Artificial Insemination

Level-I

Learning Guide -20

Unit of Competence: Support Handling of Hide and Skin

Module Title Supporting Handling of Hide and Skin

LG Code: AGR ATI1 M07 0919 LO1-LG-20

TTLM Code: AGR ATI1 TTLM 0919 v1

LO 01: Prepare materials, tools and equipment's

Instruction Sheet	Learning Guide 20

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ✓ Selecting appropriate methods of hide/skin preservation
- ✓ Preparing preservation materials and equipment's

Recognizing mechanisms of milk synthesis and secretion This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- ✓ Select appropriate methods of hide/skin preservation
- ✓ Prepare preservation materials and equipment's

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1 and Sheet 2,
4. Accomplish the "Self-check 1 and Self-check 2" **in page 5 and 11,** respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1 " **in page -12.**
6. Do the "LAP test" **in page – 13** (if you are ready).

Information Sheet-1	Prepare materials, tools and equipment's

I. INTRODUCTION

A, General structure of Hide and skins

The terms "skins" and "hides" have differences in meaning. The distinction is one of size and substance or thickness. Smaller and lighter skins derived from sheep, goats or pigs are termed "skins". In some species, the deciding factor will be the type of animal rather than size alone.

One of the most valuable exports of many developing countries is hides and skins. Hides are, therefore a valuable source of income to the livestock owner. If properly cured, the value of the hides is often 3% to 10% of the value of the whole animal.

The skin histology of animals normally used in leather production is similar but species differences are readily observed. There are, for examples, differences in the relative amounts of the component tissues and their arrangement in different types of skin and in different places in the skin. The component structures of the skin are capable of flexing, stretching or contracting with the movements of the body.

An animal's skin has a number of functions, the most important being to:

- ✓ Provide a light, durable covering for the body;
- ✓ Assist in the regulation of body temperature;
- ✓ Prevent or minimize possible injury to internal organs;
- ✓ Provide a barrier to bacterial infection; and
- ✓ Provide a waterproof covering for the body while allowing moisture to leave the body, e.g., through perspiration.

1.1. The main components of the mammalian skin

1.1.1. The epidermis

It is a thin top layer covering about 1-2% of the total thickness of the entire skin. The epidermis consists of two layers of cells namely the outer horny layer and the inner layer rests on the corium. The epidermis also consists of fat glands, sweat glands, horns, erector pilli muscle etc.

1.1.2. Corium or dermis

This is the main layer of the hide or skin consisting of about 98% of its thickness. Divided in to two layers:

a. Grain or papillary layer

It is also called the thermostat layer as it keeps the body temperature through Sweat and fat glands. This upper layer of corium occupies about 10-25% of its entire thickness.

b. The corium or reticular layer

The corium proper is just below the grain layer constituting about 75-90% of the total thickness is having a netlike woven structure made of thicker and longer fibers.

1.1.3. Flesh or adipose tissue (hypodermis)

- A layer appended to the bottom of corium is called flesh or adipose layer
- It is the loose connecting tissue lying b/n the hide or skin and the actual body of the animal
- Although this layer exists in all flayed hides and skins, this is removed during the tanning operations and it is not part of the hide.

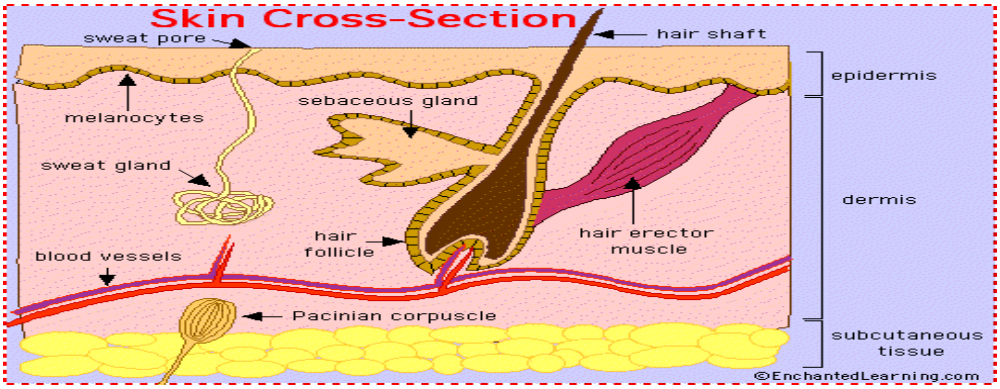

Figure 1. Histological feature of mammalian

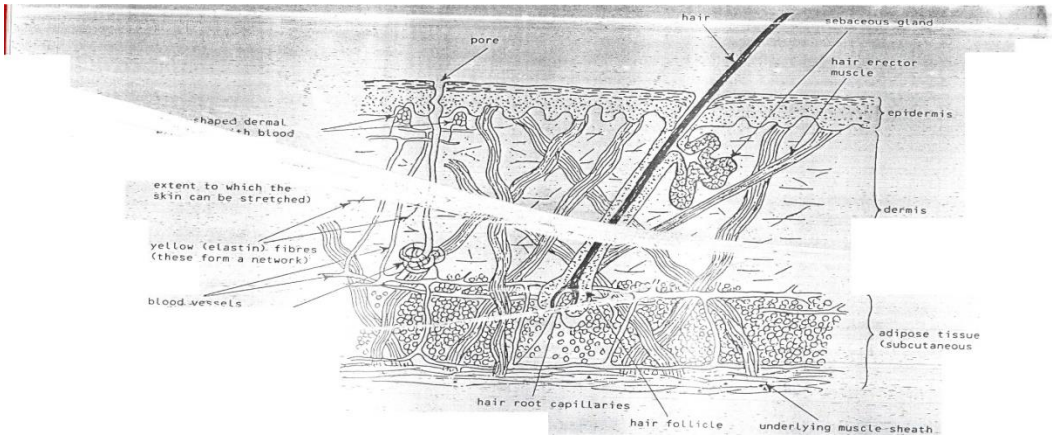

Figure 1. Histological feature of mammalian skin

1.2. Selecting appropriate methods of hides and skin preservation

Preservation prevents putrefaction and keeps skins in good condition until they are processed in tanneries. Being protein in nature, skins are susceptible to attacks by bacteria or mold that leads to putrefaction in hot and humid climates. Dust, dirt, soil, water, blood, fodder, etc., are sources of infection apart from microorganisms that could be transmitted by air, insects, or contact with diseased animals. The weight of a fresh skin is about 60% water, ideal conditions for bacteria to thrive. The protein matter hydrolyzed by bacteria leads to loss of skin substance resulting in poor-quality leather.

Curing creates conditions whereby bacteria are prevented from destroying skins. The type of curing used depends on weather conditions, availability of materials, location of tanneries, and so on. For instance, some drying techniques do not work during the rainy season, and salting is preferred. In all techniques, the natural water is removed so that the low percentage of moisture makes the bacteria ineffective and as soon as this condition is reversed, bacteria become active again.

In tropical countries, it is advisable to begin curing within four hours of flaying depending upon outside temperature. Raw skins should be sent to the curing facility in closed carts and protected from exposure to the sun and without being rolled. Skins can be dried with or without a frame, in the sun or in a shed.

Wet salting, dry salting and brining are other methods of skin preservation. There are also more recent techniques not yet universally applied.

1.3. Principles of preservation and types of hide and skin preservation.

The following points should be considered in undertaking skin preservation:

- ✓ Point of application of the treatment and how long preservation is required.
- ✓ Methods of application and any extra equipment and handling involved.
- ✓ The cost-effectiveness of the treatment for the required period of preservation.
- ✓ The effect of salt and other chemicals in causing pollution.

The following are some of the common drying preservation techniques

1.3.1. Air drying

- ✓ Suspension drying
- ✓ Line/wire drying
- ✓ Skin drying sheds

1.3.2. Salting

- ✓ Wet salting
- ✓ Dry salting
- ✓ Brining

See the detail of this section under LO2

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the function of Hides and skin for the animals. (4 points)
2. Explain the Principles of preservation and types of hide and skin preservation (5 points)

Note: **Satisfactory rating - 5 and 8 points** **Unsatisfactory - below 5 and 8 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

References

Devassy, T. J and Mr Getachew Argaw 1998. Hides and Skins Improvement Handbook.

Elliot, R.G.H. 1985. Hides and Skins Improvement in Developing Countries, FAO/Rome. FAO. Agricultural Development Paper No. 49.

Mann, I. 1962. Hides skins and glue stock. In Animal by- products processing and utilization. Pp80- 137.

Mohammed. 2000. Ethiopian hides and skins. Proceedings of a Conference Held at Debub University, Awassa Ethiopia, 10–12 November 2000, pp.133–137. Productivity Improvement Program. p 275.

Tekle Zeleke, 2008. Sheep and goat products and by-products. Ethiopia Sheep and Goat Ahmed

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INFORMATION SHEET 2	PREPARE MATERIALS, TOOLS AND EQUIPMENT FOR PRESERVING HIDE AND SKIN

2. Preparing and handling materials, tools and equipment for preserving hide and skin

Tools, overalls and other protective working equipment represent the necessary equipment for people working in the slaughterhouses, meat processing facilities and other operations of the meat industry. These aids also help to protect meat and meat products against the bacterial contamination.

This category of working aids and means is very wide and involves all things that are used by workers in the individual working operations and situations, e.g.

- Knives
- Hangs and hooks for hanging meat
- Sharpening steel
- Meat choppers
- Meat saws
- Holders of price labels etc.

This category involves also all types of machinery, especially those parts of these machines, which come in contact with the meat and different containers, dishes, roast plates utensils and others aids.

The current trend is oriented at a more and more intensive protection of hygienic quality and safety of food. The consumers should be protected against the microbial contamination and for that reason, the requirements concerning hygiene of individual operations are increasing not only in the meat industry but also in catering facilities and similar establishments.

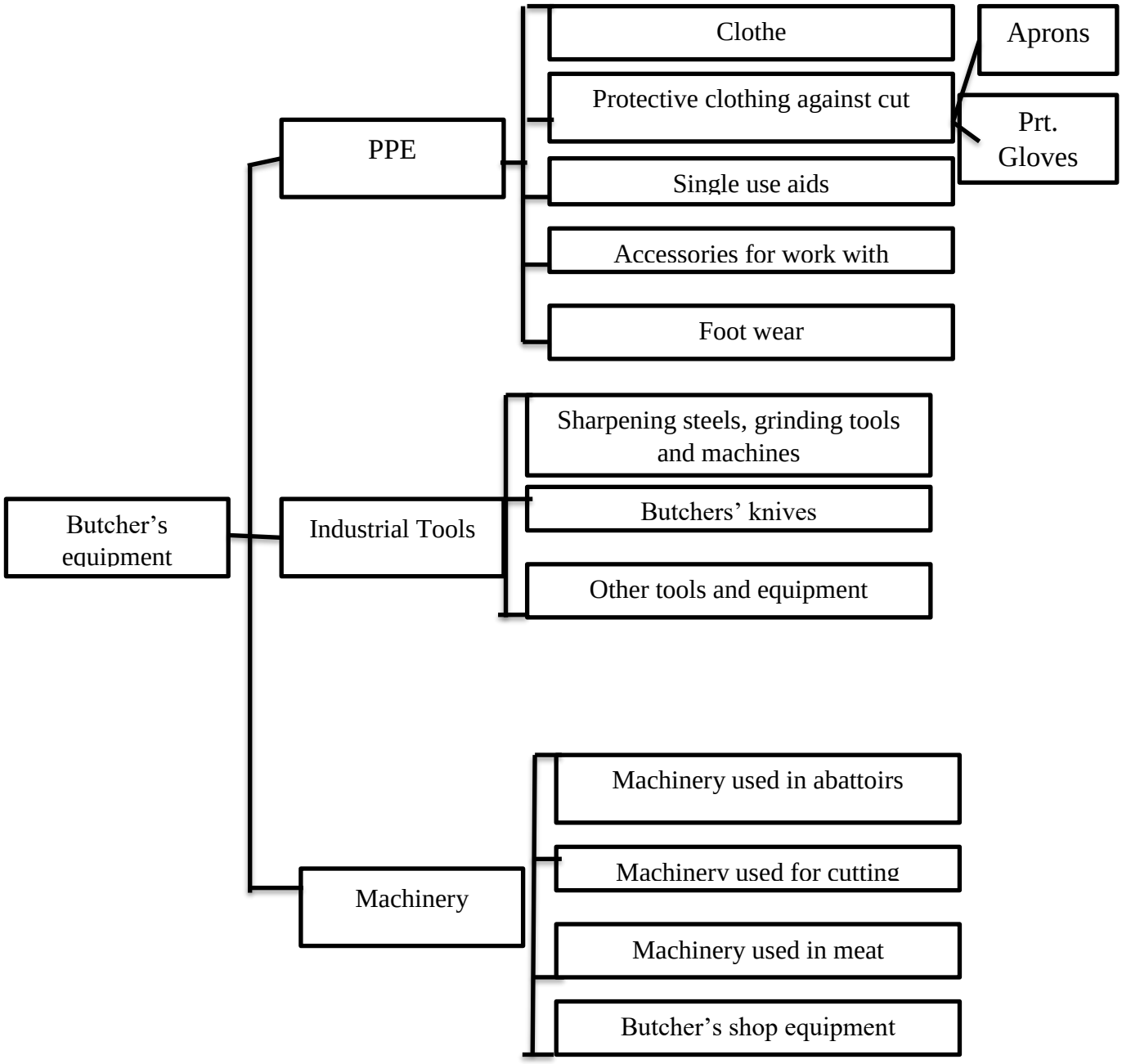

Figure 3. Butcher's Equipment

- ✓ **Washing and drainage table** helps for washing and draining of water from hides and skins before preservation can takes place.
- ✓ **-Frame**:-Useful to dry the hide and skin. the thickness depends on the materials from which the frames are made. The thickness for metal and wood are 5cm and 7cm respectively. the frame size for exotic and local cattle breeds are

(2.7m*3.1m) and (2.7m*2.4m),while the frame size for small ruminants is1/4-1/3 the size of cattle frame

- ✓ **Flaying knives** which has blunt and rounded tip helps for separating or removing hides and skin from the carcass.
- ✓ **Ripping knives** have a straight cutting edge, curved and sharpened pointed knife for inserting line to cut edge foreword and upward with the blunt back edge.
- ✓ **Mechanical flaying machine** is the machine driven by compressed air on an oscillating scissors at round to separate the connective tissue from the carcass without making any cutting on the stock.
- ✓ **Salt** which used for preservation**.**
- ✓ **Clean water and detergents** used for washing of hide and skin
- ✓ **Chemicals such as DDT-** used for disinfecting the warehouse**.**
- ✓ **Sharpening steels**:-To keep flaying knives as sharp as possible
- ✓ **Brush**:-It is made from plastic and useful to wash hide and skin to remove dirt.
- ✓ **Rope**:-useful to stretch the skin and hide of animals.
  Jar:-essential for pouring liquid substances into them.
- ✓ **Rubber hose**: - to apply water to wash hide, skin and equipments
- ✓ **Mechanical hoist*:* -** a lifting device like pulley
- ✓ **Slaughter slab**: - it is equipped with wooden or tabular steel gantry hoists such slab will allow control to be exercised over the butcher and permit hides and skins inspection and fuller use of other by products.
- ✓ **Pit:** - to burn left over and offal
- ✓ **Scales**:-Beam balance which measures 100kg must be available.
- ✓ **Table**:-Table for washing hide with dimension of (70cm*2m*1.50m).it can made from wood or cement.

Preservation and storage house constriction materials

- ✓ Corrugated iron sheet
- ✓ Rope, nail, string, wire, hammer, wood
- ✓ wire mesh and other materials for flooring
- ✓ Insect proof wooden pallet etc

- ✓ Bucket -helps for transportation of water and collection of blood.
- ✓ Wheel-barrow for transporting of different materials.

The estimation of the amount of construction materials are determined by the type and dimension of the selected area for construction.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ has blunt and rounded tip helps for separating or removing hides and skin from the carcass. (3 points)
2. _____ is a straight cutting edge, curved and sharpened pointed knife for inserting line to cut edge. (3 points)
3. Explain the materials and tools for hides and skin preservation. (6points)

Note: **Satisfactory rating - 8 and 10 points** **Unsatisfactory - below 8 and 10 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	**Prepare materials, tools and equipment for preserving hide and skin**
Operation Title:	**Selecting appropriate tools and equipment for preservation**
Purpose:	
Equipment, Tools, and Materials:	Saw, hammer ,nail, drying frame, washing table, drainage table, flaying knife ,ripping knife, wood pallet ,rope, salt, wheel barrow and others
Conditions:	Before the slaughter operation takes place all the necessary materials, tools and equipment's.
Procedure:	1. Wear personal protective clothes while preparing tools and equipment's for preservations. 2. Identify materials, tools and equipment's helps for preservations. 3. Check weather all materials and equipment's are properly work or not. 4. Follow correct handling of tools and equipment's for preservations. 5. Prepare and list the role of tools and equipment's used for preservation.
Precautions:	Be sure if the materials properly prepared
Quality Criteria:	Did PPE wear properly? Did materials and tools identified properly? Did all materials and tools are checked properly and accordingly? Did all list of materials are listed correctly?

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 4 hour.

Task 1- Identify types of tools and equipment used in hides and skin preservation.

Task 2- Determine types of PPE Used in this operation

References

Devassy, T. J and Mr Getachew Argaw 1998. Hides and Skins Improvement Handbook.

Elliot, R.G.H. 1985. Hides and Skins Improvement in Developing Countries, FAO/Rome. FAO. Agricultural Development Paper No. 49.

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