DAIRY PRODUCTION

Level III

Learning Guide -50

Unit of Competence:- Rear newborn and young dairy animals

Module Title:- Rearing newborn and young dairy animals

LG Code: AGR DRP3 M13 LO1-LG-50

TTLM Code: AGR DRP3 M13 TTLM 1219v1

LO1:- Prepare for care of new born and young

Instruction Sheet	Learning Guide 50

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

- Identifying, selecting & prepare facilities, equipment and supplies
- Assessing and preparing needs of newborn and young animals.
- Feeding colostrums the new born calves
- Implementing and observing feeding routines.
- Identifying and maintaining hygiene, health and environmental requirements.
- Identifying and handling newborn and young appropriately

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, select & prepare facilities, equipment and supplies
- Assess and prepare needs of newborn and young animals.
- Feed colostrums the new born calves
- Implement and observe feeding routines.
- Identify and maintain hygiene, health and environmental requirements.
- Identify and handle newborn and young appropriately

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 1 to 7
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1,2,3,4&5” **in page -.8,15,19,21&25 respectively**

5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Provide fresh, clean calf starter, milk replacer and water every day. Make sure you offer water at least twice daily. Place these outside the pen to reduce urine and manure contamination. This will also keep spilled liquid feed and water away from the calf's bedding.

1.1. Identify Equipment for newborn care

❖ **Individual Calf Hutches**

Individual calf hutches are an excellent housing example for all young stock designs to follow. They meet each calf-housing goal by:

1. Allowing separation of a calf from other stock
2. Providing good ventilation
3. Having a well-defined eating and resting space
4. Allowing convenient access to feed and water
5. Permitting ease of cleaning and sanitation
6. Offering good observation and access potential for the caretaker.

❖ **Feeding equipment**

Care with regards to feeding

- Types of feeds provided - milk laxative, palatable &c nutritious.
- Suitable feeds - Wheat bran, oats, and linseed oil seeds.
- DCP & TDN of ration must be 16-18% & 70% respectively.
- 40-60 gms. Sterilized bone meal & 40 gm common salt may be adder', to grains.
- Succulent green, palatable fodders containing 50-60% legumes are suitable while amount concentrates should be increased gradually in three weeks.

- During early stages of pregnancy, there is no need of special feeding for heifers. The system of feeding and management recommended for heifers before breeding may continue. During last three months of pregnancy when foetal growth is very rapid, a special pregnancy allowance of about 1-2 Kg of concentrate should be offered.
- After normal birth, the dam is alert and willing to eat and drink within one or two hours of calving. Warm water and some wheat bran should be offered to dam after calving. It is necessary to encourage the dairy animals to rise and to move to the manger for feeding after calving, especially on the day of calving and the first 2 days after calving

a

b

Figure(a). Peach Teat Nurse Bottle with Handle **Figure(b). Peach Teat – Reversible Feeder**

Figure (a) Individual calf feeder **Figure(b) Mass calf feeder**

❖ Dairy Calf Housing

On a dairy farm, there are new babies being born every day. Just like people, cows only produce milk (lactate) if they have recently had a baby. The cows get a break from milking for about two months before they calve (have their baby).


Figure 3. Calf house

❖ Identification equipments

Animal identification using a means of marking is a process done to identify and track specific animals. It is done for a variety of reasons including verification of ownership, bio-security control, and tracking for research or agricultural purposes.

Ear tagging

- Most popular method of identification system.

- **Equipments Required**
  - Tagging forceps & tags

Figure 4. Ear tag equipment

- **Procedure**
  - Select the tag type (Single piece / Double piece).
  - Use the contrasting ink and style based on the skin colour of the animal.
  - Invert the ear tag into the appropriate applicator.
  - Locate the area in the ear for tagging) (half the way between base and tip of the ear).
  - Puncture the ear with applicator if the tags are non-piercing type.
  - Apply the ear tag by puncturing the ear with the applicator.

Figure 5. Ear tag

❖ **Castration Equipments**

In general, castrated men experience a much-diminished sex drive, because their bodies have very low levels of the male hormone testosterone. This lowers the frequency, strength, and duration of erections, and can cause hot flashes, vertigo, loss of body hair, and breast growth.

Figure 6. Castration equipment (Burdizzo)

Self-Check -1	Written test

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

1. Identify newborn animal caring equipment?

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

_____

Information Sheet-2	Assessing and preparing needs of newborn and young animals

2. Care of the Calf at Birth

The newborn calf should begin to breathe shortly after the umbilical cord breaks. Mucus around the nostrils should be removed. Do not pound on the calf's chest or lift it by the rear legs since this can do more harm than good. Shortly after birth, the navel cord should be dipped (not sprayed) with a 7% tincture of iodine solution. (Do not use teat dip or weaker iodine solutions.) The cow should be allowed to lick the calf after delivery.

2.1. Feeding newborn dairy animal

2.1.1. Coloustum feeding

For the first two weeks of life, calves receive most of their nutrition from milk. From four days of age, calves can be fed either whole milk, waste milk, reconstituted milk replacer, or fermented or fresh colostrum

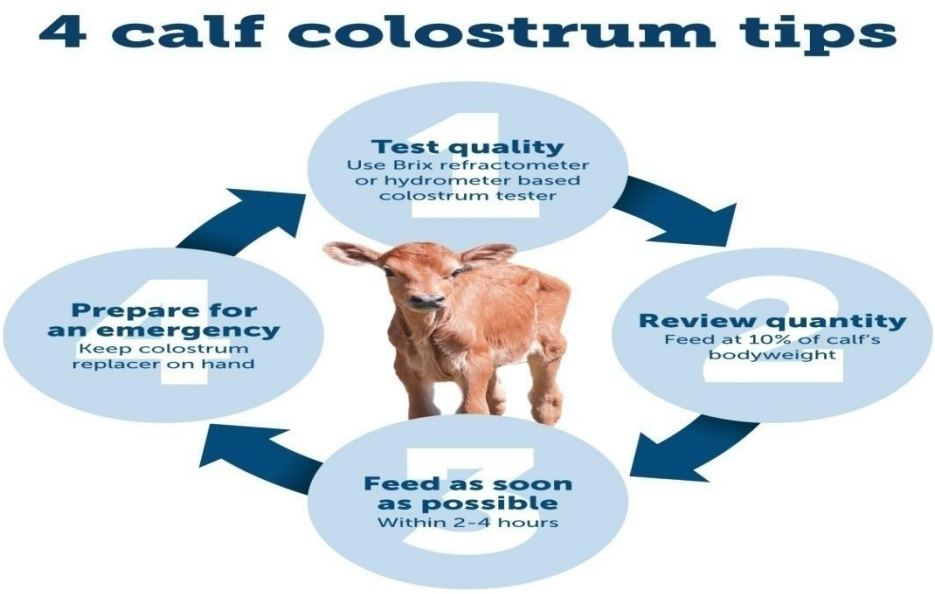

Figure 7. Calf coloustrum feeding


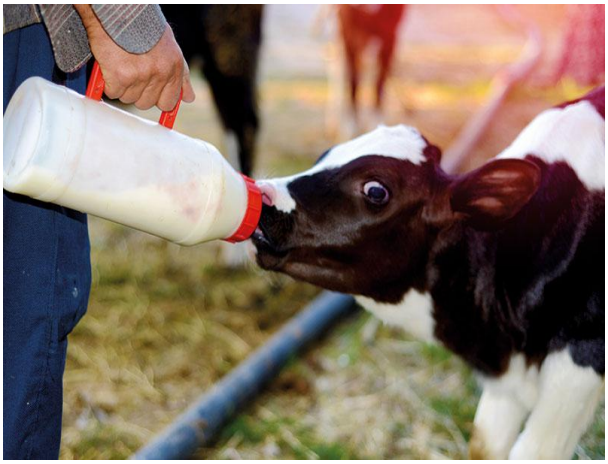

Figure. 8 Coloustrm feeding

Phases of Calf Feeding

Table 1. Four phases of the calf feeding program

No.	Phase	Feed
1	Coloustrm phase (1-4 day)	Coloustrum
2	Pre ruminate phase (5 to 20-30 day)	Milk
3	Transition stage (Liquids & dry feeds)	Milk replacer and calf starter
4	Pre weaning stage (dry feeds)	Calf starter

The aim should be to switch young calves to cheaper feeds as early as possible so that more milk can be available for sale. However, the diet must be able to promote health and growth.

2.1.2 Milk Feeding Options

For the first two weeks of life, calves receive most of their nutrition from milk. From four days of age, calves can be fed

- Either whole milk,
- Waste milk,
- Reconstituted milk replacer, or

- ❖ Fermented or fresh colostrum

Calves are generally fed milk twice daily from a nipple bottle or bucket, or they can drink from an open bucket. When milk or reconstituted milk replacer is fed to calves from either a nipple or open bucket.

Figure 9. Milk feeding

Calves should be completely weaned off milk at 8-10 weeks. It is a good idea to increase their interest in grass and concentrates. Calves must have water. Calves will begin to drink water between their feeds of milk from one to two weeks of age.

2.2. Calf Housing

Calves should be housed individually in facilities which are draft-free but provide good ventilation. One way to house calves to prevent the spread of disease from one calf to another is to use calf hutches.

Bedding

Bedding plays a key role in calf comfort. Managing bedding during early preweaning is important. An ample, dry bed of fluffy material can:

- Provide a cushioned resting surface.
- Help calves stay clean.
- Act as a moisture absorption media.
- Decrease the risks of disease.

- Reduce stress.

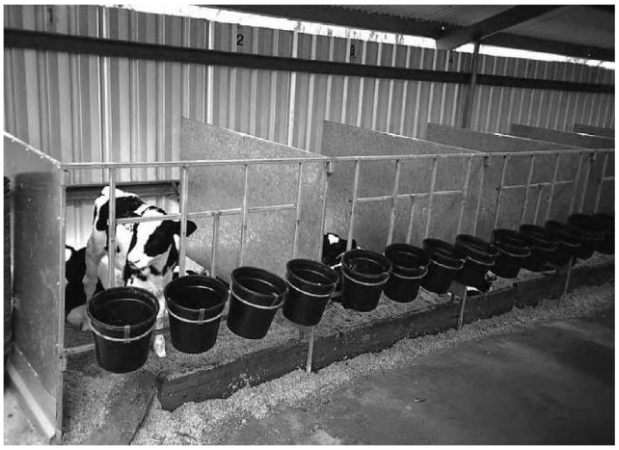

Figure10. bad of new born dairy animal

Selecting bed

Overall, bedding types don't affect average daily gain and dry matter intake of calves with proper management. There are many types of bedding including:

- Straw
- Shavings
- Sawdust
- Sand
- Gravel

Fly control

Of the bedding types, straw promotes the highest fly populations.

Sawdust is less desirable for maggot growth because it

- Poorly absorbs liquid.
- Has little organic matter.
- Is harder to breakdown.

Comfort

Sand and gravel bedding tend to compact and get dirty after a few weeks. Adding fresh straw over soiled bedding will keep the calf comfortable. But this will allow the bedding to hold more moisture and possibly ferment.

Shavings and sawdust differ in size, which can affect animal comfort and productivity. Thus, you should use a reputable supplier for bedding.

keeping calf bad clean and dry

A clean living space reduces the number of pathogens the calf must overcome. In dirty conditions, calves use energy to fight mud, heat or pathogens. In clean conditions, calves can use this energy for growth and maturing instead.

- Check calf bedding regularly to make sure it isn't constantly wet. Pathogens don't do as well in dry environments.
- Remove soiled bedding and manure from pens and add fresh bedding to keep beds clean and dry.
    - Don't walk or use equipment between pens and animals. People and equipment can spread disease.
- Always replace bedding between calves.

Provide deep bedding if your hutches are directly on the ground or other solid surface

When considering rearing dairy replacement calves, generally three distinct management groups can be formed:

The newborn group, the transition group, and the adolescent group..

- ❖ Newborn Group: Retaining a calf in this group for 10 days post-weaning
- ❖ Transition Group; encompasses post-weaned calves to about 5 to 6 months of age.
- ❖ Adolescent Group; Calves remain in this group until they enter the pre-fresh group.

vaccination

- The Newborn (1 to 10 days of age):

    - Inject with 3 cc Vit E and Selenium at birth (white muscle disease)
    - Inject with 2 cc Vit A and D (calves are born with small reserves)

- Tattoo and/or Identify calf
- Begin ionophores at 4 to 5 days of age for coccidia prevention (in milk replacer or calf starter)
- Bleed at 2 to 10 days of age to determine immunoglobulin levels (colostrum management)

 One Month Calf:

- Dehorn with electric dehorners
- Vaccinate with 7-way clostridium
- Measure height and weight when removed from the hutch

 2 to 5 Months:

- Clean and disinfect hutches when calf is removed
- Start fly control program (summer months), concentrate on udder area if using sprays
- Monitor weight, height, body condition scores
- Continue coccidia control
- Strategic deworming if turned out to pasture

 5 to 6 Months:

- Vaccinate for brucellosis
- Vaccinate with 7-way clostridium (repeat in 3 weeks)
- Vaccinate for IBR, PI3, BVD, BRSV * * (follow label directions for repeating procedure) * * (Use the modified live productãkeep calves away from adult cows)
- Deworm
- Check for extra teats
- Measure weight, height, and body condition score

Self-Check -2	Written Test

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

1. Mention calf caring activates?
2. Housing of newborn ?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

Information Sheet-3	Feeding colostrums the new born calves

3.1. Coloustum feeding

What is colostrums

Bovine colostrum is a milky fluid that comes from the breasts of cows the first few days after giving birth, before true milk appears. It contains proteins, carbohydrates, fats, vitamins, minerals, and specific kinds of proteins called antibodies that fight disease-causing agents such as bacteria and viruses.

Figure Colostrym feeding

3.2. Types of coloustrm

There are two types of coloustrm

- ❖ Natural coloustrm and
- ❖ Artificial coloustrm.

3.3. Composition of Colostrum

Constituents	Colostrum of cow milk	Colostrum of buffalo milk	Normal Milk
Total solids	28.30	31.0	12.86
Ash	1.58	0.9	0.72
Fat	0.15-1.2	4.0	4.0
Lactose	2.5	2.2	4.8
Casein	4.76	7.7	2.8
Albumin	1.5	3.6	0.54
Globulin	15.06	12.5	-
Total protein	21.32	23.8	3.34

3.4. Feeding colostrum to newborn calves

US veterinarians now recommend feeding 4 L rather than 2 L of good quality colostrum at first feeding, just to ensure that adequate Ig are ingested. Increasing volumes at first feeding markedly reduces the number of calves with low blood Ig levels, indicative of failure of passive transfer of immunity. It takes the first 2 L to fill the rumen while the second 2 L spills over into the abomasum. Newborn calves should readily drink 2 L through a teat from a nipple bottle, however, greater volumes are generally reftised.

For the first two weeks of life, calves receive most of their nutrition from milk. From four days of age, calves can be fed either whole milk, waste milk, reconstituted milk replacer, or fermented or fresh colostrum

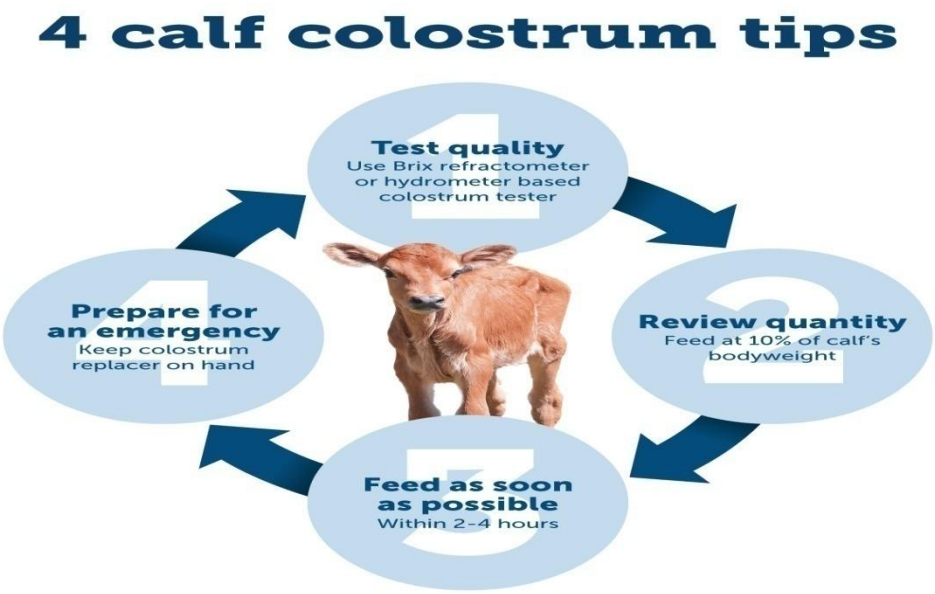

Figure 7. Calf coloustrum feeding

Figure. 8 Coloustrm feeding

Phases of Calf Feeding

Table 1. Four phases of the calf feeding program

No.	Phase	Feed
1	Coloustrm phase (1-4 day)	Coloustrum
2	Pre ruminate phase (5 to 20-30 day)	Milk
3	Transition stage (Liquids & dry feeds)	Milk replacer and calf starter
4	Pre weaning stage (dry feeds)	Calf starter

The aim should be to switch young calves to cheaper feeds as early as possible so that more milk can be available for sale. However, the diet must be able to promote health and growth.

Self-Check -3	Written Test

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

1. What is colostrum feeding?
2. Write types of colostrum?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2.

_____

_____

_____

Information Sheet-5	Identifying and maintaining hygiene, health and environmental requirements.

5.1. Newborn calf hygiene

When a calf is born, it needs to be moved to a clean dry pen as soon as possible and dried off with a clean towel. As you observe, keep in mind the three ways infection can enter a calf's body:

- Orally (through the mouth)
- Nasally (through the nose)
- Umbilically (through the navel)

was desperate to solve his problem and was looking for more medications to do so.

5.2. Colostrum hygiene

Feeding colostrum is the ultimate act of delivering immunity that will protect the calf for the next 10 to 20 days until it has the ability to build its own (active) immunity. To be effective, colostrum should be fed within the first half-hour after birth, at 105ºF, containing more than 200 grams of Immunoglobulin G in the 4 quarts being fed in one meal.

While it sounds like a daunting task, preventing bacterial growth in colostrum boils down to three things:

- Do not introduce new bacteria to the colostrum.
- Do not allow existing bacteria to grow.
- If you know you have a bacterial problem, pasteurize.

Keeping new bacteria away from colostrum starts with collection. Properly wash the udder and milk the cow. Collect only into a properly washed and sanitized stainless steel milking bucket with a lid. Decide where the colostrum will go from here.

Self-Check -4	Written Test

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

1. What is newborn care hygiene ?
2. How keeping colostrum hygiene ?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2.

_____

_____

_____

Information Sheet-5	Identifying and handling newborn and young appropriately

5.1. Handling Newborn Calves

Shortly after birth, dairy calves are given colostrum and handled by humans. Calves that are handled shortly after birth are more confident with human interaction than calves that do not have any or have minimal human interaction the first two weeks of birth.

- Calves that do not have human interaction or the interaction is negative, have a larger flight zone than calves that are positively handled by humans.
- As calves experience handling, whether positive or negative, the interaction is noted by the calf and will be remembered.
- Negative interactions include yelling, hitting, slapping, dragging the animal or rough handling. These actions result in an increased fear of humans, and calves and cows quickly learn to discriminate between humans and their handling behavior.
- No animal should ever be hit or slapped. This is especially important for newborn calves as they learn behavior and carry their experiences as they move into adulthood. Not only will they fear humans in adulthood, but fear of humans accounts for up to a 20% reduction in milk yield.
- Animals that are handled negatively approach humans slower, spend less time with the humans, and have a greater flight distance.
- In growing animals, negative experiences may lead to animals that tend to gain less weight and at a slower rate compared with animals that are handled positively.

Figure 10. Care newborn

Self-Check -5	Written Test

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

1. What is the importance of newborn handling ?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

_____

_____

_____

Operation Sheet 1	Colostrum pasteurization

Techniques to Colostrum pasteurization

Step 1. Cleanly transfer colostrum into the open Perfect Udder® COMBI Pasteurizer and replace lid.

Step 2. Choose the PASTEURIZE profile from the options menu

Step 3. The colostrum will automatically heat to 60°C/140°F and hold there for 60 minutes before cooling back to a feeding temperature.

Step 4. Use the spout adapter on the exit valve to fill Perfect Udder® bags from the front of the machine.

Step 5. Then properly label the bags with the date and quality of the colostrum.

Step 6. Either feed the colostrum immediately or cool the colostrum in the refrigerator or freezer. Do not stack bags until they have cooled completely.

Step 7. Clean the pasteurizer with a warm water rinse, scrub with hot water and detergent, followed by final rinse and non-acidic disinfectant spray on all surfaces.

Step 8. Remove the valve and clean thoroughly after each use.

.

Operation Sheet 2	Artificial Colostrum preparation

Techniques to Artificial Colostrum preparation

Step 1. Get one fresh egg (proteins)

Step 2. Also 0.5litr whole milk (whole meal)

Step 3. Warm Water, 0.5lt

Step 4. Cod liver oil 1 tea spoonful (vitamins)

Step 5. Castor oil 1 table spoonful (laxative effect

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1. Colostrum pasteurization

Task 2. Artificial Colostrum preparation

References

Marshall, R.T. (1992) Standard Methods for the determination of Dairy Products. 16th ed. Publ. American Public Health Association.

Richardson, G.H. (1985) Standard Methods for the examination Dairy Products 15th edition, American Public Health Association, Washington

DAIRY PRODUCTION

Level III

Learning Guide -51

Unit of Competence:- Rear newborn and young dairy animals

Module Title:- Rearing newborn and young dairy animals

LG Code: AGR DRP3 M13 LO2-LG-51

TTLM Code: AGR DRP3 M13 TTLM 0120v1

LO2:- Providing care for newborn and young

Instruction Sheet	Learning Guide 51

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

- Providing feed and feed supplements
- Monitoring and implementing relationship between mother and young
- Maintaining and monitoring feeding, water and shelter areas
- Collecting, storing and administering colostrum
- Treating routine health and feeding problems promptly.

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 –

- Provide feed and feed supplements
- Monitor and implement relationship between mother and young
- Maintain and monitor feeding, water and shelter areas
- Collect, store and administer colostrum
- Treat routine health and feeding problems promptly.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1,2,3&4” **in page -. 6,8,11&19**
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Providing feed and feed supplements

1.1. Nutrient Requirements

The newborn calf must be fed highly digestible feedstuffs containing adequate levels of high-quality protein, energy, vitamins, and minerals.

Protein

Protein provides amino acids used to build body tissues. A newborn calf has few digestive enzymes, and it cannot utilize most vegetable proteins as well as it utilizes milk proteins. Follow the newborn calf's colostrum diet with whole milk or milk replacer containing milk protein or specially processed alternative proteins (see Table 8). By the time a calf is weaned, at 4 to 6 weeks of age, it can utilize most vegetable proteins very efficiently. After 4 months of age, when the calf has a fully developed rumen, larger rumen volume that reduces rate of passage, and an established microbial population, non-protein nitrogen compounds (such as urea) may be fed.

Energy

Energy is used to support body functions and allow dietary protein to be used in building body tissue. Young calves lack certain digestive enzymes and are therefore unable to completely digest starch, some sugars (e.g., sucrose or table sugar), and some types of fat. While calves can digest saturated fats, including milk fat, coconut oil, palm oil, and lard, they have limited ability to digest unsaturated fats such as corn and soybean oils. The major sources of energy for the newborn should be derived primarily from lactose (milk sugar) and highly digestible fat. It is very important to provide adequate energy, since the calf's metabolic rate, or rate at which energy is used, is greatest during the first two weeks of life. Cold weather and other environmental stresses increase the calf's energy requirements.

The rate of rumen development and microbial growth determines how soon the young calf can digest complex starches and carbohydrates, since microbes convert these energy sources into microbial protein. Within two weeks of age, the calf can digest starch. Shortly thereafter, it can digest complex carbohydrates.

The amounts of protein and energy required by a calf are divided into two categories based on their use for maintenance and growth. Maintenance describes the amount of energy and protein needed to support normal bodily functions, including maintaining body temperature. Maintenance requirements are related to body size; bigger animals have higher maintenance needs. Environmental conditions also affect maintenance requirements. Calves housed in drafty, wet conditions have more maintenance energy needs than those housed in draft-free, dry environments.

Vitamins

Calves require many of the same vitamins as monogastrics, including vitamin K and the water-soluble B vitamins: thiamine, riboflavin, niacin, choline, biotin, pyridoxine, folic acid, B12, and pantothenic acid. Vitamin K and water-soluble B vitamins are found in colostrum, fermented colostrum, whole milk, and good milk replacers. Rumen microorganisms can produce these vitamins once the calf's rumen begins to function. The young calf also requires the fat-soluble vitamins A, D, and E, which are in short supply at birth, but which are present in colostrum. Whole milk or milk replacers and supplemented grain mixtures normally supply all of these vitamins. Vitamin C is synthesized in the calf's tissue and is not required in the diet.

Minerals

Dairy calves require the same minerals for growth as other animals. Milk and milk replacers generally supply adequate amounts of many minerals needed during the first few weeks of life. The mineral content of colostrum and milk may be low or deficient, especially in mineral-

deficient dams. Calf starters usually contain adequate levels of the major and trace minerals required by the young calf.

Self-Check -1	Written Test

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

1. What is the nutrient required for newborn handling ?
2. List nutrient required for newborn handling?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-2	Monitor and implement relationship between mother and young

For cows to produce milk, they have to give birth to a calf. Standard dairy industry practice is to separate calves within 24 hours of birth. This is done to reduce the risk of disease transmission to the calf (e.g. Bovine Johne's Disease, a bacterial infection that is transmitted through calf contact with contaminated feces), to ensure adequate colostrum and feed intake, and to simplify disease detection. Separation of the calf from the dam also occurs to facilitate milking and management of the cow.

2.1. Early separation has long-term effects

Research has shown that the early social environment affects behavior, stress reactivity and the ability to cope with different challenges in various animal species," says project leader Susanne Waiblinger from the Institute of Animal Husbandry and Animal Welfare. Waiblinger and first author Kathrin Wagner studied these effects in dairy cows. A previously published substudy by the researchers already showed that rearing with maternal contact gives rise to adults with higher social competence.

Animals reared with maternal contact are more active in stress situations

"Cattle are herd animals. As expected, all animals, whether they were reared with or without mothers, produced higher levels of the stress hormone cortisol when being isolated from the herd, " Waiblinger explains. Cattle which grew up with their mothers expressed the highest levels of cortisol during isolation, but the heart rate measured in these animals was the lowest. Waiblinger explains: "There are fundamentally different reaction types. Some animals respond to stress situations with an increased heart rate, others produce cortisol. It is possible that the different rearing treatments result in different reaction types."

Self-Check -2	Written Test

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

1. What is the early separation has long-term effects?
2. List nutrient required for newborn handling?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-3	Collecting, storing and administering colostrum

3.1. Collection

- Fresh cows move to milking area within 2 hours of calving
- Milk fresh cows before sick or treated cows
- Cow preparation is identical to routine parlor practices
- Milking equipment is serviced and sanitized between cows and between milkings
- Save colostrum for calves only if the cow or heifer meets these criteria
    - Johnes ELISA test negative ‰
    - Healthy ‰
    - No mastitis ‰
    - Has not leaked milk ‰
    - No bloody milk ‰
    - Has been dry at least 45 days and in the transition group for a minimum of 14 days ‰

3.2. Labeling and Storage

- Fresh colostrum is put into 2 or 4 quart calf bottles or ziplock containers
- Each container is marked with cow ID and date of collection
- Colostrum not fed within 2 hours is placed into a clean refrigerator
- Colostrum > 7 days old is discarded ‰

3.3. Administration

- Calves are moved out of the calving area immediately after birth
- One single meal of first milk colostrum is given to newborn calves
- Between 2 and 4 hours of age or when calves stand and suckle, administer 4 quarts of colostrum from a single cow at one single feeding. ‰

- Suckling ‰
- Suckling + esophageal feeder ‰
- Esophageal feeder

- Calves that fail to stand or suckle are given 4 quarts of colostrum from a single cow by esophageal feeder at 4 hours after birth

Self-Check -3	Written Test

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

1. What is colostrum for newbor animal?
2. List nutrient contain for newborn handling?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-4	Treat routine health and feeding problems promptly.

4.1. Calving supervision

Good calving supervision involves being present to assist during stage two of calving or to call for veterinary assistance, if required but not intervening unnecessarily. The day and time of calving is best predicted from altered behavior such as increased frequency of rising and lying down, pawing with the forefeet and urinating and pelvic ligament relaxation.

Lack of supervision can lead to

- perinatal death due to prolonged calving with resultant anoxia or acidosis, which can predispose neonates to failure of passive transfer of colostral immunoglobulins

4.2. Care of the newborn calf to prevent poor viability and ill-health

Three important disease problems for young calves are

- Septicemia
- Diarrhea, and
- Pneumonia.

Septicemia

Septicemia is a systemic infection in which bacteria and toxins get into the bloodstream of the calf and travel throughout the body. It usually occurs while the calf is in the uterus or during or immediately after birth. In most cases, these toxins in the blood are characterized as gram-negative bacteria like *E. coli* and *Salmonella.* Septicemia is difficult and expensive to treat, and survival rates are low.

Diarrhea

Diarrhea is the most common cause of death in young calves and is almost entirely avoidable by good management.

The highest risk period for calf diarrhea is within the first month after birth. In the very young calf, diarrhea is generally caused by E. coli. If that bacterium crosses the GI tract into the bloodstream (and the calf has no immunity to fight it), that calf will become septic and will be very hard to save without early and diligent treatment. There are other bacteria, viruses, and/or parasites that cause diarrhea in calves.

Pneumonia

Another common disease we see in dairy calves from birth to weaning is pneumonia–inflammation of the lungs.Clinical signs of pneumonia include nasal discharge, dry cough, body temperature of greater than 41°C, respiratory distress, and decreased appetite.

The emergency medicine concept of the 'golden hour' can be applied to at-risk newborn calves. This term refers to the principle of rapid intervention to prevent subsequent sequelae.

High risk calves can be identified

(a) Before birth by the predicted likelihood of suffering from dystocia;

(b) During birth by large forelimbs, swollen tongue, cyanosed muzzle and gums; or

(c) After birth by apnoea or dyspnoea, lateral recumbence, flaccid musculature and poor pedal and suck reflexes. The triage approach to paediatric care of the at-risk bovine perinate in the first hour of life involves etho-physical assessment, resuscitation as necessary, umbilical antisepsis and colostrum feeding.

Self-Check -4	Written Test

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

1.Identify high risk calves health condition ?

2. List the three important disease problems for young calves?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Operation Sheet 1	Colostrum pasteurization

Techniques to Colostrum pasteurization

Step 1. Cleanly transfer colostrum into the open Perfect Udder® COMBI Pasteurizer and replace lid.

Step 2. Choose the PASTEURIZE profile from the options menu

Step 3. The colostrum will automatically heat to 60°C/140°F and hold there for 60 minutes before cooling back to a feeding temperature.

Step 4. Use the spout adapter on the exit valve to fill Perfect Udder® bags from the front of the machine.

Step 5. Then properly label the bags with the date and quality of the colostrum.

Step 6. Either feed the colostrum immediately or cool the colostrum in the refrigerator or freezer. Do not stack bags until they have cooled completely.

Step 7. Clean the pasteurizer with a warm water rinse, scrub with hot water and detergent, followed by final rinse and non-acidic disinfectant spray on all surfaces.

Step 8. Remove the valve and clean thoroughly after each use.

.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1. Colostrum pasteurization

References

https://www.google.com/search?client=opera&q=calve+rearing&sourceid=opera&ie=UTF-8&oe=UTF-8

https://www.farmosan.com/en/ruminants/dairy-farming/calf-rearing/

https://www.teagasc.ie/media/website/animals/beef/dairy-beef/Segment-002-of-Section1-The-Newborn-Calf.pdf

Marshall, R.T. (1992) Standard Methods for the determination of Dairy Products. 16th ed. Publ. American Public Health Association.

Richardson, G.H. (1985) Standard Methods for the examination Dairy Products 15th edition, American Public Health Association, Washington

DAIRY PRODUCTION

Level III

Learning Guide -52

Unit of Competence:- Rear newborn and young dairy animals

Module Title:- Rearing newborn and young dairy animals

LG Code: AGR DRP3 M13 LO3-LG-52

TTLM Code: AGR DRP3 M13 TTLM 0120v1

LO3:- Monitor health of newborn and young

Instruction Sheet	**Learning Guide 52**

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

- Monitoring newborn and young against benchmarks.
- Taking appropriate action for sick, weak, orphaned and injured, newborn and young.
- Seeing assistance for more complex health and feeding problems.
- Separating, treating and returning newborn and young animals
- Carrying out treatments and checks.

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 –

- Monitor newborn and young against benchmarks.
- Take appropriate action for sick, weak, orphaned and injured, newborn and young.
- See assistance for more complex health and feeding problems.
- Separate, treat and return newborn and young animals
- Carry out treatments and checks.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 1 to 7.

3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

4. Accomplish the “Self-check **1,2,3,4&5” in page -. 8,11,14,16,&18**

5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Monitoring newborn and young against benchmarks

1.1. Benchmarking calf performance

There are several areas of calf management needing improvement that have been identified by animal welfare experts, including

- Calving and newborn care
- Colostrum management
- Dehorning,
- Feed management, and
- Housing practices.

Colostrum and feed management in particular, lend themselves to the benchmarking process by each having a singular well-established quantitative performance indicator; the passive transfer of immunity and average daily gains, respectively.

1.2. Passive transfer of immunity

Passive transfer of immunity refers to components of the immune system that were externally received, such as a neonatal mammal will obtain maternally through the placenta or colostrum until its own immune system is fully functioning.

- Failure of passive transfer Consequences of FPT Colostrum quantity
- Colostrum quality Colostrum timing Additional risks

1.3. Growth

How well an animal grows is a crucial indicator of the degree of success for producers, as a wide range of management factors can influence this outcome measure. This section will focus on the effects of nutrition management, as this is the primary and most immediate determinant of growth for pre-weaned calves.

Self-Check -1	Written Test

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

1.What is the bench mark calves health performance ?

2. List the three important disease problems for young calves?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-2	Take appropriate action for sick, weak, orphaned and injured, newborn and young.

Take appropriate action

2.1. Colostrum feeding

A calf is born without protective immunoglobulins/antibodies to protect it against disease. Colostrum is an extremely rich source of these antibodies. The calf depends on the successful passive transfer of these maternal antibodies from the colostrum in order to defend itself against infection until its own active immunity begins to work.

2. 2. Disease Prevention

Three important disease problems for young calves are

- Septicemia
- Diarrhea and
- Pneumonia**.**

This content will discuss factors and potential sources of infection on the farm that put young dairy calves at risk of developing these diseases.

By designing health management programs that include

- Care and housing of calves
- Standard operating procedures for the calving process,
- Proper nutrition and
- Preventive health measures for newborn calves, these diseases can be controlled.

2.3. Isolation of sick and injured newborn animal

The Care and Welfare of Sick and Injured Animals

It is the duty of sheep farmers, shepherds or anyone who has charge of sheep to identify sick or injured animals promptly and to give appropriate treatment immediately or obtain veterinary advice as soon as possible. It is a simple enough matter to spot a lame sheep or to decide that a sheep which constantly walks around in circles is unwell, but it takes considerable skill, experience and commitment to detect animals in the early stages of many diseases.

Self-Check -2	Written Test

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

1.Identify high Disease Prevention calves health ?

2. List the three important disease problems for young calves?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-3	Seeing assistance for more complex health and feeding problems.

3.1. Early Identification of Sick Calves

Successful treatment protocols for diarrhea and pneumonia depend on early identification of sick calves. These criteria can be used to trigger a treatment intervention:

- Early morning rectal temperature (taken at the same time every day for the first week of life or identified risk period) that exceeds 39.4°C for two successive mornings or is accompanied by slow, reduced, or no milk intake that feeding.
- Slow, reduced, or no milk/milk replacer intake.
- Watery and/or bloody diarrhea.
- Cough, nasal discharge, or labored breathing.
- Head tilt, umbilical or joint swelling.
- Weakness, inability or reluctance to rise.
- Lameness.

Supportive care is more valuable than antibiotics. Sick calves must be able to stay clean and dry. Keep it in its own housing area, but put fresh bedding down. Administration of warmed fluids is an effective way to raise body temperature.

Make sure fresh water is available at least twice daily. Offer milk/milk replacer at the usual dilution and temperature, but reduce volume (to 1 liter, for example) and feed more frequently (4 times/day, if needed).

Use antibiotics when they are known to be effective for the problem that is identified. Antibiotic selection should be based on culture of the bacterial organism from the premises or during the outbreak. The veterinarian should advise you on route, dose, and duration of therapy. Responsible use of antibiotics is a must!

The five C's provide an effective formula for managing the young dairy calf:

- ❖ Colostrum
- ❖ Cleanliness
- ❖ Comfort
- ❖ Calories
- ❖ Consistency

While the agents that cause disease are always there and can be extremely important in a disease outbreak, a comfortable, clean calves with good colostrum management, consistent feeding and management practices, and plenty of calories in the diet can be disease free even if they become infected.

3.2. Feeding Weak or Sick Calves

- **Esophageal Feeder**

Newborn calves are sometimes too weak to suckle or nurse from a pail or bottle. The esophageal feeder is an excellent device for force-feeding colostrum to these calves. This inexpensive piece of equipment can save the life of a sick or weak calf. The esophageal feeder consists of an esophageal probe, tube, clamp, and collapsible fluid container. The probe is a rigid or semiflexible tube made of plastic or stainless steel.

- **Electrolyte Supplement**

Electrolyte supplements are often needed for calves with moderate to severe scours. Treatment should be aimed at replacing lost fluids, restoring acid-base balance, and furnishing nutrients and energy to the calf. A 100-pound calf can lose up to 10 percent of its body weight in one day. This calf needs an extra 3 to 5 quarts of fluid per day to correct dehydration; that is in addition to the 4 quarts the calf would normally consume. Electrolytes do not supply enough energy to be the sole source of nutrients. Therefore, milk should be given in addition to the electroly

Self-Check -3	Written Test

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

1.Identify method Feeding Weak or Sick Calves?

2. List the criteria can be used to trigger a treatment intervention:?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2_____

_____

_____

Information Sheet-4	Separate, treat and return newborn and young animals

4.1. Health and sick management

- Dip the calves' navels in iodine solution soon after birth.
- Understand calf behaviour.
- Be confident with veterinarian support.
- Be aware of how to assist the veterinarian with follow-up treatments of sick calves.
- Purchase items for a 'calf nursing kit' (thermometer, stomach tube feeder and watch).
- Develop knowledge of local disease problems (such as pneumonia, joint-ill or bloat).
- Minimise faecal contamination of the calf-rearing area.
- Minimise exposure to infections.
- Identify, record and isolate all treated calves.
- Within group pens, don't mix calves of different ages.
- Plan for disease prevention rather than treatment.
- Consider routine vaccination against Clostridial diseases.
- If using antibiotics, record treatment dates and the withholding period to avoid sale of
    - contaminated stock.
- If selling stock, ensure they are fit for travel and sale.
- Ensure excellent hygiene in calf pens and of milk feeding equipment.
- Be aware of important calf welfare issues.
- Record all instances and degree of health problems for later reference.
- Decide on protocol for other herd management (disbudding, vaccinations, and
    - internal and external parasite prevention and treatment).
- Ensure newly introduced stock are kept in a separate quarantine area.
- Ensure all staff are aware of farm health protocols.
- Ensure any children wash their hands and change into clean clothes after leaving the

Self-Check -4	Written Test

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

1. Mention Health and sick management ?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

_____

_____

_____

Information Sheet-5	Carry out treatments and checks appropriately

5.1. Preventing and treating scours

- Be aware that good colostrum feeding management is the key.
- Be consistent with all feeding and herd management.
- Minimise stresses on calves (overcrowding, climatic conditions, rough handling).
- Understand the difference between nutritional and infectious causes of scours.
- Understand types of scours and age when they can occur.
- Understand how to identify type of scours from symptoms (age, body temperature, faecal characteristics).
- Understand how to assess degree of dehydration in sick calves (sunken eyes, skin pinch test).
- Have good quality electrolyte fluid replacement on hand.
- Keep feeding milk but space out feeding times.
- Do not consider antibiotics until the type of infectious scours is identified by a veterinarian.
- Have a hospital pen for isolation of sick calves.

Self-Check -5	Written Test

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

1. Mention prevention method of sick newborn?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

_____

_____

_____

Operation Sheet 1	. Early Identification of Sick Calves

Techniques of performing identification of sick calves

Step1. Identify sick anima

Step2. Isolation

Step3. Care giving

Step4. Supplement feeding

Step5. Treating

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1. Identification of Sick Calves

References

https://www.google.com/search?client=opera&q=calve+rearing&sourceid=opera&ie=UTF-8&oe=UTF-8

https://www.farmosan.com/en/ruminants/dairy-farming/calf-rearing/

https://www.teagasc.ie/media/website/animals/beef/dairy-beef/Segment-002-of-Section1-The-Newborn-Calf.pdf

Marshall, R.T. (1992) Standard Methods for the determination of Dairy Products. 16th ed. Publ. American Public Health Association.

Richardson, G.H. (1985) Standard Methods for the examination Dairy Products 15th edition, American Public Health Association, Washington

DAIRY PRODUCTION

Level III

Learning Guide -53

Unit of Competence:- Rear newborn and young dairy animals

Module Title:- Rearing newborn and young dairy animals

LG Code: AGR DRP3 M13 LO4-LG-53

TTLM Code: AGR DRP3 M13 TTLM 0120v1

LO4:- Undertake weaning

Instruction Sheet	Learning Guide 53

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

- Identifying and weaning Young animals
- Identifying weight, body condition and health status of new born
- Starting weaning
- Identifying and meting feeding requirements
- Ensure all work is conducted safely and in accordance with enterprise requirements, work health and safety and animal welfare legislation and regulations

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 –

- Identifying and weaning Young animals
- Identifying weight, body condition and health status of new born
- Starting weaning
- Identifying and meting feeding requirements
- Ensure all work is conducted safely and in accordance with enterprise requirements, work health and safety and animal welfare legislation and regulations

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -.**

5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Identifying and weaning Young animals

1.1. Definition

Weaning is defined as “the accustom (an infant or other young mammal) to fed other than its mother's milk”. Essentially, the calves are removed from their mothers and placed on a man-made feeding system. This process takes place within many farming operations, such as dairy, sheep, goats.

Calves are ideally weaned when they are 7 to 8 months old. The right time to wean a calf depends on the condition of the cow and not the age of the calf. Calves should be weaned before the condition score of the cow falls below 2,5 if adequate winter feed is available and the cows maintain their condition

1.1.1. Factors to consider before weaning

Is the calf:

- Consuming the desired amount of feed? Is its rumen sufficiently developed?
- Meeting its weight-for-age target, based on its breed and/or the rearing system?
- At the minimum age for the rearing system?
- Able to compete within a group?

1.2. Pre-weaning calves

Preparation for weaning involves the introduction and use of solid feed as a source of nutrients. The transition from a monogastric, reliant on milk, to a ruminant is dependent on several factors. The development of the rumen has been summarized as the development of microbial ecosystem and its environment. The major contributors to the efficiency of rumen development are timing, quantity and type of solid feed in pre-weaned calves.

- ❖ Development of rumen papillae

- ❖ Maintaining correct rumen pH
- ❖ Establishment of the rumen microflora
- ❖ Increasing the rumen capacity

1.2.1. Early Weaning Strategies

Recommendations for weaning criteria, strategies for successful weaning, and feed and growth from weaning to 6 months.

Latest estimates of average weaning age in the United States indicate that 70% of calves are weaned at 7 weeks of age or later. In addition, 25% of farms surveyed said they weaned calves at 9 weeks or later. Considering that calves with adequate rumen development can be physiologically ready for weaning as early as 3 weeks of age, many farms have a significant opportunity to reduce age at weaning and save money and time spent on calves

- ❖ **Development of rumen papillae**

First a quick review of rumen development, which is essential for a successful early weaning program. When the calf begins to eat dry feed, especially starter, the rumen begins to supply nutrients produced by fermentation and the population of rumen bacteria begins to grow.

From a management standpoint, we can assist rumen development by providing free-choice water and a quality grain in the first few days after birth. With this feeding strategy, by 3 to 4 weeks of age the calf's rumen can be well-developed and ready for the change to a diet of solid feeds. Assisting the calf in eating those first few bites of grain can have dramatic, positive effects on starting the process of rumen development

- ❖ **Maintaining correct rumen pH** Many dietary factors affect the ruminal pH. A low rumen pH has been hypothesised to result in an undesired shift in the microflora and inefficient digestion, as well as a decrease in rumen motility and an increase in keratinisation. A common time for a low rumen pH to develop in calves is immediately after weaning when the volume of starter intake increases significantly.

Table 1: Role of feeding concentrates and forage in the development of the rumen in pre-weaned calves

No.	Role of feeding pre-weaned calves concentrates	Role of feeding pre-weaned calves forage
1	Provision of energy as starch is the main component, as well as provision of essential proteins and minerals	Development of ruminal muscular layers due to the main components being fibre and lignin
2	Rumen epithelium development, creating a large surface area for volatile fatty acid absorption	Mitigation of the effects of low rumen pH
3	Establishment of microbial fermentation	Establishment of appropriate microflora before weaning

The development of the rumen has been summarized as the development of microbial ecosystem and its environment. The major contributors to the efficiency of rumen development are timing, quantity and type of solid feed in pre-weaned calves in above (Table 1).

- **Establishment of the rumen microflora**

The rumen microflora of a pre-ruminant is different from that of a mature ruminant. Initial colonization is by aerobic and facultative anaerobic microbes, which decrease gradually over time being replaced by exclusively anaerobic microbes

- **Increasing the rumen capacity**

At birth, the rumen accounts for only 30 per cent of the fore stomachs and abomasal capacities, while in a mature ruminant it accounts for 80 per cent. As such, it needs to rapidly increase in capacity during the pre-weaning phase and this relies on the physical structure of the diet and is independent of rumen papillae development. Feeding bulky feed, such as forage, allows for increased muscular development and increased capacity.

1.3. Weaning of heifers

When to wean calves has been a contentious issue, with different recommendations suggested based on different measurements (Table 1). Weaning often occurs before full rumen development, which can lead to inefficient weaning onto purely solid food and a decrease in growth rates. To avoid this, weaning should be based on concentrate intake. Solid feed intakes indicate that there has been adequate rumen development and establishment of microflora, as well as the capacity to supply enough energy to the heifer via solid feed once the liquid diet is removed. If the farmer is unable to measure the volume of solid feed being eaten, then using calf body weight would be the next best option.

Table 2: Parameters used for deciding the timing of weaning

Variable	Recommendations
Starter intake	Between ≥1 and 1.2 kg/heifer/day before weaning for at least three to four days
Weight	Once a heifer has doubled its bodyweight
Height	Used as a proxy for weight and is breed dependent; approximately 87 cm for Holstein, 84 cm for Friesian and 78 cm for Jersey heifers
Age	At least five-weeks-old

Many different weaning methods are advocated, but broadly they can be divided in to two approaches:

- Abrupt weaning
- Step-down (gradual) weaning.

The weaning strategy and the nature and amount of solid feed eaten influence the rumen microbiome and feed conversion efficiency of the calf. Step-down weaning has been shown to increase solid feed intake and growth during weaning for calves on both automated

feeders and traditional twice a day feeding. The aim of feeding pre-weaned calves is to steadily increase the amount of milk fed.

Self-Check -1	Written Test

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

1. What is the Factors to consider before weaning?
2. What is Pre-weaning calves

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

_____

Information Sheet-2	Identifying weight, body condition and health status of new born

2.1. Identify weaning weight of newborn

Weaning weight

Individual heifers should reach a minimum weight prior to weaning. No specific weaning weight has been defined by research. The type of rearing system will affect the target weaning weight. Although, common weights used for weaning are 70kg for Jerseys, 80kg for Fr x J Crossbreds, 90kg for Friesians.

Body condition

Body condition at calving, for spring-calving cows, has a major impact on reproductive performance during the next breeding season. Cows and first-calf-females in good body condition at calving, BCS 5 for cows and BCS 6 for first-time-calves, will resume estrous cycles and conceive early in the breeding season. How cows are managed late in the grazing season will have a major impact on their body condition as they enter the winter.

Weaning, BCS7

Mid-winter,BCS5

Calving—BCS 5

Matingat least BCS 6

BCS at weaning depends on the summer feed conditions each year, but should usually be BCS 6-8. Cows with BCS 7 at weaning can safely lose up to 2 BCS in autumn and early mid winter. Running beef cows at too high a BCS wastes valuable feed resources. There is usually a compromise between fat on the back and feed in the paddock. It is better to take body condition off earlier post-weaning to preserve covers in winter, than to eat the grass in autumn/early winter and be forced to take the condition off the cows just prior to calving. It is not recommended to let cows drop below BCS 4 during winter. If they drop as low as BCS 4 then they should be drafted off and preferentially fed. Ideally they should regain some condition prior to calving at which time they should be BCS 5.

Self-Check -2	Written Test

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

1. Identify weaning weight of newborn?
2. What is weaning calves

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

_____

Information Sheet-3	Starting weaning

3.1. Weaning

Successful weaning based on calf weight and meal intake will help calves develop into healthy heifers.

Making sure a heifer is fully prepared before weaning reduces the chance she will need preferential treatment post-weaning. Preferentially managing small groups of animals to try and “catch them up” to the group is time-consuming and can be difficult to manage, so it is best avoided by good early management.

3.2. Weaning time

Calves should only be weaned after they have been eating at least 1kg of starter concentrates per day for three consecutive days. This will avoid a growth check after weaning. This level of intake is usually achieved by eight weeks of age. The amount of concentrates a calf eats depends on the availability of concentrates and the volume of milk being fed. If calves are fed milk ad lib or close to the level of milk they would normally drink (for example to make use of transition, non-saleable milk or to achieve higher weight gains in an automated feeding system), gradual weaning should not be initiated before the 12th week of life.

If calves are fed milk ad lib or close to the level of milk they would normally drink (for example to make use of transition, non-saleable milk or to achieve higher weight gains in an automated feeding system), gradual weaning should not be initiated before the 12th week of life.

Calves can be weaned once they are consistently consuming 1kg of concentrates per day. This level of intake can potentially be reached at an age of six weeks if access to palatable starter and water is available ad lib.

Concentrate consumption in the period immediately before weaning can be increased by restricting milk replacer availability for seven to 14 days pre-weaning.

- This can be done by:

a) Limiting the total quantity of milk replacer offered by restricting the daily allowance per calf in the period prior to weaning.

- Two weeks before weaning allow 0.75kg milk powder and one week before weaning reduce to 0.50kg powder per calf per day.

b) Limiting daily access to the nipples in the period before weaning.

- Two weeks before weaning allow 12 hours access and one week before weaning allow six hours access per day.

c) Reducing the bore of the pipeline by restricting the flow of the milk for seven to 14 days before weaning.

- This makes it difficult for the calf to satisfy its appetite with milk alone and encourages it to consume solid food.

d) Abruptly turning off the water heating system and reducing the concentration from 10 to 5% is also effective in reducing milk intake and thereby increasing concentrate intake.

3.3. Critical of weaning

- Calves should have been consuming at least 1kg calf starter/day for three consecutive days.
- Calves should be healthy.
- Calves must not be stressed (avoid disbudding, castration etc. at the same time).

The post-weaning growth check found in many calves is due to three factors:

I. Low intake of dry feed up until weaning, resulting in limited rumen development. This results in a growth check for about two weeks while the rumen becomes accustomed to digesting significant quantities of dry feeds.

II. High intake of bulky roughage such as grass and hay. Calves are physically unable to eat enough roughage to sustain rapid growth weights with their small, developing rumen.

III. Calf stress when feeds are changed. Feeding concentrates before, during, and after weaning should limit the level of growth check. If a growth check does occur, the lost growing time will never be made up and it will take longer to attain target weights.

Self-Check -3	Written Test

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

1. What is the criteria of weaning ?
2. What is post weaning calves

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

_____

Information Sheet-4	Identifying and meting feeding requirements

Feeding newly weaned animal

Weanlings are often used to feedstuffs such as grass and hay, which are not rich in nutrients, so producers must find a way to balance the familiar feedstuff with new, nutrient-rich feeds.

The dry matter intake on calves is often about 1 percent of body weight. The Hays protocol suggests that producers offer the calf 0.5 percent of its body weight of concentrate-based 75 to 85 percent total digestible nutrients or TDN ration. Try to limit silage and other familiar feeds. So, the calf is offered half of 1.0 or 0.5 percent of body weight of a weaning ration or pellet and half of 1 percent of body weight of good quality grass hay.

- Positioning the feed is as important as the feed itself. Put the hay the calves are most familiar with on top of the feed ration on the first day.
- The second day the ration should be increased to around 0.7 percent of the body weight and keep the hay the same. Put the hay on top of the ration.
- On the third or fourth day, increase the amount of feed, but not the hay. At this time, put the ration on top of the hay.
- Days seven through 10 of weaning, the goal is to have a calf eating 2 percent to 2.2 percent of its body weight – maybe even 2.5 percent."

"We are trying to build a transition into the calves as they move into new feeding rations in a stabilized way," said Waggoner, noting that this regimen balances the need to transition the calves and ensure they have enough nutrition. Often weanling calves are fed as much as they will eat which can lead to problems later.

4.2. Nutritional requirements of weaned animal

- Water is essential for all living animals. Weaned calves require 10–15 L/day with up to 25 L/day on hot days.
- Energy is required to maintain body temperature and to support normal body function. Energy is best described as metabolisable energy (ME), with requirements quantified in MJ of ME/day.
- Milk is digested in the abomasum with much higher energetic efficiency than are solid feeds in the rumen.
- Proteins are required to maintain normal body processes, repairing tissues and forming blood and also laying down muscle. Protein is quantified in g/day or percentage of feed dry matter.
- Rumen development in the milk-fed calf depends on its intake of solid feeds that contain fibre.
- Calves also require small amounts of minerals and vitamins. The most important minerals are calcium, phosphorus and magnesium.

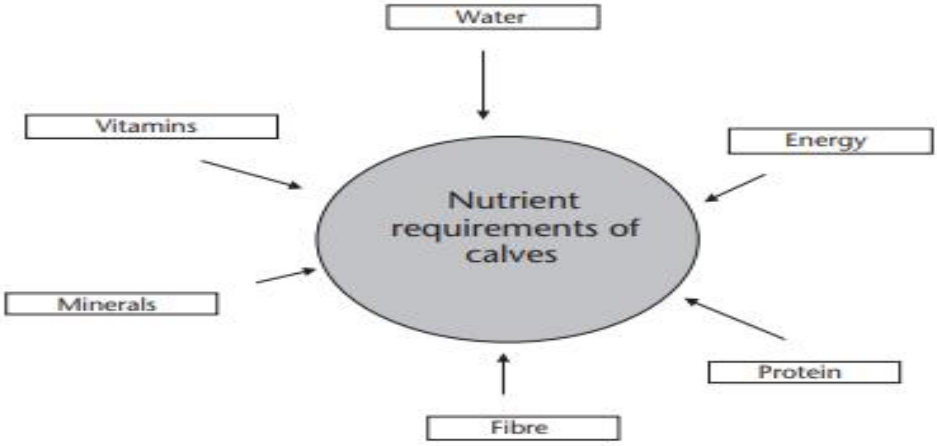

Figure 4.1. The nutrient requirements of calves

Self-Check -4	Written Test

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

1. What Nutritional requirements of weaned animal newborn?
2. What is the consideration feeding weaning calves

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

_____

Information Sheet-5	Handling animal regularly

Separation of calf and making independent of its mother for food is known as weaning.
Now days, early weaning is recommended for better management.
Under early weaning system, weaned calves housed separately and scientific feeding schedule and managemental practices followed.
In this method, the cow is not allowed to suckle by its calf after colostrum feeding.
Instead, the cow is completely milked out and required quantities of whole milk or skim milk are fed to the calf.
Weaned calves should be trained to drink milk from pails / nipple pail so that feeding management is easier.
Weaned calves should be weighed every week and the quantity of milk to be fed is calculated accordingly.

Identification of animals is must, as a requirement in the daily management, to spot and identify a particular animal in a herd/group/flock.

Reasons

- For registration and recording of the parentage in breeding programme / birth
- For individual feeding of animals.
- During milking
- During sale, for participation of animals in the rally, show and exhibition.
- For treating the animal, heat detection etc.

Methods of Identification

- Neck chain/Neck rope
- Ankle band
- Brisket tag
- Tail tag

- Chalk/grease marker
- Black/light coloured paints
- Pictures/sketches
- Photographs
- Ear tattooing
- Ear Notching
- Branding
- Ear tagging

1.Ear tatooing

- It is one of the permanent methods of identification system.

Instruments Required

Tattooing forceps, tattoo no/letters

Tattooing ink/paste

Procedure

The required dies (Numbers and letters) assembled in the tattooing forceps.

Locate the area in the ear to be tattooed. (above the cartilage equidistance between tip and cartilage of the ear).

Clean the area with alcohol.

Position the equipment. Check the Number / letter in a piece of paper before applying in the ear.

Then squeeze the forceps for puncturing properly.

Rub the tattoo ink / paste on the punctured area.

2.Ear tagging

- Most popular method of identification system.

Equipments Required

Tagging forceps & tags

Procedure

Select the tag type (Single piece / Double piece).

Use the contrasting ink and style based on the skin colour of the animal.

Invert the ear tag into the appropriate applicator.

Locate the area in the ear for tagging) (half the way between base and tip of the ear).

Puncture the ear with applicator if the tags are non-piercing type.

Apply the ear tag by puncturing the ear with the applicator.

3.Branding

- It is one of the permanent method

Hot Iron branding

A good hot iron branding should be visible and recognizable since it destroys hair follicles located under several layers of the skin and leaved a permanent bald scar on the skin of the animal.

Required

Branding irons / Electric branders made up of iron or steel, squeeze chute / Trevice (for restraining)

Procedure

Assemble and keep the equipment ready

Heat the branding iron

Before branding, restrain the animal

Check the temperature of branding iron. It should be grey ashes.

Then press the iron and shake the handle against the skin for fixing the iron properly.

Time of application usually 3-5 sec.

The brand marks should be big enough to read identify at a distance and each letter separated 2.5cm to prevent sloughing of the skin.

Apply an antiseptic for healing of wound.

Freeze branding

Application of cold iron to the skin of the animal causes destruction of melanocytes and white hairs grows on the branded area.

Procedure

Assemble the necessary cold branders / iron.

Cool the branding irons in the liquid nitrogen or dry ice

Before application, restrain the animal

Clip the area of the branding site, clean and apply alcohol to the clipped area

Apply the cold branders to the clipped area and apply equal pressure by pressing iron properly and evenly on the skin.

Time of application 30 sec to 1 min.

4.Ear notching

- Commonly used in pigs and in beef cattle.
- Notching means making a 'V' shaped notches at specific areas of the ear with the help of a sharp scissors or pincers.
- For e.g. a notch in lower right ear is no.1. and notch in lower left ear is No.3.

Self-Check -5	Written Test

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

1. What identification of newborn?
2. What is the important of calves handling?

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

_____

Operation Sheet 1	Ear tatooing

Techniques to perform Ear tatooing

Step 1. The required dies (Numbers and letters) assembled in the tattooing forceps.

Step 2. Locate the area in the ear to be tattooed. (above the cartilage equidistance between tip and cartilage of the ear).

Step 3. Clean the area with alcohol.

Step4. Position the equipment. Check the Number / letter in a piece of paper before applying in the ear.

Step 5. Then squeeze the forceps for puncturing properly.

Step 6. Rub the tattoo ink / paste on the punctured area.

Operation Sheet 2	Ear tagging

Techniques to perform Ear tagging

Procedure

Step1. Select the tag type (Single piece / Double piece).

Step2. Use the contrasting ink and style based on the skin colour of the animal.

Step3. Invert the ear tag into the appropriate applicator.

Step4. Locate the area in the ear for tagging) (half the way between base and tip of the ear).

Step5. Puncture the ear with applicator if the tags are non-piercing type.

Step6. Apply the ear tag by puncturing the ear with the applicator.

Operation Sheet 3	Branding

Techniques to perform Branding

Procedure

Step1. Assemble and keep the equipment ready

Step2. Heat the branding iron

Step3. Before branding, restrain the animal

Step4. Check the temperature of branding iron. It should be grey ashes.

Step5. Then press the iron and shake the handle against the skin for fixing the iron properly.

Step6. Time of application usually 3-5 sec.

Step7. The brand marks should be big enough to read identify at a distance and each letter separated 2.5cm to prevent sloughing of the skin.

Step8. Apply an antiseptic for healing of wound.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1. Handling animal regularly

- **Ear tattooing**
- **Ear tagging**
- **Branding**

References

https://www.google.com/search?client=opera&q=calve+rearing&sourceid=opera&ie=UTF-8&oe=UTF-8

https://www.farmosan.com/en/ruminants/dairy-farming/calf-rearing/

https://www.teagasc.ie/media/website/animals/beef/dairy-beef/Segment-002-of-Section1-The-Newborn-Calf.pdf

Marshall, R.T. (1992) Standard Methods for the determination of Dairy Products. 16th ed. Publ. American Public Health Association.

Richardson, G.H. (1985) Standard Methods for the examination Dairy Products 15th edition, American Public Health Association, Washington

Trainers prepared the TTLM with their full address

No	Name of trainer d	TVET Represent	Occupation	E-mail	
1	Addise Desta	W/Sodo ATVET College	Animal and range science(B.sc)	0913270120	addiserahel2701@gmail.com
2	Ayele Mengesha	Holeta Poly tech. College	An. Nutr.(MSc)	0911802467	ayelemengesha@ymail.com
3	Sead Taha	Agarfa ATVET College	Animal science(Bsc)	0920356174	tahasead@gmail.com
4	Sisay Fekadu	Gewane ATVET College	An. Production (MSc)	0913115358	sisrobel09@gmail.com
5	Tesfahun Kebede	Alage ATVET College	Animal breeding & Genetic (MSc)	0910618584	praiselord21@gmail.com
6	Ybrah Weliyergs	Michew ATVET College	Livestock production &pastoral Dev't (MSc)	0910569723	ybrahababa@gmail.com
7	Sintayehu Belina	Assossa ATVET College	Animal Science Bsc	0953307311	Sintayehubelina@yahoo.com
8	Tesfu Abtie	Burie Poly TVET college	Animal Science	0910162233	tawe2111@gmail.com
9	Tamirat Chanyalew	Bako ATVET College	Animal and Range science(Bsc.)	0942922400/ 0917819403	tamiratgeletac@yahoo.com