Meat and Meat Product Processing

Level-III

Module Title: - Operating Blood Processing Plant and process blood meal

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LG #75	Lo #1- process blood meal

Instruction sheet

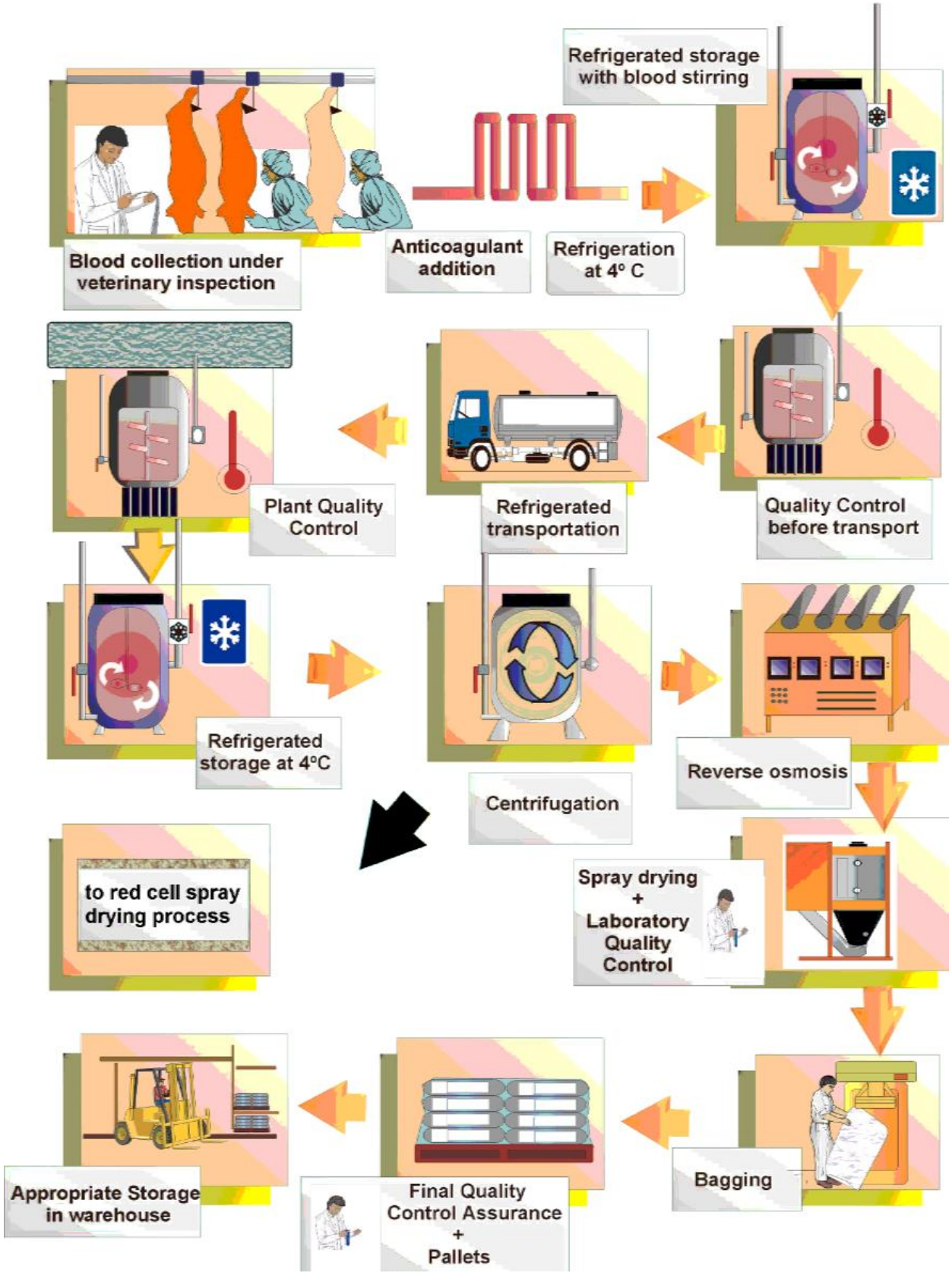
Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Work instructions for processing blood are followed. • Blood from slaughter floor is pumped into feeder tanks and the quality monitored. • Coagulation of blood is monitored. • Blood is dried and temperature is monitored. • Blood meal is monitored for quality. • Blood meal samples are taken for analysis. • Flow of blood for processing is regulated according to work instructions
Learning Instructions:
1) Read the specific objectives of this Learning Guide. 2) Follow the instructions described below. Read the information written in the information Sheets 3) Accomplish the Self-checks 4) Perform Operation Sheets Do the “LAP test”

Information Sheet 1- Following work instructions for processing blood

1.1 Following work instructions for processing blood

Blood processing system blood collected for blood processing tends to be collected more carefully and hygienically than that destined for rendering, so less may contaminate the waste water at the bleeding stage of the process. Less stringent hygiene requirements apply to blood which can be rendered, so if it is collected from floors, the floors have to be washed and the waste water volume and contamination are consequently increased. Hollow knives used to collect blood for food or pharmaceutical use reduce spillage, but the back-pressure they cause means that they also capture less blood than when an animal's throat is cut and natural bleeding occurs.

At the slaughterhouse, following hoisting, the stunned beast is stuck with a sticking knife at the lower end of the neck. This severs the major blood vessels, including at least one of the carotid arteries and jugular veins. Blood gushes from the stick hole to drain into a tank, canal or collection trough that receives the blood from multiple animals. For the collection of blood for the preparation of spray dried plasma, it should not be allowed to clot. To prevent this, blood is mixed with a solution of sodium citrate and/or sodium phosphate. Collections can be made singly but this is generally not practical for large numbers of animals. Thus it is usually pooled at the point of collection.


Refrigerated storage with blood stirring
Blood collection under veterinary inspection
Anticoagulant addition
Refrigeration at 4° C
Plant Quality Control
Refrigerated transportation
Quality Control before transport
Refrigerated storage at 4°C
Centrifugation
Reverse osmosis
to red cell spray drying process
Spray drying + Laboratory Quality Control
Appropriate Storage in warehouse
Final Quality Control Assurance + Pallets
Bagging

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____used throughout blood processing plant

A.vacuum drier

B. vacuum evaporation

C.referigeation

D.all

2. From the given choose which one is importance of blood processing.

A.sodium salphate

B.potasium salphate

C.a$b

Information Sheet 2- Pumping blood from slaughter.

2.1 Introduction

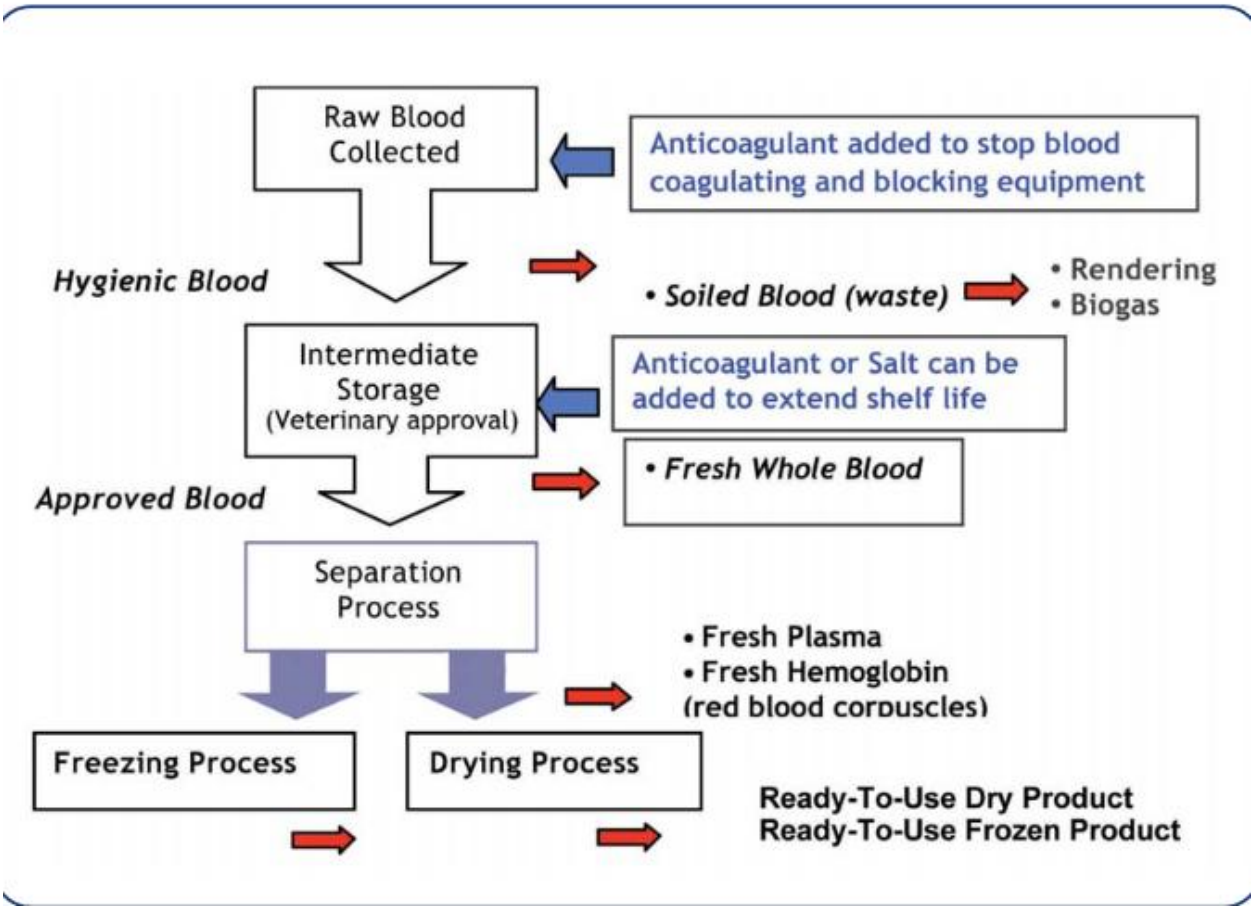
Blood collection companies prefer daily blood collections but a minimum collection of at least once per week (old blood can have an offensive odour, and is nearly impossible or very expensive to process). Blood collection companies have different methods of collection, according to the amount of blood being generated. The various categories of plant are listed below: Small plants are less than 3m3per week medium plants are greater than 3m3but less than 10m3per week. Large plants are greater than 10m3per week Small Plants The use of a 1000 litre Intermediate Bulk Container (IBC) is the most cost effective option. The tank can be located on the “dirty” side of the plant and stands are available which include a “bund” to safeguard against spillage due to a faulty IBC or leaking connections. Two collection schemes are proposed.

The tanks will be emptied by a “milk round” tanker fitted with a hose and a vacuum pump. The exhaust from this pump will be passed through a charcoal filter to reduce odour pollution and this filter would be located at the slaughterhouse next to the tanks would be collected full and taken to the blood processing facility. Cleaned IBC tanks would be supplied on an exchange basis. (NB Ensure fitted connections are compatible with blood collection contractor. Medium and Large Plants the use of storage tanks emptied on a milk round basis is the most appropriate method.

The tank would need to be located in a position so that articulated vehicles can gain access with minimal amounts of pipe work (10m).For larger permanent installations you should contact your local Council to check if Planning and Building Regulation approval is required. An Environmental Impact Assessment may also be required as part of the Planning application.Most bulk vacuum collection tankers in the industry are about 27 tonne capacity and you should discuss the size of your storage tank with your blood collection contractor.For all plant sizes it is important to talk to your blood collection contractor about tank sizes and to ensure compatible connections are fitted. It will be necessary to add preservatives to the tank, e.g. Sodium meta bisulphite, particularly in warm weather, and your blood collection contractor will be able to give details or supply the preservative. To reduce odour pollution

the exhaust from all pumps should be passed through a charcoal filter. Again your blood collection contractor will be able to provide advice on types and suppliers.

Processing of blood for human consumption



Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1.which one of the following is the purpose of sodium salphate

A. to prevent coagulate of blood
B. anti-coagulant of blood
C. coagulant of blood
D. .A and B

Information Sheet 3- Coagulation of blood is monitored

3.1 introduction

Blood coagulation is a critical step of hemostasis. The coagulation cascade is a complicated process, during which blood coagulation is achieved through extrinsic pathway (begins with trauma to vascular wall and surrounding tissues), intrinsic pathway (begins in the blood), and common pathway (merged pathway) for clot formation.

Blood processing uses blood from animals which have been passed fit for human consumption. The blood is collected from multiple animals and stored in a holding vessel where, to prevent clotting, it is mixed with a solution of sodium citrate and/or sodium phosphate. The blood if filtered at the slaughterhouse and at the processing plant to remove gross particles. Following filtration it is centrifuged to separate plasma from the blood cells. The plasma yield is collected in a refrigerated stainless steel storage tank and refrigerated at 4oc. The plasma is then machine homogenised and pressurised, in preparation for spray drying. Alternatively, the plasma may be concentrated by vacuum evaporation, i.e. the removal of water under vacuum at <40oc. Once the plasma has undergone the drying procedure it is then bagged and stored. The red blood cell fraction is pumped under high pressure; spray dried, bagged and stored in a similar manner to that for plasma, except that as the red cell fraction already comprises 30%solids, it is not necessary to concentrate it prior to drying.

A. Plasma production

The plasma yield is collected in a refrigerated stainless steel storage tank and chilled to 4 °C. At this point the plasma from various sources is allowed to mix in the storage tank. One tank may hold the blood from 1500 - 8000 pigs or 350 - 750 adult cattle. Cattle and pig plasma may be mixed.

The plasma received from the slaughterhouse contains approximately 8 % solids. These are removed by reverse osmosis and/or nano-filtration. This also concentrates the plasma, removing water and minerals, as well as the anticoagulant. The filters remove particles down to a 1 nm diameter. The purified plasma is then machine-homogenised and pressurised, in

preparation for spray drying. Alternatively, the plasma may be concentrated by vacuum evaporation. This technique involves the removal of the water from the plasma, under vacuum at < 40 °C.

The spray drying involves the injection of the plasma into a heated drying chamber, at high pressure to form very fine droplets of 10 - 200 µm diameter, using a high-pressure nozzle. The type of nozzle used depends on the configuration of the drying chamber and on the flow of heated air. The drying chamber is the part of the system where the tiny plasma droplets contact the heated air and hence which the drying process takes place. When the droplets encounter a stream of heated air the moisture quickly evaporates to form a dry powder. It is important that the drops are uniformly sized and are produced at a consistent rate, so that all the particles are exposed to the same temperature conditions. Specially designed and engineered nozzles are used to achieve this. The air circulating through the drying chamber is atmospheric air, finely filtered and warmed by passing through a steam heater or an indirect gas heater. A centrifugal ventilator moves the heated air into the circulation system. The inlet temperature at one installation is reported to be 240 °C. The minimum contact time is 15 seconds at that same installation. It may be up to 30 seconds in other plants. The outlet temperature is 90 °C. The plasma fraction is then bagged and stored. It has a moisture content of < 10 %. It is used in pet food and piglet feed. Plasma can currently be used by the meat Industry, e.g. in cooked ham and cooked sausages and for pet food production.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____is the refrigerated temperature of plasma yield collected and store in stainless steel tank.

A. .4^{o}c
B. 5^{o}c
C. 15 ^{o}c
D. 20^{o}c
E. All

Information Sheet 4- Drying blood and monitoring temperature

4.1 Introduction

Animal and poultry blood from slaughter houses and poultry processing plants is efficiently dried without loss or destruction of the desirable protein and amino acids content and without creating pollution problems. In one embodiment, the raw blood is ground to break up gelatin-like globules, and masses of impurities such as hair, feathers, hide and the like, has the plasma coagulated at low temperatures, is next finely comminuted to form a free-flowing slurry and is then deposited onto the descending side of the top of a heated drier drum and formed into a film by one or more spreader rolls. In another embodiment, the raw blood is comminuted in a high speed hammer mill, screened, and fed to the drier drum, coagulated on top of the drum and formed into a film by the spreader rolls. The film is rapidly dried and scraped from the ascending side of the drum in the form of a dried sheet which can then either be flaked or pulverized to provide a high grade blood meal product. Liquid dripping from the drier drum is recirculate back to the drum in advance of the layer deposited from the main feed. Vapors above the drying cylinder are scrubbed before being released to the atmosphere and represent the only effluents from the process.

The method of drying animal and poultry blood from slaughter houses and poultry processing plants without destruction of blood solids or discharge of polluting effluents which comprises finely comminuting the raw blood to break up globules and solid masses there in, coagulating the plasma in the comminuted blood at low temperatures on top of a rotating drier drum heated to temperatures of about 250° - 350° f, pressing the coagulated blood on the drum to form a film on the drum surface of desired thickness, drying the film on the drum as it rotates with the drum, scraping the dried film from the drum, recirculating stick water draining from the drum back to the bare surface of the drum in advance of the blood being coagulated on the drum, and rotating the drum at a speed sufficient to keep the blood solids at temperatures insufficient to destroy the protein and amino acid content of the blood.

The method of drying animal and poultry blood from slaughter houses and poultry processing plants without destruction of blood solids or discharge of polluting effluents which comprises grinding the raw blood to break up globules and solid masses therein, injecting steam into the

ground blood to coagulate the blood plasma, maintaining the temperature of the blood being coagulated below about 150° f, finely comminuting the coagulated blood, spreading comminuted coagulated blood on top of a rotating drier drum heated at temperatures of about 250° - 350° f, pressing the spread layer of the comminuted coagulated deposited on top of the drum to form a film on the drum, drying the film on the drum, scraping the dried film from the drum, collecting stick water draining from the drum, spreading the stick water on the top of the drum in advance of the layer of comminuted coagulated blood deposited on top of the drum and rotating the drum at speeds sufficient to keep the blood film on the drum for less than about 2 minutes.

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ is the temperature of blood coagulated with live steam

A. below 140 degree faranite
B. below 150 degree faranite
C. Above 160 degee faranite
D. All

Information Sheet 5- Monitoring blood meal for quality

5.1 introduction

Blood meal is a dry product made from clean, fresh animal blood, exclusive of all extraneous materials. The most common blood meal is produced by spray-drying after an initial low-temperature vacuum evaporation has reduced the moisture content to about 70%. Other processes of drying blood include flash-drying and conventional drying in a cooker. Blood meal has a minimum protein content of 85% and a lysine content of 9–11%, with a lysine availability of over 80%.

The temperature of 5 ºc on its own seemed to be effective to microbiological Safety of blood within the first 48 h of storage, since the microbial counts did not enough to imperil the potential valorisation of this product. Taking into account the self-stability of blood within the first hours of storage at temperatures, and the fact that LAB prevented spoilage processes, not only at 5 ºc but also when blood was stored at 15 ºc, it could be stated that inoculation may be specially useful to prevent the development undesirable bacteria and the worsening, or even loss, of functional properties in the case of cold-chain breakdowns.

The strain PS99, identified as *E. Raffinosus*, was the best inhibitor in the preservation of blood, and its inoculation could be used as a feasible method of taking advantage of this abundant by-product.

Self-check 5	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ **a dry product made from clean, fresh animal blood, exclusive of all extraneous materials**

A. blood meal
B. blood product
C. raw blood
D. All

Information Sheet 6- Taking blood meal samples for analysis.

6.1 Introduction

Blood meal is hygroscopic which axiom that, control of moisture is mandatory and less than10-12 % moisture is allowed to prevent it from deterioration. The final moisture of the product was recorded 10.17%. TBC (Total Bacterial Count), TCC (Total Coli form Count), TFC (Total Fungi Count) were three different categories that microbial investigation were maneuvered. Blood meal Protein is suitable enough for proliferation of bacteria and fungi, which signify that huge amount of TBC and Coli form were grown but in result no TFC were found.

6.2 Blood collection:

Fresh blood was collected from a slaughter simply immediate after slaughtering. Care had taken, so that only clean blood be collected, where contamination with undigested food from the stomach can be prevented from grasping esophagus firmly at the moment of slaughtering.

To prevent clots of blood 0.2% citric acid was used as anticoagulant agent that was diluted with 2part water and must be kept in the container before blood was collected.

Centrifugation Blood consists of 60% plasma and 40% cells in volume also contain urine, ammonia and other undesirable ingredient along with protein. To separate the blood cell from plasma, blood was centrifuged in the centrifugal machine at 3000 rev/min with the time 15 minutes. Then the blood cell was collected from plasma.

Drying: Drying was an inevitable operation to dwindle the moisture level.The separated blood cell was desiccated in a vacuum drier, where vacuum was created by the vacuum suction pump & regulated air pressure was adjusted 0.06 Mpa. Initially the sample was dried at 50℃ for 3hours then examined by moisture analyzer and 39.36% moisture was found. Then temperature of the drier was adjusted at 60℃ and dried for 1.5hours to get the resultant moisture.

Culture Preparation: Bacterial strains inside the blood were cultured in solid Nutrient Agar media. NA media composition was as following: 0.5% peptone, 0.3% beef extract, 1.5% agar, 0.5% nacl. Ph was adjusted to 6.8.

Irradiation:

Irradiation was the most important step to remove pathogens that were grown in the blood meal. Electromagnetic gamma radiation, which was generated by the using of the Cobalt 60's isotope and this electromagnetic radiation were performed as irradiation with different level of dozes 2.5 kgy,5 kgy,7.5 kgy,10 kgy after packaging of the products and was involved any aseptic handling.

Self-check 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ Centrifugation Blood consists of

A. 60% plasma and 50% cells
B. 60% plasma and 40% cells
C. 70% plasma and 40% cells
D. 80% plasma and 40% cells
E. None

Information Sheet 7- Regulating flow of blood for processing.

Blood is a highly perishable product and must be processed as soon as possible slaughter. Blood meal can be prepared by a small-scale operation. Blood meal is hydroscopic and needs to be dried to less than 10-12% moisture and stored in a dry place in order for it not to deteriorate. There are different ways to prepare blood meal: solar drying, oven drying, drum drying, flash drying, and spray drying. The drying method is important because there is an inverse relationship between the amount of heat applied and protein digestibility. Particularly, lysine content and lysine availability decrease when the amount of heat increases. Overcooked blood meals are darker, due to the destruction of the hemoglobin, and less palatable.

A.Pre-treatment

Blood can be coagulated to aid in the removal of water by adding 1% unslaked or 3% slaked lime. However, this method of water removal increases the amount of dry matter losses by 10-15%, which includes many of the minerals.

In some situations, blood needs to be stored prior to being processed and dried. Raw blood can be stabilized and stored for one week by adding 0.7% sulphuric acid or an equivalent amount of another acid. A method for preparing blood meal by adding 3% sulphuric acid and storing for 72 h before sun-drying has been described .

The following are the different blood drying systems:

B. Solar and oven drying

Solar drying is well suited for small-scale operations or when advanced technical equipment is not affordable. Blood is collected in large pans and slowly boiled while stirring constantly. When moisture is sufficiently reduced (10-12%), blood meal is spread on a clean cemented surface and then sun-dried. It can also be oven-dried. The blood may be spread on milling offals, rice bran or other plant products for better drying and that result in a complete feed.

For large scale operations the 3 processes detailed below are used.

C. Drum drying

The raw blood is finely comminuted to form free-flowing slurry that is then deposited onto the descending side of the top of a heated drier drum and formed into a film by one or more spreader rolls. The film is rapidly dried and scraped in the form of a dried sheet which can either be flaked or pulverized to provide a high grade blood meal product. Vapors above the drying cylinder are scrubbed before being released to the atmosphere and represent the only effluents from the process

D. Ring and flash drying

The blood is dispersed into the high velocity venturi section of the system. The blood first comes into contact with the hot drying airstream and the bulk of the evaporation occurs. The product is then dried as it is conveyed up through the drying column. The presence of a "manifold" or "internal classifier" in the ring drying system is what differentiates it from the flash dryer

F. Spray drying

The blood is spray dried as whole blood, or after separation into plasma and red albumin Blood products have to be dried at low temperatures in order to prevent heat coagulation Spray dried blood meals are also called spray dried blood powder or blood flour. Spray-dried porcine plasma is prepared as follows: the blood from slaughtered pigs is added to anticoagulant (generally sodium citrate) and then centrifuged to remove erythrocytes. The plasma obtained subsequently spray-dried and used for the production of animal feeds Products resulting from the 3 processes have an overall higher quality than sun-dried blood meals since the duration of the heating period is lower than with cooking. Proteins and amino acids are better preserved and lysine content is higher.

H. Environmental impact

Processing blood into feed removes potentially contaminating slaughter wastes from the environment. Modern drying techniques require high amounts of energy but solar drying is an interesting option in warm climates

Self-check 7	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ is a highly perishable product and must be processed as soon as possible after slaughter

A. blood
B. meat
C. milk
D. all

2. Which of the following used for drying of blood.

A. spray drying
B. flash drying
C. ring drying
D. all

Material and equipment use

1) blood
2) moister analyzer
3) curcible
4) incubater
5) oven
6) balance
7) soxlet extractors
8) kejeldhal flask

Operation sheet 1- Coagulation of blood is monitored

1) Blood receiving from slaughter house
2) The blood store in referigrated storage tank at 4 degree celecius
3) Add sodium sulphate to prevent cogulation of blood and elongate shelf life.
4) Finally the blood is dry to reach the moisture content 10.2%.

Operation sheet 2- Drying blood and monitoring temperature

1) Raw blood is comminuted in a high speed hammer mill
2) Acomminute blood is fed to drier drum.
3) The coagulated blood is heated at low temperature at 250-350 degree faranite.
4) The water recirculate to remove the remaining cogulated blood place on drier drum.
5) The blood blood being cogulated below atemperature of below a temperature of 150 degree faranite.

Operation sheet 3 - Monitoring blood meal for quality

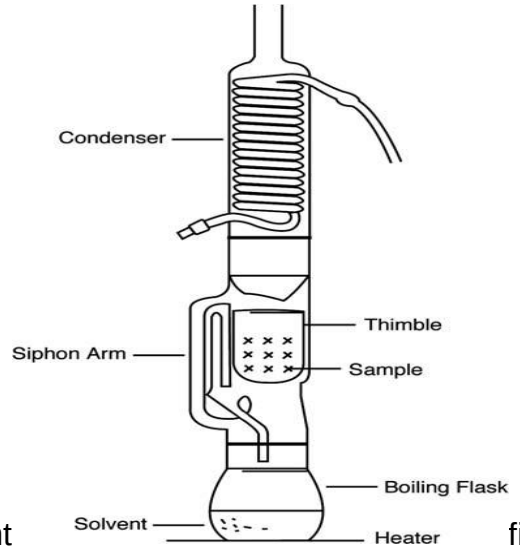
1. The blood meal is store in low temperature and the moisture is 10.2 %

2. Lactic acid bacteria add to the blood to preserve the blood.

Operation sheet 4 - Taking blood meal samples for analysis.

Protein content

1) Weigh 1.5 gram of blood and transfer kejeldhal flask
2) Add 15 gram of potassium sulphate, 0.5 gram coupper sulphate and 25 millilitre of sulpheric acid.
3) Heat the flask gently in an inclined position for 2 hour
4) Allow to cool and add 200 milliliter of water 25 milliliter of sodium sulphate solution (80mg) and mix.
5) Pippete volume of digestion flask and boil until about 150 ML of the distillate has been collecte
6) Add 5 drobs of methyl red indicator and titrate with 0.1 N sodium hydroxide.
7) Total protein =nitrogen×0.625



Fat content figure 1 soxlet extractor

1. Weigh 4gram blood into place on a thimble.

2. The solvent prepare and the sample heat in condenser flask.

3. Finally weigh the getting result.

Ash content

1) Weigh 2 gram of blood and place on the muffule furnace at temperature 500-600 degree celecius.
2) Cool in the desiccator to prevent air pollution
3) Lastly weigh the resulted ash content

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task1: perform Coagulation of blood is monitored

Task2: perform drying blood and monitoring temperature

Task 3: perform Monitoring blood meal for quality

Task 4: perform Taking blood meal samples for protein, fat and ash.

LG #76	Lo #2- Routine maintenance.

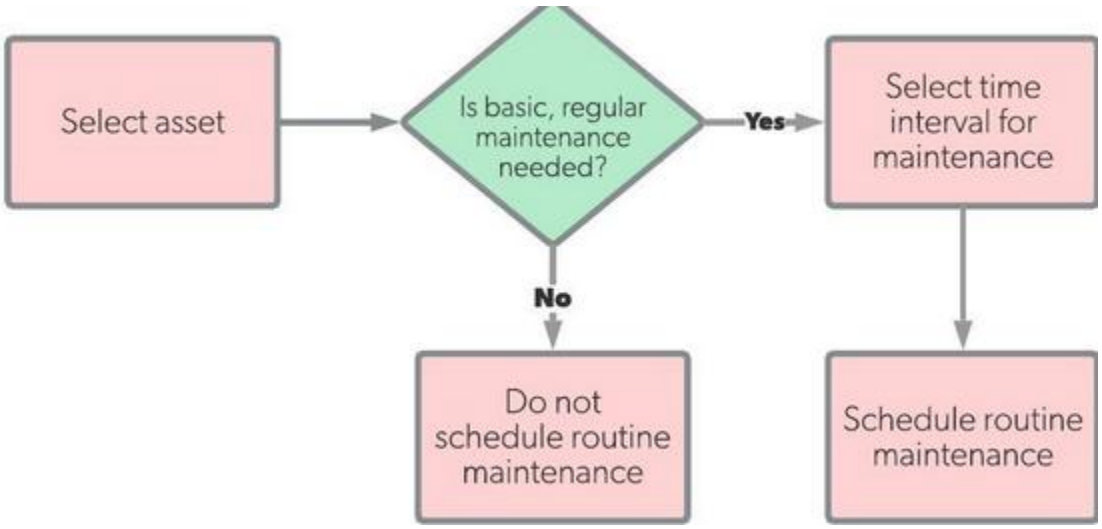
Instruction sheet

Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Routine maintenance is undertaken in accordance with workplace specifications • Workplace, Occupational Health and Safety (OHS) requirements are met for operating a blood processing plant.
Learning Instructions:
1) Read the specific objectives of this Learning Guide. 2) Follow the instructions described below. 3) Read the information written in the information Sheets 4) Accomplish the Self-checks 5) Perform Operation Sheets 6) Do the “LAP test”

Information Sheet 1- Undertaking routine maintenance

1.1 Introduction

Routine maintenance is maintenance activities such as regular inspections or machine servicing. Routine maintenance is done on a regular basis, whether that be daily, weekly, monthly, or yearly. Routine maintenance is an important part of keeping systems up to date and functional. Routine maintenance workflow



Routine maintenance tasks are small and simple in nature and only require basic maintenance skills to perform well. They may be completed daily, weekly, monthly, quarterly, or annually. Companies that invest in routine maintenance can extend the life of their assets, reduce emergency maintenance, and keep their production lines or facilities up and running more consistently.

1.2 How routine maintenance decreases downtime

Routine maintenance is designed to help keep equipment, machines, and buildings operating optimally. If a particular piece of equipment needs lubrication, it may work at a slower rate and reduce the efficiency of an entire line. If dirt interferes with a certain component, an entire production line can be shut down until the problem is identified. Lubricating and cleaning equipment on a regular schedule prevents such problems.

In addition, routine maintenance can be scheduled on a daily basis, allowing a company to maximize the use of its maintenance resources. For example, if maintenance technicians move from one emergency work order to another, they may have to travel between locations, gather different tools and equipment, or simply switch mental gears from one problem to the next. A maintenance worker performing routine maintenance can clean, inspect, and adjust many items on a single piece of equipment much more quickly.

Routine maintenance is a type of preventive maintenance and also a key part of total productive maintenance in which machine operators perform small maintenance tasks to increase the reliability of the machines they use every day. Benefits of routine maintenance

Routine maintenance prevents larger problems from occurring. Taking good care of equipment, machines, and facilities extends their overall life as well as keep them performing at their best. Routine maintenance gives technicians an opportunity to regularly “lay their eyes on” important components of a production line or specific system as well as a chance to catch any other potential problems that are lurking.

In addition, most maintenance technicians assigned to perform routine inspections, cleaning, or adjustments are entry-level or relatively new to a particular maintenance department. Routine maintenance is typically simple and straightforward and is an excellent training ground for a new technician to learn about a particular facility, business, or complex.

1.3 How to maximize routine maintenance

Routine maintenance provides an excellent return on investment considering the reduction of emergency work orders, increased efficiency of equipment, and fewer equipment replacement needs.

In order to maximize the benefits of routine maintenance, provide training and education to maintenance technicians about how to clean, inspect, lubricate, service, and adjust equipment, components or systems. Comprehensive maintenance checklist for each piece of equipment or machinery that requires routine maintenance, and research the industry standard for lubricating, replacing, or cleaning to ensure the routine maintenance is appropriate.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____ is maintenance activities such as regular inspections or machine servicing.

A.routine maintenance

B.routine cleaning

C.routine procedure

D.none

Information Sheet 2- Meting workplace, Occupational Health and Safety (OHS)

2. Introduction

Occupational health is concerned with the control of occupational health hazards that arise as a result of or during work activities. Occupational health or industrial hygiene has been defined as that “science and art devoted to the anticipation, recognition, evaluation and control of those environmental factors or stresses arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community”. It encompass the study of chronic as well as acute conditions emanating from hazards posed by physical agents, chemical agents, biological agents and stress in the occupational environment and the outdoors environment.

The primary responsibility of the industrial hygienist is as follows:

1. To protect the health of the employees.

2. To maintain an objective attitude towards anticipation, recognition, evaluation and control of health hazards.

3. To council employees regarding the health hazards and the necessary precaution to avoid adverse health effects.

4. To respect confidences, advise honestly, and report findings and recommendations accurately.

5. To act responsibly in the application of industrial hygiene principles toward the attainment of a healthful working environment.

There are three types of interaction in a working environment: -

1. Man and Physical, chemical and biological agents

2. Man and machine

3. Man and his psychosocial environment

Importance of occupational health and safety management at workplace

Multidisciplinary field of occupational health and safety with the goal of occupational safety and health programs is concerned to foster a safe and healthy environment. The main focus of occupational health include promotion and maintenance of working capacity and employee health; improvement of working environment; development of work cultures and organizations to support health and safety; promotion of positive social climate and smooth operation; enhanced productivity of the organization. Occupational health and safety (OHS) standards mandate reduction, removal or replacement of job site hazards. OHS programs also help minimize the effects of such hazards. Occupational health and safety considerably benefits the company, as healthy employees are guaranteed to be more productive. Company management and employers are obliged to provide a safe working environment for all of the employees. Working conditions at employment in the existing economy need to embrace important determinants of working hours, salary, maternity policies, provisions for health promotion and protection.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1._____is concerned with the control of occupational health hazards that arise as a result of or during work activities

A.occupational health

B.Occupational performance

C.ocuupational cleaning

D.all

Operation sheet 1- Meeting workplace, Occupational Health and safety

Occupational safety procedure

1) All accidents, injuries or near misses, regardless of their nature, shall be promptly reported to the safety officer.

2) Clothing shall be appropriate to the duties being performed.

3) Hard hats and safety vests are provided for all warehouse staff.

4) Running is not permitted except in extreme emergencies.

5) Smoking is not permitted in any part of the warehouse or office. You may only smoke in designated areas.

6) Visitors and customers are to be escorted by staff while on company property. 7) Hand tools are to be used for their intended purpose only.

8) Only licensed personnel may operate forklifts or other warehouse equipment and must wear a seatbelt while doing so.

9) Riding on equipment is prohibited except where designated for operator.

10) Horseplay, fighting or tomfoolery is strictly prohibited on Your Company Name premises.

11) All spacers are to be of equal proportion and undamaged. Damaged spacers are dangerous.

12) Open lifts are to be stored on the floor or in assigned bunks. Do not stack an open lift; this act will result in disciplinary action up to and including dismissal. All lumber lifts must be banded.

13) Only solid spacers are to be used on lumber products, no particle board spacers.

14) All bunked products will be placed securely in the bunks.

15) All spills will be immediately cleaned up and reported.

16) Drawers and filing cabinets will be kept closed when not in use.

17) Filing cabinet drawers are to be filled from the bottom up or the cabinet is to be securely fastened /anchored.

18) Lifts and clutter will be cleaned up before the end of your workday.

19) Aisles are to be kept clear at ALL times.

20) Do not unload a truck alone under any circumstances.

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task-1 perform Meting workplace, Occupational Health and safety

References

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The trainers who developed the Curriculum

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1	Admasu Sefera	B	Food tec & process Eng.	A.A	Kolfe Inds. college	admasusefe
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9	Zinash Derese	B	Animal produ.& tecnology	Amhara	Tilili TVET College	zinaderese1

Lo1: answer

Self-check one: 1.D 2.C

Self-check two: 1. D

Self-check 3:1.A

Self chek4:1.B

Self-check 5:1.A

Self-check 6:1.A

Self-check 7:1.A 2.D

Lo2 answer:

Self-check 1:1 A

Self-check 2:1.A