Learner Guide
Primary Agriculture

Animal product harvesting procedures

My name: ..........................................................
Company: ....................................................
Commodity: ......................... Date: .................

The availability of this product is due to the financial support of the National Department of Agriculture and the AgriSETA. Terms and conditions apply.
Dear Learner - This Learner Guide contains all the information to acquire all the knowledge and skills leading to the unit standard:

**Title:** Apply animal products harvesting procedures  
**US No:** 116144  
**NQF Level:** 2  
**Credits:** 5

The full unit standard will be handed to you by your facilitator. Please read the unit standard at your own time. Whilst reading the unit standard, make a note of your questions and aspects that you do not understand, and discuss it with your facilitator.

This unit standard is one of the building blocks in the qualifications listed below. Please mark the qualification you are currently doing:

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<tr>
<th>Title</th>
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<th>NQF Level</th>
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<td>National Certificate in Mixed Farming Systems</td>
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Please mark the learning program you are enrolled in:

Your facilitator should explain the above concepts to you.

This Learner Guide contains all the information, and more, as well as the activities that you will be expected to do during the course of your study. Please keep the activities that you have completed and include it in your Portfolio of Evidence. Your PoE will be required during your final assessment.

**What is assessment all about?**

You will be assessed during the course of your study. This is called *formative assessment*. You will also be assessed on completion of this unit standard. This is called *summative assessment*. Before your assessment, your assessor will discuss the unit standard with you.
Assessment takes place at different intervals of the learning process and includes various activities. Some activities will be done before the commencement of the program whilst others will be done during programme delivery and other after completion of the program.

The assessment experience should be user friendly, transparent and fair. Should you feel that you have been treated unfairly, you have the right to appeal. Please ask your facilitator about the appeals process and make your own notes.

**How to use the activity sheets...**

Your activities must be handed in from time to time on request of the facilitator for the following purposes:

- The activities that follow are designed to help you gain the skills, knowledge and attitudes that you need in order to become competent in this learning module.

- It is important that you complete all the activities and worksheets, as directed in the learner guide and at the time indicated by the facilitator.

- It is important that you ask questions and participate as much as possible in order to play an active role in reaching competence.

- When you have completed all the activities and worksheets, hand this workbook in to the assessor who will mark it and guide you in areas where additional learning might be required.

- You should not move on to the next step in the assessment process until this step is completed, marked and you have received feedback from the assessor.

- Sources of information to complete these activities should be identified by your facilitator.

- **Please note** that all completed activities, tasks and other items on which you were assessed must be kept in good order as it becomes part of your Portfolio of Evidence for final assessment.

*Enjoy this learning experience!*
How to use this guide ...

Throughout this guide, you will come across certain re-occurring “boxes”. These boxes each represent a certain aspect of the learning process, containing information, which would help you with the identification and understanding of these aspects. The following is a list of these boxes and what they represent:

**What does it mean?** Each learning field is characterized by unique terms and definitions – it is important to know and use these terms and definitions correctly. These terms and definitions are highlighted throughout the guide in this manner.

**My Notes ...**

You can use this box to jot down questions you might have, words that you do not understand, instructions given by the facilitator or explanations given by the facilitator or any other remarks that will help you to understand the work better.

**Activity**

You will be requested to complete activities, which could be group activities, or individual activities. Please remember to complete the activities, as the facilitator will assess it and these will become part of your portfolio of evidence. Activities, whether group or individual activities, will be described in this box.

**Examples**

Examples of certain concepts or principles to help you contextualise them easier, will be shown in this box.

**How am I doing?**

The following box indicates a summary of concepts that we have covered, and offers you an opportunity to ask questions to your facilitator if you are still feeling unsure of the concepts listed.
What are we going to learn?

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SAQA Unit standard
What will I be able to do?

When you have achieved this unit standard, you will be able to:

♦ Understand how to harvest animal products, prepare them for processing and identify processes involved in processing of animal products.
♦ Gain specific knowledge and skills in harvesting animal products and will be able to operate in an animal production environment implementing sustainable and economically viable production principles.

Learning Outcomes

At the end of this learning module, you must be able to demonstrate a basic knowledge and understanding of:

♦ Comprehension, identification and understanding of the specific animals and animal products.
♦ The origin of animal products.
♦ Sensory observation and evaluation of animals and their products.
♦ Evaluation of the potential of animal products.
♦ Animal product harvesting.
♦ The purpose of learning about animal products.
♦ Animal product production.
♦ Animal product processing.
♦ Animal product presentation.
♦ Demonstration and illustration techniques.

What do I need to know?

It is expected of the learner attempting this unit standard to demonstrate competence against the unit standard:

♦ NQF 1: Harvest animal products.
♦ NQF 1: Observe and handle animals.
♦ NQF 1: Apply basic food safety practices.
♦ NQF 1: Collect agricultural data.

My Notes ...

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Introduction

In primary agriculture, production is a term that is widely used. But to what is it referring? It refers to the growing process of products that can be used either for human consumption or animal consumption.

In animal production most of the products produced are used for human consumption like meat, milk, honey, etc. These products are included but are not limited to meat, milk, bones, feathers, fibre or animal derivatives such as semen and ova.

- How do you identify animal products that can be used for human consumption?
- What is the origin of these products?
- How would you estimate the value of these products?

Identifications

- Before you can identify a product you should take a look at the possible use of the product.
- The purpose of use.
- You have to give the definition of each product e.g. What is the definition of meat, milk, fibre, etc.

Origin of these products

- After the explanation of the definition, the origin of the products will be clear.

Value of product

Here are the factors that will influence the value of a product:

- Availability.
- Demand.
- Readiness.
- Quality.
- Genetic parameters – age, fertility, reproductive performance.
Session 1

The value of animal products

After completing this session, you should be able to:
SO 1: Identify the estimated qualitative and quantitative value of various animal products.

In this session we explore the following concepts:
- The ability to identify, evaluate and illustrate all the various animal products used by man and their purposes.
- The ability to identify and illustrate the origin of all the various animal products used by man.
- The ability to identify, demonstrate and illustrate estimated value of these various animal products.

1.1 Introduction

There are a variety of products on the market for human and animal consumption that are products produced by animals. Most of these products like hides, meat, fibre, milk and other by-products such as bones and hooves are used widely. Insect products such as honey and beeswax are also very much in demand.

The term animal production is therefore a well-known term and referred to a lot of specific goods that is in demand. It will be difficult to handle all the aspects of harvesting the above products. In the previous level we have looked at the harvesting of a fibre product like wool and mohair.

In this unit standard you will cover meat as animal product

Please complete Activity 1 at the end of this session.
1.2 **Meat as animal product**

Red meat is the collective name for meat that originates from cattle, sheep and pork. White meat is the collective name for meat that originates from chicken, turkey, duck, pigeon, guinea fowl, etc. Livestock production has developed to supply the world’s demand for meat. In order to obtain the final product, it has to go through certain production and processing procedures.

Meat is very versatile and its uses are limitless. To ensure the best quality product, there are certain parameters that give you an indication of its quality according to its specifications and grades and be aware of meat safety. If meat is handled and stored correctly, its shelf life could be prolonged, for example by using the correct packaging.

- **Meat:** The flesh of an animal, the muscle tissue of an animal.

- **Uses**

  Meat is available in fresh, frozen, canned and cured forms. Fresh meat is raw meat. Frozen meat is also available and it has the same food value as fresh meat. Tinned meat has been sealed in a metal can and then heated. Meat is often canned with other ingredients, such as vegetables or gravy. Cured meat, such as ham, bacon, sausage and biltong has been treated with salt and/or sodium nitrate to control bacterial growth.

- **Origin**

  Meat is animal flesh that is eaten as food. Meat consists largely of muscles, but fat and other animal tissue are also considered meat. The most commonly eaten meats come from animals that are raised for food. These animals - and the meat that comes from them - include cattle (beef and veal), pigs (pork), chicken and sheep (lamb and mutton). The meat from cattle, pigs and sheep are all classified as red meat. Chicken and fish are classified as white meat. There are several different types of meat. The names for meat from cattle and sheep also indicate the age of the animal from which the meat was taken.
Veal is the flesh of calves less than 14 weeks old. It is light pink and contains very little fat. Veal is tenderer than beef, and has a milder flavour. Beef is the flesh of full-grown cattle. Most beef sold in shops comes from animals one to two years old. Beef is bright red and has white or yellow fat, depending on the food the animal was raised on.

Lamb is the flesh of sheep slaughtered at a young age (younger than 6 months). It is red and has white fat. Lamb has a milder taste than mutton.

Mutton is the flesh of sheep older than 6 months. It has a deep red to purple colour. Mutton has a stronger flavour and a coarser texture than lamb.

Pork is the flesh of pigs. Pork has a light pink colour with white fat. It has a mild taste. Many cured meats, such as ham and bacon are made from pork.

Chicken is the flesh of broilers. Chicken has a white colour with slightly yellow fat.

Offal is the general name for various organs and glands of animals. Common offal includes brains, hearts, kidneys, livers and tongues of animals. Other offal includes sweetbreads (thymus gland) and tripe (the lining of the stomach).

The value of the product depends on the following factors:

- Availability.
- Demand.
- Readiness.
- Quality.
- Genetic parameters – age, fertility, reproductive performance.

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Divide into four to five groups of learners and each group list as many as possible animal products that you can think of. Each group of learners must then name the following:

- The origin of the product
- The use of the product
- The preparation of the product
- The way the product is harvested

At the end each group choose one product and explain to the class the value and use of that product in practice.
Session 2

The origin and harvesting of animal products

After completing this session, you should be able to:
SO 2: Observe, illustrate and report on observations in animals regarding animal products and their origin and their readiness for harvesting.

In this session we explore the following concepts:
- The origin of the production of animal products in animals is understood, described and illustrated.
- The sensory signs and indicators that imply that the animal is ready to have products harvested from it are described.
- The sensory signs and indicators that indicate that the animal product is ready for harvesting are described.
- The handling of the animal and animal products to determine these sensory signs and indicators is described.

2.1 Production

Animal production or stock farming is the most viable agricultural activity in a large part of the country.

Since animals were domesticated to be available when it is needed, the areas suitable for raising livestock, particularly cattle, sheep, pigs and goats have greatly expanded. Therefore, harvesting of animal products has become a common industrial enterprise. There are many differences within harvesting animal products.

Due to the factors that influence the value of a product, animal production had intensified during the years and will certainly not stop there. The technique and methods used for harvesting have also undergone some changes to enhance the harvesting process.

When you have an objective what to produce, you need to review with what type of animal you should produce that. Animals are being used in many different production units and therefore differ in age, breed and species.
For example: Animals that are being breed for mutton production must be early matured so that they can be slaughtered at a very early stage e.g. 3 – 4 months (±35kg weight). At this stage only the male animals are slaughtered. At a young age, better quality mutton is produced.

In milk production it takes longer to produce the product, at least 3 years. Before a cow can produce milk it must first become pregnant, for that to happen it must be at a certain age and weight to conceive.

In fibre production we distinguish between wool and mohair. Woollen sheep produce wool at an early stage, but that wool is of less value due to the lack of length. The older the sheep gets the longer the wool. Between 8- 12 months the wool is at optimum length and the value are more but it depends on the fineness of the wool (six months).

Mohair is also produced at an early stage, but here the product has the best value relative to adult goats (the fibre diameter of mohair can vary a lot from very fine fibre produced by young kids up to six months of age to coarse fibre production by rams at adult stage).

In animal derivatives such as semen and ova the animal has to be mature and should be able to reproduce (fertile), before collection can be made.

By viewing these production systems, you should have noticed that production is time depended, so if you need products available at all times, you should have a large variety of animals at different stages of their life.

You should also have the infrastructure/ holding capacity available to make such production possible. For sustainable matter the following factors should be considered:

♦ Time of harvesting.
♦ Harvesting methods.
♦ Infrastructures to enable products to be harvest.

The supply shortage of livestock products is a consequence of the traditional marketing systems, where fresh, unprocessed meat is sold at meat markets a few hours after slaughter. To provide consumers with adequate quantities of quality meat and meat products, the processing of products has become very important. Appropriate processing techniques offer the opportunity of overcoming the two main constraints to a better supply of livestock products - availability and price.

Using specific processing techniques, it is possible to produce shelf-stable meat products that can be stored under ambient temperatures. In the traditional system, the consumption of livestock products was within in a very short period.
Due to the factors above-mentioned above, meat was not available all the times. But as time passes new techniques/methods were used to maintain availability and product quality. Here are some techniques and methods:

- Extend the shelf-life of meat by the replacement water (product's microbiological stability increases when less water is present for microbiological growth.)
- Salting, curing or smoking; suitable preservatives.
- Boiling, cooking or roasting.
- Sterilization.
- Drying of unsalted pieces of meat.

Due to the wide variety you will mainly focus on meat as animal product, but this is not limited to meat only.

**Product readiness to be harvested**

The consumer faces an on-the-go lifestyle that demands consistent, high-quality foodstuffs that are convenient to prepare. These and other attributes are important in driving consumer purchasing of meats. Producers recognize that management practices could affect product quality and are important to consumers. You want consistently high quality, safe, and nutritious foods that are easy and convenient to prepare.

Therefore you as producer should take the following into consideration:

- Consumers want meat products that are tender, safe, nutritious, and conveniently available.
- You should measure the consumers’ acceptance and willingness to pay for new products and different product attributes.

When you harvest products (meat), you should do it as early as possible, meaning, when the animal is produced economical. *For example:* animals that are used for lamb production must be early matured so that they can be slaughtered at very early stage e.g. 4 – 6 months (± 40kg live mass). At this stage the animal’s daily requirements are still low and its feed conversion ratio (FCR) is still high.

**Definition**

**FCR:** The amount of feed needed to produce 1 kg meat.
Why slaughtered at 4 - 6 months? At this stage the animal develops and the different parts are formed. First the nerves systems (brain), then the skeleton (bones), thereafter the muscle tissue (meat) and fat are deposited.

The illustration below shows that at ± 5 months muscle are at an optimum and after ± 6 months fat deposited increases, whereas muscle decrease relative to fat deposition.

Mutton and lamb differ from each other in that lambs are slaughtered very young and before much connective tissue has developed, hence their meat is very tender. Mutton, having more connective tissue, is less tender but also very tasty on account of its higher proportion of connective tissue. During cooking, the white connective tissue (collagen) is converted into gelatine, which makes mutton as tender and tasty as lamb.

Pork is tender meat derived from animals of approximately six months. Only carcases of 21 kg to 55 kg are made available to meat traders for selling. Heavier and older carcases are marked as "sausage" pork or "rough" pork and used for processed products such as sausage. "Suckling pigs" are piglets of less than three months of age weighing less than 20 kg and are popular for Christmas and special occasions.

Most of animal products cannot be harvested any time of the year or season. As explained in the previous session the harvesting of most products depends on their readiness for harvesting. This readiness is influenced by several factors.

As explained in Session I, milk, eggs and many other products can be harvested only after puberty or after lambing or calving. That is because the animal is only capable of producing such products at that stage.
2.2 The readiness of wool and mohair for harvesting

The animal produces wool, mohair, cashmere and other fibres from birth, but the fibre diameter and length plays an important role in the quality and price of the final commodity. The wool and hair produced by the young merino lamb or Angora kid, respectively, will attain better prices at auctions than that of older animals.

Wool and mohair is sheared at certain stages. Wool will be sheared, most of the time between eight to twelve months of growth. That will produce a fibre with a length of between 50 – 60 mm for eight months of growth and 80 – 90 mm for twelve months of growth. Depending on the breed, it will either produce wool with a fibre diameter less than 20 µ for fine wool, between 20µ and 21µ for medium wool and more than 22 µ for strong wool. The fibre diameter of merino wool will be determined by the age of animal, breed of the merino, whether it is fine, medium or strong wool animal as well as the diet it receives during the wool growth period.

The length of hair growth in Angora goats is determined by the growth period but the fibre diameter is influenced primarily by the age of the goats. Young kinds up to 6 months of age will produce hair that grows approximately 25 mm a month depending on the availability of adequate, nutritious food. The fibre diameter of the hair will be in the range 20µ to 25µ and will be the most sort-after hair on the market. The next 6 months will produce hair with more mass but also with a thicker fibre diameter of between 25µ and 30µ. The length grown will be more or less the same: 25mm per month of growth. The growth rate will vary very little if a constant feed supply is given. The fibre diameter will increase up to 34 – 38µ in the peek adult stages depending on the breed and nutritional level of the goat.

2.3 The readiness of meat for harvesting

Both beef and mutton can be harvested at different stages. Breeding stock is slaughtered only at the end of their productive lives, but their offspring are slaughtered when they will produce the best quality meat. For most mutton sheep breeds this is when a body mass of between 35 and 45kg is reached depending on the breed.

Breeds that tend to put on fat at an early age such as the Dorper, Persian and fat-tailed breeds will be slaughtered at between 35 – 42kg. At this stage the lambs will have very little fat and tender meat.
The mass of the carcass is approximately 45% of the live body mass of approximately between 17 – 20kg. This will give a high quality carcass.

Other breeds such as the S A Mutton Merino, the Dormer and other breeds that put on fat later will produce carcasses with weights between 20 – 25kg with the same characteristics as the lighter carcasses.

Young cattle vary more and are mostly fed in a feedlot (a place where animals are fattened for slaughtering) until they reach the correct slaughter stage. They are then slaughtered depending on their fatness and depending on the breed. The carcass mass can vary a lot. The carcass is also classified in the same manner as that of sheep and pigs on age, fat distribution and body conformation or condition score.

2.4 The readiness of feathers for harvesting

Feather production in geese and ducks will depend on the growth stage of the feather. As long as the feather grows, it will be unsuitable for plucking. If the feather-stem is dry it is an indication that the feather is mature and then the feathers can be plucked as well as the down. The down is used to make very light commodities like sleeping bags and light, puffed-up blankets like eiderdowns and comforters.

**Down** The down is very soft and light. These are the soft feathers that are found amongst the bigger feathers.

Ostrich feathers are harvested at the mature stage. The feathers are either plucked or cut with a side cutter depending on the type of feathers. Feathers from the wings are more sort-after than the body feathers.
2.5 The use of senses to determine readiness for harvesting

To illustrate this concept we will use the harvesting of wool and mutton.

The following senses can be used to assess the readiness for harvesting.

- Sight; and
- touch.

#### Wool

As mentioned above the biggest factor determining the readiness of wool to be harvested is its length. The length of wool that is sheared may vary but should be at least 50-60 mm. This length is measured on the back of the sheep to be sheared behind the shoulders. When measuring the length of the wool the handler can also assess the quality fines of the wool to be sheared by using his/her senses.

The following will give you an idea of the quality of the wool.

- **Color**: An off white, creamy color that shows of shiny in direct sunlight is preferable.
- **Lanolin**: When touching wool of high quality a fair amount of lanolin must be felt between the fingers.
- **Foreign material**: Check for foreign material within the wool e.g. seeds, thorns etc. that has a detrimental effect on the wool.
- **Tip**: The tips of the wool tufts must be stained dark to give the handler an idea of the amount of lanolin and the flow thereof to the tips of the individual strands of wool.
- **Fiber crimp/ curvature**: The higher the crimp frequency of the fibers the finer the thickness of each fiber. This will give the handler an indication of the expected micron / µ that can be measured when the wool is sampled at the factory where it will be processed for different uses. The finer the wool, the higher the marked value thereof.

#### Mutton

To asses if a sheep is ready for slaughter one must measure its weight, deposition and distribution of fat on the potential carcass. There is a method that can be used to determine these qualities in the crush before the sheep is slaughtered.

While the sheep is standing in the crush one can easily feel the amount of fat deposited on the back of the animal. By placing the thumb and middle finger on either side of the spinal column at the juncture to the ribcage, when moving the hand back and forth whilst having a firm grip, the handler will feel the amount of fat distribution as a soft rubbery mass under the skin.
If the feeling under hand below the skin is still bony and sinewy it is a good indication that the animal is still too lean to be slaughtered.

By weighing the animal the handler will also have a good idea of its readiness for slaughter and by observing the measure of muscle development on the shoulders and thighs.

Remember the modern consumer market prefers a fairly lean product which is tender and that must be the focus of the inspection.

Please complete Activity 2 at the end of this session.

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Select out of a larger group the animals that are ready for their produce to be harvested.

Facilitator must be present and give guidance to learners in this regard. Make notes.

Facilitator comments:

Assessment:
3 Core animal products

After completing this session, you should be able to:
SO 3: Identify and illustrate the core animal product and the parts of the product that are waste (if any).

In this session we explore the following concepts:
♦ The animal product’s core product and parameters is observed and described.
♦ The waste component of the animal product (if any) is observed and described in relation to the product produced or spoilage.
♦ A knowledge about the separation of the agricultural product from the waste is demonstrated.
♦ The disposal of waste product from animal products is demonstrated.

Please complete Activity 3 at the end of this session.

My Notes ...

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3.1 Animal by-products

When an animal is slaughtered you get in addition to the meat a number of by-products, which are of economical value when used correctly especially where they occur in large quantities in abattoirs.

The most important of these by-products are:

■ Skins

Skins are by far the most important by-product and must receive special treatment to prevent damage. Skins are an important export product and many are used within this country.
- **Oils and Fat**
  Edible fats are used for eating and baking and high grades oils are used for margarine. Non-edible come from condemned carcasses and from processes during the production of gelatine and bone meal. They are used mainly for the production of soap. Animal oils are used for the lubrication of delicate machinery and during the production of certain types of leather.

- **Intestines**
  Intestines are used mainly in the manufacturing of sausage and polony and also for other purposes such as the supply of gut for the sewing up of wounds.

- **Blood**
  The blood is caught up at abattoirs, boiled under pressure, which sterilise it, dried, ground and sold as blood meal. Blood meal is an important feed supplement.

- **Bones**
  Only a limited amount of bones occur in the abattoir and are used for bone meal, which is important ingredient of animal licks.

- **Condemned carcasses**
  Owing to diseases some carcasses are not suitable for human consumption and are processed for the production of animal feeds.

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Write a report on the core-, by-, and waste products that can be found within the animal production system that you are familiar with.

Facilitator comments:

Assessment:
After completing this session, you should be able to:

SO 4: Demonstrate the harvesting of the specific animal products

In this session we explore the following concepts:

- The harvesting of the specific animal product is demonstrated practically.
- The process and method used in the harvesting of the animal product is illustrated, as well as any ranges and parameters involved in the harvesting process.
- The separation process of cleaning the product from the waste is demonstrated practically.

Please complete Activity 4 at the end of this session.

4.1 Harvesting of meat

The following describes the harvesting of meat.

Meat goes through many operations before it hangs dressed in cold stores. Skilled workers perform these operations with great speed. The animals are stunned before they are slaughtered and dressed. After slaughtering the carcases are suspended from an overhead rail for the dressing operation, in which the hide and internal organs are removed. Further along the line various trimming procedures are performed. By the time it reaches the end of the chain the carcase is clean, "dressed" and ready for chilling and classification. After slaughtering and dressing, the carcases are inspected by a meat inspector to make sure that it is fit for human consumption.
Diseased carcases are destroyed or sterilised and turned into meat-meal and bone meal, which are used mainly for feeding livestock. In the case of the beef parasite known as "measles", carcases with a very light infestation are frozen at -10°C for ten days. This renders the cysts harmless and the meat fit for human consumption.

At abattoirs that participate in the voluntary classification system, the carcases are classified according to certain characteristics (see "Specifications & Classes"). Roller marks, which tells the consumer more about the meat, are put onto the carcases. After classification, traders buy the carcases. The meat trader then sells it to the consumer in the meat market. The carcases are transported from the abattoir to the meat market by a refrigerator-truck. The carcases are hanged in large cold rooms at the meat market.

- **Processing of the carcase**

A beef carcase is divided lengthwise because of its large size. Each half of the carcase is then divided into a forequarter and hindquarter. The retail dealer buys beef carcases from the wholesaler, in the form of forequarters and/or hindquarters. Pig, goat and lamb or sheep carcases are kept whole. These carcases are cut up in the meat market according to the consumer's choice.

- **Slaughterhouse**

A *slaughterhouse*, also called an *abattoir* which means "to strike down", is a facility where farm animals are killed and processed into meat products (*Meat*, in its broadest modern definition, is all animal tissue intended to be used as food. In this context, it not only refers to muscle tissue, but also includes fat or non-muscle organs, including lungs, livers, tongues, skin, brains, marrow, and kidneys. )

The animals most commonly slaughtered for food are cattle (beef and veal), sheep (lamb and mutton), pigs (pork), poultry, and horses (mostly in Europe).

The design, process, and location of slaughterhouses respond to a variety of concerns. Slaughtering animals on a large scale poses significant logistical problems and public health concerns. Most religions stipulate certain conditions for the slaughter of animals. Public aversion to meat packing, in many cultures, influences the location and practices of slaughterhouses.
Apply animal products harvesting procedures

Primary Agriculture  
NQF Level 2  
Unit Standard No: 116144

Process

General the harvesting process are as follows:

- Stunning.
- Dehiding / dehairing and cleaning.
- Removal of organs.
- Conveyors.
- Cooling.

The slaughterhouse process differs by species and region. A typical procedure follows: (Kosher and halal religious laws prescribe specific methods of slaughter that differ from those described below.)

The steps in harvesting halal and Kosher meat.

1. Animals are received by truck or rail from a ranch, farm, or feedlot.
2. Animals are herded into holding pens.
3. A pre-slaughter animal inspection is conducted.
4. Animals are rendered insensible (unconscious - lack of responsiveness to people and other environmental stimuli) by stunning - the process of rendering animals immobile or unconscious prior to their being slaughtered for food (method varies).
5. Animals are hung by hind legs on processing line.
6. The main artery is cut, the animal's blood drains out and the animal dies.
7. Animal's hide/skin/plumage is removed.
8. Carcass is inspected and graded by a government inspector for quality and safety.
9. The carcass is cut apart and the body parts separated.
10. Meat cuts are quickly chilled to prevent the growth of microorganisms and to reduce meat deterioration while the meat awaits distribution.
11. The remaining carcass may be further processed to extract any residual traces of meat, usually termed mechanically recovered meat, which may be used for human or animal consumption.
12. Material not destined for human consumption is sent to a rendering plant.
13. The waste water generated by the slaughtering process and the cleaning of the slaughter house is treated in a waste water treatment plant.
14. The meat is transported to distribution centers that distribute to local retail markets.
4.2 Pig slaughtering

**Receiving**

Pigs are usually slaughtered after 4-7 months. Pigs intended for pork are usually slaughtered 1-2 months younger than pigs for bacon. The pigs are transported with trucks that have compartments with an individual capacity of 12-15 pigs. On arrival, they are unloaded and driven in pens having a capacity equivalent to a truck compartment. The pigs are held there for 24 hours to recover from fatigue and stress; and they are provided with enough water to flush out intestinal pathogenic bacteria. Moreover, health inspections can be held during that holding period. The live animals are weighed prior to processing so that yield can be accurately determined.

**Stunning**

Before slaughtering, pigs undergo electrical or carbon dioxide stunning. In the first case, they are stunned using high frequency (50 Hz), low voltage electric current applied by means of two electrodes, which are placed on either side of the brine using tongs. The current induces a state of immediate epilepsy in the brain during which time the animal is unconscious. In the later case, the pigs are passed through a well with a CO2 and air atmosphere. Legally a minimum of a 70% concentration of CO2 by volume is required, but a 90% concentration is recommended. The pigs are again rendered unconscious due to the acidification of the cerebrospinal fluid upon inhalation of the CO2. With the CO2 method “blood splashing” is eliminated, and it also removes the human element required in the electrical stunning.

During their state of unconsciousness, the pigs are hoisted onto an overhead rail for slaughtering.

**Sticking & bleeding**

The stunned animals undergo sticking, with blood collected through a special floor drain or collected in large barrels and sent to a rendering facility for further processing.

The carotid artery and jugular vein are cut to drain out blood and to get the muscles relaxed for easy dehairing. Pigs should be allowed to bleed for about 5 minutes.

**Scalding & dehairing**

Pig carcasses are not skinned after sticking. Instead, the carcasses are dropped into scalding water, which loosens the hair for subsequent removal. The carcasses should be kept under water and continually moved and turned for uniform scalding. In large plants, carcasses enter the scalding tub and are carried through the tub by a conveyer moving at the proper speed to allow the proper scalding time. During the hard-hair season (September-November), the water temperature should be 59°C to
60°C and the immersion period 4 to 4.5 minutes, while in the easy-hair season (February-March), a temperature of 58°C for 4 minutes is preferable. In small plants without automation, hair condition is checked periodically during the scalding period. The dehairing process is begun with a dehairing machine, which uses one or more cylinders with metal tipped rubber beaters to scour the outside of the carcasses. Hot water (60°C) is sprayed on the carcasses as they pass through the dehairer moving toward the discharge end. The carcasses are removed from this machine; hand scraped, and then hoisted again, hindquarters up. The carcasses are hand-scraped again from the top (hind quarters) down. Any remaining hairs can be removed by singeing with a propane or similar torch. Once the remaining hairs have been singed, the carcasses are scraped a final time and washed thoroughly from the hind feet to the head. Some plants pass the carcasses through a singeing through gas flames.

**Evisceration**

After scalding and dehairing, singeing, or skinning, the head is severed from the backbone at the atlas joint, and the cut is continued through the windpipe and oesophagus. The head is inspected, the tongue is dropped, and the head is removed from the carcass. The head is cleaned, washed, and an inspection stamp is applied. Following heading, the carcass is eviscerated. The hams are separated, the sternum is split, the ventral side is opened down the entire length of the carcass, and the abdominal organs are removed. These viscera are received in a moving gut pan to segregate edible (heart, liver) and non-edible offal. Intestines are cleaned for sausage casings. The thoracic organs are then freed. Non-edible offal is discarded into a barrel to be shipped to the rendering plant.

**Splitting**

The carcass is cut into two halves. The meat is controlled.

**Washing**

The carcass is then washed from the top down to remove any bone dust, blood, or bacterial contamination. A mild salt solution (0.1 M KCl) weakens bacterial attachment to the carcass and makes the bacteria more susceptible to the sanitization procedure, especially if the sanitizing solution is applied promptly. Dilute organic acids (2 percent lactic acid and 3 percent acetic acid) are good sanitizers. In large operations, carcass washing is automated. As the carcass passes through booths on the slaughter line, the proper solutions are applied at the most effective pressure.

**Cooling**

Cutting and deboning are easier to carry out at lower temperature. Therefore, the carcasses are transferred to chill tunnels and chill rooms to cool them down to 0-1°C with air velocity typically 5 to 15 mph, equating to −5°C wind chill, for a 24-hour chill period. For thorough chilling, the inside temperature of the ham should reach at least 3°C. With accelerated (hot) processing, the carcass may be held (tempered) at an intermediate temperature of 16°C for several hours, or be boned immediately.
When large numbers of warm carcasses are handled, the chill room is normally pre-cooled to a temperature several degrees below freezing –3°C, bringing the wind chill to –9°C to compensate for the heat from the carcasses.

### Cutting into smaller pieces

The carcasses are processed into 3 cuts of meat (fore-end, middle and hind leg). During further cutting into smaller pieces, the slaughters are assisted in their work by automated transport trays and conveyors. They help in cutting and sorting meat and bone. The products are finally efficiently packaged and stored at low temperature prior to further processing.

<table>
<thead>
<tr>
<th>Concept (SO 4, AC 1-3)</th>
<th>I understand this concept</th>
<th>Questions that I still would like to ask</th>
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</thead>
<tbody>
<tr>
<td>The harvesting of the specific animal product is demonstrated practically.</td>
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</tr>
<tr>
<td>The process and method used in the harvesting of the animal product is illustrated, as well as any ranges and parameters involved in the harvesting process.</td>
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<tr>
<td>The separation process of cleaning the product from the waste is demonstrated practically.</td>
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</table>

Please complete Activity 5 at the end of this session.

My Notes ...

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The harvesting of the specific animal product is demonstrated practically. The process and method used in the harvesting of the animal product is illustrated, as well as any ranges and parameters involved in the harvesting process. The separation process of cleaning the product from the waste is demonstrated practically.

Field trip. Practical exercise and observation and report writing

My Name: ....................................
My Workplace: ..................................
My ID Number: .................................

Facilitator comments:

Assessment:

version: 01  version date: july 2006
To understand the meat harvesting process better, a visit to an abattoir should be arranged by the facilitator. Write a report on the flow of the animal through the facility and the processes it undergoes before transporting to the various wholesalers.
Session 5

Separating core from waste products

After completing this session, you should be able to:
SO 5: Identify and demonstrate the basic methodology regarding the separation of the core product from the waste.

In this session we explore the following concepts:
♦ The processes involved in separating the waste from harvested animal products are illustrated and described.
♦ The separation of animal products from waste is demonstrated practically.
♦ The methodology involved in the separation of animal products from the waste is illustrated and described.

5.1 Introduction

Until recently it was part of tradition to slaughter a sheep or goat for the pot at least once a week. In those days, however, offal was still much in demand but today it is virtually unknown, particularly by the younger generation. This is unfortunate because not only is offal gourmet food but it also has a high nutritional value.

What is offal? Offal is everything removed during the dressing (slaughtering) of a carcase. This includes the brains, tongue, trotters, tripe, kidneys, liver, sweetbreads and heart.

Liver

Liver is a good source of complete proteins and is rich in vitamin A and the B-complex vitamins as well as mineral salts such as iron, calcium, phosphorus, copper and iodine.

♦ Lamb’s liver: It is fairly readily available. Lamb’s liver has a fine texture and is ideal for frying and grilling. Dark-coloured lamb’s liver often comes from older sheep and is less tender.
♦ Calf’s liver: This liver is very tender but very scarce. It is suitable for grills and fried dishes.
♦ Pig’s liver: Pig’s liver has a stronger flavour and is generally used for pâtés and terrines. It can also be used in grills, casserole dishes or in sausage meat and meat loaves.
Apply animal products harvesting procedures

Primary Agriculture  NQF Level 2  Unit Standard No: 116144

♦ **Ox liver:** Ox liver is freely available. This liver is less tender and has a strong
flavour. Soak ox liver in salt water or milk for 20 minutes to remove some of
the strong flavour. Ox liver can be used in stews, braised and casserole
dishes. Ox liver is used in liver patties, liver-and-beef pies and many other
well-known dishes.

■ **Kidneys**

Kidneys are considered by some to be the choicest offal item. Ox, calf and lamb's
kidneys are protected in the carcase by a large amount of white fat, known as the
kidney fat. Pig's kidneys have no kidney fat.

♦ **Lamb's kidneys:** The shape of lamb's kidneys differs from that of ox and
calf's kidneys. Lamb's kidneys can be fried or grilled successfully.

♦ **Ox kidneys:** These kidneys are the largest of all the kidney types
(approximately 750 g) and have a strong flavour. Ox kidneys are usually
cubed and used in stews and braises.

♦ **Calf kidneys:** Calf's kidneys are scarce and resemble ox kidneys, but are
smaller. These kidneys are tender and have a less pronounced flavour than
ox kidneys. Calf's kidneys can be fried or used in stews or braises.

♦ **Pig's kidneys:** Pig's kidneys resemble lamb's kidneys but are larger, less
tender and have a stronger flavour. They can be fried, grilled or used in
stews and casseroles.

■ **Tongue**

Ox tongue is most popular because of its fine texture and excellent taste. Lamb's
tongues are delicious, small and tender but very scarce. Lamb's tongues are sold
with the head as lamb's or sheep's offal. Lamb's and pig's tongues are usually served
whole while ox tongue is served sliced. Tongue may be served fresh or pickled.

■ **Tripe**

This is the stomach tissue of cud-chewing animals. Tripe has a very coarse texture
and is fairly tough and, therefore, requires long, slow cooking. Traditionally the
stomach (tripe) is curried with trotters.

■ **Oxtail**

Oxtail is perhaps the most popular of the animal extremities. Long, slow cooking is
required to make tasty stews and soup

Please complete Activity 6 at the end of this session.

My Notes ...
Write a report on the various waste products that can be derived from the animals that you are familiar with.
<table>
<thead>
<tr>
<th>Concept (SO 5, AC 3)</th>
<th>I understand this concept</th>
<th>Questions that I still would like to ask</th>
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<tbody>
<tr>
<td>The processes involved in separating the waste from harvested animal products are illustrated and described.</td>
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<tr>
<td>The separation of animal products from waste is demonstrated practically.</td>
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<td></td>
</tr>
<tr>
<td>The methodology involved in the separation of animal products from the waste is illustrated and described.</td>
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</table>
Session 6

Methods used to preserve and present animal products

In this session we explore the following concepts:

- The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for preservation is demonstrated.
- The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for presentation is demonstrated.
- The various processes used in the preservation of animal products are demonstrated where appropriate.

6.1 Methods of processing and preservation of meat

Meat was originally processed to preserve it, but since the various procedures cause so many changes in texture and flavour it is also a means of adding variety to the diet.

Processing also provides scope to mix the less desirable parts of the carcass with lean meat and in addition is a means of extending meat supplies by including other foodstuffs such as cereal in the product.

Meat is a highly perishable product and soon becomes unfit to eat and possibly dangerous to health through microbial growth, chemical change and breakdown by endogenous enzymes.

These processes can be limited by reducing the temperature sufficiently to slow down or inhibit the growth of micro-organisms, by heating to destroy organisms and enzymes (cooking, canning), or by removal of water by drying or osmotic control (binding the water with salt or other substances so that it becomes unavailable to the organisms).
It is also possible to use chemicals to inhibit growth and, very recently, ionising radiation (however, the latter is not allowed in some countries).

Traditional methods that have been used for thousands of years involve drying in wind and sun, salting and smoking. Canning dates from early in the 19th century and allows food to be stored for many years since it is sterilised and protected from recontamination.

## Chilling and Freezing

While mechanical refrigeration is a modern process it is known that the ancient people kept food cool with ice. "Chilled" meat is usually stored at temperatures around 1°C to +4°C when it keeps well for several days. Provided that the meat is kept very cool (1°C to 0°C) and that slaughter and meat cutting are carried out under strict hygienic conditions, modern packaging techniques including storage under carbon dioxide or in vacuum can extend this period to about 10 weeks.

Chilling at temperatures very close to the freezing point of meat, -15°C, diminishes the dangers of most pathogens and slows the growth of spoilage organisms; growth of some organisms, moulds, virtually ceases at -10°C.

Most pathogens (Salmonella, Staphylococcus species and Clostridium) are inhibited by cooling but pathogens can grow at + 2°C, some Salmonella species at +5°C.

Non-pathogens include Pseudomonas species, which predominate on the exposed surface of chilled meat, and Lactobacilli on vacuum-packed meat.

Freezing - commercially at -29°C and domestically at -18°C - is now a standard method of preserving for periods of 1-2 years but there is some deterioration of eating quality compared with fresh or chilled meat.

However, there are problems in chilling and freezing meat. If it is cooled too rapidly below 10°C before the pH of the muscle has fallen below a value of about 6, the muscle fibres contract (cold shortening) and the meat is tough when cooked.

This problem applies more to small animals, such as lamb, which cool down rapidly. The modern procedure is to cool the carcass to 10-15°C ("conditioning") and to hold that temperature for a few hours until the pH has fallen to 6°C.

Beef carcasses can be suspended in such a way as to exert a pull on certain muscles to prevent contraction. Another method is to apply electrical stimulation to the carcass after slaughter (low volt) or after evisceration (high volt) for 2-4 minutes to bring down the pH rapidly.

Another problem can arise during thawing of pre-rigor frozen meat when the muscle contracts and exudes a substantial part of its weight as tissue fluids. Clearly, freezing of meat is not a straightforward procedure and calls for certain expertise. Only post-rigor meat should be frozen.
Nutritional Changes by Freezing

Meat is frozen without any prior treatment, unlike vegetables, which have to undergo a preliminary blanching process to destroy enzymes involving considerable loss of water-soluble nutrients. So there is little or no loss of nutrients during neither the freezing procedure nor, so far as there is reliable evidence, during frozen storage - apart from vitamin E.

Processing - General Aspects

Processed meats are products in which the properties of fresh meat have been modified by the use of procedures such as mincing, grinding or chopping, salting and curing, addition of seasonings and other food materials, and, in many instances, heat treatment. Most of these processes extend the shelf life of meat. Their manufacture, in most instances, depends on the ability of the mixture to retain water since they are emulsions of protein, fat and water.

Curing

Curing was originally a term applied to preservation in general but is now restricted to preservation with salt (sodium chloride) and sodium or potassium nitrite or nitrate or a mixture of these two salts. The nitrate serves as a reservoir for nitrite - the active compound - since bacteria in the curing solution form it from the nitrate. The use of salt is one of the oldest methods of preserving meat since at concentrations greater than 4% in the aqueous phase it inhibits the growth of most spoilage organisms.

Smoking

Meat has been treated with smoke from the earliest days - traditionally over a wood fire and more recently by producing smoke from wood sawdust in a generator and conducting the smoke over the meat.

The substances deposited on the meat contribute to the flavour and appearance but with ordinary, light smoking the preservative effect is limited and the product has to be stored refrigerated.

Intensive smoking does prolong shelf life both by heavier deposition of preservatives and by the drying effect of the hot air but it has a detrimental effect on flavour. Consequently preservation by smoking is regarded as an emergency measure when other methods cannot be used.

A modern development making use of the flavouring effect is to use an aqueous solution of the constituents of smoke, which reduces the amount of strongly flavoured and other unwanted substances.
Drying

Micro-organisms cannot grow unless there is sufficient moisture available to them and drying meat under conditions of natural temperatures and humidity with circulation of air and the assistance of sunshine is the oldest method of preservation. Muscle meat of almost any kind can be dried but it is necessary to use lean meat since fat becomes rancid during the drying process. Drying involves the removal of moisture from the outer layers and the migration of moisture from the inside to the outside, so the pieces of food must be thin. The meat is cut into long thin strips or flat thin pieces and preferably salted, either dry or by dipping into salt solution, to inhibit bacterial growth and to protect from insects.

Canning

Micro-organisms can be completely destroyed by heat (sterilisation) but a sterile product can be readily re-contaminated unless it is protected. This is achieved by heating in an airtight can or bottle, or, more recently, in a heat-resistant or aluminium foil-laminated plastic pouch.

The procedure is to seal the food into the container and then heat it under pressure in an autoclave (retort) to the required temperature for the required length of time and to cool rapidly to avoid overheating. Overheating results in too soft a consistency and a burnt taste. It is not always possible to destroy all the organisms without excessive heat which would spoil the product so the objective is to destroy the greater proportion of the organisms when the remaining few pose no hazard so long as the container is cooled rapidly and stored below 20-25°C.

Please complete Activity 7 at the end of this session.

My Notes...

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..........................................................
We have identified the value of animal products.
We have discussed the products and the relative value of the products.
We have looked into the harvesting of meat as an example of a very important animal product.
We have looked at the uses, origin of different meat products and the readiness for harvesting.
We have looked at the core animal product produced by certain animals and how the core product is separated from the waste.
We have looked at the processing of the waste and their uses.
We have look at the harvesting of different meat products of different species of farm animals.
We have looked at the processing of the core as well as the waste products of the animals.
We have looked at the equipment used for harvesting of meat and the handling of the animals and the product.
We also looked at the storage of the products as well as the uses.
We have looked at the preservation of meat like chilling, curing, smoking, drying and canning.

<table>
<thead>
<tr>
<th>Concept (SO 6, AC 1-3)</th>
<th>I understand this concept</th>
<th>Questions that I still would like to ask</th>
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<tbody>
<tr>
<td>The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for preservation is demonstrated</td>
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<tr>
<td>The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for presentation is demonstrated</td>
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<td></td>
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<tr>
<td>The various processes used in the preservation of animal products are demonstrated where appropriate</td>
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</tbody>
</table>
Divide into groups. Each group must draw up a list of products derived from animal production. At least 5 products derived from different species of animals must be included. For each product the group must describe in written form all the measures taken to preserve and market the products to ensure maximum client satisfaction.
Am I ready for my test?

♦ Check your plan carefully to make sure that you prepare in good time.
♦ You have to be found competent by a qualified assessor to be declared competent.
♦ Inform the assessor if you have any special needs or requirements before the agreed date for the test to be completed. You might, for example, require an interpreter to translate the questions to your mother tongue, or you might need to take this test orally.
♦ Use this worksheet to help you prepare for the test. These are examples of possible questions that might appear in the test. All the information you need was taught in the classroom and can be found in the learner guide that you received.

1. I am sure of this and understand it well
2. I am unsure of this and need to ask the Facilitator or Assessor to explain what it means

<table>
<thead>
<tr>
<th>Questions</th>
<th>1. I am sure</th>
<th>2. I am unsure</th>
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</thead>
<tbody>
<tr>
<td>1. Name 5 factors that will determine the market value of an animal product.</td>
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<tr>
<td>2. What is the difference between mutton and lamb?</td>
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<tr>
<td>3. Name 5 procedures to preserve product quality.</td>
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<tr>
<td>4. Describe how you will ascertain the readiness of wool and meat to be harvested.</td>
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<tr>
<td>5. For what purpose can one use the intestines of slaughtered animals?</td>
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<td>6. What is the difference between veal and beef?</td>
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<tr>
<td>7. Names the procedures of harvesting meat.</td>
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<td>8. What is the meaning of the term splitting and why is it used?</td>
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<tr>
<td>9. Describe the cooling procedure of meat after slaughter.</td>
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<tr>
<td>10. Name 5 animal waste products.</td>
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</table>
Checklist for practical assessment ...

Use the checklist below to help you prepare for the part of the practical assessment when you are observed on the attitudes and attributes that you need to have to be found competent for this learning module.

<table>
<thead>
<tr>
<th>Observations</th>
<th>Answer Yes or No</th>
<th>Motivate your Answer (Give examples, reasons, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you identify problems and deficiencies correctly?</td>
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<tr>
<td>Are you able to work well in a team?</td>
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<td>Do you work in an organised and systematic way while performing all tasks and tests?</td>
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<td>Are you able to collect the correct and appropriate information and / or samples as per the instructions and procedures that you were taught?</td>
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<td>Are you able to communicate your knowledge orally and in writing, in such a way that you show what knowledge you have gained?</td>
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<td>Can you base your tasks and answers on scientific knowledge that you have learnt?</td>
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<tr>
<td>Are you able to show and perform the tasks required correctly?</td>
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<tr>
<td>Are you able to link the knowledge, skills and attitudes that you have learnt in this module of learning to specific duties in your job or in the community where you live?</td>
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</tbody>
</table>

♦ The assessor will complete a checklist that gives details of the points that are checked and assessed by the assessor.
♦ The assessor will write commentary and feedback on that checklist. They will discuss all commentary and feedback with you.
♦ You will be asked to give your own feedback and to sign this document.
♦ **It will be placed together with this completed guide in a file as part of you portfolio of evidence.**
♦ The assessor will give you feedback on the test and guide you if there are areas in which you still need further development.
Paperwork to be done …

Please assist the assessor by filling in this form and then sign as instructed.

<table>
<thead>
<tr>
<th><strong>Learner Information Form</strong></th>
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<tbody>
<tr>
<td><strong>Unit Standard</strong></td>
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<td><strong>Program Date(s)</strong></td>
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■ **Project Management:**
  M H Chalken Consulting
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■ **Developer:**
  Mr J H P van der Merwe

■ **Authenticator:**
  Mr M M Ratsaka

■ **Technical Editing:**
  Mr C Klindt

■ **OBE Formatting:**
  Ms P Prinsloo

■ **Design:**
  Didacsa Design SA (Pty) Ltd

■ **Layout:**
  Ms P Prinsloo
  Ms N Matloa
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SOUTH AFRICAN QUALIFICATIONS AUTHORITY
REGISTERED UNIT STANDARD:

Apply animal products harvesting procedures

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<th>UNIT STANDARD TITLE</th>
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<td>2007-10-13</td>
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PURPOSE OF THE UNIT STANDARD

A person achieving this unit standard will be able to understand how to harvest animal products, prepare them for processing and identify processes involved in processing of animal products. In addition they will be well positioned to extend their learning and practice into other areas of animal production.

Learners will gain specific knowledge and skills in harvesting animal products and will be able to operate in an animal production environment implementing sustainable and economically viable production principles.

They will be capacitated to gain access to the mainstream agricultural sector, in animal production, impacting directly on the sustainability of the sub-sector. The improvement in production technology will also have a direct impact on the improvement of agricultural productivity of the sector.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

It is assumed that a learner attempting this unit standard will demonstrate competence against the following unit standards or equivalent:

- NQF 1: Harvest animal products.
- NQF 1: Observe and handle animals.
- NQF 1: Apply basic food safety practices.
- NQF 1: Collect agricultural data.

UNIT STANDARD RANGE

Whilst range statements have been defined generically to include as wide a set of alternatives as possible, all range statements should be interpreted within the specific context of application.

Range statements are neither comprehensive nor necessarily appropriate to all contexts. Alternatives must however be comparable in scope and complexity. These are only as a general guide to scope and complexity of what is required.
Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1
Identify the estimated qualitative and quantitative value of various animal products.

OUTCOME RANGE
Animal products include but are not limited to bee products (such as wax, honey, propolis, bee venom, brood, royal jelly), manure, urine and other excretions of animals, meat, horns, bones, skins, feathers, snake venom, silk, fibre, cochineal, whole (live or slaughtered) animals such as marine molluscs and crustaceans and insects such as mopane worms or animals for use in medical science and research, animal derivatives such as semen and ovaries (including eggs), glandular and endocrine products (including hormones and milk), animal body parts, animal work and services such as traction, pollination, guiding as relevant to the context of application.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
The ability to identify, evaluate and illustrate all the various animal products used by man and their purpose is demonstrated.

ASSESSMENT CRITERION 2
The ability to identify and illustrate the origin of all the various animal products used by man is demonstrated.

ASSESSMENT CRITERION 3
The ability to identify, demonstrate and illustrate estimated value of these various animal products is demonstrated.

SPECIFIC OUTCOME 2
Observe, illustrate and report on observations in animals regarding animal products and their origin and their readiness for harvesting.

OUTCOME RANGE
Animal products include but are not limited to bee products (such as wax, honey, propolis, bee venom, brood, royal jelly), manure, urine and other excretions of animals, meat, horns, bones, skins, feathers, snake venom, silk, fibre, cochineal, whole (live or slaughtered) animals such as marine molluscs and crustaceans and insects such as mopane worms or animals for use in medical science and research, animal derivatives such as semen and ovaries (including eggs), glandular and endocrine products (including hormones and milk), animal body parts, animal work and services such as traction, pollination, guiding as relevant to the context of application.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
The origin of the production of animal products in animals is understood, described and illustrated.

ASSESSMENT CRITERION 2
The sensory signs and indicators that imply that the animal is ready to have products harvested from it are described.
ASSESSMENT CRITERION 3
The sensory signs and indicators that indicate that the animal product is ready for harvesting are described.

ASSESSMENT CRITERION 4
The handling of the animal and animal products to determine these sensory signs and indicators is described.

SPECIFIC OUTCOME 3
Identify and illustrate the core animal product and the parts of the product that are waste (if any).

OUTCOME RANGE
Animal products include but are not limited to bee products (such as wax, honey, propolis, bee venom, brood, royal jelly), manure, urine and other excretions of animals, meat, bones, horns, skins, feathers, snake venom, silk, fibre, cochineal, whole (live or slaughtered) animals such as marine molluscs and crustaceans and insects such as mopane worms or animals for use in medical science and research, animal derivatives such as semen and ovaries (including eggs), glandular and endocrine products (including hormones and milk), animal body parts, animal work and services such as traction, pollination, guiding as relevant to the context of application.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
The animal product’s core product and parameters is observed and described.

ASSESSMENT CRITERION 2
The waste component of the animal product (if any) is observed and described in relation to the product produced or spoilage.

ASSESSMENT CRITERION RANGE
Waste components could include but are not limited to products that may or may not be used as products by any alternative process, such as shells, bones, hair, wax, casings, offal, fat, etc.

ASSESSMENT CRITERION 3
A knowledge about the separation of the agricultural product from the waste is demonstrated.

ASSESSMENT CRITERION 4
The disposal of waste product from animal products is demonstrated.

SPECIFIC OUTCOME 4
Demonstrate the harvesting of the specific animal products.

OUTCOME RANGE
Animal products include but are not limited to bee products (such as wax, honey, propolis, bee venom, brood, royal jelly), manure, urine and other excretions of animals, meat, bones, horns, skins, feathers, snake venom, silk, fibre, cochineal, whole (live or slaughtered) animals such as marine molluscs and crustaceans and insects such as mopane worms or animals for use in medical science and research, animal derivatives such as semen and ovaries (including eggs), glandular and endocrine products (including hormones and milk), animal body parts, animal work and services such as traction, pollination, guiding as relevant to the context of application.

ASSESSMENT CRITERIA
ASSESSMENT CRITERION 1
The harvesting of the specific animal product is demonstrated practically.

ASSESSMENT CRITERION 2
The process and method used in the harvesting of the animal product is illustrated, as well as any ranges and parameters involved in the harvesting process.

ASSESSMENT CRITERION RANGE
Ranges and parameters include but are not limited to the humane and safe treatment and handling of the animal, product readiness, legal aspects regarding the harvesting process and the product, the equipment used to harvest the product.

ASSESSMENT CRITERION 3
The separation process of cleaning the product from the waste is demonstrated practically.

SPECIFIC OUTCOME 5
Identify and demonstrate the basic methodology regarding the separation of the core product from the waste.

OUTCOME RANGE
Waste components could include but are not limited to products that may or may not be used as products by any alternative process, such as shells, bones, hair, wax, casings, offal, fat, etc. as relevant to the context of application.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
The processes involved in separating the waste from harvested animal products are illustrated and described.

ASSESSMENT CRITERION 2
The separation of animal products from waste is demonstrated practically.

ASSESSMENT CRITERION 3
The methodology involved in the separation of animal products from the waste is illustrated and described.

SPECIFIC OUTCOME 6
Identify and demonstrate the basic methodologies regarding the processing of animal products for preservation or presentation.

OUTCOME RANGE
Animal products include but are not limited to bee products (such as wax, honey, propolis, bee venom, brood, royal jelly), manure, urine and other excretions of animals, meat, horns, bones, skins, feathers, snake venom, silk, fibre, cochineal, whole (live or slaughtered) animals such as marine molluscs and crustaceans and insects such as mopane worms or animals for use in medical science and research, animal derivatives such as semen and ovaries (including eggs), glandular and endocrine products (including hormones and milk), animal body parts, animal work and services such as traction, pollination, guiding as relevant to the context of application.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1
The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for preservation is demonstrated.

**ASSESSMENT CRITERION 2**
The ability to identify, demonstrate and illustrate all the processes involved in preparing the harvested animal products for presentation is demonstrated.

**ASSESSMENT CRITERION RANGE**
Presentation involves but is not limited to the presentation of animal products for inspection, for showing, for offering for sale, for presenting to the next process in the range of processors.

**ASSESSMENT CRITERION 3**
The various processes used in the preservation of animal products are demonstrated where appropriate.

**UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS**
The assessment of qualifying learners against this standard should meet the requirements of established assessment principles.

It will be necessary to develop assessment activities and tools, which are appropriate to the contexts in which the qualifying learners are working. These activities and tools may include an appropriate combination of self-assessment and peer assessment, formative and summative assessment, portfolios and observations etc.

The assessment should ensure that all the specific outcomes; critical cross-field outcomes and essential embedded knowledge are assessed.

The specific outcomes must be assessed through observation of performance. Supporting evidence should be used to prove competence of specific outcomes only when they are not clearly seen in the actual performance.

Essential embedded knowledge must be assessed in its own right, through oral or written evidence and cannot be assessed only by being observed.

The specific outcomes and essential embedded knowledge must be assessed in relation to each other. If a qualifying learner is able to explain the essential embedded knowledge but is unable to perform the specific outcomes, they should not be assessed as competent. Similarly, if a qualifying learner is able to perform the specific outcomes but is unable to explain or justify their performance in terms of the essential embedded knowledge, then they should not be assessed as competent.

Evidence of the specified critical cross-field outcomes should be found both in performance and in the essential embedded knowledge.

Performance of specific outcomes must actively affirm target groups of qualifying learners, not unfairly discriminate against them. Qualifying learners should be able to justify their performance in terms of these values.

- Anyone assessing a learner against this unit standard must be registered as an assessor with the relevant ETQA.
- Any institution offering learning that will enable achievement of this unit standard or assessing this unit standard must be accredited as a provider with the relevant ETQA.
- Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

**UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE**
The person is able to demonstrate a basic knowledge of:
• Comprehension, identification and understanding of the specific animals and animal products.
• Understanding of the origin of animal products.
• Sensory observation and evaluation of animals and their products.
• Evaluation of the potential of animal products.
• Animal product harvesting.
• The purpose of learning about animal products.
• Animal product production.
• Animal product processing.
• Animal product presentation.
• Demonstration and illustration techniques.

UNIT STANDARD DEVELOPMENTAL OUTCOME
N/A

UNIT STANDARD LINKAGES
N/A

Critical Cross-field Outcomes (CCFO):

UNIT STANDARD CCFO IDENTIFYING
Problem Solving: Relates to all outcomes.

UNIT STANDARD CCFO WORKING
Teamwork: Relates to outcomes:
• Demonstrate the harvesting of the specific animal product.
• Identify and demonstrate the basic methodology regarding the separation of the core product from the waste.
• Identify and demonstrate the basic methodologies regarding the processing of animal products for preservation or presentation.

UNIT STANDARD CCFO ORGANIZING
Self-Organisation and Management: Relates to all outcomes.

UNIT STANDARD CCFO COLLECTING
Interpretation of information: Relates to all outcomes.

UNIT STANDARD CCFO COMMUNICATING
Communication: Relates to all outcomes.

UNIT STANDARD CCFO SCIENCE
Science and technology: Relates to all outcomes.

UNIT STANDARD CCFO DEMONSTRATING
The world as a set: Relates to all outcomes.

UNIT STANDARD CCFO CONTRIBUTING
Personal Development: Relates to all outcomes.

UNIT STANDARD ASSESSOR CRITERIA
N/A
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