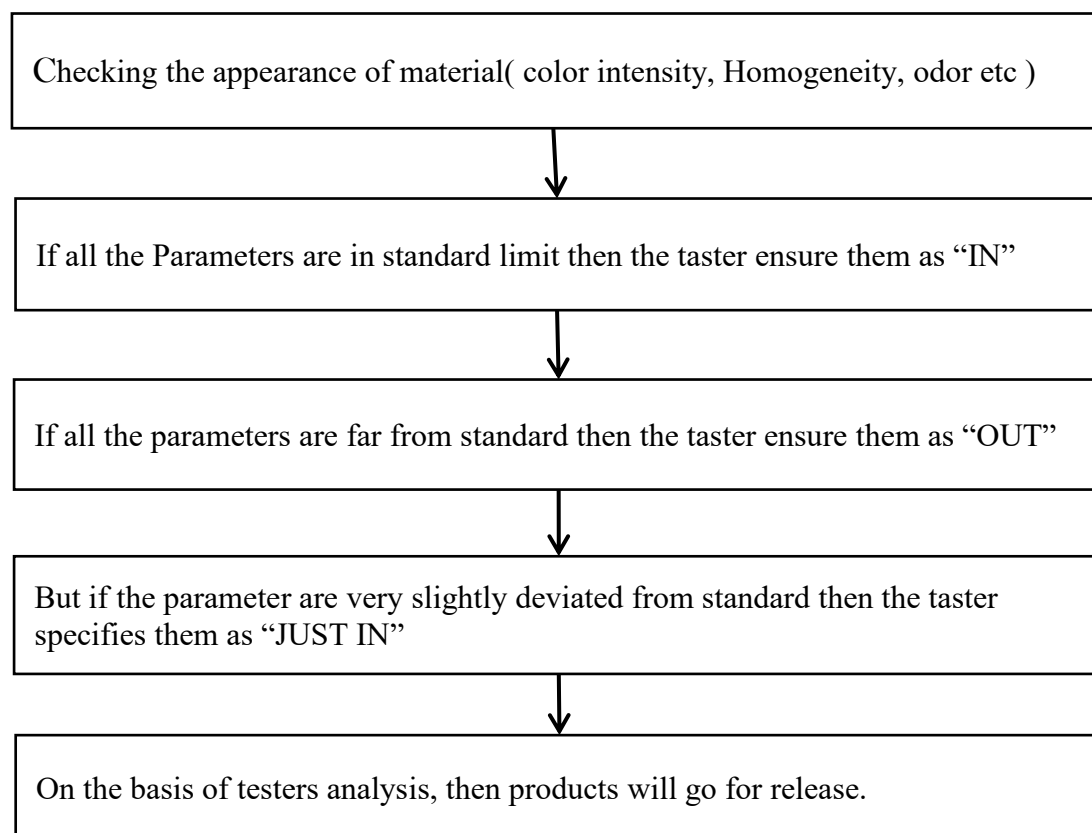


Figure 2: Raw material testing flow chart

3.5.3 For Finished Product Testing the below flow chart is followed-

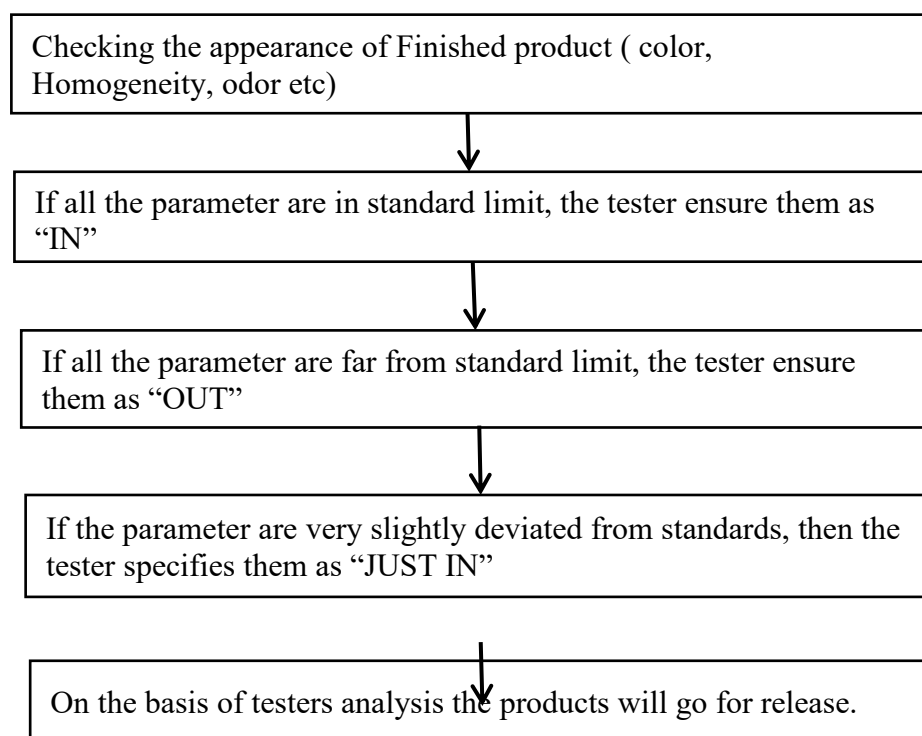


Figure 3: Finished product testing flow chart

In sensory Lab for daily basis testing lab assistant check some parameter such as-

- ✓ Weight the product and record it in ICP (Internal control plan)
- ✓ Oxygen checking for keeping the quality sample
- ✓ Organizing the separate samples for each category of product such as - culinary, milk cereals, Coffee & Beverages.
- ✓ Quality of water check and as well as conductivity too.
- ✓ Challenge test for approved sensory panelist.

3.6.Packaging Lab:

Nestle Sreepur QA lab also checks packaging material. Packaging is the most popular material needed to preserve Nestle's product. Nestle Bangladesh is more concerned and careful about selecting right vendors for its packaging materials. Based on the requirement, appropriate packaging material is utilized to help preserve the nutritional balance and also freshness of the products as Nestle offers all edible products in Bangladesh.

Some important information is given in packaging material such as nutritional information, net weight, product name how to prepare the product etc. Then the packaging material goes through the scanner machine. Scanner machine matches all the

information with standard artwork and identifies if any difference arises. In Packaging lab there are also one oven which is used for **sensory of packaging material**.

- First of all foil take into the oven at 40°C for 1 h. After 1 hour packaging material analysis by approved tester.
- They test the odor of packaging material, if any strong odor is present in the packaging material or any theleate tester ensure that material as “OUT”.

If packaging material release without sensory test , finished product can contaminated through packaging material.

3.7 NRT (Normal Temperature Room)-

Products store in NRT room for study of keeping quality trend until end of the shelf life. Products are store for 3months, 6 months or more than shelf life to understand the product quality. In NRT room raw material also keeps storing.

3.7.1 Raw Material Sampling:

In Nestle Bangladesh, different types of raw materials are used for different products. To the achieve best quality finished products, raw material handling need to complete properly. Nestle Bangladesh select some vendors for raw and packaging materials. They have total 60 vendors for their raw material. Raw material such as wheat flour, oil, sugar, spices etc. To release these raw materials, raw material coordinator follow the below flow chart-

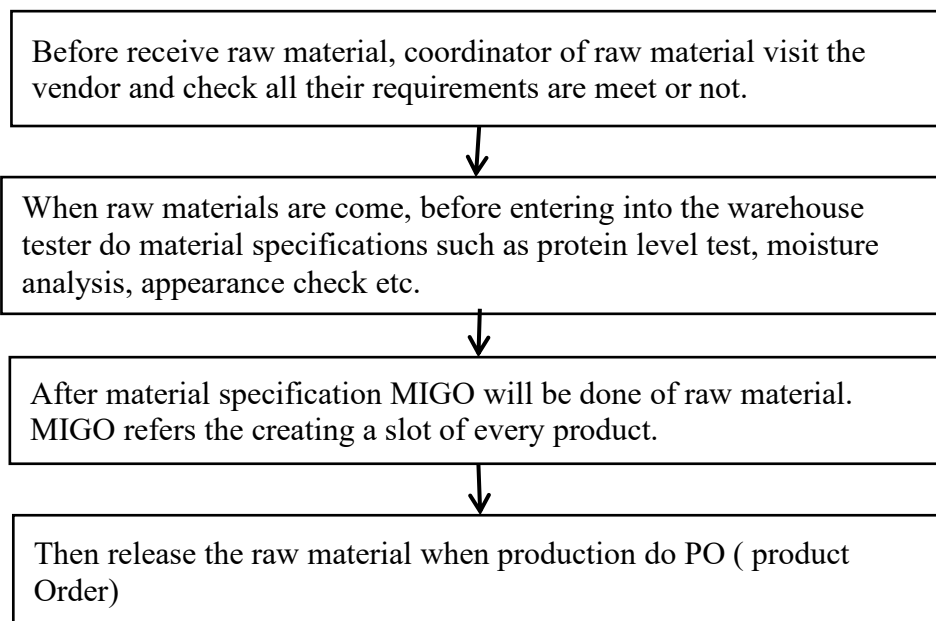


Figure 4: Raw material sampling flow chart

3.8 Consumer Complaint Management:

Nestle Bangladesh always gives their customer top priority. They accept their consumer complaint or suggestion in a respective way. Nestle Sreepur QA lab also manage Consumer Complaints. Nestle have Consumer service mailbox and center to connect with their consumer. If any complaints from consumers comes they follow the below steps-

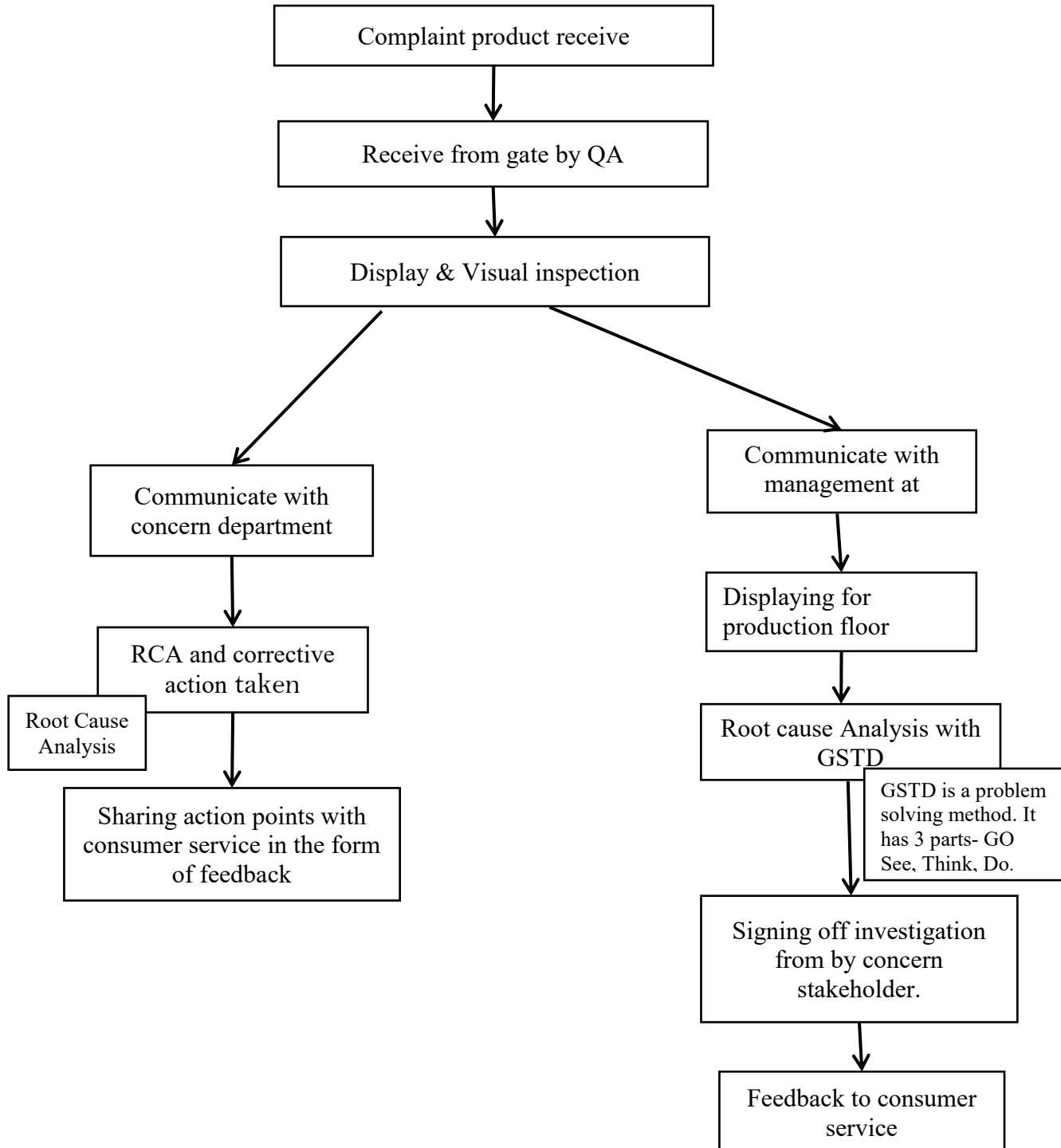


Figure 5: Consumer complaint handling flowchart

To satisfy their consumer Nestle has a 1:1 replacement policy. In this policy complaints products are replaced with new product. For Root cause analysis 5 why tools or fish bone analysis tools are used. Nestle always try to develop their works than previous works.

3.9 CAR-PAR Management-

Both the CORRECTIVE ACTION REPORT AND the PREVENTATIVE ACTION REPORT are mentioned. Together with ensuring product quality, the quality department also determines why, when, and by whom quality deviates. The most popular tool for this is CAR-PAR. The document's goal is to provide a standard operating procedure to complement their philosophy of "always pursuing zero defect and no waste attitude."

3.9.1 Scope of this management: it will applicable in all process line where deviation can occurs. It also included investigation how, why, where and by whom it is happened. Corrective action tools and monitoring of proper implementation also included.

3.9.2 Corrective Action:

It is eliminates the problem or decrease the problems which is arised. To implement corrective action first need to identify the problems or investigation the root cause After identify the problem SMART actions are taken as a corrective action.

3.9.3 Preventive Action:

preventive action takes to ensure that the same problem won't be repeat in future. After generate preventive action it also need to monitoring and validation that the preventive action is correct.

3.9.4 Procedure of CAR-PAR-

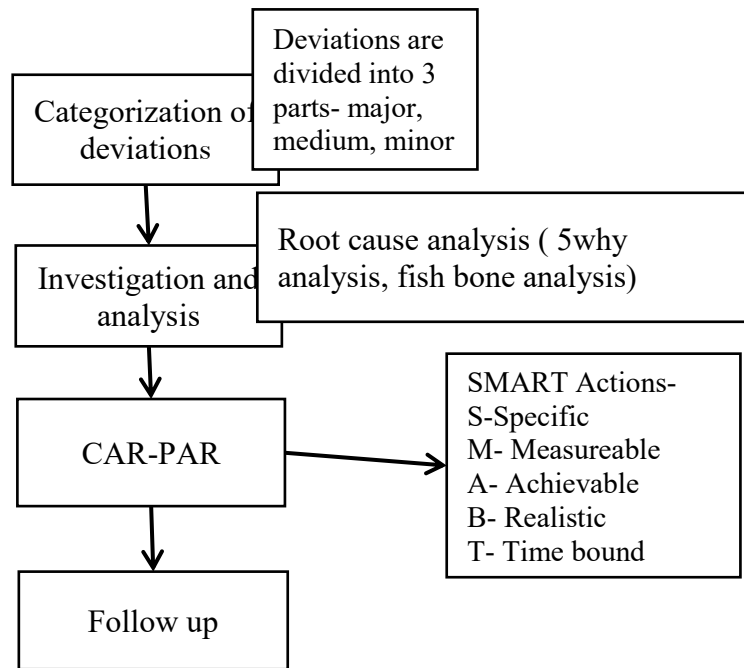


Figure 6: procedure of CAR PAR

3.10 Waste water lab-

Nestle Bangladesh also concerned about the environment. that's why they don't release any product waste or any treatment samples direct into the environment. They first treat it so that aquatic life don't hamper. In waste water lab analyst checked the BOD (Biological oxygen demand), COD (chemical Oxygen Demand), DO (Dissolve Oxygen), TDS (Total Dissolve Solid), TSS (Total Soluble solid).

There are three phase for treating waste water:

- ✓ Segregation of processed sewage waste and operation of STP
- ✓ Operation of MBR
- ✓ Operation of ETP RO

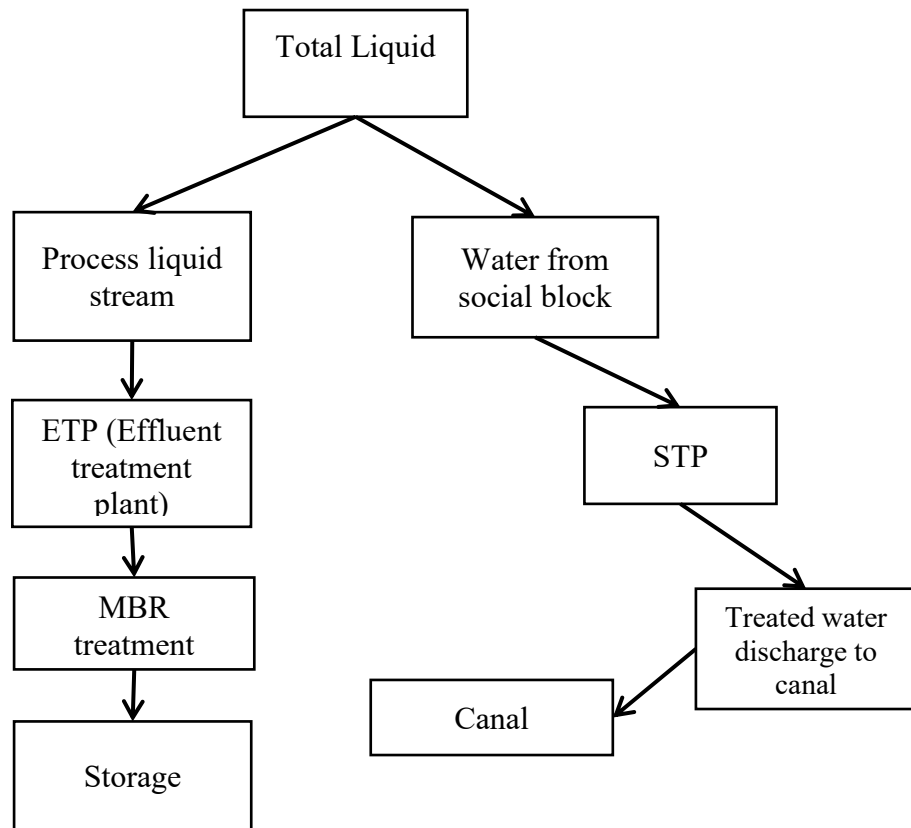


Figure 7: waste water treating procedure

CHAPTER 4

Production

Nestle Bangladesh has offered different types of food products and beverages. Nestle production line divided mainly in 2 parts-

1. Culinary and Beverages
2. Nutritional

In Nestle Sreepur factory below products are manufactured and produced-

- Noodles
- Taste Maker, Seasoning mix
- Maggi Soup
- Nescafe
- Cerelac (Cerelac 3 fruits, Cerelac 4 fruits, Cerelac chicken rice, Cerelac baby rice, Cerelac apple cherry, Cerelac Rice & Carrot, Cerelac Apple corn flakes etc)
- Nido (Nido1+, Nido3+, Nido fortigrow)
- Everyday
- IF- Infant Formula (Lactogen, NAN)

In every production line to manufacture product successfully each responsible person has knowledge about QMS (Quality monitoring scheme) and they follow it. In some production line such as IF plant, PPP plant, Cereal Plant they do sensory test for monitoring product quality. Total 2 CCPs and 81 OPRP are maintained to keep product safe.

4.1 Noodles Plant-

In Noodles production plant there are mainly 3 lines. Noodle line 3 is most consistent and efficient production line of noodles. In line 3 four, eight and twelve packs of noodles are produced.

4.1.1 Line-1: used for packaging 4,8,12 packs of noodles. Average speed of this line is 300 cakes/minutes.

4.1.2 Line-2:

Noodles line-2 mainly operate for single pack noodles packaging. It doesn't contain any pre-dryer and its speed is lower than other line. Average speed of line 2 is 150 cakes/minutes.

4.1.3 Line-3: Noodles line 3 is the most consistent line. Line 3 used for four, eight and twelve packs of noodles.

First wheat flour come through a pipe to a tipping hopper than it comes in dough mixer where it is mixed with a brine solution (which is called kansui solution) and water. After Mixing, it come through Dough feeder to sheeting roller. Sheeting Roller makes dough as two sheet and after that in combining roller two sheets are combine together and makes

one sheet. Dough sheet is go through a metal detector to reducing roller where sheet width is decrease and then sheet is go into Kiriha. Kiriha gives noodles its shape and it is consider as **the heart** of noodles plant. After that noodles cake in three line go through a wet steamer(100°C). Then noodle cakes go through cutter&folder and after that goes into pre-dryer which maintain temperature at 93°C.After that noodle go through fryer(122°C) to cooler and then final cake is ready. Final noodles cake go through Channelizer which has 3 lines and it is divided noodles cake into three lines. After that noodles go through over head conveyor to sachet dispenser to auto feeder. In auto feeder noodles cake and taste maker are come together then both are packed together. After primary packaging products goes for sealing to secondary packaging. Then final sealing is occurred and after that product packed in carton and goes in warehouse for store.

4.2 Maggi Soup:

Bulk of Maggi Soup is coming from Nestle Malaysia. In Nestle Sreepur factory Soup is mainly filling. For filling Maggi Soup Mungmun Machine are used. First of all bulk of soup are collected in a bag. Then manually bulk give into a hopper and then filling. After filling, sealing is happened and then packaging.

4.3 PPP Plant (Popularly Position product):

In this plant most various types of products are manufactured such as- Taste Maker, Shade a magic, Masala Blast, Fried Rice seasoning etc. On the basis of products different types of spices or raw material used which is come from different vendor.

4.3.1 Noodles Taste Maker:

For taste maker mixing different type of spices are used. After mixing when bulk are ready then it goes for packaging. For Packaging Bulk is brought inside a big hopper then filling is occurs by high speed TOPACK and KOMATSU machine. Inside the machine there are discharge plate, bush, upper chute, lower chute etc. Then the chain of product is passed through 3 rollers and collected it .

4.3.2 Shade-E-Magic(4g):

Shade-E-Magic Spices Mixing steps are same as noodles taste maker. After mixing all the ingredients in a mixer it is come into a hopper and after that bulk is collected in a big bag. Shade-E-magic Filling occurs by High speed TOPACK machine.

4.4 Cereal Plant: Cereal plant mainly divided into six areas:

- ✓ Rice milling area
- ✓ Dry Tipping area
- ✓ Z-L Area
- ✓ Roller dryer area
- ✓ Dry mixing area
- ✓ Dry filling & packaging area

In Cereal plant various types of Cerelacs are produced such as Cerelac 3 fruits, Cerelac 4 fruits, Cerelac chicken rice etc. For different types of cerelacs different ingredients are used. Some ingredients are MSK, Crunches(carrot,corn,potato,straw-berry etc), probiotics, vitamin, rice flour etc.

In rice milling area, First of all rice is tipped through sieve(it has 2 layers. First layer is 15mm and second one is 4 mm). Then rice is go through the screw conveyor to star valve. Star valve transfer the bulk to KASAR (560 rpm)which is mainly a crusher. Transfer from star valve to Kasar metal detecting is done by magnet. After that bulk is go through to a Jet filler hopper and passes from a star valve and then finally the powder of rice is collected in a 20kg big bag.

After collecting the flour it is go to the **Z-L area**. Wet mixing is done there. At Z-L area, in tipping hopper according to recipe all ingredients are tipped and there is a sieve where if any lump greater than 4 mm are stucked. After that in rotary shifter room bulk is gone through a star valve to magnet than 2 mm sieve and after that in a hopper. Then bulk is again go through a star valve and magnet. After that bulk is passed into a wet mixer where liquids such as enzyme, water, juice, oil etc are added. After mixing, bulk is released by a gate valve to the balance tank. Bulk is go through a magnet to the cold soup pump where Milk and Steam come from two pipes which is called DSI 1-75-80°C (Direct Steam Injection) process. After that bulk go into a hydrolyzer tank (250L) and then into a Hot CHE pump. Here DSI 2 (132-135°C) is used for high pressure steam. By flow pump bulk goes into a pasteurizer tank. There is a CPM valve, Deviation valve etc. Deviation valve gives alarm when the soup temperature rises to 121°C. It will stop the line below 121°C. Then bulk goes to dry roller dryer area through hot soup pump.

4.4.1 Roller Dryer Area: In roller dryer area there are 2 roller dryer(180°C). In these dryer thin solid film of cerelac is created. With the help of vaccum pump it absorbs the vapor of hot soup pump. There is a sharp knife for smoothing the film. Then film cooling blower cool the film and by screw conveyor the film is grinded as a powder and pass through a star valve to silo hopper(500L). After that bulk is passed through a star valve, a 2mm guda sieve and a metal detector to a sender hopper. By base powder vaccum pump it goes to the cyclo hopper. Then the base powder passes through a screw conveyor to the ribbon blender. In Ribon blender all ingredients(on the basis of products) are mixed properly and the mixing time is 10min. After that bulk is goes to the PTA hopper and then in dry filling area.

In dry filling area bulk is mainly filled and packed properly. In these area, there are 3 filling line are which is-

- **VIP 1 line-** In VIP 1 line bulk is fills with **Nichrome machine**. Products such as NIDO (1+,3+), Nestle Everyday are filled and packaged. For NIDO 1+ and 3+, base hopper fills with 770kg per bag of bulk. For ensure products quality or shelf life oxygen level 1.5% is maintained. After filling of a product oxygen level checked in a certain time by operator.

In VIP-1 after tipped products in hopper manually it goes through a metal detector to the filling hopper. The range of metal detector is 1.8mm. In filling hopper, there is N₂ gas filling line also with bulk. Product fills in Aluminum foil then sealing is done by 2 types of sealing(vertical and horizontal). After sealing, weight of product is checked manually in a certain time. Then product is go through a x-ray machine by this any type of unwanted things or hazards can detect. If any hazard will detect in product machine will discharge it in a waste bucket. After X-ray checking packaging is done and it is stored in warehouse.

- **VIP-2 line:** VIP 1 & VIP 2 line functions are same. But in VIP 2 line can operate in both manually or automatic way. Filling is done in VIP-2 line by **Wolf machine**. In this line cerelac filling & packaging products are done.

Different ranges vibratory sieve are used for different cereal products such as-

5mm vibratory sieve- Cerelac chicken rice, cerelac 4 fruits, cerelac Apple cherry, cerelac Carrot Chicken.

8mm vibratory sieve- Cerelac Apple Corn

15mm vibratory sieve- Cerelac MG chicken, cerelac 5 fruits.

Metal detector range of VIP 2 line is 1.2 mm.

- **CAN line-** Can product fills by **Indosa machine** IN this line all CAN cereal products such as NIDO, cerelac are filled and packaged. 25 kg bag of NIDO bulk tipped into tipping hopper. Then bulk go though vibratory sieve and metal detector to small hopper. Inside small hopper there a valve which can control the amount of bulk discharge. After discharge the necessary amount bulk is filled into tin can. Tin can comes from the other side conveyor line. After filling bulk goes through vibrator where products are set properly inside the can. Then weight of can measure manually by weight machine. Then product goes through the conveyor line to lid sealing area. After sealing CAN products goes for capping and then for coding. After coding can is packed in carton (12 can products packed in one carton).

4.5 IF Plant (Infant Formula Plant)-

Infant formula plant is the most high hygiene maintained plant in Nestle Sreepur Factory. As Nestle claims the best quality products, they maintained it so well.

In Infant formula there are mainly three elements which is essential and healthier for baby.. Elements are-

- ✓ Base powder
- ✓ Trace elements
- ✓ Probiotics

In IF plant there are 3 big hopper. One for base powder,one for probiotics and one for trace elements. Base powder boss pack which is hanging by chain hoist tipped into a big hopper. The capacity of big hopper is 950kg. After that base powder go through vibratory sieve which is 2mm, metal detector to mixer. For adding Probiotic, Probiotic boss pack tipped into probiotic hopper. Then it goes by screw feeder to mixer. Before go to the mixer probiotic bulk go through vibratory sieve and metal detector which is rotary

magnet and for adding trace elements, boss pack of trace elements tipped into hopper. Then bulk goes to screw feeder than vibratory sieve than metal detector to mixer. All elements are mixed properly for 120 sec in 50hrz and after that mixing bulk is go into mixer bottom hopper. From bottom hopper bulk is go through by 2 mm vibratory sieve, metal detector and connecting pipe to Chute. In chute foil are enters into rollers and code is printed in the filled bulk. After filling, sealing is done by 2 types of sealer those are vertical and horizontal sealer and by cutter cutting is done. Then product is goes through a automatic weight checker which has monitoring system also. If any product is overweight than standard or less weight, than weight checker will release it in a waste bucket. After weight checker product is go through by conveyor to BIB packaging. In BIB box, by automatic spoon machine spoon is added into the box then again sealed the secondary packaging with glue. Then product goes through a X-ray machine for checking any unwanted things happen or not. After that product is go for Cartoning and finally after that products goes in warehouse.

4.5.1 CAN Filling-

Mixer procedure is same for both Packaging material. After mixing bulk is goes into mixer bottom hopper. In mixer bottom hopper there is vibratory sieve and a valve. Valve can control the necessary amount. Valve releases the necessary amount and then filling is occurred.

After release bulk goes for filling. From other outer-side empty canes are comes through conveyor line. Before entering into the filling room empty CAN's are checking through Scanning which is called ECI Analysis. Then can is filled with necessary amount of bulk and then goes for sealing which is called Rotary lid sealing. After sealing CAN product goes for coding and then X-Ray machine for checking (Any foreign body is present or not). Through automatic capping machine CAN's are capped and then goes through another X-Ray machine for packaging information checking. Then finally product goes for cartoning, sealed.

4.6 Coffee Plant-

In Nestle sreepur factory production plant coffee mainly fills and pack here. Different weight base packaging are done here. Nescafe 3in1 mix(3kg, 3gm), Nescafe classic 1kg, 1.5kg

4.6.1 Nescafe 3in1 Manufacturing:

For making Nescafe 3in1 all raw material are mixed manually. Mixer machine is called manual mix All materials for Nescafe mixing are weighting separately and preparing 1 batch for 250 kg. After weighting bulk is tipped into tipping hopper manually. Then bulk goes for mixing where it is mixed for 10 min in horizontal trough mixer. After mixing, powder go through screw conveyor and metal detector. Then manufactured product is collected and store in a bag.

4.6.2 Nescafe 3in1 (3g):

25 kg coffee mix big bag is lifted by scissor lifter and hanging by chain host. 3in1 mixer 3g filled by MESPAC machine. Hanging bulk tipped into tipping hopper. Then bulk go through rotary sieve to weighting hopper. Weighting hopper weight the necessary amount and rest of the bulk store in hopper until next filling. Weighting hopper than discharge the

necessary amount. Mespac machine sensors sense the bulk and send it to cyclo hopper. Bulk then go through metal detector to filling. Filling is done by auger system. Foil packaging is used and code printing also done at that stage. The foil is cut into 10 lines to fill 10 sachets at a time. After filling and sealing then coffee pack go through conveyor and X-ray machine. Then sachet packaged in carton box and sealed.

4.6.3 Nescafe Classic(1kg BIB):

Nescafe Classic of BIB packaging is filled by vendor machine. Steps are mentioned below:

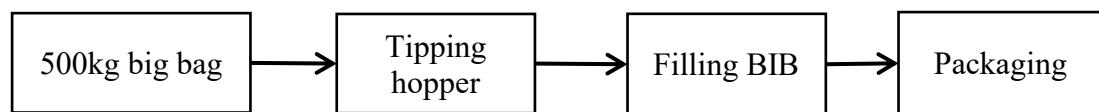


Figure 8: Nescafe Classic (1kg BIB) packaging procedure

500 kg big bag of coffee mixing is hanging by a chain hoist and then tipped into a tipping hopper. Inside tipping hopper there is valve which can control the amount of valve. 1kg amount of bulk goes into small hopper. After that manually filled the product and weight the product for checking. After that sealing and coding are done manually. 16 packs of Nescafe classic is packed in a carton and stored in warehouse.

4.6.4 Nescafe Classic (1.5g):

Nescafe classic 1.5g is filled by high speed TWOPACK machine. Steps are given below:

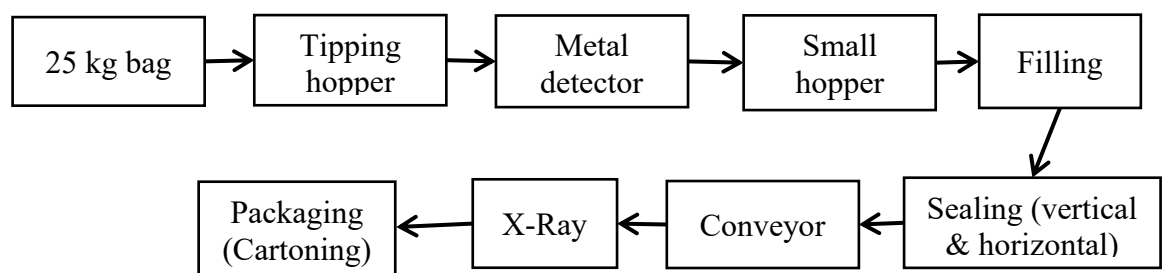


Figure 9: Nescafe Classic (1.5g) packaging procedure

25 kg of bulk bag is tipped into tipping hopper. Tipping process is done by chain hoist. Tipping hopper discharge the bulk and then go through metal detector for filling. Inside the Twopack machine there is a brush and funnel. Brush determine the amount of bulk going to funnel. There are 25 cups through which bulk is discharged. 750mm foil is used for sachet filling. Foil comes from chute where coding also done. After coding and filling, sealing is done by vertical and horizontal sealing. Then sachet products go through conveyor to X-ray machine. Then products goes for Cartoning and final sealing.

CHAPTER 5

PROJECT

5.1 An approach to decrease the cereal bulk loss.

Cereal plant of Nestle Sreepur factory is most effective plant. Bulk loss of this plant is huge loss for the company. For reducing bulk loss I would like to share an approach.

Some causes are identified for bulk loss such as-

- I. Overfilling (intentionally or unintentionally)
- II. For QA lab sampling
- III. O2 testing sample
- IV. Underweight
- V. Cleaning wastage.
- VI. Floor wastage

I have observed seven days production of cereal plant and loss amount:

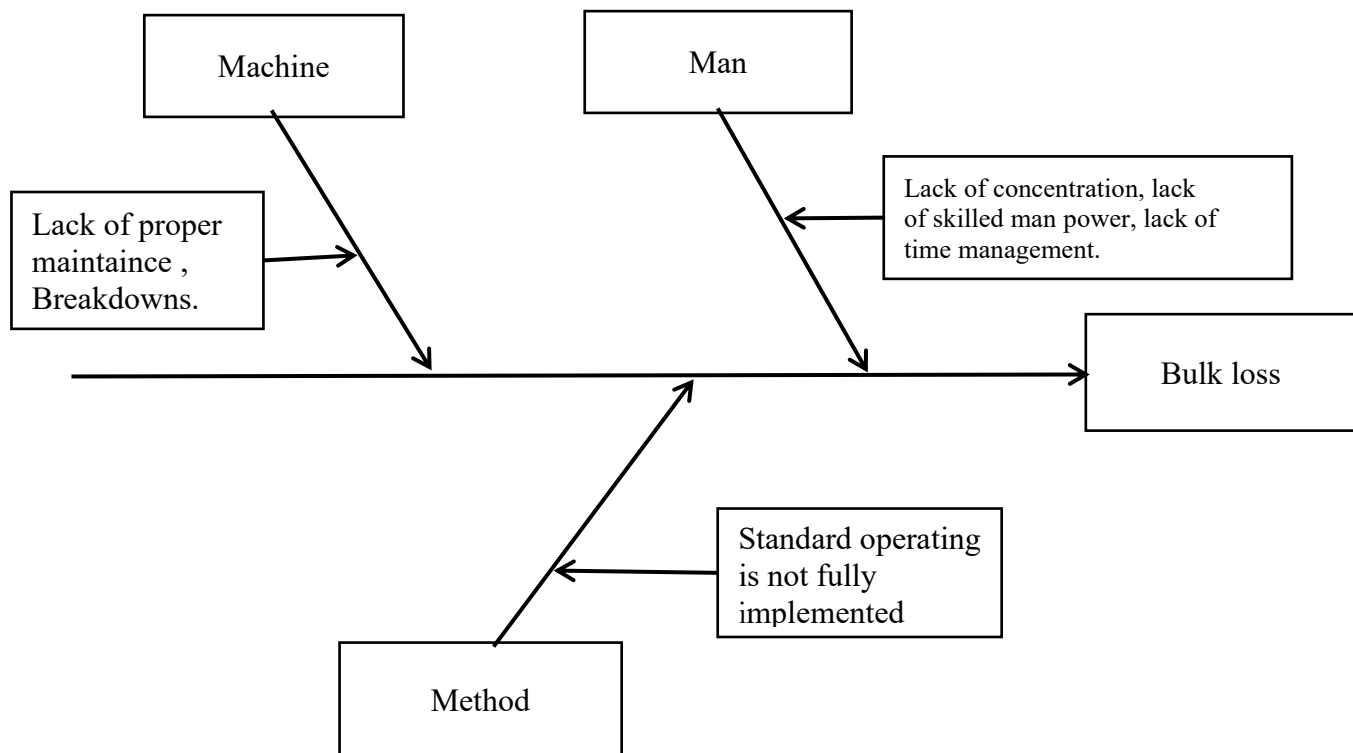


Figure 10: Fishbone diagram of bulk loss

5.2 How to overcome the loss-

5.2.1 Man Power: Need to give proper training about method and time management. They should give proper concentration during their work. Proper timing of operating machine and need to execute trained staff in line. While tipping bulk manually, staff shouldn't be in a hurry.

5.2.2 Machine: Proper maintenance is important for production machines. CAN sealing machines needs proper maintenance. otherwise it is time consuming. Weekly basis maintenance of machine need to be implemented.

5.2.3 Method: It would be more convenient if an automatic tipping procedure is implemented for mixing nutrients in cereal plant. CAN filling area of cereal plant need to more improvement otherwise it is causing more breakdown during packaging and have chance to contamination by some parts of machine parts.

I think by focusing on these categories bulk loss would decrease. If the machinery of the plant is improved, cleaning and floor waste are automatically decrease.

CHAPTER 6

Conclusion

Being a small part of this prestigious company has enabled me to gain my first real life working experience in a friendly environment. I have learned lots of things: process of production plant (Noodles, PPP plant, Maggi Soup, IF plant, Cereal and coffee plant), gained more knowledge about quality assurance, how all works are maintained. Internship in Nestle Bangladesh Ltd is one of the greatest opportunities I ever have. I am lucky to observe the way of working in NBL. It's increase my desire for learning new things. I feel very captivate about my overall experience of Nestle Bangladesh Ltd.