

Animal production Level III
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January 2021, Version 3 Curriculum



Module Title: Coordinate Camel Production Practices

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LG #52- LO # 1 - Develop production plan for camel

Instruction Sheet-Learning Guide # 52

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

- Selecting types camel
- Assessing production factors of Camel Production
- Identifying resource requirements and production risks and strategies
- Establishing strategies for herd sourcing and improvement
- Determining breeding program.
- Determining feed requirements for physiological condition
- Determining feeding strategy
- Developing feeding programs for each camel herd category.
- Developing product quality specifications and setting production targets.
- Preparing production plan for each production cycle.
- Planning logistical arrangements
- Establishing appropriate physical and financial record keeping system

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 types camel
- Assess production factors of Camel Production
- Identify resource requirements and production risks and strategies
- Establish strategies for herd sourcing and improvement
- Determine breeding program.
- Determine feed requirements for physiological condition
- Determine feeding strategy
- Develop feeding programs for each camel herd category.
- Develop product quality specifications and setting production targets.
- Prepare production plan for each production cycle.
- Plan logistical arrangements
- Establish appropriate physical and financial record keeping system

Learning Instructions:

- 1 Read the specific objectives of this Learning Guide.
- 2 Follow the instructions described below 3 to 7.
- 3 Read the information written in the information "Sheet "
- 4 Accomplish the "Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5"
- 5 If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1".
- 6 Do the "LAP test" (if you are ready).
- 7 Then processed to the next learning guide
- 8 If your performance is satisfactory proceed to the next learning guide,
- 9 If your performance is unsatisfactory, see your trainer for further instructions or go back to "Operation sheets".

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Information sheet 1 - Selecting types camel

1.1. Definitions

Camel:- a large hoofed animal that has one or two large humps on its back and is used in the deserts of Asia and Africa for carrying passengers and loads

Dromedary camels:- A one-humped domesticated camel widely used as a beast of burden in desert regions from northern Africa to western Asia.

Bactrian camel:- the two-humped camel, which has been domesticated but is still found wild in central Asia.

Wild Bactrian camel:- The wild Bactrian camel is a critically endangered species of camel living in parts of northern China and southern Mongolia. It is closely related to the Bactrian camel. Both are large, double-humped even-toed ungulates native to the steppes of central Asia

1.2. Selecting types camel

There are three surviving species of camel

1. The one-humped dromedary makes up 94% of the world’s camel population.
2. Two-humped Bactrian camel makes up 6%.
3. The Wild Bactrian camel is a separate species and is now critically endangered.

1.2.1. Dromedary – one humped

The dromedary camel or the Arabian (Camelus dromedarius)

- Camel species with a single hump, distinguishing it from the double-humped
- The smallest of the three extant camel species.
- Males weigh about 400 to 600 kg while females weigh between 300 and 540 kg.
- The narrow chest, single hump, long, curved neck, and long hairs on hump, shoulders, and throat are the important characteristic features of the camel.
- The coat color ranges from brown to black to even white

1.2.2. Bactrian Camel (Camelus Bactrianus)

- An extant species of camel that lives in the Central Asian steppes.
- The name of the species is derived from Bactria, a historical region in Central Asia.
- The camel has two humps on its back, the most notable feature that distinguishes the species from the dromedary camel.

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- Has a population of about 2 million, existing primarily in the domesticated form.
- The Bactrian camel is the biggest animal in its native range.
- The largest living camel species, the Bactrian camel has a length of 220 to 350 cm from head to body and a tail length of 35 to 55 cm.
- These camels weigh between 300 and 1,000 kg

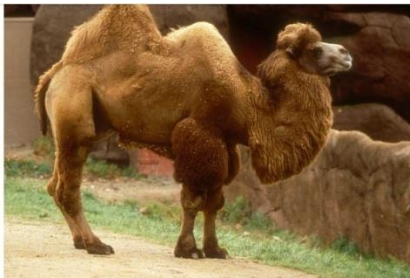


Fig 1. Bactrian (two-humped) Fig 2. Dromedary (one humped) Fig 3. Wild Bactrian camel

- In Ethiopia they are the principal source of income and food for millions of pastoralist. In addition, camels play a central role in providing draught power and determining the wealth and social status of pastoralist. Ethiopian breeds are:

Afar Camel (Barka and Denkel)

- They are small but entirely hardy
- Use for transportation, salt
- Use for milk production

- Use really for transportation
- Used for travel goods

Borana Camel

- Found in Oromia
- Has intimidate size
- Use as pack, draught and dairy anima

Ogden Camel

- The largest in number in Ethiopia
- Found around Somalia
- Use for milk production

The Eastern part of Ethiopia is considered the heartland of the Camel population. The two-thirds of the national of Camel.



Fig 4. Boren, Afar and Somali breeds of Camel in Ethiopia respectively

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Self Check 1 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention the three surviving species of camel (5pts)
- 2 List the Ethiopian camel breeds (5pts)
- 3 Discuss the difference between two types of camels (5Pts)

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

Note: Satisfactory rating - 15 points Unsatisfactory - below 15 points

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**Information sheet 2 - Assessing production factors of Camel Production****2.1. Introduction**

The resources (input) used to produce final products (output) are termed as factors of production. In economic terms factors of production can be defined as inputs that are used for the production of goods or services with the aim to make economic profit. The factors, of production are the resources that include land, labor, capital, and enterprise.

2.2. Assessing production factors of Camel Production**2.2.1. Assess farm environment parameters**

Most of camel production system is extensive system. The input requirements are not as such significant. Limited required inputs are:

- Land
- Foundation stock
- Shelter
- Milk transportation equipments
- Finance

Land requirement

- The Ethiopian arid/semi-arid rangelands, where land use options such as agriculture are not economically and ecologically feasible.
- The environment is a basic determinant of the nature and productivity of the range ecosystem.
- Physical factors such as climate, topography and soil determine the potential of the rangeland to support certain types and levels of land use..
- The major rangelands of the country is home to the pastoral and agro-pastoral communities and hence have primarily been used for some livestock and camel
- Having sufficient land space for camels will ultimately improve their wellbeing.
- Most importantly the nutrition value that land does & does not offer, because ultimately a camel is only as healthy as what it's consuming, so getting this right is very important.

Foundation stock

- In Ethiopia Average camel herd sizes per household are different.
- Ownership usually varies from several hundred, 50 to 100 and less camels.
- Females are found to be numerically dominant, mostly accounting for above 75% of the herd.

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- Male camels are usually sold early as pack animals or for slaughter
- Milk and others transportation equipments



Fig 5. Equipment and transportation

Provide shelter

- To reduce stress; isolate sick animals, protection from wind, especially important for calves.
- Avoid contact with affected herds.

2.2.2. Define production objectives of camel production

The Benefits of Raising Camels:-

- Camels are the main income source of farmers
- Camel meat is high in nutrients and has become famous among chefs around the world. When compared to other meat it is fewer amounts of fat and proteins as well.
- It's milk comprises some great source of ingredients which include unique proteins, plus nutrients that make a good milk alternative, nutraceutical products and skin care components.
- When viewed as a pack animal, camels turn to perform better than oven and horses.
- They require less food and water, and can carry a large amount of load for longer distances.
- Their urine act as antibiotics with a number of healing factors.
- The reason being there's a good bacteria content, salt plus urea in their urine.
- Since camels have good immune system they are ready the fight viruses, fungi and bacteria.
- Camels are attractive beautiful animals with their large furs and unique faces, these making them a joy for kids to play around.

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Self Check 2- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 What are the production factories of camels (5pts)
- 2 Mention the benefits of raising camel (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 3- Identifying resource requirements, production risks and strategies

3.1 Introduction

Nowadays, the changes in camel production systems are modifying the traditional relationships between the camel and its environment.

3.2. Identifying resource requirements, production risks and strategies

3.2.1. Identify resource requirements

- Capital
- Herds
- Production facilities like house, road, electricity, telephone etc
- Feed and water
- Educated man power
- Health care facilities
- Market
- Technology
- Updated materials and equipments

3.2.2. Identify production risks and strategies to mitigate

- Technical innovations are required to overcome consequences on environment, technical, economic, health or social sustainability.

Traditional environment:

- Scattered resources
- Low nutritive value
- Scarcity of waterθ High mobility
- Multi-purpose use
- High protein diet
- Regular watering
- Sedentarily
- Specialization: dairy farms, feedlots, racing stable

Intensive environment:

- Monotonous feeding

Table 1: Effect of traditional and intensification of Camel productions

No	Resources	Traditional	Intensifications
1.	Management and labour	Low	High
2.	Capital	Low	High
3.	Production facilities	Low	High
4.	Infrastructures	Low	High
5.	Technology required	Low	High



Mitigation strategy:

- Plan interventions with ministry officials and with the pastoralist groups themselves. Where possible use community-based planning, monitoring and evaluation.
- Build on the knowledge and experience of the local people.
- Include communities in quarterly project reporting and planning meetings.
- Set out a clear strategy for all project components and adopt a logical framework approach.
- Draw up a seasonal activity calendar with the community and the agencies involved and plan activities in accordance with that calendar.

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Self Check 3- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What are the resources required of camel production? (5pts)
2. What are the camel production risks? (5pts)
3. Mention the mechanism to mitigate camel production strategy. (4Pts)

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

Note: Satisfactory rating - 14 points Unsatisfactory - below 14 points

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Information sheet 4 - Establishing strategies for herd sourcing and improvement

4.1 Introduction

Adaptation to a hotter climate is vital for future livestock as heat stress can extremely reduce their productivity, health and fertility. Camels have developed, through adaptation the ability to produce quality meat, milk and fiber in some of the hottest and most hostile environments in the globe. Gradual herd improvement is crucial to produce more products.

4.2. Establishing strategies for herd sourcing and improvement

Improving breed by introducing high vigor breed camels and gradually remove low productive breeds:- The aim is:

- To increase production rapidly by introducing high-potential imported genetic stock.
- The growth rate and the potential for increase in production are high.
- They are higher milk yields.
- The large male calves provided bigger, stronger working bulls and more meat.
- The initial investment was expensive
- It need trained man power
- It need maintain genetic purity.
- It require controlling of the environments
- Overall improvements in milk yield, growth rates and meat productions.
- Establishing of camel improvement groups within locations and sub locations:

This is important:

- ✓ to pool their resources and afford wholesale veterinary drugs –
- ✓ To act as a contact point for further development and training initiatives
- ✓ To produce high vigor young camels and distribute to others
- ✓ To act as extension agents, trainers and monitoring and supervisory bodies

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Self Check 4. Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the system of herd sourcing (5pts)
2. Discuss the way to improve beed (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 5- Determining breeding program

5.1 Introduction

Breeding is the mating and producing of young. Camels are generally slow reproducers; Females generally only give birth to one calf every two years. They are not ready to copulate until they are six years old and males have only a once-a-year rutting season. The gestation period of a Bacterin camel is 406 days and around 11 months for dromedary camel. Most females give birth to a single calf.

5.2. Determining breeding program.

A **breeding program** is the planned breeding of a group of animals, usually involving at least several individuals and extending over several generations. There are a couple of breeding methods, such as artificial (which is man made) and natural (it occurs on its own).

The type of mating system in camels

Generally there are two types of mating systems, natural service (bull service, natural mating) and artificial insemination. The selection of mating system depends on service cost, availability of trained manpower and resource, health, feeding and management.

Natural service

The selection of a suitable bull is very important as it is said a sire is “half the herd”, that is half the inherited characteristics of all the calves are obtained from him. Natural service is the natural way to get pregnancy. Advantages of natural service are easy heat detection and the cost of keeping the bull is low. On the contrary the disadvantages of natural service is risk of spreading diseases and bulls have to be exchanged frequently (at about every 3 years) to avoid inbreeding

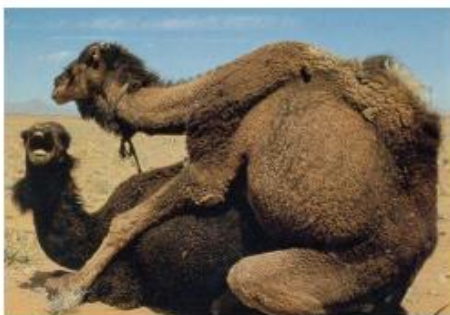


Fig 6. Natural Mating

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Artificial Insemination

AI has been used successfully in both one humped and two humped camels, but still presents some practical problems on large-scale application because of the **difficulties of inducing ovulation and maintaining semen quality in frozen serves.**

Advantages of AI

- Pregnancy can be achieved conveniently and safely
- The breeding process is effective
- The spreading of venereal disease is prevented

Disadvantages of AI

- It may be the means of spreading disease much faster and over a wide area than with natural service
- Inbreeding
- Expensive - AI needs equipments, well-trained technician, liquid nitrogen and frozen semen, transportation facilities etc.

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Self Check 5 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Define breed (5pts)
2. Mention methods of mating (5pts)
3. What are the advantages of artificial insemination? (4Pts)

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

Note: Satisfactory rating - 14 points Unsatisfactory - below 14 points

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Information sheet 6 - Determining feed requirements for physiological condition

6.1 Introduction

Essential requirements may include energy, protein, vitamins, water and minerals. Essential requirements may vary due to live weight and body condition, mating, pregnancy, lactation and milking, growth, weather conditions/wind chill, sex and age of livestock, energy concentration of feeds, distance walked for feed, water or shade, pasture digestibility, and disease/health status.

6.2. Determining feed requirements for physiological condition

Factors that affect nutrient requirements

- | | |
|-----------------------------------|---|
| 1. Species | 7. Growth |
| 2. Breed (not in tables) | 8. Stage of gestation |
| 3. Weight | 9. Level of milk production |
| 4. Body condition (not in tables) | 10. Work (except for horses, not in tables) |
| 5. Age | 11. Environment (not in tables) |
| 6. Sex | 12. Others (genetic potential, disease, stress) |

Generally the highest nutrient requirements are during lactation. To be profitable in camel production these different dietary requirements need to be met as inexpensively as possible.

a) Requirements for Maintenance

For a camel to survive, it needs a certain amount of feed. This feed needs to provide it with the water, energy, protein, vitamins and minerals that are needed to keep the life processes (heart beating, liver functioning, etc.) going.

b) Requirement for growth

A camel obviously needs more feed when it is growing, and again it is usually energy that is limiting but extra protein is needed as well. If the camel is overfed then it will lay down fat rather than lean meat, but this may be wanted if the market is for fat animals.

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C) Requirement for production

Lactation

Camels producing milk have a need of large quantities of water (milk is about 87 % water) and the main nutrient required is protein. Generally any high protein type of feed at about 250 gram per litre milk produced should be satisfactory for maintaining milk production.

d). Requirement for Reproduction

Adjustments to requirements for reproduction are based on expected birth weight and stage of gestation. Requirements include development of maternal tissue as well as the fetus. Usually, pregnancy does not significantly affect requirements until the last one-third of pregnancy when the fetus is growing rapidly. Nutrient deficiencies prior to breeding may result in low fertility or failure to maintain pregnancy. Underfeeding during growth can result in delayed sexual maturity. Fetal tissues have priority for nutrients over maternal tissues. Body reserves may be depleted.

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Self Check 6 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the reason for feed required for camel (5pts)
2. Discuss the requirement for reproduction (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 7 - Determining feeding strategy

7.1. Introduction

It is therefore of the utmost importance to design a feeding strategy that allows for **optimized animal performance and minimal waste**. An effective strategy is one that provides each animal with a feed whose content and digestibility are sufficient for its needs (maintenance and growth).

7.2. Determining feeding strategy

Feed hay as they can eat and allow grazing as well as browsing

- Oats and grains are far too rich for a camel’s diet, as camels are used to nutrient-poor desert scrubs.
- Alfalfa, which they love, is also much too rich, but can be used as a treat in small bunches.
- Feeding of hay and any other grass
- If the camel has grass and shrubs in their field, this is a supplement to their diet. It cannot replace regular feeding.
- Access to browsing and grazing

Make sure they have access to salt

- Sodium is incredibly important in a camel diet.
- Camels should have constant access to a salt lick, which you can buy at any store that sells horse supplies.
- The owner can get chunks of salt that they can chew, or hanging “salt treats.
- In general, these smaller chunks are easier for a camel to lick than a large block.
- make sure the camel can access all crucial nutrient source.

Give them fresh, clean water every day

- Camels may not drink if the water isn’t clean.
- Run the hose into their bowls each day so that they get fresh water and nothing is stagnant.
- The more water you can get them, the better.

Ensure that your camel gets their required supplements

- These can be easily given to them with a treat, such as a handful of alfalfa pellets, carrots, or apples.
- A standard horse multi-vitamin, with vitamin B, potassium, etc.

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- generally do want a selenium supplement and plenty of vitamin E. Talk to your veterinarian, however, about the exact amounts for your camel.
- If there are powdered supplements, try wetting the treats with water or apple cider vinegar. This helps the powdered supplements stick to the treats.
- Some camel-specific salt blocks have selenium in them as well. These two nutrients are perhaps the most vital for the camel’s health.

Feeding habits of Camels

- The camel covers large areas while browsing and grazing, and is continually on the move, even if food is plentiful. Distance of 50–70 kilometers a day can be cover. Camels in the Horn of Africa still range for their food even though they are brought to graze on crop residues, such as sorghum Stover, cotton stalks and sesame waste.
- The main forage is obtained from trees and shrubs. The diet is made up of species of Acacia, Indigofera, Dispera, and Tribulus. The Acacia, Salsola and Atriplex plants which contain the highest content of moisture, electrolytes and oxalates are preferred. It is noteworthy that most of the preferred plants are not readily eaten by other animals because they are thorny and bitter.
- The camels graze in the early morning and late afternoon which are the coolest times of the day for feeding. Analysis of the fodder indicated that the plants had a high water and protein content.

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Self Check 7 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Discuss the way you determine camel feeding (4pts)
2. Why it need supplement feed for camel (4pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 8- Developing feeding programs for each camel herd category

8.1. Introduction

Camels are free ranging animals and under many conditions need little in the way of additional feed. However if they are expected to produce extra work or large quantity of products supplementary feeding is required.

8.2. Developing feeding programs for each camel herd category

Feeding program includes:-

- Setting of objective about supplementary feeding
- Fodder conservation plan
- Feed purchases
- Drought reserves
- Minimum camel condition levels
- Age categories
- Production requirements
- Use of adjustments

When the requirements of the different animals are known as well as the values of the available feed stuffs, either from tables or from analysis, it is possible to make feeding plans. The feeding plans make it possible to judge if an animal is receiving the proper amount of nutrients according to its production. The following measures have to be taken according to the guidelines described in the feeding plan:-

- Camel are grazed and browsed on pasture
- Required supplementary feed is obtained
- Supplementary feed is provided to camel

Indications of any negative environmental impacts are identified and assessed, and amendments are made to the feeding plan as required.

Feeding system of camel

The system will include the locations and times for grazing, browsing and the types and quantities of supplementary feeding. The feeding system selected is regularly assessed against the range of required parameters which are mentioned on the feed plan, and adjustments are made as and when they are required

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Self Check 8 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Why it needs feeding program? (3pts)
2. What are the feeding systems of camel? (5pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 9 - Developing product quality specifications and setting production targets

9.1. Introduction

Quality specifications are detailed requirement that define the quality of a product, service or process, Quality includes tangible elements such as measurements and tangible such as smell and tests.

9.2. Developing product quality specifications and setting production targets

9.2.1. Developing product quality specifications

Milk is one of the best products of camel and it needs special attention. **Milk testing and quality control** is an essential component of any milk processing industry whether small, medium or large scale. Milk being made up of 87% water is prone to adulteration by unscrupulous middlemen and unfaithful farm workers. Moreover, its high nutritive value makes it an ideal medium for the rapid multiplication of bacteria, particularly under unhygienic production and storage at ambient temperatures.

Testing milk and milk products for quality and monitoring those milk products, processors and marketing agencies adhere to accepted codes of practices costs money. There must be good reasons why we have to have a quality control system for the dairy industry.

The reason milk quality control:

1. To the Milk Producer
2. To Milk Processor
3. To Consumer
4. To Public and Government Agencies

Quality control in the milk marketing chain:

1. At the farm
2. At Milk collection Centers
3. At the Dairy Factories
4. Within the Dairy Factory
5. During Marketing Of Processed Products

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Techniques used in milk testing and quality control:

1. Milk sampling
2. Sampling milk for bacteriological testing
3. Preservation of sample
4. Labeling and records keeping
5. Common testing of milk.

9.2.2. Setting production targets

This marketing plan has been developed from the preceding marketing research. It sets out a strategic direction, and outlines specific activities that can be pursued by the camel meat industry to better meet the needs and expectations of its target market. Implementation of this plan will result in improved marketing and sales performance of camel meat products.

Target markets:

Primary

- Potential target markets identified for camel meat includes: -
- e.g. international and domestic tourists visiting

Secondary

e.g. consumers high income professionals,

Intermediaries

The above target markets would be best reached by distribution of camel meat products through:

- Supermarkets in tourist areas
- On-site sell
- Butchers
- Restaurant
- Traveler
- Resorts

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Self Check 9 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What is the importance of keeping quality of milk? (4pts)
2. Mention the procedure to milk quality testing (5pts)
3. What are the benefits of setting production targets? (4pts)

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

Note: Satisfactory rating - 13 points Unsatisfactory - below 13 points

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Information sheet 10 - Preparing production plan for each production cycle

10.1. Introduction

Production planning is the planning of production and manufacturing modules in a company or industry. It utilizes the resource allocation of activities of employees, materials and production capacity, in order to serve different customers.

10.2. Preparing production plan for each production cycle

Production is a scientific process which involves transformation of raw material (input) into desired product or service (output) by adding economic value. Production can broadly categorize into following based on technique:

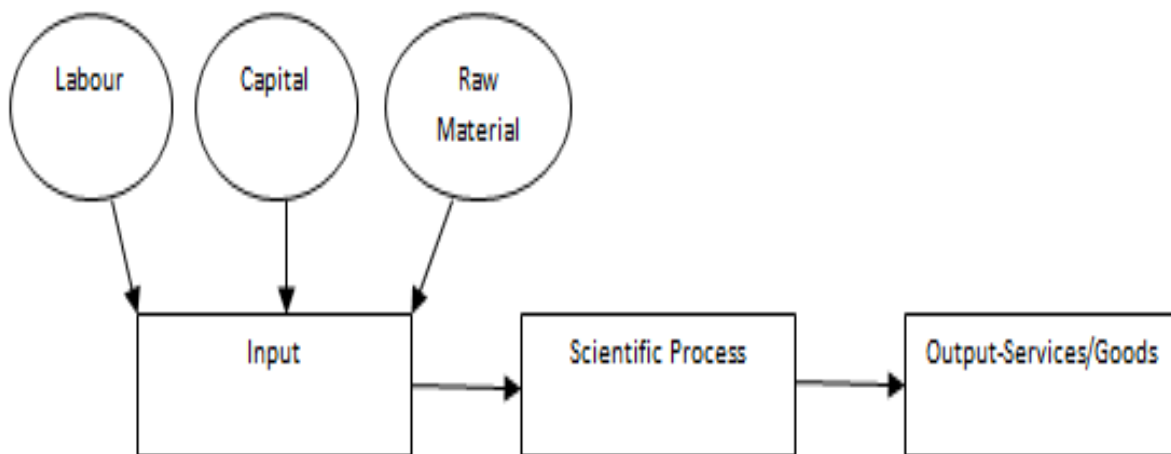


Fig 7. Input to output

Milk Production plan:-Camels are popular for their milk and it is a stable food for the nomads. They produce high amount of milk then cattle and even during dry periods they produce high amounts of milk.

Meat Production plan: Camel meat is leaner, and sweeter than any other meat because of the high glycogen content and protein that it contains. The meat has low fat, Low cholesterol, high polyunsaturated fatty acids. It is highly recommended because camel meat highly nutritious and healthier.

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Hair and wool production plan:- Camel hair is commonly reddish brown with variants from brown to grey. Camels produce hair of about 1-3 kg that can be used to make ropes, carpets and blankets.

Operations planning:- is an integrated camel farm process through which the executive/leadership team continually achieves focus, alignment and synchronization among all functions of the farm production capacity are optimally allocated to meet demand

Scheduling is the process of arranging, controlling and optimizing work and workloads in a production process processes. Scheduling is used to allocate plant and machinery resources, plan human resource management. **Materials management** plan is a core supply chain function and includes supply chain planning and supply chain execution capabilities. Specifically, materials management is the capability firms use to plan total material requirements.

Operations management is **an area of management concerned with designing and controlling the process of production and redesigning farm in the production of milk. It involves the responsibility of ensuring that business operations are efficient in terms of using as few resources as needed.**

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Self Check 10 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What are the importances of setting milk production plan? (5pts)
2. What are the benefits of operations managements? (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 11 - Planning logistical arrangements

11.1. Introduction

Logistical Operating Arrangements has two common characteristics. All logistical arrangements have two common characteristics: First, they are designed to manage inventory. Second, the range of alternative logistics systems is based on available technology.

11.2. Planning logistical arrangements

The development of the strategic logistics plan is dependent on the marketing, production, finance/accounting and logistics functional areas. Marketing provides information about product or service offerings, pricing and promotion for each channel. This includes planned sales volume per month, type of customer and regional areas; product introductions and deletions and customer service policies for various types of customer and geographical area. Manufacturing provides information such as locations of current and planned production facilities and planned volume and product mix for each site.

The logistics planning process in terms of 11 major steps as follows:

- 1 Initiate and plan the process.
- 2 Evaluate the current logistics activities.
- 3 Identify product manufacturing requirement.
- 4 Determine the impact of business growth
- 5 Develop a profile of competitive logistics networks.
- 6 Develop customer service requirement.
- 7 Rationalize the logistics network.
- 8 Review and recommend improvement.
- 9 Formulate performance measurement and service levels.
- 10 Review and recommend steps to improve organizational responsibilities.
- 11 Document the plan and prepare an implementation plan.

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Self Check 11 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What is logistical operating arrangements (5pts)
2. Mention as list 5 logistics planning process (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 12 - Establishing appropriate physical and financial record keeping system

12.1. Introduction

Record keeping is a vital tool in zoo institutions as it provides a history on each specimen currently held in captivity. Record cards should have instructions on how to individually identify the specimen your recording on. E.g. photo or microchip number

12.2. - Establishing appropriate physical and financial record keeping system

Records should be kept for any notable events that occur. Some that should always be noted are listed following:

Physical (Identification) Records

The needs are for an identification method that is cheap, not damaging to the animal and reliable at a distance of at least 2-3 metres and by preference permanent. Identification of animals is usually through use of numbering, by marking of the animal and by description of certain characteristics of the animal. Methods of identification can be subdivided into 2 categories: permanent and non-permanent.

a. Permanent Identification

- Tattooing (ear or under)
- Description (diagrams, sketches and photographs)
- Ear-notching/Punching
- Brands (Hot iron, freeze and chemicals)

b) Non-Permanent identification

- Tags (Ear-tags, Flank-tags, tail-tags and Brisket-tags)
- Collars or neck straps (chains)
- Paint and dyes
- Hair Braiding
- Naming

Financial Records

- The records of the expenditure and revenue should be kept for cash analysis and enterprise appraisal.
- Economic records are of paramount interest in providing the farmer with information concerning the profitability of his farm.
- Moreover they are of great help in decision making at the right time.

For example:-

- ✓ is it profitable to feed concentrates?

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- ✓ is it advisable to apply for a loan or credit to invest in a machinery or technology?
- ✓ is it more economic to raise the calves with whole or skimmed milk?
- Answering these questions is only possible if adequate records are available.
- Moreover, for tax purposes and for the purpose of getting loans or credit, economic records are required.

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Self Check 12- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the benefits of record keeping (3pts)
2. Mention types of records (5pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Operation Sheet 1- Selection of Camel

Procedures for Selecting Camel

Step1. Wear PPE

Step2. Prepare necessary Equipments

Step3: Go to the nearby market

Step4 Approach all camels

Step5: Observe all of market situation

Step6: Choose camel meet minimum requirements based on the criteria's

Step7: Record required data

Step8: Report to concerned body

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Operation Sheet 2- Ration formulation

1. Wear PPE
2. Identify the class of camel in which the ration is formulated
3. Identify ingredients used in ration formulation
4. Consult feed composition table to know the nutrient
5. Consult feeding standard tables to check the nutrient requirement of camels
6. Calculate the ratio and amount of ingredients used for ration formulation
7. Blended the crushed ingredient thoroughly by using mixer
8. Add minerals (salt), vitamins and other additives in the ration
9. Pack and store the formulated ration
10. Offer the ration for the group it is formulated according to feeding schedule

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LAP Test -Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: you are required to perform the following tasks within 8hours.

Task1. Perform selection of breed

Task2. Identify camel production factors

Task3. Perform determination of breeding program

Task4. Perform identification of feed requirement for camel

Task5. Perform specification of production quality

Task6. Apply production plan preparations

Task7. Apply planning of logistical arrangements

Task8. Apply camel farm keeping records

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LG #53- LO # 2 - Select camel for milk production

Instruction Sheet-Learning Guide # 53

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

- Determining criteria for selection and assessing camels
- Determining and organizing culling and replacement practices
- Preparing milking sheds; yard and equipment
- Identifying and reporting existing and potential hazards
- Handling lactating camel for maximum production.

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:

- Determine criteria for selection and assessing camels
- Determine and organizing culling and replacement practices
- Prepare milking sheds; yard and equipment
- Identify and reporting existing and potential hazards
- Handle lactating camel for maximum production.

Learning Instructions:

- 1 Read the specific objectives of this Learning Guide.
- 2 Follow the instructions described below 3 to 7.
- 3 Read the information written in the information “Sheet “
- 4 Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5”
- 5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1”.
- 6 Do the “LAP test” (if you are ready).
- 7 Then processed to the next learning guide
- 8 If your performance is satisfactory proceed to the next learning guide,
- 9 If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

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Information sheet 1- Determining criteria for selection of camels

1.1. Introduction

Selection is determining which animal will be the parents of the next generation. The selection of a suitable camel is very important as it is said a sire /dam is “half the herd”, that is half the inherited characteristics of all the calves are obtained from them.

1. 2. - Determining criteria for selection of camels

There are two types of selection

Natural selection:- is the fittest ones that reproduce

Artificial selection:- is reproduction ability is determined by human which have the best performance. Artificial selection is based on the following criteria:-

1. **Breed:-** Improved breeds gain weight faster with less feed than native animals.
2. **Fertility:-** High level of fertility, or reproductive performance is fundamental
3. **Age:-** Young animals have striking advantages over older cattle.
4. **Disposition:-** An active yet mild, quiet, and easily-handled steer usually grows fast and fattens easily..
5. **Constitution and Vigor:-** determined by the size and quality of the vital organs.
6. **Sex:-** If fed for the same period of time, male gain about 10% faster than heifers and require 10 to 15% less feeds with equal weight gain. On the other hand, young male have 20% greater gain in of the same quality as that of steers.
7. **Dam selection:-** based on physical appearance, health, milk production and pedigree
8. **Health Considerations:-** A healthy animal is active, has a soft and smooth hair coat, bright eyes and moist muzzle.
9. **Temperament:-** is the way in which an individual animal reacts to an unfamiliar or challenging situation. Temperament of an individual animal is a result of both its inherent temperament and its environment, including handling and training.
10. **General appearance and condition:-** selecting animal that have good body condition because they have high compensation capacity.
11. **Growth rate:-** At birth, there is very little fat in a carcass and initial development is mainly bone and muscle growth. As the animal matures and gains mass, a stage is reached when fat deposition accelerates and production capacity increase.

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Self Check 2- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Define the importance of breed selections (3pts)
- 2 What are the two type of selection? (4pts)
- 3 What are the criteria for artificial selections? (5Pts)

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

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

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Information sheet 2 - Determining and organizing culling and replacement practices

2.1. Introduction

Culling:- is the process of removing unproductive animals. Those are old female animals with poor mothering abilities, poor reproductive performance and animals with chronic sicknesses) from the flock or herd. It is the removal dairy animal from the main herd due sale, slaughter or death.

2.2. Determining and organizing culling and replacement practices.

2.2.1 Reasons to Cull

The primary productive objective of any animal in the herd is to produce a young generation. Therefore, any camel that does not get pregnant or wean a calf should be a primary candidate for culling from the herd. Other culling decisions are made based on additional undesirable camel characteristics or financial and environmental reasons. Camel culled at a young age reflect a potentially poor match of female camel genetics to the production environment, primarily because camel nutrient requirements are not met by the nutritional resources and other reasons are:

- Poor production
- Very poor reproductive ability
- With sterility problem and breeding
- Very poor condition
- Stunted growth
- Suffering from incurable illness or diseases

2.2.2. Replacement of practice

Camel culling necessitates replacement of those animals in order to maintain the herd population. Replacements can potentially be found among the heifer calves born from the camel herd. Assuming that heifers are retained from the camel herd, the number of replacement females needs to be determined. The number of female calves that must be kept varies from herd to herd and depends on a number of factors. The primary factors that determine the number of young female needed as replacements include

- The reproductive rate in the herd,
- Future herd size plans
- Age and status of the female in the herd
- The female herd culling rate

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Self Check 2- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What is culling? (5pts)
2. List and explain the reason for culling (5pts)
3. How to practice replacement of herds? (4Pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 3 - Preparing milking sheds, yard and equipment

3.1. Introduction

Milking place is the place where the farmer obtains the milk, the end-product of the dairy farm. Adapted to the cows to the milking place is a tool to optimize milk production. Adapted to people, the milking place is an easy place to manage and a pleasant working environment for milkers.

3.2. Preparing milking sheds, yard and equipment

Profitability is directly related to this cornerstone of each dairy farm. Efficacy and quality of production depends on good milking practice:

- Milking efficiency is influenced by time management.
- Milk quality is influenced by hygiene during milking and milking place.

Preparation and hygiene of milking place

- Floor is made of hard washable surface
- Wall should be smooth and washable
- Door should be self closing while windows should be rendered
- Rooms should be kept clean and in good repair
- All the milking area and around should be cleaned
- Personal hygiene and wear appropriate cloths

Preparation and Hygiene of equipments

- Equipments and utensils should be well cleaned
- Equipments and utensils should be disinfected before and after use
- Equipment repairs and maintenance
- Machines have to be fixed before
- Adequate precautions should be taken to prevent contamination

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Self Check 3 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the reason to consideration of milking place (3pts)
2. List and explain common disease of Calves (4pts)
3. Mention the importance of hygiene of milking place (5Pts)

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

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

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**Information sheet 4 - Identifying and reporting existing and potential hazards****4.1. Introduction****Hazard:- Something that is potentially very dangerous.****Occupational health and safety (OHS):-** are actions to be taken to ensure safe operation and maintenance of machinery and equipment. Hazards during milling can arise from incorrect installation, use, inspection, maintenance, service, repair or alteration of milling plant in the workplace**4.2. Identifying and reporting existing and potential hazards**

Occupational health and safety (OHS) hazards in the workplace has to be recognized and reported to supervisor, and action is taken to minimize risks to self and others. The potential and existing hazards during handling of camel are:-

- Moving machinery and vehicles
- Noise
- Slippery roads
- Cold weather

During achieving these activities the workers should follow safe systems and procedures for:

- handling camels
- handling and storing hazardous substances, chemicals and camel medications
- manual handling, including heavy lifting
- operating handling and husbandry equipment
- outdoor work, including protection from cold weather and noise
- using and maintaining PPE
- Reporting hazards to supervisor

Workplace risk assessment

A workplace risk assessment is one of the key tools for improving occupational safety and health conditions at work. Thus it plays an important role in protecting workers and businesses, as well as complying with the laws in many countries. It helps everyone focus on the risks that really matter in the workplace – the ones with the potential to cause real harm.

A well conducted workplace risk assessment will contribute to the protection of workers by eliminating or minimizing work related hazards and risks. It should also benefit businesses through better organization of working practices potentially increasing productivity.

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Self Check 4 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What are the importune of hazards (3pts)
2. List and explain some hazards in camel farm (5pts)
3. Mention the advantage of workplace risk assessment (4Pts)

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

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

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Information Sheet 5 - Handling lactating camel for maximum production

5.1. Introduction

Poor feeding management of camel can lead to shorter, lower yielding lactations and increase calving interval. Changing feed requirements of camel over the lactation cycle and how to match this with camel genetics.

5.2. Handling lactating camel for maximum production

In lactating camels and during breeding, feed amounts must be increased to ensure that there is a minimum weight loss as poor nutrition will result in decreased milk production and a higher mortality rate in calves. Camels calves are highly dependent on milk in their diet, much more so than cattle of a similar age

Camels must calve to produce milk and the lactation cycle is the period between one calving and the next. The cycle is split into four phases, the early, mid, late lactation and the dry period. In an ideal world, camels calve every 24 months. A number of changes occur in camel as they progress through different stages of lactation.

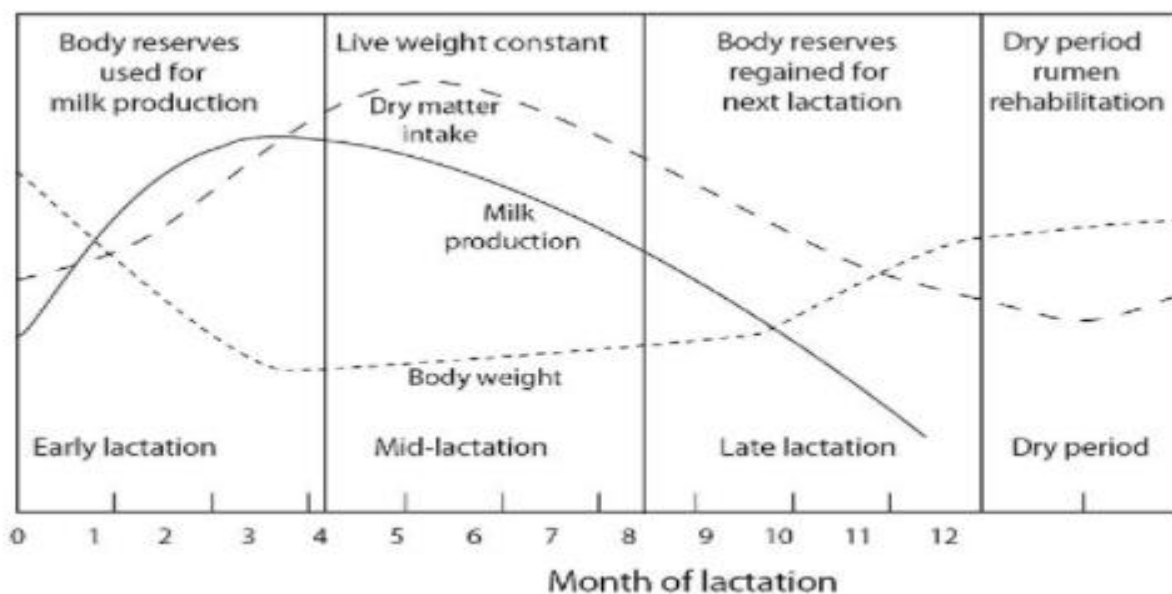


Fig 8. Changes when in a cow during her lactation cycle

Proper management of lactating camels is:-

- Clean and balance feeding
- Clean and sufficient water
- Health care
- Housing
- Free from potential risk factors
- Care when transport

Self Check 5 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the importance of handling lactating camels (5pts)
2. List the criteria for proper management of lactating camels (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points



Operation sheet I - Basic training of camel

Procedures for training camel

Step1. Wear PPE

Step2. Condition the animal to accept close human presence and handling.

Step3. Make an attempt to bring the animal to a confined space so that a halter can be fitted to its head.

Step4. Then secure to a small fenced area or better secured to a fixed object with a travelling ring attached to the halter rope to allow the camel to circle the object

Step5. Proceeds to work in the vicinity of the camel while gradually working towards it and finally being able to pat it

Step6. The camel may be left tied for several days until it has accepted the halter and patting from the trainer

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LAP Test - Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: you are required to perform the following tasks within 8hours.

Task1. Perform selection of camel using criteria

Task2. Apply culling of unproductive camels

Task3. Apply milking place hygiene

Task4. Perform handling of lactating camel

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LG #54- LO # 3 - Identify Camel reproduction requirements

Instruction Sheet-Learning Guide # 54

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

- Identifying sign of puberty and sexual maturity of camel.
- Identifying sign of rutting in camels..
- Identifying factors decide breeding season.
- Determining condition of camels
- Checking camels for any signs of infection.
- Identifying receptive females.
- Using mating procedures and handling techniques
- Supervising field mating and undertake intervention or obtained
- Undertaking pregnancy testing or commissioned at earliest opportunity.
- Keeping records of mating accurately and legibly.
- Identifying signs of pregnancy,
- Detecting pregnancy and performs of parturition.
- Identifying abnormal, normal and difficultness of birth

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:

- Identify sign of puberty and sexual maturity of camel.
- Identify sign of rutting in camels..
- Identify factors decide breeding season.
- Determine condition of camels
- Check camels for any signs of infection.
- Identify receptive females.
- Use mating procedures and handling techniques
- Supervise field mating and undertake intervention or obtained
- Undertake pregnancy testing or commissioned at earliest opportunity.
- Keep records of mating accurately and legibly.
- Identify signs of pregnancy,
- Detect pregnancy and performs of parturition.
- Identify abnormal, normal and difficultness of birth

Learning Instructions:

- 1 Read the specific objectives of this Learning Guide.
- 2 Follow the instructions described below 3 to 7.
- 3 Read the information written in the information “Sheet “
- 4 Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5”
- 5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1”.
- 6 Do the “LAP test” (if you are ready).
- 7 Then processed to the next learning guide
- 8 If your performance is satisfactory proceed to the next learning guide,
- 9 If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

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Information sheet 1- Identifying sign of puberty and sexual maturity of camel

1.1. Introduction

Puberty is time of sexual maturity, when animal becomes capable of propagating its species. Sexual maturity is often related to physical maturity.

1.2. Identifying sign of puberty and sexual maturity of camel

Under most conditions male camels reach puberty as early as 3 years, but their full reproductive powers are not well developed nor they normally used until they are 5 to 6 years old. Their sexual abilities remain more or less constant until they are 18 to 20 years old. Female camels are normally mature at 3 years of age, but they are not generally bred until they are 4 years old. They may continue to breed until they are over 20 years old.

Table 2. Sexual maturity

Females:

Sexual Maturity	3 years
Reproductive Maturity	4-5 years to 20 years (Max 30 years)
Peak Reproduction	6-7 years to 20 years

Males:

Puberty (Rutting)	3 years
Sexual/Reproductive Maturity	6-7 years
Peak Reproduction	A males' peak reproduction time is determined by his opportunity and length dominating over a harem.

Signs of puberty

- A spectacular increase in weight and volume of testes
- Sexual excitement or libido is high
- Increase in weight and age of camel



Self Check 1 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What is puberty (3pts)
2. Mention the signs of puberty (5pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 2- Identifying sign of rutting in camels

2.1. Introduction

Rutting is the physical and physiological sign of sexual activity in a male camel. Male camels show a strong “rut” when they are ready for breeding, at sexual maturity and at various times of the year. Though the onset of the season in both males and females is hormonally controlled, all the external factors that initiate hormonal activity have not yet been determined.

2.2 Identifying sign of rutting in camels

2.2.1. Identify behavioral change

Heavy and strong males are often dominant over smaller and weaker males. Dominant males attack those lower down the pecking order, or subordinate animals, which then lose libido and go out of rut. The common signs of rut are

- Change in behavior that results in being aggressive
- Grinding his teeth, waves head and neck about
- Move restlessly and lashes the tail
- Frothy discharge from the mouth
- Urinate frequently
- Diarrhea
- Loss of appetite
- Gargling sound – attractive sound to females
- Exudation of poll glands (red/pink sac) in dromedary

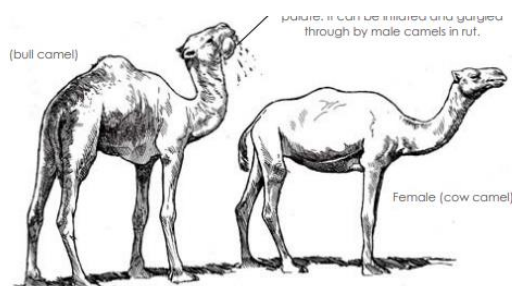


Fig 9. Rutting

2.2.3. Different physiological condition of camel

The physiological changes associated with the physical signs of rut are increase in androgens in the blood. The poll glands in male camels increase in size during the rut and secrete a sticky fluid, which has an androgen concentration similar to that of the blood. These secretions are often the first signs that mating season is approaching and can help a handler to begin to proper his herd for mating.

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Self Check 2- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Define rutting (3pts)
- 2 List and explain the signs of behavioral changes in male camel (5pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 3 - Identifying factors decide breeding season

3.1. Introduction

Camels are seasonal breeders, which are believed to be associated with environmental conditions. Wet and cool months of the year (the rainy seasons) favor the onset of breeding season in camels.

3.2. Identifying factors decide breeding season

Follicular wave activity occurs all the year round but length of the whole wave, the phasing and the duration of oestrus vary considerably. In areas where there are marked weather changes among the seasons follicular activity is at the greatest in winter and spring and the total cycle is longer at this period. Thus, the breeding season is believed to be related to:

1. Favorable environmental conditions (cool and wet months), and
2. Availability of more feed and water.

But the availability of feed and water is believed to be the most important factor (condition). Because the active reproductive cycles can be observed throughout the year if feed & water conditions are good.

Breeding seasons could possibly be prolonged through better nutrition and improved management. This conditions will ensure, especially, longer follicular waves and longer heat periods in females as well as strong rut in males.

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Self Check 3 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention factors decide to breeding seasons (4pts)
- 2 What is the importance of feed in determining breeding seasons (5pts)

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

Note: Satisfactory rating - 9 points Unsatisfactory - below 9 points

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Information sheet 4 - Determining condition of camels

4.1. Introduction

The camel's hump can be used to estimate a camel's general body condition. "Hump scores" of 0-5 are used. Camels with hump scores of 0 or 1 are in poor condition. Camels with a hump score of 5 are excessively fat and they don't tolerate much physical activity and may find long distance transport stressful.

4.2. Establishing strategies for herd sourcing and improvement

Include: age; condition scoring; physical observation, and pregnancy status or lactation. It is not advisable to use camels for breeding until they are at least four years old. The hump score has to be in the range of 3 & 4 which indicate good development and it should not be very big which shows that a male is a poor breeder (probably no rut) and that a female is sterile. Those camels which are emaciated, weak and unhealthy should not be selected for mating during physical observation as they are not fit for mating. Lactating camels should be scored regularly to reflect changes in fat reserves in each stage of lactation accordingly they can be abstained from mating. Pregnant camels should not be bred again.

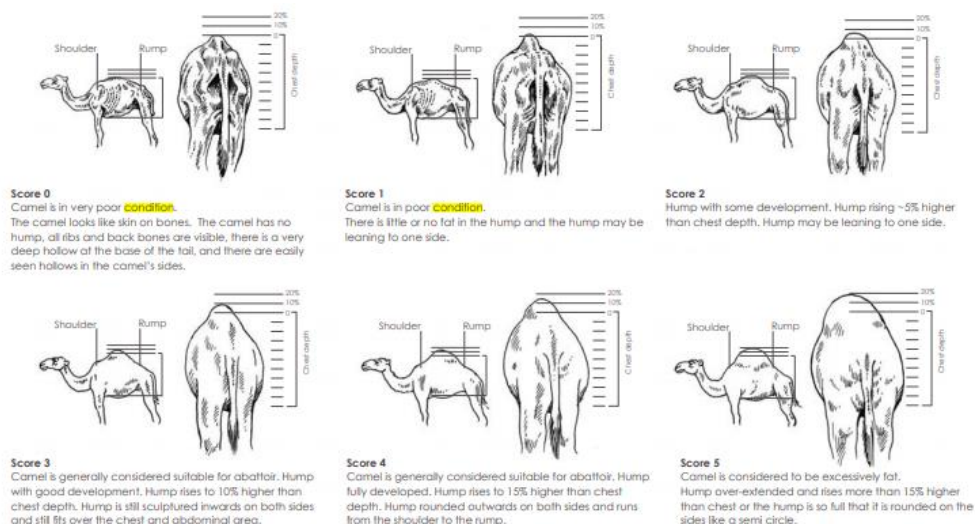


Fig 10. Body conditions and Camel hump scores

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Self Check 4 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 What are importance of body scour of camel in improvement (4pts)
- 2 Out of 1 to 6, which of good body condition of camel? (4pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 5 - Checking camels for any signs of infection

5.1. Introduction

The skin of the animal body is first defense against infections. Breaks in the skin, like cuts, scrapes, or surgical incisions, can provide an entryway into the body for bacteria. Infection occurs when an organism, such as a virus or bacterium, invades the body. The infectious agent rapidly multiplies in the body's tissues. Although not all infections result in disease, some can trigger the immune system, causing symptoms of illness.

5.2. Checking camels for any signs of infection

Signs and symptoms of a bacterial infection may vary depending on the location of the infection and the type of bacteria that's causing it. However, some of the most common general signs and symptoms of infection include:

- 1 Fever
- 2 Chills and sweats
- 3 Swollen lymph nodes
- 4 New or sudden worsening of pain
- 5 Unexplained exhaustion
- 6 bloat
- 7 Skin flushing, swelling, or soreness
- 8 Gastrointestinal symptoms

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Self Check 5 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the cause of camel infractions (4pts)
2. What are the common signs of camel infections (4pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 6 - Identifying receptive females

6.1. Introduction

Receptive is performed only in the second stage that the female is receptive to the male. This stage is estrus, typically lasts 4-6 days (up to 10). If the female is still in the first stage (proestrus) or has already passed out of the second stage of the cycle into the third stage (interestrus) she will not **be receptive to the male.**

6.2. Identifying receptive females

The external symptoms of female shows seeks out a male and stands beside him, becomes restless and is very ready to be mounted, bleat frequently or even continuously. The tail is lifted and waved about and small quantities of urine are passed frequently, the vulva, the lips of which are swollen, is opened and closed irregularly and it emits a foul smelling mucus (foul smelling to humans and is a very attractive scent to male camels). The vagina is pink-coloured and moist, although the degree of wetness decreases as heat progress.

Vaginal examination shows that the cervix is moist and relaxed. Rectal examination shows uterine horns are swollen at the beginning of heat, although not so much as in the cow. Females that are not in heat do not mount others in heat, but they will run after them in playful manner and attempt to bite their vulva. In general Signs in the females that show she will be receptive to the males displays are:-

- Restless
- Seeks the company of the male
- Bleats continuously
- Develops a swollen Vulva that often produces an accompanying
- discharge Foul smell that comes from the Vulva

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Self Check 6 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Define the meaning of receptive camel (4pts)
2. How you can identify receptive camel? (5pts)

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

Note: Satisfactory rating - 9 points Unsatisfactory - below 9 points

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Information sheet 7 - Using mating procedures and handling techniques

7.1. Introduction

The **Mating Procedure** is capable of carrying out a breeding under a watchful breeder's eye. However, the owner may need to help the camel into position if mating difficulty.

7.2. Using mating procedures and handling techniques

Before mating:

- The male sniffs and bites the vulva and other parts of the body of the female prior to attempting to copulate with her.
- During mating the male rotates his penis until the vulva is found and does not thrust into female in violent manner during intercourse.
- The whole sex act lasts as long as 35 minutes
- usually consists of several entries
- Males may exhaust themselves on one female if handler does not remove them.
- Both sexes are noisy during the act and males particularly
- Generally the sexual act is in unusual position for domestic animals. It takes place with the female on the ground.

Mating procedures and handling techniques should be:

- minimize stress and discomfort to camels and
- meet occupational health and safety (OHS) and camel welfare requirements.
- keep a rutting bull from fighting other males and from
- wandering off in search of females in other herds, his
- forelegs of male are tied together with a short rope just above the fetlocks, efficiently restricting him to very short strides.
- Sometimes the ankle ropes are secured to the ground to further restrict the movements of the animal.
- Follow lay down of female
- Follow the situation if there is abnormality

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Self Check 7- Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention mating procedure (5pts)
- 2 What are the benefits of proper handling of mating? (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 8 - Supervising field mating and undertake intervention

8.1. Introduction

One male will usually be mated with 5 to 7 animals although good males will mate with more than this and can mate with up to 70 females in one season. In one day a good male can mate two to three times with up to three females.

8.2. Supervising field mating and undertake intervention

Field mating has to be supervised by the manager and when required intervention is undertaken or obtained to maximize conception rates. Mating behavior could be recorded by a "Focal animal sampling". In this case it is useful, the mating time may be divided into three parts according to the different states that the male could show:

- 1 Standing over/near the female time
- 2 Copulation/service time
- 3 Walking around time.

Moreover, to standardize the procedure, the sample session may be scheduled at a predetermined time, before starting: a maximal latency time (from when the male is free to the first mating attempt) of 15 minutes, a maximal mating time of 45 minutes, a maximal time between two copulations of 30 minutes, maximal standing over the female of 20 minutes and as previously mentioned, with maximal three refuses to approach the female. Finally, it is important to note down the frequency of the following events: mounting attempts, number of mounts, blaterring, defecation, dulaa extrusion, flehmen, jumping, neck-touching, sniffing, sound emission, tail flapping, teeth-grinding and yawning.



Fig 11. Field mating intervention

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Self Check 8 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. Mention the importance of supervising field mating (4pts)
2. What are the three parts of mating time? (4pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 9 - Undertaking pregnancy testing

9.1. Introduction

Pregnancy test is used to confirm that female is pregnant or not. Pregnancy in the camel on average lasts 387 days – or one year and three weeks. A month prior to calving, pregnant camels require special care.

9.2. Undertaking pregnancy testing

In order to improve the efficiency and increase the economical viability of camel breeding, it is important to know if and when the females are pregnant. This can be done by rectal palpation and by biological assay using infantile mice. The latter method is only feasible at certain stages of pregnancy. The surest method is by radio-immuno assay. Pregnancy determination is important in the care of the females, the selection of males and in long-term planning.

The easiest and most reliable way to identify a cow camel in the last month of pregnancy is by their large, full and tight udder.

The procedure performed is as follows:

Per Rectal Examination:

1. Bring the cow in breeding crate/chute for proper control.
2. Clean the hands with soap and water and wipe off using clean dry towel.
3. Put the polythene gloves on the hands.
4. Now lubricate the hand gloves with liquid paraffin.
5. Insert the hand into the rectum and lake out the dung.
6. Palpate the cervix and push the hand forward to palpate common body of uterus and uterine horns through rectal wall

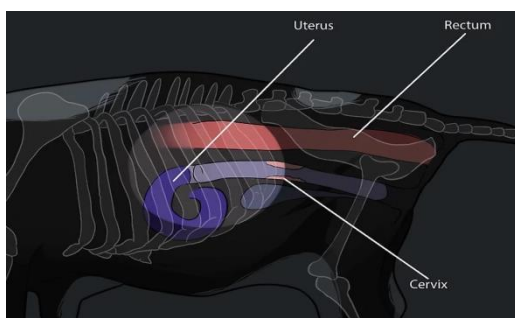


Fig 12. Rectal palpation

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Self Check 9 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Discuss the importance of pregnancy testing? (3pts)
- 2 List the procedure of performing per rectal examinations (5pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 10 - Keeping records of mating accurately and legibly

10.1. Introduction

Record keeping is a vital tool in zoo institutions as it provides a history on each specimen currently held in captivity. Record cards should have instructions on how to individually identify the specimen your recording on. Records should be kept for any notable events that occur

10.2. Keeping records of mating accurately and legibly

The importance of breeding is to measure the productive efficiency of the herd and to enable culling and selection exercise to be carried out for breeding and genetic improvement. A good farmer would like a cow camel which gives a calf within two years. Therefore, an accurate breeding record of each individual cow camel which is up-to-date is needed and also a breeding record for the total herd.

An indicator for that is e. g the number of inseminations needed to get a cow camel in calf. In addition to this, the data for the breeding record provides information about when certain animal have to be dried off and when certain cows camels are due to calve while others need to be insemination for proper herd management. The important data in breeding records include:

- Pedigree/parentage (Dam name, grand dam, sire name, grand sire)
- Growth (Date of birth, birth weight, date of weaning, weaning weight, sale weight, sale date)
- Fertility (Age at first service, age at first calving, date of calving, number of services per conception)

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Self Check 10 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention the importance record keeping for mating (5pts)
- 2 List the relevant data for mating record(3pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information sheet 11 - Identifying signs of pregnancy

11.1. Introduction

Pregnancy, also known as gestation is the condition where a female animal has young, developing in her uterus. The gestation period is the time between conception and parturition (giving birth). It is economically important to detect if a female animal is pregnant or not

11.2. Identifying signs of pregnancy

When an animal is pregnant, there are various signs that the animal will exhibit. Some of these signs are as follows:

- The animal concerned tends to become sluggish in temperament and more tractable.
- There is an increase in body weight of the animal in the last half of pregnancy due to the development of fetus and hypertrophy of the uterus and mammary glands.
- The animal has a tendency to grow fat.
- There are changes in the mammary gland; as parturition approaches, the mammary gland becomes firm, enlarged and glossy and teats have a waxy appearance.
- There is a cessation of oestrus (heat); cessation of oestrus cycle after sexual copulation is the first indication of pregnancy, and it is very reliable although the following should be considered.
- Heat may be inhibited following mating due to hormonal dysfunctions.
- Low intensity of heat maybe overlooked and thus the animals may be thought to be pregnant.
- Sometimes animals still show signs of heat even after they are pregnant.

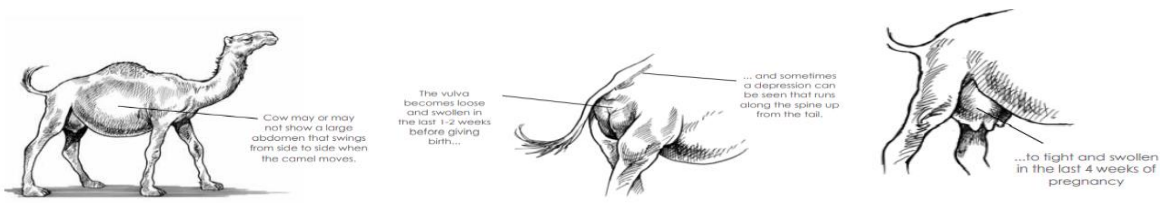


Fig 13. Sign of pregnancy

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Self Check 11 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 What is pregnancy? (3pts)
- 2 What are the signs of pregnancy? (3pts)

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

Note: Satisfactory rating – 6 points Unsatisfactory - below 6 points

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Information sheet 12 - Detecting pregnancy and performs of parturition

12.1. Introduction

It is possible to **detect pregnancy** in camels from as early as 15 days by observing an erect and coiled tail in the pregnant animal when approached by a male camel.

12.2. Detecting pregnancy and performs of parturition

Diagnosis of pregnancy until recently the only reliable method of pregnancy diagnosis was by palpation of the camel genital organs per rectum. Now, however, ultrasonic scanning of the camel genitalia and estimation of blood progesterone level are also available The rectal palpation method is the same as for cattle, but the she-camel needs to be restrained in the sitting position.

In connection with early diagnosis, it is important to remember four features of camel reproduction: Large corpora lutea are only present in pregnancy. 99% of pregnancies are in the left horn. The empty (or early pregnant) right horns is congenitally shorter than the left. The amount of fetal fluid at all stages of camel pregnancy is less than in the cow; from the foregoing it is clear that the presence of a palpable corpus Luteum in one or both ovaries is a very strong indication of pregnancy. It should be noted that because the camel placenta is non-cotyledonary it is not possible to ‘slip’ the fetal membrane.



Fig 14. Giving birth

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Self Check 12 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention the benefits of detecting pregnancy (4pts)
- 2 What are the cares at parturition? (4pts)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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**Information sheet 13 - Identifying abnormal, normal and difficultness of birth****13.1. Introduction**

Normal birth is starts naturally and does not involve any medical or technological intervention. This definition would therefore exclude births which involve induction, acceleration, medical pain relief (including epidurals), forceps, venous, a Caesarean or an episiotomy.”

Abnormality is developed at or before birth and is present at the time of birth, especially as a result of faulty development, infection, heredity, or injury.

13.2. Identifying abnormal, normal and difficultness of birth

In camels the normal signs of parturition are: Swelling of vulva, Restlessness, Frequent urination, Camel finds a corner or a dark place and cleans it with the help of fore legs. Generally, parturition occurs in sitting position. The fore limbs of the young one appear first followed by the head. The duration of the labour is more pronounced. Navel cord generally breaks by itself when the camel licks her young and the placenta is expelled soon after parturition. Securing of animal as soon as the symptoms are seen is advisable. The labour pains continue for 5 to 10 hours. She camel remains in recumbent position for few minutes after parturition. Camel calf stands on its own within 6-8 hrs after birth. The female generally produces one calf at a time.

Abnormal Birth

The incidence of early embryonic death seems to be high in the camel. Some of the problems are:

- Abortion and stillbirth
- Diseases of the female reproductive tract
- Dystocia
- Vaginal prolapsed
- Other problems of reproduction
- Reproductive problem in the male

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Assisting difficult births in animal

Difficult births- also known as dystocia- happen in animals from time to time

Examine the dystocia situation. What is wrong? The most common way of doing this is first put your hand inside to check the disposition of the calf. Is the calf too big? Is the calf presentation normal (anterior presentation with front legs and head). Is calf's posture correct (i.e. extended forelegs and head)? Is the calf facing upwards or downwards? day after birth when the afterbirth has not come out

The best way to find out is by tying calving ropes to the presenting parts of the body. Then you push the calf inwards into the womb to create more working space. You then have to make a decision on:

- 1. Is the calf over-sized?** If the calf is slightly over-sized but presenting normally, using calving ropes to pull out and assist the cow's straining resolves the case.
- 2. Abnormal posture:-** calf may have an abnormal posture. This means it may have a leg folding at the front knees (knee flexion), or shoulder flexion, or neck may be twisted to the side
- 3. Sometimes the calf is too big** even to come outside with the assistance of calving ropes. Maybe it has become bloated or it's just too big. In that case, it is wise to ask for professional assistance.

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Self Check 13 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What are normal and abnormal births? (5pts)
2. Why it needs to identify abnormal birth? (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Operation sheet I Assisting camel mating

Procedures for assisting camel mating

Step1. Put on /wear your protective clothes

Step2. Prepare favorable ground mating by disposing any solid waste from mating area

Step3. Grasp the body of penis

Step4. Guide the penis inside the vulva

Step5. Remove them apart after satisfactory sexual intercourse, if required

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Operation sheet II Pregnancy diagnosis by rectal palpation

Procedures for pregnancy diagnosis by rectal palpation

Step1. Wear on proper protective cloth and apply proper lubrication,

Step2. Properly restrain the camel

Step3. Make a cone of your hand and push it inside the rectum. The anal sphincter dilates and the hand enters inside the rectum.

Step4. Remove the feces without taking out your hand completely.

Step5. Follow the cervix further to locate the uterine body and the uterine horns.

Step6. When the pregnancy is beyond 60 days this cannot usually be done and the operator has to move his hand further in the rectum, so as to locate the intra-abdominally placed uterus and palpate other features diagnostic of pregnancy.

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LAP Test - Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: you are required to perform the following tasks within 8hours.

Task1. Perform identification of puberty sign

Task2. Perform identification of rutting sign

Task3. Implement herd body conditions scour

Task4. Perform supervising field mating

Task5. Apply pregnancy test

Task6. Implement keeping records

Task7. Assisting of abnormal birth

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LG #55- LO # 4 - Undertake camel handling and husbandry operations

Instruction Sheet-Learning Guide # 55

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

- Identifying camel handling areas, gates and access routes.
- Observing and anticipating behavioral characteristics
- Observing site quarantine and other bio-security protocols.
- Following procedures to control and sort camels & carry out restraint procedures.
- Carrying out all basic camel husbandries
- Recognizing and reporting plants poisonous to camels

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:

- Identify camel handling areas, gates and access routes.
- Observe and anticipating behavioral characteristics
- Observe site quarantine and other bio-security protocols.
- Follow procedures to control and sort camels & carry out restraint procedures.
- Carryout all basic camel husbandries
- Recognize and reporting plants poisonous to camels

Learning Instructions:

- 1 Read the specific objectives of this Learning Guide.
- 2 Follow the instructions described below 3 to 7.
- 3 Read the information written in the information “Sheet “
- 4 Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5”
- 5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1”.
- 6 Do the “LAP test” (if you are ready).
- 7 Then processed to the next learning guide
- 8 If your performance is satisfactory proceed to the next learning guide,
- 9 If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

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Information sheet 1 - Identifying camel handling areas, gates and access routes

1.1. Introduction

Handling of camels refers to how camels are touched, moved, and interacted with during husbandry practices. Performance standards during handling include careful, considerate, respectful, calm, human interactions with animals in as positive a manner as possible. Properly handling different materials must be prepared accordingly to carry out the task effectively. The necessary equipments for handling camels should be ready at hand and should have been well maintained and recently tested. All metal components like machine should be free of rust and dirt and have smooth surfaces.

1.2. Identifying camel handling areas, gates and access routes

- **Preparing gates and access routes for camels' departure**
 - ✓ Camel husbandry tasks are completed as instructed, and gates and access routes are prepared for camels' departure according to enterprise requirements.
 - ✓ Gates and access routes should be free from distractions and lighting problems.
- **Cleaning and maintaining handling areas and equipment**
 - ✓ Consumables materials should be discarded according to enterprise policy and procedures
 - ✓ Permanent equipments and materials should be maintained, cleaned, disinfect and stored into appropriate place.
 - ✓ Handling area maintenance requirements and equipment faults or malfunctions are detailed and reported according to enterprise requirements.
- **Disposing camel residues and waste**
 - ✓ Camel residues include pallet, spit, toe nail clippings, syringe, disposed medicine, broken glass, plastic bags and liquid waste.
 - ✓ Solid wastes should be deposited at an appropriate facility such as pit or bin and burned according to OHS and enterprise environmental practices.
 - ✓ Liquid wastes should be disposed following route of drainage canal to enable appropriate disposal.

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Self Check 1 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

1. What are the importances's of handling of camel? (5pts)
2. List the methods of waste disposal (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 2 - Observing and anticipating behavioral characteristics

2.1. Introduction

Animal behavior includes all the ways animals interact with other organisms and the physical environment. Behavior can also be defined as a change in the activity of an organism in response to a stimulus, an external or internal cue or combo of cues.

2.2. Observing and anticipating behavioral characteristics

Behavioral characteristics of camels should be observed and anticipated. Appropriate handling methods should be selected prior to identifying camels for handling. These includes:-

Rutting- The rut (the physical and physiological signs of sexual activity in a male camel) causes changes in the male camel's behavior that result in it being aggressive to other camels and to its handler.

Biting- A simple measure to control a biting camel is to keep it muzzled at all times except when eating and drinking.

Bad Kickers:-Such camels may be controlled by the use of spider hobbles that attach to all four legs, or tie the halter fairly close to a solid rail, then walk behind the camel just out of kicking range and allow it to kick into nothing.

Cud Spitting- During training or otherwise, cud spitting is certainly unpleasant. Cud spitting is not performed in the sense of a bolus being aimed at an object or a person. It is the result of a vocal complaint producing exhalation forceful enough to eject and scatter ruminal contents that happen to be in the mouth. To avoid this unpleasant happening, just be careful that before attempting to carry out any close procedure, pause and allow cud to be re-swallowed, then move in quickly and accomplish the task. Camel behavior has to be continually monitored and anticipated during moving and handling processes to ensure well being of camels and safety of handlers.

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Self Check 2 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 What are the benefits of understanding camels' behaviors? (5pts)
- 2 Mention the risk situation when handling camel (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 3 - Observing site quarantine and other bio-security protocols

3.1. Introduction

Quarantine is a restriction on the movement of people, animals and goods which is intended to prevent the spread of disease or pests. It is often used in connection to disease and illnesses, preventing the movement of those who may have been exposed to a communicable disease, yet do not have a confirmed medical diagnosis.

Bio-security is *the* procedures intended to protect humans or animals against disease or harmful biological agents.

3.2. Observing site quarantine and other bio-security protocols

3.2.1. Site quarantine

- **Ensuring the decontaminating personal and/or work activities**

- ✓ The Decontamination involves a combination of physical and chemical procedures that are used to remove soiling and inactivate the target disease organism.
- ✓ Appropriate procedures are required to allow personnel, chemicals and equipment to move safely between premises during the surveillance.

- **Reporting potential contaminants**

- ✓ Potential contaminants; include pathogens entering on clothing/footwear, equipment, vehicles or items being delivered to the enterprise.
- ✓ If the potential contaminants have been happened in the working site the worker should report to the organization or the supervisor.

- **Cleaning and sanitizing materials**

- ✓ Equipment should be carefully selected, cleaned and maintained before they can be sanitized.
- ✓ During selecting handling equipments you have to check for their soundness and prepare for use according to manufacturer instruction.

- **Handling equipments includes:**

- ✓ crush/bail, gates, pens, and loading ramps drenching and spraying equipment
- ✓ leg ropes, halters and lead
- ✓ Scales/ heart girth meter

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- ✓ Loading ramps
- **Wearing personal protective clothing and equipment:**
 - ✓ Workers entering into camel handling facilities must always change their protective clothing and footwear.
 - ✓ On leaving, the overalls and footwear must be removed and left within the isolation area, and the footwear must be disinfected.
 - ✓ Hands should be washed, or otherwise disinfected, on entering and leaving.

3.2.2. Bio Security

- Conceptual bio security, the primary level of bio security, revolves around the location of animal facilities and their various components.
- The most effective way to limit risk is physical isolation, making this a primary consideration when sitting new confinement facilities or farms.
- Ideally, facilities/farms should not be located in close proximity to other farms or public roads, especially when the area has a high density of animal facilities, or next to slaughterhouses, live-animal markets, agricultural fairs, or animal exhibits.
- Similar isolation methods include limiting the use of common vehicles and facilities; limiting access by personnel not directly involved with the operation; and controlling the spread of disease by vermin, wild animals, and wind.

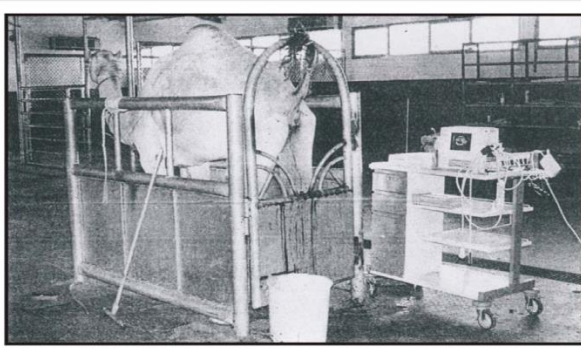


Fig 15. Camels in crush



Fig 16. Loading ramp



Self Check 3 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Define quarantine (5pts)
- 2 What are the potential contaminants in camel farm? (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 4 - Following procedures to control and sort camels & carry out restraint procedures

4.1. Introduction

Procedure is an established or correct methods of doing a given activities.

4.2. Following procedures to control and sort camels & carry out restraint procedures

4.2.1. Procedures to control and sort camel

Before implementing procedures to control and sort camels they should be classified according to age, sex and husbandry tasks to be performed.

Procedures implemented to control and sort camels are:-

- Allowing a reasonable amount of time for camels to complete movement
- Appropriate use of handling equipment with minimum force
- Use of positive and calming techniques to foster the physical and mental wellbeing of camels.
- The procedures performed accordance of OHS and animal welfare requirements.

4.2.2. Carrying out restraining procedures

- Well handled camels are always friendly and docile and they may be even affectionate to those whom they known well.
- There are occasions when they need to be restrained and immobilized.
- From among the various restraining methods which one to use depends on the treatment, the camel’s training and temperament and its relationship with its handler.
- **Some of the common methods are given below:**
 - ✓ A well trained camel needs to be restrained only by holding its head rope.
 - ✓ If directed to lie down it will do so. Restrain a small camel by holding its upper and lower lips with both hands and turning its head to one side.
 - ✓ If the camel is somewhat trained and the handler is an experienced person, this should suffice when giving an injection.
 - ✓ If necessary a second person can hold the camel by its ears.
 - ✓ The same method can be used with a large camel if it is in a sitting position. Hold the camel’s lower jaw with a rope running behind the front teeth.

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- ✓ Hold the rope in your hands; do not tie it to a tree or post, as a sudden movement can break the camels Jaw.
- ✓ Make the camel stand on three legs by tying one of its fetlocks to its foreleg with a rope.
- ✓ To restrain a violent animal, tie a rope around its neck and have two people hold the ends, one on each side of the animal.
- ✓ Make sure the camel does not suffocate.
- ✓ If the treatment is painful, make the camel lie down by tying one of its fetlocks to its foreleg.
- ✓ Then pull either the other front leg or both hind legs forward with a rope around the fetlocks.
- ✓ Tie both front legs together with a rope passing over its neck.
- ✓ To make the animal completely immobile, also tie the hind legs together.
- ✓ Bend the neck to the side by pulling on the head-rope. It is also possible to immobilize a camel by injecting it with a sedative

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Self Check 4 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Mention the procedure to control camel (5pts)
- 2 Mention procedure to carry out restraining camel (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 5 - Carrying out all basic camel husbandries

5.1. Introduction

Husbandry:- defined as a science as well as an art of management including scientific feeding, breeding, housing, and health care, of common domestic animals aiming for maximizing returns.

5.2. Carrying out all basic camel husbandries

Basic camel husbandry includes:-

- **Condition scoring**

- ✓ is estimated by looking at the store of body fat (hump).
- ✓ This reflects that provides a good correlation with total body fat.
- ✓ The camel deposits excess energy as fat into the hump sac

- **Feeding and watering**

- ✓ Feed and water requirements may vary due to
 - ❖ live weight and body condition,
 - ❖ sex and age ,
 - ❖ mating,
 - ❖ energy concentration of feeds,
 - ❖ pregnancy,
 - ❖ distance walked for feed,
 - ❖ lactation and milking,
 - ❖ water or shade,
 - ❖ growth,
 - ❖ pasture digestibility,
 - ❖ weather conditions/wind chill,
 - ❖ disease/health status

- **Training of herd using halters**

- ✓ Calves are accustomed to handling from the earlier age.
- ✓ At 2 years old they are introduced to the discipline of control by head rope
- ✓ The rope passed through the nose below and towards the nasal bones.
- ✓ At first calves merely carry the attachments, but later they are incurably handled and trained.
- ✓ Tying the upper lip with rope and drag towards the ground till it accepts all the orders and becomes perfect.

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- **Weighing camels**

Two methods are applied to obtain the body weights:

- a- Using a weighing bridge of 1000 kg capacity
- b- b- Using equation as described by Kohler-Rollefson *et al.*(2001):

Live body weight (kg) =shoulder height X chest girth X hump girth X 50kgs.

If keepers are unable or do not have access to a weighing mechanism, following is a guide to estimating a camels weight

FORMULA:

$$\text{Weight in Kg} = \text{Shoulder Height} \times \text{Chest girth} \times \text{Hump Girth} \times 50$$

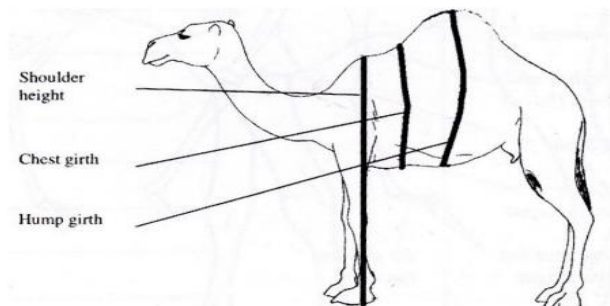


Fig 17. Weighing by using Heart girth

Chest Girth: Distance in meters around the Camels chest, measured in front of the hump and behind the front legs and chest pad

Hump Girth: Distance in meters around the Camels body, measured at its widest point, from the top of the hump and around the belly

Example:

Shoulder Height: 1.95 m

Chest Girth: 2.00 m

Hump Girth: 2.20 m

Weight in Kgs: $1.95 \times 2.00 \times 2.20 \times 50 = 429$ Kgs

- **Taking care pregnant camel and assisting parturition**

- ✓ Avoid stressing pregnant animals and
- ✓ do not bleed them to obtain food for people
- ✓ Treat the umbilical cord with iodine/pyodine or another disinfectant.

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- **Taking care for new born calves**

- ✓ During calving all the mucous and watery discharges should be clean from the new born.
- ✓ Then after help to get in to its feet and allow suckling colostrums for a short period of time.

- **Weaning of calves**

- ✓ After weaning temporary identification, plastic tags of different colors may be hung around the neck of the animal using a string or metallic tags with numbers on them may be attached to the ear of the animal and permanent marking by tattooing and branding can be done
- ✓ Camel calves are usually weaned at the age of 6 to 12 months.
- ✓ When milk is in abundant supply or demand is low, the herders do not interfere and calves suckle milk until their mothers dry up, which might be as long as 18 to 20 months.
- ✓ Such a long weaning period is not commensurate with modern husbandry practices. Prolonged weaning no doubt delays next breeding.
- ✓ Thus it seems more desirable to wean the calves at the age of 6 months.
- ✓ Normally there is still competition for the milk between the calf and herder and weaning is done when the calves intake of forage is sufficient to sustain.
- ✓ The easiest way of weaning is to transfer the calf to a different herd.

- **Identifying unhealthy stock and abnormal conditions**

Unhealthy stock can be identified by observing the following signs such as weakness, dullness, tiredness, lack of appetite, lying down at unusual times, fever and rapid heartbeat. When these signs are present, check for other more specific signs that will help you determine the disease and correct treatment. To further help in determining that the camel is diseased you have to observe abnormal camel behavior such as:-

- ✓ abnormal behavior due to cold stress and dehydration
- ✓ Eye discharge and crying
- ✓ head rubbing

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- ✓ infections
- ✓ lameness
- ✓ separation from the herd
- ✓ unusual rising and falling
- **Administering drugs to camels**
 - ✓ Oral application of drugs is done by drenching, through bolus or medicated feed.
 - ✓ Boluses (boli) and tablets should also be placed on the tongue as far back as possible.
 - ✓ Medication of feeds is rarely done since most camels have to find their feed on pastures.
 - ✓ One exception is the dosing of granulated mineral mixtures with anthelmintics, which has become a proven practice.
 - ✓ Vaccines are available against haemorrhagic septicaemia, haemorrhagic enteritis, blackquarter, pox, anthrax, rabies etc.
 - ✓ All animals must be protected against these diseases.
 - ✓ The same hygienic care and sterilization procedures have to be observed in injecting drugs to camels as in all other livestock

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Self Check 5 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 What is husbandry? (5pts)
- 2 Mention basic husbandry practices in camel production (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Information sheet 6 - Recognizing and reporting plants poisonous to camels

6.1. Introduction

Poisonous plants are plants that produce toxins that deter herbivores from consuming them. Plants cannot move to escape their predators, so they must have other means of protecting themselves from herbivorous animals. Some plants have physical defenses such as thorns, spines and prickles, but by far the most common type of protection is chemical.

6.2. Recognizing and reporting plants poisonous to camels

The handlers should be familiar with plants that are potentially poisonous. During long journeys they should not tether their camels at such points that are suspected of having poisonous plants. When camels consumed ironwood (*Erythrophloeum chlorostachys*) they exhibited staggering, star gazing, blindness and die. The toxins are alkaloid esters of diterpenoid acid. Ingestion of cape tulip (*Homeria breyniana*), oleander (*Nerium oleander*) causes salivation, tremors, convulsions and death in camels.

Other plants known to be poisonous are: *Gastrolobium grandiflorum* (desert poison bush) with the toxin, a fluoroacetate; *Gyrostemon ramulosus* (camel poison); *Dubosia hopwoodii* (emupoin bush) with the toxin, pyridine alkaloids; *Setaria* grass, toxin is oxalate content and *Trema tomentosa* (poison peach). Ingestion of the magico medicinal plant *Capparis tomentosa* causes nervous signs including muscular tremors, stiffening of limbs, 'S' shaped distortion of the neck, dyspnoea and finally convulsions. Death often occurs in 24 hours. Post-mortem shows hydrothorax, hydropericardium and pulmonary oedema. Care and treatment of poisoned camels is almost the same as observed for large true ruminants. Prevention:-Avoid introduction of camels in a pasture or rangeland where the plant is suspected to present.

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Self Check 6 - Written Test

Directions: Answer all the questions listed below.

Name..... ID..... Date.....

- 1 Why it is needed to identification of poisonous plants? (5pts)
- 2 Mention the importance of reporting plants poisonous to camels (5pts)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Operation Sheet 1 Ear-tagging

Procedures for Ear-tagging

Step1. Wear PPE

Step2. Restrain the animal and prepare materials

Step3. Select a tag style, single or double plastic tag

Step4. Select the tag size to be used

Step5. Select contrasting ink and tag colors

Step6. Select a numbering system for the ear tag

Step7. Insert the ear-tag into the appropriate applicator

Step8. Select the ear to be tagged and the tagging site

Step9. Insert the ear-tag by holding the ear

Step10. Treat the pierced ear around the tag with antiseptic

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Operation Sheet 2 - Determination of Body Temperature

DETERMINATION OF BODY TEMPERATURE

Step1. Wear PPE

Step2. It is necessary to use a tested thermometer

Step3. Take the temperature when the animal is sitting and is restrained well

Step4. Tie one end of a string to the thermometer and the other end to a clothes-peg.

Step5. Shake the thermometer to bring the mercury level below the normal T_c^0 .

Step6. The bulb of the thermometer is lubricated with Vaseline, oil, etc

Step7. Hold the tail firmly or tie it to the side

Step8. Clip the clothes-peg to the hair at the base of the camel's tail to prevent the thermometer from getting lost

Step9. Insert the bulb of the thermometer 3 to 5 cm into the rectum.

Step10. Leave the thermometer in position for about 3 minutes.

Step11. Take the thermometer out and read the temperature.

Step12. Shake the thermometer again to bring the mercury back into the bulb, then clean it and put it back into its case.

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LAP Test - Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: you are required to perform the following tasks within 8hours.

Task1. Perform camel handling

Task2. Apply identification of contaminant of work activities

Task3. Apply controlling of camel

Task4. Perform basis husbandry practices

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