Meat and Meat Products Processing Level II

Based on May 2011, Version 2 Occupational standards

Module Title: - Applying animal handling and welfare requirements

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LG #19	LO #1- Identify and explain animal handling practices

Instruction sheet

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

- Identifying and explaining animal handling practices
- Identifying the impact of stressing and injuring animals on the quality of meat
- Identifying defects of poor handling techniques

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify and explain animal handling practices
- Identify the impact of stressing and injuring animals on the quality of meat
- Identify defects of poor handling techniques

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
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Information Sheet 1- Identifying work instructions and work practices

1.1. Understanding common livestock breeds

1.1.1. Exotic breed of beef cattle

Brahman- the Brahman breed originated from *Bos indicus* cattle originally brought from India. Through centuries of exposure to inadequate food supplies, insect pests, parasites, diseases and the weather extremes of tropical India, the native cattle developed some remarkable

Figure 1.1. Brahman

Bonsmara- the Bonsmara has been scientifically bred and strictly selected for economical production in the extensive cattle grazing regions of South Africa. The Bonsmara has become so popular that it has grown to be numerically the strongest beef breed in South Africa in less than 25 years.

Figure 1.2. Bonsmara

Angus- the Aberdeen Angus breed existed in Scotland 400 years ago and evolved during the 19th century in northeast Scotland in the counties of Angus and Aberdeen. The first Aberdeen Angus was imported into Canada in 1860.

Angus cattle are solid black or red and are polled. Both colours are registered in the Canadian Angus Association herd book. Angus are noted for good maternal qualities and a high carcass quality. Angus cattle are also recognized for their ability to forage under rugged conditions.

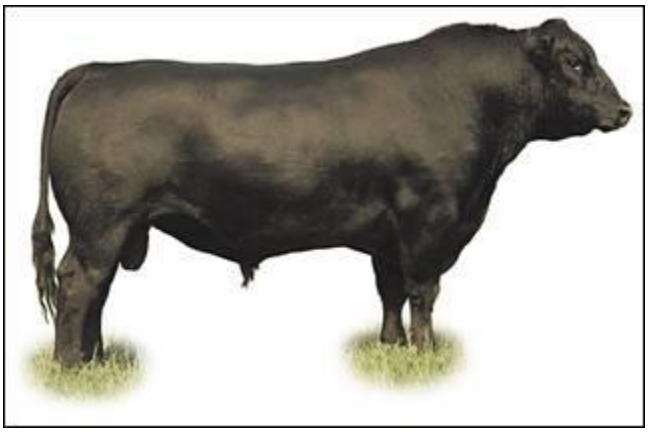

Figure 1.3. An Angus bulls.

Blonde d'Aquitaine- Originated in the southwest of France, where they developed as a dual-purpose breed. Animals are cream to fawn colored. The breed is horned and recognized primarily for its beef characteristics and high yielding carcasses.

Figure 1. 4. The Blonde d'Aquitaine.

Charolais- Charolais, one of the oldest French breeds and the earliest European import into Canada, arrived from the U.S. in 1955 and from France in 1967. Originally,

Charolais were used for meat, draft and milk, but have since become specialized as a beef breed. Cattle of the Charolais breed are large and heavy, white to cream-colored and either horned or polled. Through sire evaluation and breed improvement, they offer the beef industry hardy cattle with rapid growth and good muscling.

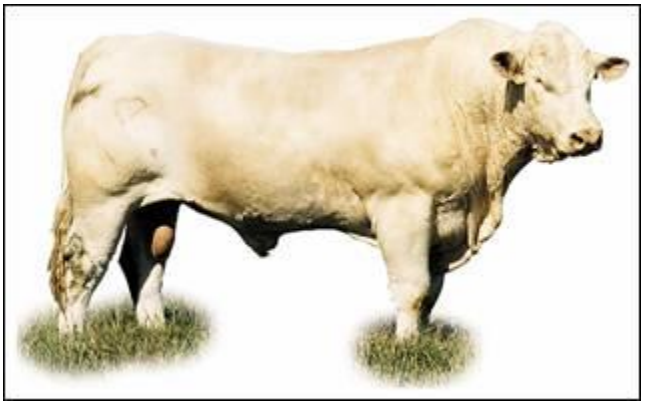

Figure 1. 5. A Charolais bull.

Gelbvieh- gelbvieh or German Yellow Cattle evolved in the early 19th century through the crossing of various breeds in northern Bavaria. This produced a growthy dual-purpose animal that also served as a draft animal. The Gelbvieh is solid-coloured, reddish gold to russet, with fine dense hair. They have good size, heavy muscling and are known for their desirable carcass and strong maternal characteristics.

Figure 1.6. A Gelbvieh bull.

Hereford- the Hereford, one of the oldest cattle breeds, was developed in Herefordshire, England. First importations into Canada were in 1860.

The Hereford is a reddish-brown color with white on the head, brisket, chest, underpart of the body, lower legs and tassel. The white face is a dominant characteristic. Herefords can be either horned or polled.

Hereford cattle are extremely hardy and show excellent foraging ability. Among beef breeds, they are not high milk producers but have good growth potential and calve relatively easily. Their popularity is shown by their continued use as a beef-producing animal that crosses well with other breeds. Bulls are usually docile and easy to handle.

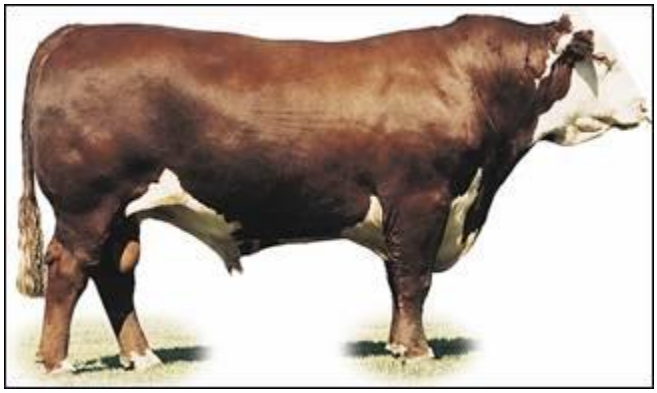

Figure 1.7. A Hereford bulls.

Limousin- the Limousin originated in the hill country of south-central France. The cattle range from a golden wheat color in the females to a deep red-gold in the males, darkening somewhat with maturity and age. The Limousin has always been selected for its meat qualities. Referred to as the "carcass breed," Limousins do well in carcass competitions with their large rib eyes and high yielding, quality, lean carcass.

Figure 1.8. A Limousin bull.

Maine-Anjou- the Maine-Anjou is one of the largest breeds of cattle in France. They were developed in Brittany when stock that existed in the area before 1850 were crossed with imported Shorthorns to produce a superior animal. The breed is large, horned, and is dark red, usually with a white underline and often with small white patches on the body. The appeal of this breed to cattle producers is their high growth rate, milking ability and good disposition. Lean carcass quality and high cutability also put them in demand.

Figure 1.9. A Maine-Anjou bull.

Shorthorn- the Shorthorn originated in the counties of Durham, Northumberland and York, England. First importations into Canada took place in 1825. The Shorthorn has been called the Foundation breed since it has been used in the development of 30 or more exotic breeds throughout the world.

Shorthorns may be red, white, roan or any combination of red and white. Cattle are either horned or polled. The breed acquired a reputation for hardiness, mothering ability, and good temperament. The major development of the breed has been for beef production, although dual- purpose herds for milk production are being maintained.

Figure 8. A Shorthorn bulls.

Simmental- the Simmental originated in Switzerland during the Middle Ages. Although developed as a triple purpose meat/draft/milk animal, they are now considered a dual-purpose milk and meat producer. Simmentals range in color from light tan to dark red with white markings on the head, behind the shoulders, belly, legs and flank. They can be horned or polled.

Simmentals are noted for their muscling, high growth rate and high milk production. Simmental cows usually wean heavy calves due to their high milk production and the breed's high growth potential. First imports into North America were in 1967.

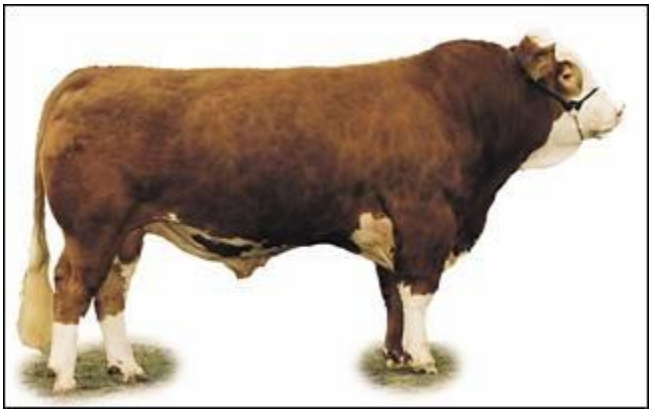

Figure 1.10. A Simmental bulls.

1.1.2. Cattle breeds of Ethiopia

1. Arsi

Location: Found in the central highlands of Ethiopia, in Arsi, Shewa, Bale, Sidamo and Harar.

Special Characteristic: Small compact animals, with thin prominent dewlap, and small short horns.

- **Main use**: Work, Meat, Milk

Figure 1.11. Arsi cattle

2. Ethiopian Boran

Main Location: main habitat of the Ethiopian Boran is the southern rangelands of Ethiopia, with the Borana pastoralists.

Characteristic: Basically, beef animals, with large and wide frame; weighs up to 500 kg; it is also a good milkier providing most of the staples for the pastoral community.

Main use: Milk, Meat

Figure 1.12. Boran cattle

3**. Horo**

Main Location: Inhabits the highlands of north-western Ethiopia, mainly in the Horro Gudru area of eastern Wollega as well as adjoining parts of western Shoa and Illubabor.

Characteristic: Coat colour is mainly brown or reddish brown; cervico-thoracic hump, small to medium.

Figure 1.13. Horro bull

4. Ogaden

Main Location: Found in the Ogaden area of Somali region of eastern Ethiopia.

Characteristic: Similar to the Ethiopian Boran with well-developed hump and large dewlap; horns are short; mainly used for milk, but are also good beef animals (Main use: Milk, Meat, Work)

Figure 1.14. Ogaden bulls

5. Raya-Azebo

Main Location: found in the region east of Lake Ashange in Tigray and the bordering areas of Wello in north-eastern Ethiopia.

Special Characteristic: Similar to the Danakil, except that the Raya-Azabo is a slightly bigger animal. Main use: Work, Milk, Meat

Figure 1.15. Raya-Azebo cattle

6. Sheko

Main Location: inhabits the humid parts of south-western Ethiopia with the Sheko tribe around Bench zone

Characteristic: Believed to have some level of tryptonomasis tolerance.

Main use: Meat and work

Figure 1.16. Sheko cattle

7. Danakil

Main Location: maintained by the Afar people in southern Eritrea, north-eastern Ethiopia (Tigrai and Wollo), particularly the lower Awash river valley, and parts of Djibouti.

Special Characteristic: large and slender body, with long lyre-shaped horns, They are very similar to the Raya-Azabo cattle

Main use: Milk, Meat, Work

Figure 1.17. Denakil Cattle

1.1.3. Exotic Breeds of Sheep

Some exotic breeds of sheep include:

- Merino
- Rambouillet
- Southdown
- Lincoln
- Leicester
- Corriedale

1.1.4. Indigenous sheep

Table 1.1. Major indigenous breed of sheep

Major group	Breed	Tail types	Fiber type
Short fat tailed	simien	Fatty and short	Wool/fleece
	Short fat tailed	Fatty and short	Wool/fleece
	Washera	Fatty and long	Short hair
Long fat tailed	Horro	Fatty and long	Short hair
	Arsi Bale	Fatty and long	Short hair
	Bonga	Fatty and long	Short hair
Fat rumped sheep	Afar	Fat rump with fat tail	Short hair
	Black haed somali	Fat rump/tiny tail	Short hair
Thin tailed sheep	Gumuz	Thin and long	Short hair

1.1.4. Indigenous goat

According to recent estimates, the goat population in Ethiopia is about 23.3 million. A large proportion is found in the lowlands of the country, raised in large flocks by pastoralists. Nearly 10 million goats (42% of the total) are found in the highlands. Figure below shows the distribution of goat types in Ethiopia. Some of the most important goat breeds and their name is correspondent to the location they occur.

Figure 1.18. Geographic distribution of Ethiopian goats

1.2. Understanding animal behavior

Cattle are large animals that can move quickly and be aggressive, and more so if mistreated and provoked. Stressed and agitated cattle are a risk to livestock handlers and to themselves. Effective handling techniques are vital to ensuring the safety of livestock handlers working cattle, as well as the welfare of the cattle themselves.

Cattle are a herding animal and have evolved as 'prey'. When threatened, their first reaction is to stand and assess the situation. If frightened, the animal's natural instinct is to escape. Social order in a mob of cattle is usually established at about two years of age. When mobs are mixed in yards or while being transported the social order of the mob has to be re-established. The cattle may become aggressive until the new order within the mob is established. This may hinder effective movement of livestock.

Cattle field of vision

With eyes on the sides of their heads, cattle have a wide range of vision of approximately 330 degrees. However, they cannot judge distances well as they usually see the object with one eye only. Cattle have a blind area directly behind them see Figure 1.19 If they detect movement to the side or rear they will seek to turn to the object so both eyes can be used to assess whether the object presents a risk and gauge the object's distance more accurately.

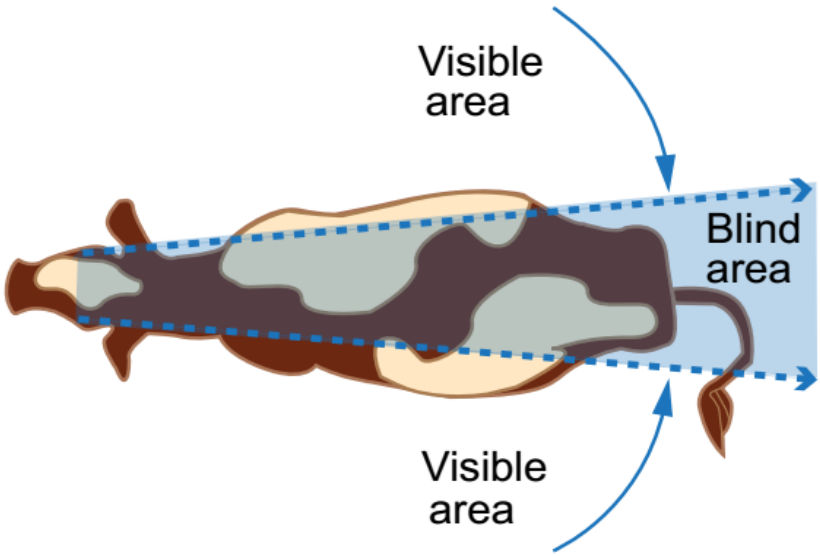

Figure 1.19. Cattle field of vision

Cattle zones- Cattle have three personal space zones surrounding them: pressure, flight and fight zones see Figure 1.20.

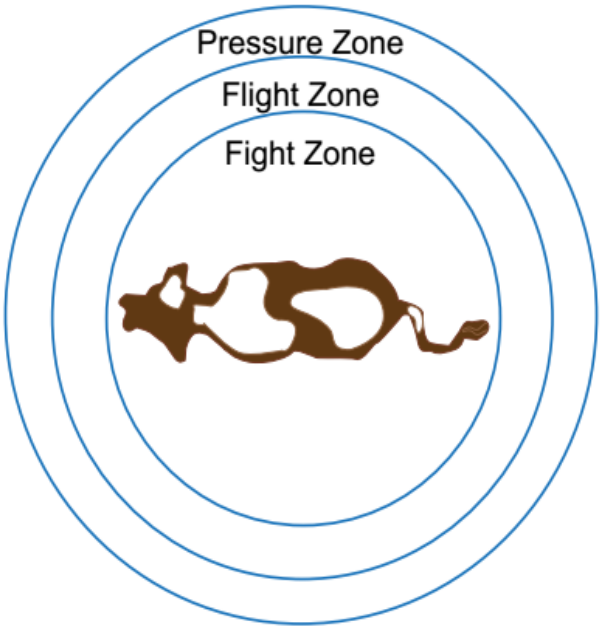

Figure 1.20. Cattle personal space zones

Cattle can be moved by entering their pressure zone. If livestock handlers move into the flight zone this will cause the animals to panic and scatter. If livestock handlers then move further into the fight zone and the animal is in a small pen for example, the animal will become aggressive and turn on the handler.

The size and shape of these zones will vary depending on the animal. For example, a dairy cow may have a smaller pressure zone compared to a wild bull on a cattle station.

Cattle handling techniques

Natural cattle handling techniques seek to encourage cattle's instinctive behaviors through the actions and positioning of livestock handlers to achieve the desired result. Whether mustering in paddocks, working through yards or loading trucks, these techniques can be applied to situations where an animal can physically go.

By encouraging natural behaviors in cattle, animals are less stressed, do not feel threatened and are less likely to react unpredictably and aggressively to livestock handlers. Other benefits from these cattle handling techniques can include:

- better animal welfare, with animals less likely to injure themselves or other animals
- increased production
- less labor is needed, and
- facilities do not need to be as strong and costly.

Self-check 1	Written test

Name…… ID……. Date…….

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

Test I: Choose the best answer (2 point)

1. From the following which one is indigenous beef cattle?
   a. Simental
   b. Angus
   c. Boran
   d. Limousin
2. Which one is not Ethiopian sheep breed?
   a. Horro
   b. Gumuz

Test II: match the correct answer from column B to column B (4 pts)

   c. Hide
   d. Merino

A

1. Short fat tailed
2. Long fat tailed
3. Fat rumped sheep
4. Thin tailed sheep

B

a. Washera
b. Arsi Bale
c. Black haed somali
d. Gumuz

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

Information Sheet 2- Identifying the impact of stressing and injuring animals on the quality of meat

1.1. Introduction

Animals could also suffer from pre-slaughter stresses arising from bruises, injuries, starvation, tiredness, water and food deprivation, and loading and unloading onto vehicles. higher levels of stress poorer meat quality are eminent, quite apart from being inhumane. Besides stress, genotype, transportation, lairage time, season of the year, environmental conditions and many other factors will affect meat quality.

Effect of pre-slaughter handling on meat and carcass quality

Improper and poor pre-slaughter handling of animals during farming, loading, transporting, marketing, unloading, lairaging and stunning have several effects on carcass and meat quality. Notably among these are; mortality, low carcass yields, blood splash, bruises, broken bones, skin blemishes, contamination by pathogens and PSE and DFD.

Mortality of animals

Animals can die from pre-slaughter handling activities. For instance, if sick animals are not treated or when animals are transported under harsh environmental and stressful conditions they can die as a result of that. Death of animals is the worst effect of pre-slaughter handling on carcass and meat quality. This is because there is total loss of carcass and meat quality as the dead animal is disposed off.

Carcass damages

Carcass damages such as bruising, hemorrhages, skin blemishes, blood splash and broken bones (particularly in poultry) are common occurrences found on carcasses due to improper handling conditions. In a bruise, hemorrhage, skin blemish and/or blood splash the skin of the animal and the blood vessels may accumulate excessive blood which has to be trimmed off during processing.

Trimming part of the carcass off will reduce meat yield and value, expensive and increase processing time. Untrimmed parts have poor appearance and can serve as substrates for microbial growth causing the meat to spoil earlier than the normal. Broken

bones may cause bone splinters in meat and this will be dangerous to the consumer if not detected after deboning.

Pale Soft Exudative (PSE) and Dark Firm Dry (DFD)

Pale soft exudative and dark firm meats are very important meat quality problems that continuous to bedevil the meat industry. Pale soft exudative is associated with pigs and chickens, and DFD affect all species although nowadays both conditions have been suggested to occur in all species. This is because PSE-like conditions continue to be reported in other species.

Acute or short-term stress such as the use of electric goads, fighting among animal just before sticking, and overcrowding in the lairage cause PSE. Exposing animals to chronic or long time stress such long hours of transportation, food and water deprivation and overcrowding of animals in the lairage can cause DFD carcasses. PSE and DFD meats are unattractive and more likely to face discrimination by consumers.

Pale soft exudative meat looks pale, lean, has soft texture and low water holding capacity and poor functional attributes. Dark firm dry meat looks dark, variations in tenderness, poor functional attributes and prone to spoilage.

Reduction in the live weight and carcass yield of animals

Animals are normally deprived of food and water prior to slaughter, depending on how long it will take for the animals to be slaughtered. There can be a reduction in live weight of animals due to food and water deprivation. This may be due to the reduction in gut fill and breakdown of muscle glycogen for energy. Losses in live or carcass weight as ‘Shrinkage’ which is a potential loss of yield of carcass and meat.

Loss of live weight in pigs begin almost directly after feed withdrawal. In sheep and cattle, the removal of skin and hides were found to be difficult under longer period of water deprivation. Subsequently greater tearing of the underlying tissue (which may be attached by some meat) and a poor surface carcass appearance may occur.

Table 1.1. Effects of pre-slaughter handling on carcass and meat quality of cattle

Pre- slaughter handling	**Carcass and meat quality effect**
Overloading	Injury and carcass damage
Held overnight in noisy yards	bruise
Transportation	Shedding of *Salmonella*
More than 24 hours of fasting	Carcass yield was reduced by 1.7 %
Cattle transported for 2 hours	1.5 % loss in carcass yield
After 12 hours of transportation	2.5 % loss in carcass yield
Prolonged stress	Meat appear darker and heat ring is formed
Poor handling	4.1 % of dark cutting
Longer journey	Associated with a significantly larger live weight loss
Longer lairage time	Decreased muscle luminosity and increased DFD
High stocking density	increased bruising and reduce dressed carcass weight
	Serious injuries and death
Impatient from crews and overloading	Increase bruises and injuries
Long distance road transport	Lost weight

Self-check 2	Written test

Name…… ID……. Date…….

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

Test I: give short answer (3 point)

1. List at least three effect of pre-slaughter handling on meat and carcass quality

a……

b. ……

c……

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

Information Sheet 3- Identifying defects of meat quality caused by poor handling techniques

3.1. Transportation

Animals are reared on farms which may be situated far away from other farms, markets and slaughter plants. Therefore, they have to be transported over some distances to such locations either for better and less expensive feed, sale and slaughter. Transportation begins with loading and ends with unloading. Both oughts' to be done in a gentle manner and under a quieter environmental condition. During transportation, animals are exposed to environmental stress such as heat, cold, humidity, noise and overcrowding. Over speeding, sudden stops, rapid acceleration and long journey times without appropriate rest should be avoided as these will increase the spate of carcass and meat quality defects. Strenuous efforts have to be put in place to ensure the safety of animals in transportation to reduce stress to its minimum.

3.2. loading and unloading

- Animals should be unloaded from transport vehicles as soon as possible after arrival at the slaughter facility.
- Animals must not remain on transport vehicles longer than one hour after arriving at the slaughter facility.
- If there is an unavoidable delay or breakdown that means animals must remain on the transport vehicle for longer than one hour the plant must make sure they have shade, shelter, ventilation and water as appropriate.
- **Note:** The best air flow and comfort for the animals may be maintained by keeping the transport vehicle moving.
- Unloading facilities must be of a height to allow animals to unload from transportation without jumping or leaping.
- Unloading areas, alleys, and ramps must provide enough room such that animals can walk freely down the ramp.
- Lighting must be sufficient to encourage animal movement in unload areas.

3.3. Feeding and watering

During transportation or marketing, animals must be provided with feed and water when necessary. During transport animals shall be offered water and appropriate food at suitable intervals. Animals shall not be left more than 24 hours without being fed and watered. This period may, however, be extended if the journey to the destination where the animals are unloaded can be completed within a reasonable period''. Provision of feed and water during transportation or marketing is therefore essential if the animals are going be transported or kept in the lairage over a longer period than recommended. This is to prevent them from starvation and dehydration that can lead to depletion of muscle glycogen and reduction in weight. Overfeeding and watering should also be avoided as this increases gut fill, cost, processing time and a higher possibility of contamination from gut fill.

Abuse or maltreatment of animals is prohibited. The following actions are prohibited and are considered by Animal Welfare Approved to constitute animal cruelty:

- Shackling, dragging, hanging, cutting, bleeding or dressing any sensible animal.
- Beating or striking any animal.
- Intentional electrical prodding or poking of an animal in a sensitive area such as the anus, the eyes or the genitals.
- Picking up or throwing a sheep by its wool.
- Intentionally driving animals over an animal that has fallen or will not move.
- Any other action that causes intentional harm to an animal.

3.4. Stunning

Pre-slaughter handling perhaps ends with stunning. Once the animal is stunned, it is made unconscious and sensitivity to pain stops unless stunning is not done properly. The type of stunning equipment used can contribute to the quality of carcass that will be produced. High voltage head-to-back electrical stunning can induce vertebral compression fractures, blood splash and poor meat quality in pigs. Blood splash carcass has poor appearance. Therefore, well trained personnel and maintained stunning equipments should be used to avoid unnecessary stress and distress to animals.

Self-check 3	Written test

Name…… ID…… Date…….

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

Test I: Choose the best answer (3 point)

Test II: Short Answer Questions (3 pts)

List the employee rights

a. ----------

b. ----------

c. ----------

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

LG #20	LO #2- Identify and explain animal welfare requirements

Instruction sheet

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

- Identifying risk to animals handled inhumane
- Identifying and explaining work place and regulatory requirements
- Identifying and Explaining animal welfare and legislation.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, **you will be able to**:

- Identify risk to animals handled inhumane
- Identify and explaining work place and regulatory requirements
- Identify and Explaining animal welfare and legislation

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Information Sheet 1- Identifying risk to animals handled inhumane

1.1. General principles

The first principle of animal handling is to avoid getting the animal excited. It takes up to 30 minutes for an animal to calm down and its heart rate to return to be normal after rough handling. Calm animals move more easily and are less likely to bunch and be difficult to remove from a pen. Handlers should move with slow, deliberate movements and refrain from yelling.

Animals may become agitated when they are isolated from others. If an isolated animal becomes agitated, other animals should be put in with it. Electric prodders (prods) should be used as little as possible or only on stubborn animals. However, it is more humane and causes less damage to give an animal a mild electric shock than to hit it with a stick or twist its tail. Battery-operated prods are preferred to mains-current operated ones. The voltage used should not exceed 32 V and never be used on sensitive parts such as eyes, muzzle, anus and vulva.

1.2. Handling in crowd pens and races

Overloading the crowd pen is one of the most common animal handling mistakes. The crowd pen and the alley that leads to it from the yard should be only half filled. Handlers must also be careful not to force animals to move by using crowd gates. Animals should walk up the race without being forcibly pushed. If they are pushed up too tightly with a crowding gate, handling becomes more difficult. Tightly packed animals are unable to turn around to enter the race. If animals refuse to enter the single file race, they may be hesitating because of a distraction ahead, such as a moving person.

The need to transport food animals occurs essentially in commercial agriculture and to a lesser extent in the rural or subsistence sector. These animals need to be moved for a number of reasons including marketing, slaughter, re-stocking, from drought areas to better grazing and change of ownership. Typically, methods used to move animals are on hoof, by road motor vehicle, by rail, on ship and by air.

Generally, the majority of livestock in developing countries are moved by trekking on the hoof, by road and rail. Historically, livestock has been moved on foot, but with increasing urbanization of the population and commercialization of animal production, livestock transport by road and rail vehicles has surpassed this.

Transport of livestock is undoubtedly the most stressful and injurious stage in the chain of operations between farm and slaughterhouse and contributes significantly to poor animal welfare and loss of production.

1.3. Poor handling effects of transport

Poor transportation can have serious deleterious effects on the welfare of livestock and can lead to significant loss of quality and production.

Effects of transport and movement include:

a. Stress- leading to DFD beef and PSE pork.

b. Bruising- perhaps the most insidious and significant production waste in the meat industry.

c. Trampling- this occurs when animals go down due to slippery floors or overcrowding.

d. Suffocation- this usually follows on trampling

e. Heart failure- occurs mostly in pigs when overfed prior to loading and transportation

f. Heat stroke- pigs are susceptible to high environment temperatures and humidity;

g. Sun burn- exposure to sun affects pigs seriously

h. Bloat- restraining ruminants or tying their feet without turning them will cause this

i. Poisoning- animals can die from plant poisoning during trekking on hoof

j. Predation- unguarded animals moving on the hoof may be attacked

k. Dehydration- animals subject to long distance travel without proper watering will suffer weight loss and may die

l. Exhaustion- may occur for many reasons including heavily pregnant animals or weaklings

m. Injuries- broken legs, horns

n. Fighting- this occurs mostly when a vehicle loaded with pig stops, or amongst horned and polled cattle.

Self-check 1	Written test

Name…… ID…… Date…….

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

Test I: short answer (7 point)

1. List five effects of transport and movement (5 pts).

2. Notify the effect handling animal in crowd pens and races (2 pts)

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

Information Sheet 2- Identifying and explaining work place and regulatory requirements

Transportation is stressful for animals. Unfamiliar surroundings, noises, vibrations and movements, unfamiliar humans and animals, handling, loading and unloading, exposure to adverse conditions, lack of access to feed and water, and other stressors are part of the process.

Individual animals differ in their ability to withstand transport. The condition of animals can change over time. An animal that is fit to load at the beginning of the transport continuum can become compromised or unfit during the journey.
Situations also change during the transport continuum (weather, road conditions, conveyance equipment function, scheduling).
In response to all these changes, actions must be taken to prevent avoidable animal suffering.

Transported animals must be:

- fit for the intended transport process before transport begins
- monitored on an ongoing basis
- at a frequency which assures the animal remains fit throughout the journey and that they receive prompt care if needed

All transport situations are different. What is appropriate for a specific animal's welfare will depend on the context and situation. It is not possible to create a "black and white" rule that will apply to every scenario.

All persons involved in transport of animals share responsibility under the law, including those who:

- Plan the transport
- Prepare animals for the journey (including food and water withdrawal)
- Assemble animals
- Catch animals
- Load animals

- Confine animals in a crate or conveyance
- Move animals from a point of origin to their destination
- Unload animals from the conveyance or container at their final destination.

The transport process covered under the regulatory authority applies to all aspects of the animal transport continuum and related confinement including:

- Withdrawal of feed, safe water and providing rest in preparation for transport
- Selection of animals that are fit for the intended transport and confinement
- Handling the animal(s) for the purpose of loading
- Loading of animal(s) into conveyances, including into crates, or containers;
- Transport and related confinement of animal(s)
- Post transport access to feed, safe water and rest when it is required (or the animal is slaughtered)
- Unloading the animal(s)
- Animals (in containers) remain in transport until they are removed from the container or enter a stunning chamber for the purposes of slaughter

Persons involved in the transport of animals need to:

- know and comply with the humane transport regulations, including
  - ✓ provincial welfare regulations and transport regulations
- be trained and competent to work with the species they are transporting, including
  - ✓ taking actions suited to the species, the risk factors, the type or transport and the conditions
  - ✓ being able to identify and correct potential problems in a timely manner
  - ✓ seeking assistance as needed from experts, industry groups, private veterinarians or other sources(s) for the required knowledge, training and risk assessment and monitoring procedures

A number of factors must be taken into account during the journey in order that the animals do not suffer, become injured or die.

1. Trekking-Only cattle, sheep and goats can be successfully moved on hoof, and here certain risks are involved. The journey should be planned, paying attention to the distance to be travelled, opportunities for grazing, watering and overnight rest. Animals should be walked during the cooler times of the day and, if moving some distance to a railhead, they should arrive with sufficient time to be rested and watered before loading. The maximum distances that these animals should be trekked depend on various factors such as weather, body condition, age etc., but the distance given in Table 2.1 should not be exceeded when trekked.

Table 2.1. Maximum distances for trekking

Species	One day journey	More than one day	
		First day	Subsequent days
Cattle	30 km	24 km	22 km
Sheep/goats	24 km	24 km	16 km

2. **Time of the day**-high environment temperatures will increase the risk of heat stress and mortality during transportation. It is important to transport animals in vehicles during the cooler mornings and evenings or even at night. This is particularly important for pigs. A combination of high humidity and high environment temperatures is especially deadly to pigs. Heat can rapidly build up to lethal levels in a stationary vehicle. Wetting pigs with water will help keep them cool.

3. **Duration of journey-**Where possible, journeys should be short and direct, without any stoppages. If the vehicle stops, pigs will tend to fight. Cattle and sheep/goats should not travel for more than 36 hours and should be offloaded after 24 hour for feed and water, if the journey is to take longer than that. Pigs should have access to frequent drinks of water during long journeys, particularly in hot and humid conditions.
There are recent moves in developed regions, seeking to limit the duration of livestock transports to 8 hours or less.

4. **Driving-**Vehicles should be driven smoothly, without jerks or sudden stops. Corners should be taken slowly and gently. The second person should be in attendance to spot

downer animals so that the vehicle can be stopped and the animal lifted. Train drivers should avoid “fly shunting” of trucks with livestock.

5. **Wind Chill**-Wind blowing on wet animals being transported in cold weather causes a wind chill factor, where the body temperature is considerably reduced, resulting in severe stress or deaths.

Pens-Livestock pens on farms, feedlots, auction yards and slaughterhouses should have sufficient space for the animals to be able to lie down.

Table 2. 2. Required floor space (m^2) per head of livestock for different species

Cattle	loose	2.0-2.8
	tied	3.0
Pigs	Baconers /small porker	0.6
	sow	0.9
Calves/sheep	-	0.7
Ostriches	-	0.9

Bulls and boars should be individually penned, and if tied, they should be able to lie down. Water must be easily available. Troughs should be high enough or protected to prevent animals from falling in and drowning. In cold climates, pens should have walls and roofs to protect animals from weather stress. In the tropics, a roof is necessary for holding pens to protect stock, particularly pigs, from heat stroke and sunburn. Water sprays in the pig pens are useful to cool pigs down. In open pens without roof and shade, even free-range cattle may suffer. Ostrich pens can be partially enclosed to make them darker as this keeps the animals more docile.

Partitions-rails made of tubular iron, wood or concrete should be smooth and without projections such as hinges, broken ends or wire. Spaces should be adjusted to prevent animals from getting through or stuck and injuring themselves.

Table 2.3. Rail distances and heights for different species

Animal species	**Rail distances**	**Rail height**
Cattle	20 cm apart	Top rail 1.5 m high
Sheep/goat	15 cm apart	Top rail 0.9 m high
Pigs	15 cm apart	Top rail 0.9 m high
Ostriches	20 cm apart	Top rail 1.5 m high

Self-check 2	Written test

Name…… ID…… Date…….

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

Test I: choose the best answer from the given choice alternatives (2 point)

1. which one is correct about one day journey of cattle?
   a. 10 km
   b. 39 km
   c. 30 km
   d. 60 km
2. which one is correct about more than one day journey of sheep and goat?
   a. 19 km
   b. 23 km
   c. 16 km
   d. 10 km

Test II: **Short Answer questions (6 pts)**

1. List three point that transported animals fulfilled before transportation.

2. Notify the floor space required per head of livestock for at least two species.

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

Information Sheet 3- Identifying and Explaining animal welfare and legislation

1.1. Introduction

In the modern era, the human-animal bond has become much stronger, with animals forming an important part of humans' lives.

Animal welfare can be defined as 'how well an animal is coping with the conditions in which it lives'. This is the generally accepted definition of animal welfare. In its simplified form, animal welfare is about ensuring that animals are not cruelly treated or caused unnecessary pain and suffering. It describes how well an animal is coping mentally and physically with the conditions in which it lives. In situations where animals manage with little expenditure of resources and effort, the animal's welfare status is said to be satisfactory.

In other words, animal welfare refers to the physical and emotional state that is produced in animals by human attitudes and practices, the amount and quality of resources available to an animal and by the environment in which the animal lives. Psychological well-being is particularly important because farm animals are sentient beings, that is, they have feelings and emotions and can therefore suffer psychological trauma. Good and bad experiences are an acceptable part of an animal's life as long as animals are able to adapt. However, physical and mental suffering that exceeds an animal's ability to cope should as far as possibly kept to a minimum.

1.2. Five freedom of animals

The five freedoms of animal welfare can be used as a framework for defining and assessing animal welfare. The five freedoms are applicable to farm animals, but require prior knowledge of species-specific wants for successful implementation. The focus of four of the five freedoms is on relieving suffering or doing away with the negative components that have the potential to impair the well-being of animals. However, one of the 'five freedoms' seeks to promote the positive aspects by advocating for animals to

be provided with conditions that enable them to express normal behavior. The 'five freedoms' are essential as a basis for preventing animal suffering and poor welfare.

The five freedoms

Freedom from hunger and thirst- by providing ready access to freshwater and an appropriate diet to maintain full health and vigor.

Freedom from discomfort- by providing an appropriate environment including shelter and a comfortable resting area.

Freedom from pain, injury or disease- by preventing, rapid diagnosis and treatment of diseases.

Freedom to express natural behavior- by providing sufficient space, proper facilities and company of the animal's own kind for social interactions.

Freedom from fear and distress- by ensuring conditions and care which avoid mental suffering (appropriate treatment and surroundings).

The welfare status of animals is not constant. It is ever changing due to the fluctuation of the factors responsible for good or bad welfare. Therefore, the welfare status of an animal can be good, bad or somewhere in between and varies with time. In general, an animal is in a good state of welfare if it is healthy, comfortable, well-nourished, free from pain, fear and distress and is able to express innate behavior. Good animal welfare requires good husbandry including disease prevention and treatment, humane handling and slaughter, and the provision of suitable nutrition and shelter. Evidence that an animal has a good state of welfare includes having low levels of disease, displaying of innate behavior, normal reproduction and living longer.

Ensuring animal welfare is a human and collective responsibility that includes consideration for all aspects of animal well-being, including proper management, housing, nutrition, disease prevention and treatment, animal care, humane handling, and, when necessary, humane euthanasia. Domesticated species have retained some of the adaptations of their ancestors, and so they need an environment which allows them to express their unique natural behavior. Whilst not all-natural processes are good

for animal welfare, positive natural behaviors that enhance well-being should be promoted.

Poor animal welfare can manifest as high mortality rates, poor reproduction, increased incidence of disease, body damage, behavior anomalies, heavy internal parasite and tick burdens and severe malnutrition. Human concern for animal welfare is based on the awareness that animals are sentient and that they have a valuable role in human lives. All vertebrates (mammals, birds, reptiles, amphibians and fish) are sentient in that they have the capacity to experience pain, distress, suffering, positive and negative feelings.

Farm animals are sentient beings, which mean they have feelings and emotions. As a result, they can suffer fear and pain, but also experience pleasure and happiness. Animals as sentient beings have the ability to evaluate the actions of other animals in relation to themselves and to remember some of their own actions and consequences and to assess risks and benefits.

There is still a lack of convergence on which animals are sentient or not among researchers. Sentience is important to welfare because the animal's level of awareness and cognitive abilities influence people's attitudes and therefore their treatment of them. Sentient or not, all living organisms should be handled and treated with the utmost care until scientific evidence proves otherwise. Examples of complex abilities that highlight sentience in some farm animals are given below.

- Pigs are capable of using deception and knowledge held by other individuals to search for food.
- Cattle value social interactions with other individuals and have been reported to remember up to 50–70 other individuals.
- Chickens can exercise self-control and can show signs of emotional frustration.

1.3. Different views regarding animal welfare

Society's views of animal welfare are influenced to varying degrees by cultural beliefs and economic viewpoints. Two divergent views stand out among many the animal welfare and animal rights standpoints. The animal welfare viewpoint advocates for the

judicious use of animals by humans as long as their welfare status is satisfactory and unnecessary pain and suffering is not inflicted. Some in society disagree with the use of animals by humans. They believe that animals should be afforded basic rights so as not to be misused by humans. These are animal rights advocates who view animals as equal to humans and are against the exploitation of animals in any form. An animal rights view is an ethical position in which non-human animals are recognized as having rights that go beyond the basic animal welfare considerations. Some of these rights equate to the rights afforded to humans. Although the two views are often divergent, there is some convergence in that both views seek to improve animal welfare. Some of the views of animal welfare and animal rights advocates are presented in Table 3. 1.

Table 3.1. Comparison of different views relating to animal welfare.

Animal welfare advocates	**Animal rights advocates**
judicious use of animals for human benefit is morally right	Using animals for human benefit is morally wrong
Human interests always come first before animal interests.	Humans interests should not overrule animal interests
Humans should not cause animals unnecessary pain or death	Humans should not cause pain or death at all in animals
Treat animals as humanely as conveniently possible	Treat animals humanely always and eliminate human-made causes of animal suffering
Humane euthanasia/killing of animals	No killing of animals
Objects to cruel practices such as dog fighting, confinement of veal calves, and pregnant sows	Abolish the use of animals in any form, it is exploitation.
	Animals have the same rights as humans

The economic benefits of good animal welfare in the meat industry include:

- Reduced carcass damage due to bruises and injuries.
- Lowered incidence of dark firm dry (DFD) and pale soft exudative (PSE) meat which are candidates for condemnation.
- A reduction in employee accidents during handling and stunning.
- A reduction in labor costs due to the smooth and easy movement of animals through the pens, races and restrainer
- Improved public perception of the meat industry which can serve as a marketing tool.

Self-check 3	Written test

Name…… ID…… Date…….

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

Test I: Match the following from column B to A (5 point)

A	B
1. Freedom from hunger and thirst.	a. Ready access to freshwater and an appropriate diet
2. Freedom from discomfort.	b. Appropriate environment
3. Freedom from pain, injury or disease	c. preventing, rapid diagnosis and treatment of diseases.
4. Freedom to express natural behavior	d. animal's own kind for social interactions.
5. Freedom from fear and distress-	e. Avoid mental suffering

Test II: Short Answer Questions

Give brief and short answer for the following question. (3 pts)

1. List at least three benefits of good animal welfare in the meat industry.
   a. _____
   b. _____
   c. _____

Note: **Satisfactory rating - 7 points** **Unsatisfactory - below 7 points**

LG #21	LO #3- Identify and explain workplace health and safety requirements for handling animals safely

Instruction sheet

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

- Identifying risks with handling animals
- Identifying workplace health and safety

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, **you will be able to**:

- Identify risks with handling animals
- Identify workplace health and safety

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information Sheet 1- Identifying risks with handling animals

1.1. Introduction

Animal behavior has been defined as 'the overt and composite functioning of animals individually and collectively and the means whereby the animal mediates dynamically with its environment, both animate and inanimate'.

Several behavioral features should be considered when working with animals. Among the most important of these features are flocking instinct, visual fields and flight distance. Genetics, sex and previous experience also influence the response of animals.

The flocking instinct is particularly strong in sheep and less so in cattle and pigs. It is very difficult to separate one sheep from a flock, and even cattle and pigs will attempt to rejoin the group when frightened. It is generally easier to move a group of animals than individuals.

All animals are aware of their environment and the changes occurring around them. They use their five senses just as we do, particularly those of sight, smell, and hearing. The question of how an animal senses your encroachment into its environment must be a primary consideration in approaching that animal

-Smell, Hearing, vision, Fight or flight, Aggressive behavior

Animal Handling Hazards

Farm employers and workers handling large animals can be killed or injured in a number of ways, including being:

- stepped on
- knocked down
- kicked
- bitten
- pinned against a hard surface, or
- exposed to a transmittable disease

Self-check 1	Written test

Name…… ID…… Date…….

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

Test I: Choose the best answer (1 point)

1. All animals are aware of their environment and the changes occurring around them.

Test II: Short Answer Questions

1. List at least four animal handling hazards. (4 pts).

Note: **Satisfactory rating - 4 points** **Unsatisfactory - below 4 points**

Information Sheet 2- Identifying workplace health and safety

Livestock safety applies to both the animal and the animal handler. It also involves much more than simply being "careful" around sows with new litters and cantankerous bulls. In fact, many livestock accidents are not directly related to the animals themselves but are caused by improper use of equipment and poorly-maintained or poorly-built facilities.

People tend to give animals human qualities and forget that animals quickly revert to primal reflex reactions when they are threatened or under stress. Animals will fiercely defend their food, shelter, territory, and young. When frightened or in pain, animals may react in ways that threaten their and our health and safety. While livestock fatalities are not nearly as frequent as deaths involving tractors or machinery, animals are involved in more total accidents and with more work-related accidents. Typical animal caused injuries to the handler range from cuts and sprains from falls, to broken bones and whole-body injuries from being kicked, pushed, shoved, or run over by an animal.

Livestock handlers must be fully aware of the different ways livestock and humans react to certain situations. Handlers must remain in control of potentially dangerous situations and avoid actions which make them vulnerable to injury. The more predictable our actions, the less likely we are to injure livestock or be injured. The better we understand livestock, the less risk of animals harming us or themselves.

Observing animals to determine their temperament can alert the handler to possible danger. These signs include raised or pinned ears, raised tail or hair on the back, bared teeth, pawing the ground, and snorting. Male animals are always dangerous. Males of some breeds are more aggressive than others, but protective females, especially new mothers, can be just as dangerous. Often injuries occur from animals that do not openly exhibit aggression or fear. This reaction may be triggered by excitement caused, for

example, by a person walking nearby. Typical injuries from this type of situation are usually a result of being kicked, bitten, stepped on, or squeezed between the animal and a solid structure as the animal tries to flee.

Livestock can also be the source of illness in humans. Zoonoses are diseases that can be transmitted between humans and animals. Examples of such diseases are rabies, brucellosis, trichinosis, salmonellosis, and ring worm. Preventive measures, such as keeping animal facilities clean, testing, immunizing and sanitary practices in handling animals and their products will help to eliminate the danger of zoonoses.

Treat livestock with respect. Always know where you are and where the animal is in relation to you when you are working with livestock. Never overlook warning signs exhibited by animals being handled.

An ounce of patience when handling livestock will be worth a pound of good working relationship when farm animals are concerned. Take time to understand how animals respond to various situations. This understanding should reduce the potential for accidents.

To reduce exposure to a livestock accident or Illness

- Understand animal behavior.
- Provide proper and safe facilities.
- Protect against diseases by using good sanitation practices.
- Wear appropriate personal protective equipment.

Self-check 2	Written test

Name…… ID…… Date…….

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

Test I: True or False (2 point)

1. Livestock safety applies to both the animal and the animal handler.
2. Zoonoses are diseases that can be transmitted between humans and animals.

Test II: Short Answer Questions (3 pts)

1. List three points to be considered to reduce exposure to a livestock accident or Illness
   a. _____
   b. _____
   c. _____

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

LG #22	LO #4- Identify and explain livestock identification procedures

Instruction sheet

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

- Animals identification
- Explaining mob and lot Identification of individual animals
- Identifying lots requirements in workplace
- Explaining the consequences of incorrect identification

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Animals identification
- Explain mob and lot Identification of individual animals
- Identify lots requirements in workplace
- Explain the consequences of incorrect identification

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information sheet 1- Animals identification

1.1. Animal Identification and Meat Traceability

Animal Identification refers to the marking of individual farm animals, or a group or lot of animals, so that they can be tracked from place of birth to slaughter. Many producers already know, and keep records on, the identities of each animal. In addition, many animals have been identified as part of official disease eradication or control programs. However, no nationwide marking system, backed by universal numbering and a central data registry, is in place yet.

Animal Identification is one component of meat traceability. Traceability is the more comprehensive concept of tracking the movement of identifiable products through the marketing chain. An extensive form of meat traceability is the ability to follow products forward from their source animal (i.e., birth or ancestry), through growth and feeding, slaughter, processing, and distribution, to the point of sale or consumption (or backward from the consumer to the source animal). Traceability can be used to convey information about a product, such as what it contains, how it was produced, and every place it has been.

Animal Identification and meat traceability are not themselves food safety, animal disease prevention, quality assurance, or country-of-origin labeling programs. However, they may be important components of such programs.

Criteria for Selection

Selecting and identifying livestock's for slaughter needs deal with the health condition and the physical quality characteristics of the animal, two important factors in the production of wholesome, good quality meat.

The Health Aspect

The obvious mark of a healthy animal is a quick, smart appearance underlying which are keen, well-disposed body reflexes. When such animals move, they do so steadily

with ease, not jerkily or with difficulty. Animals that are not fat or bulky, yet unable to move or walk with ease, must be suspect of unsound condition.

The Quality Aspect

Maturity as a criterion for selection of livestock for slaughter in developing countries does not necessarily mean very old animals. A mature animal simply means a fully developed animal. Thus in sheep the following forms of maturity exist: Lambs (sheep under 1 year); yearlings (sheep about one year old), and mutton (sheep over 1 to 2 years old).

Self-check 1	Written test

Name_____ ID_____ Date_____

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

Test I: Say true or false (2 points each)

1. Animal Identification starts from birth up to the death or slaughter of animals in production or farm.
2. Selecting and identifying livestock's for slaughter needs deal with the health condition and the physical quality characteristics which did not have zero value on meat production
3. Maturity as a criterion for selection of livestock for slaughter in developing countries does not necessarily mean very old animals

Test II: Short Answer Questions

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

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

Information sheet 2- Explaining mob and lot Identification of individual animals

2.1. Introduction

Natural cattle handling techniques seek to encourage cattle's instinctive behaviors through the actions and positioning of livestock handlers to achieve the desired result. Whether mustering in paddocks, working through yards or loading trucks, these techniques can be applied to situations where an animal can physically go.

By encouraging natural behaviors in cattle, animals are less stressed, do not feel threatened and are less likely to react unpredictably and aggressively to livestock handlers. Other benefits from these cattle handling techniques can include:

- Better animal welfare, with animals less likely to injure themselves or other animals
- Increased production
- Less labour is needed, and
- Facilities do not need to be as strong and costly.

2.2. Point of balance

An animal has two points of balance. When inside the pressure zone, the livestock handler's position in relation to an animal's point of balance can affect which way the animal will go.

When the handler moves behind this line the animal moves forward. By moving in front of this line the animal will move backwards or turn away.

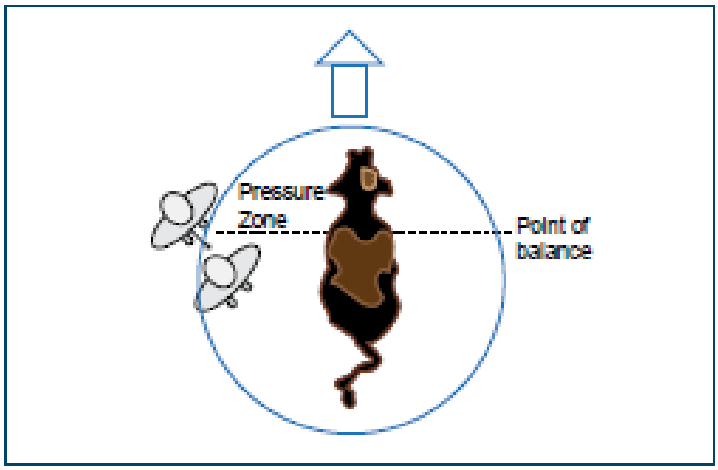

Figure 2-0-1 First point of balance

The livestock handler will move an animal sideways by moving either side of this line.

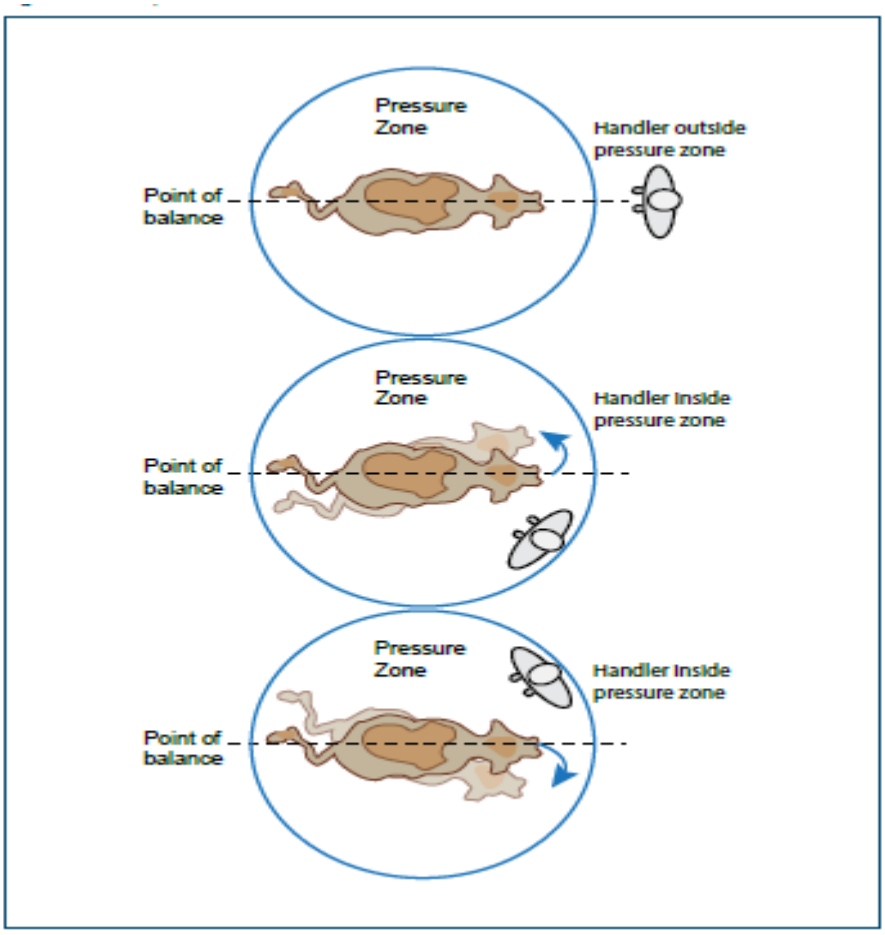

Figure 2-0-2 Second point of balance

The points of balance apply equally to a mob of cattle as they do to individual animals.

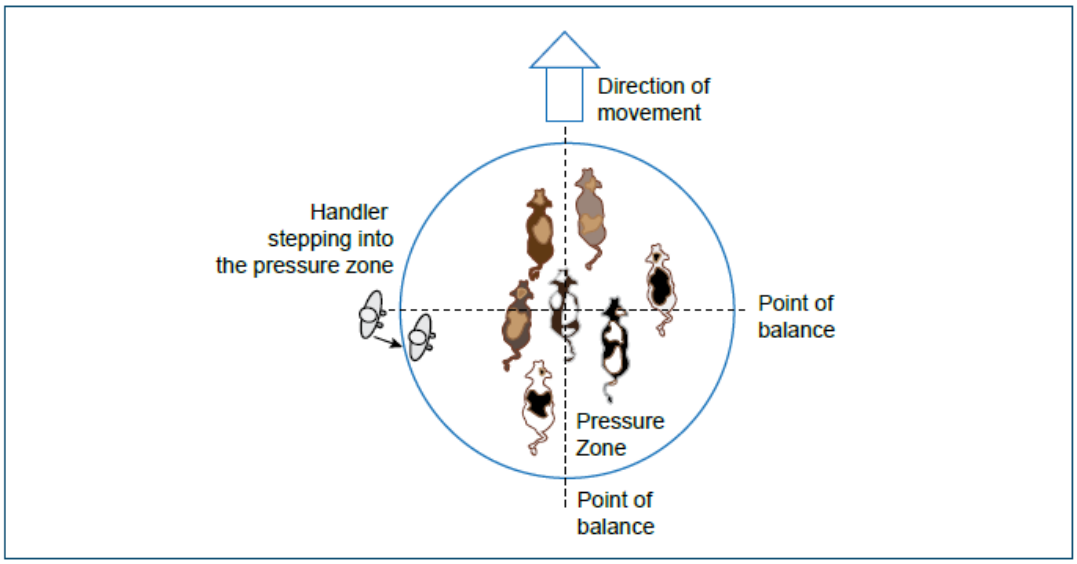

Figure 2-0-3 Mob points of balance

2.3. Pressure

To move cattle using natural techniques, livestock handlers must move into the pressure zone of the animal but stop before the flight zone. Stepping beyond the pressure zone into the flight zone will cause an unpredictable reaction as it increases the animal's stress and generates a flight response.

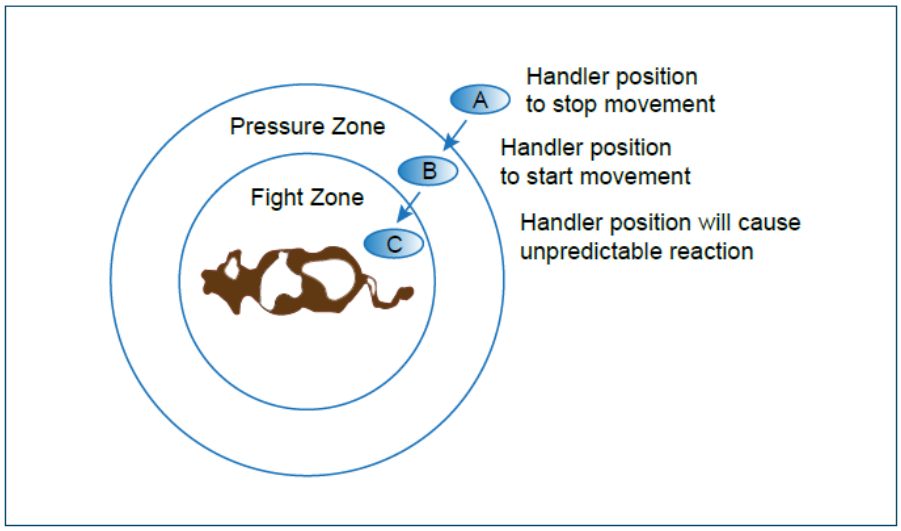

Figure 2-0-4 Livestock handler's position in pressure zones

Once pressure is applied and the cattle respond to the pressure, the cattle must be 'rewarded' by releasing the pressure. Continual pressure is not tolerated by cattle and this will cause them to respond by lying down, breaking away from the herd or fighting the livestock handler.

Livestock handlers release pressure by exiting the pressure zone or allowing the animal to move away.

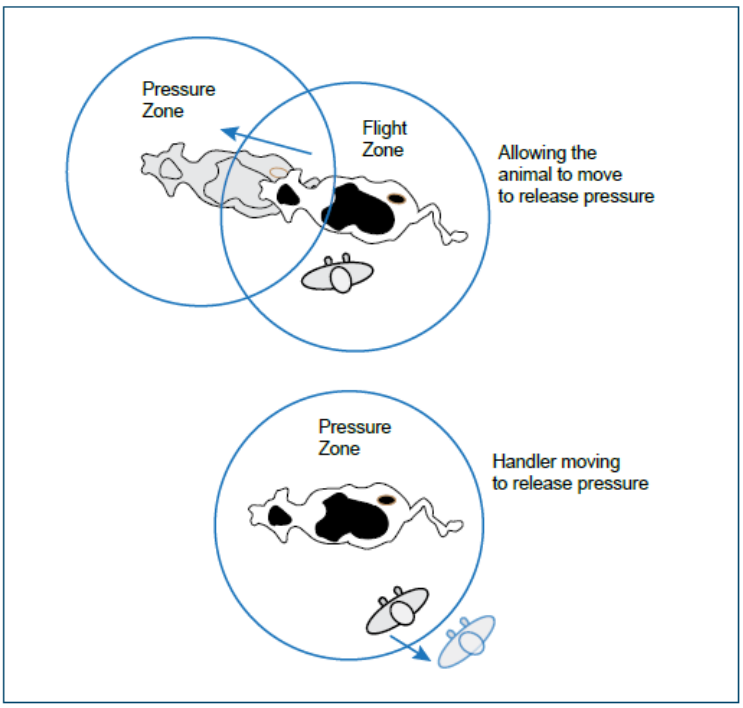

Figure 2-0-5 Releasing pressure

By teaching cattle how to take pressure and rewarding them with pressure release, cattle will respond better to other livestock handlers including those that do not use natural handling techniques.

2.4. Moving in straight lines

Livestock handlers should move in straight lines and not curves to handle cattle. Curves are used by predators to stalk prey and will cause cattle to want to escape, rather than cooperate with the handler.

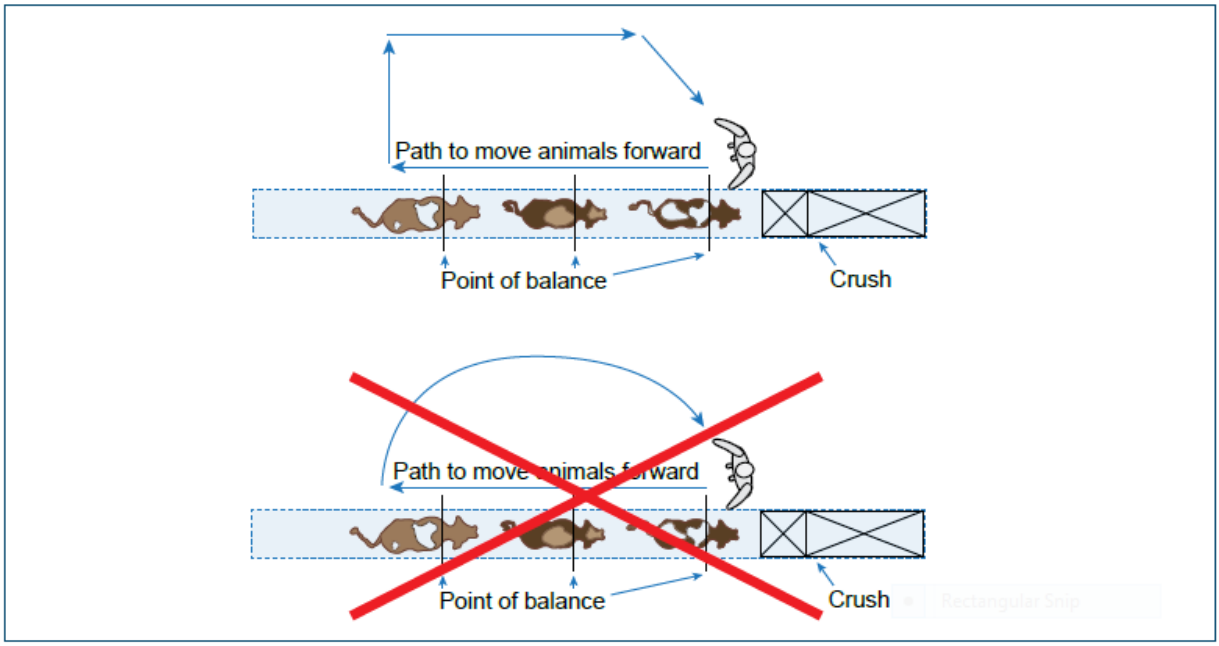

Figure 2-0-6Livestock handler movement - straight lines

Moving in curves can also apply pressure unevenly across a mob, prompting cattle to react poorly as described above.

A zigzag approach is the preferable method, with the first line aimed so the livestock handler would go past the cattle if they continued on that line. Using zigzags to move livestock can be used by livestock handlers on foot, motorbikes, horses, vehicles and aircraft.

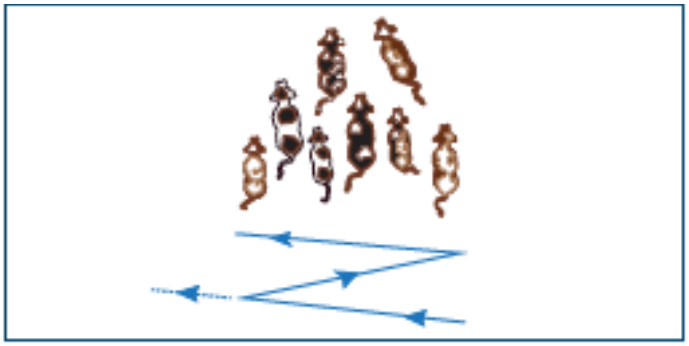

Figure 2-0-7 Zigzag technique

2.5. The 'inverted T' technique

To move cattle towards the goal, like a gateway or water point, livestock handlers should work the livestock using the inverted T approach. The horizontal line in the 'T' represents the line along which the livestock handler can move to apply pressure to the mob, while the vertical line reaches straight to the goal.

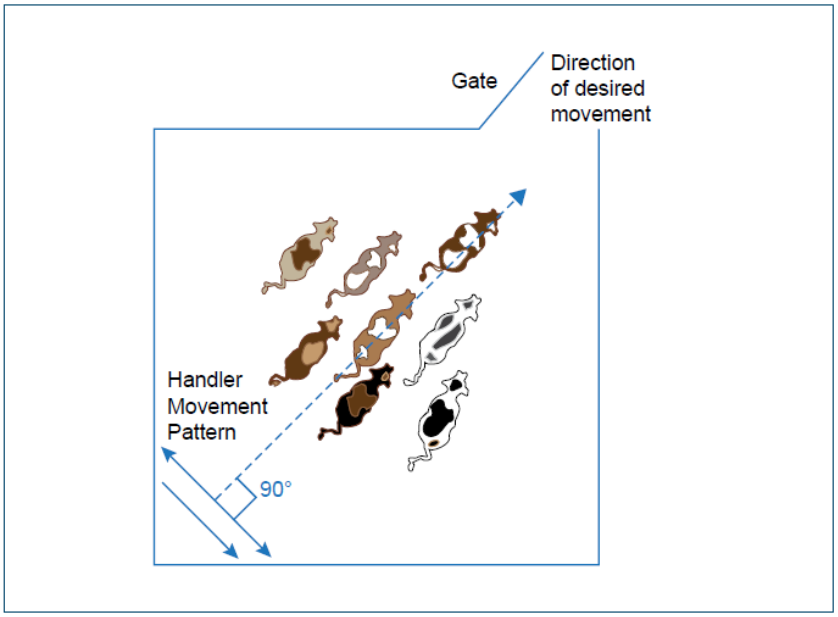

Figure 0-8 Inverted T technique

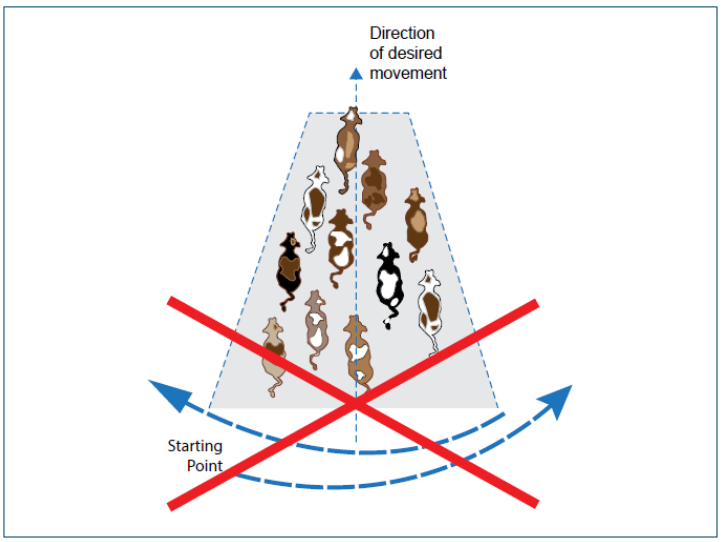

Figure 0-9 Inverted T technique - livestock handler movement

The horizontal line of this technique does not need to be perfectly 90 degrees to the vertical line; instead the zigzag action is to be used by the livestock handler.

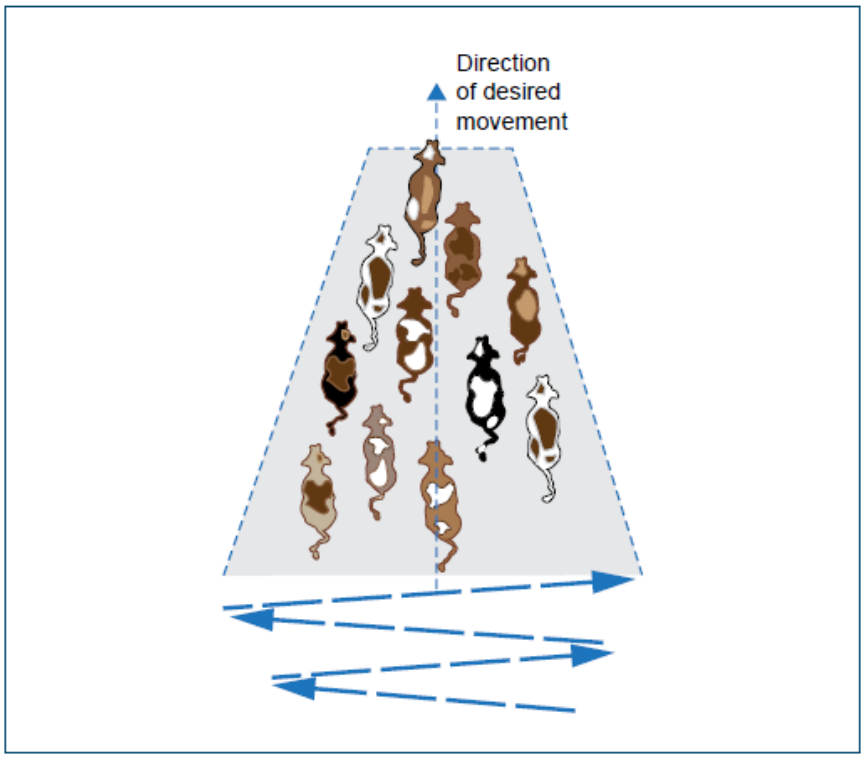

Figure 2-0-10 Inverted T technique - with zigzag

The inverted T technique can be used by livestock handlers on foot, motorbikes, horses, vehicles and aircraft. However it should be noted when not on foot, livestock handlers must be particularly aware not to hook the edges of the T. This technique is suited to mustering in paddocks, laneways and large yards.

2.6. The 'dot the i' technique

This technique is suitable for use in smaller yards or where cattle must pass through a narrow area like a gateway.

The livestock handler stands to the side of the animals, pressuring towards the rear of the yards. This pressure encourages the cattle to move past the handler to have the pressure released. As the cattle move past the livestock handler they place pressure on the animal's side and then back away to repeat the process on the next animal.

This pressure is sufficient to encourage the animal to move through the yard or gate for the pressure release reward.

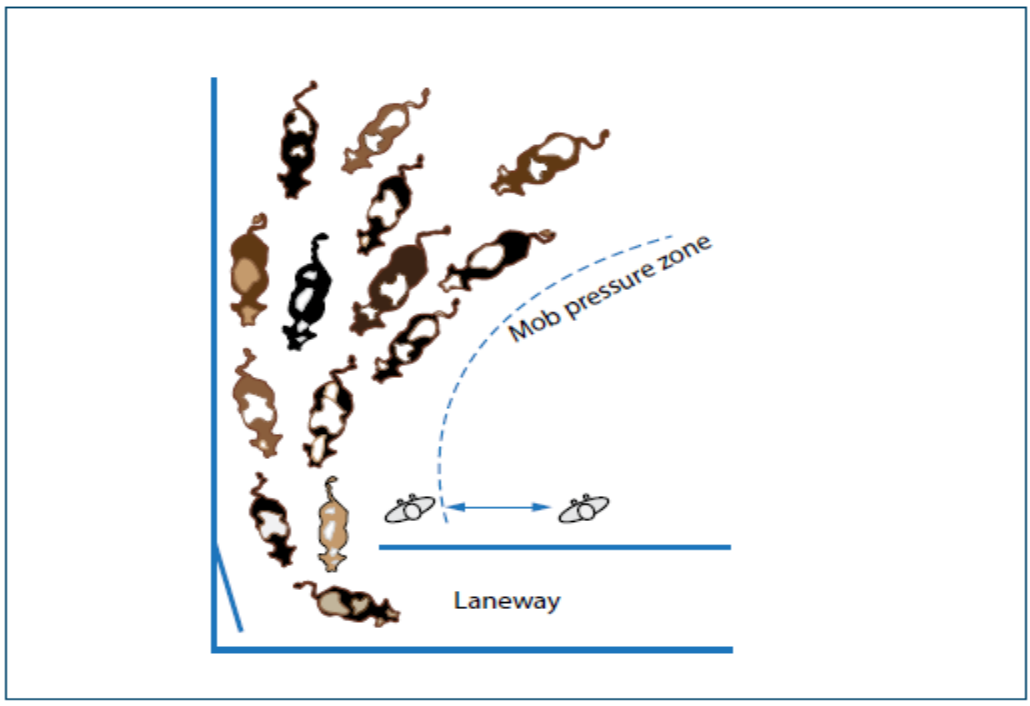

Figure 2-0-11 Dot the i technique – cattle movement

2.7. Drafting cattle

Where livestock are drafted in separate groups without using a dedicated drafting facility like in yards, then all techniques should be employed.

Draft quiet cattle from more excitable livestock, rather than the other way around, for example cows from bulls, cows from calves and old from young.

If livestock handlers need to stop or block an animal then they should not move or jump into its path. Blocking the path will increase the stress level for the animal and may lead to injury for livestock handlers if the animal continues to charge. Instead livestock handlers should step backwards to release the pressure and the animal will typically return back to the group they are being drafted from.

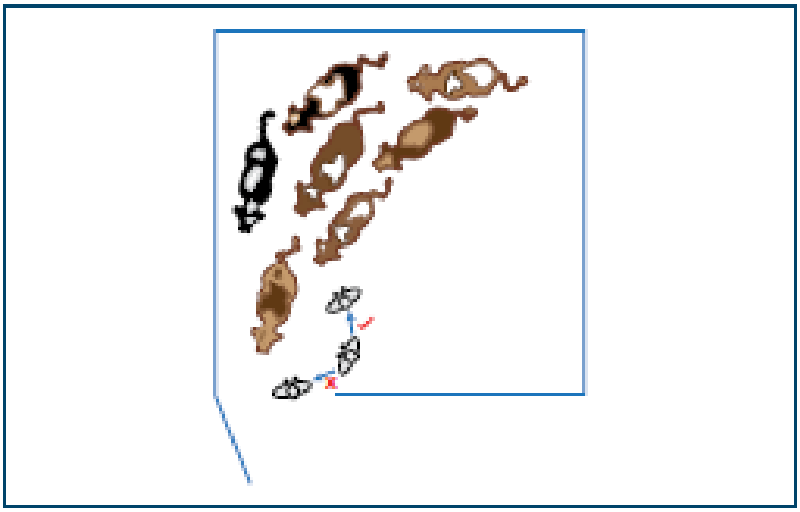

Figure2-12 Backward pressure release

Self-check 1	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (2 points each)

1. Of the following one is not a benefit of better cattle handling techniques

A. Better animal welfare

B. Increased production

C. Less labour is needed

D. Increased labor used

Test II: Say true or false

1. Blocking animals path will increase the stress level for the animal and may lead to injury for livestock handlers if the animal continues to charge (2 point)
2. Dot ”i’ technique is suitable for use in smaller yards or where cattle must pass through a narrow area like a gateway. (2 point)

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

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

Information sheet 3- Identifying lots requirements in workplace

3.1. Handling cattle in work place

The correct handling of cattle is a vital component of quality food production and good animal welfare. Handling cannot improve the basic product, but good handling will minimize product quality loss and lessen stress on animals.

The basic elements of animal handling are the handler, the stock and the facilities. These elements are all interdependent. These are:

Handler -Desirable attributes for handlers are a positive attitude to stock; understanding of animal behavior; the ability to recognize and interpret animal actions; and the allowing of sufficient time for operations.

Livestock -Livestock differ in their ease of handling due to factors including previous experiences, breed characteristics, sex and physiological state.

Facilities -Poorly designed or maintained facilities can lead to confusion and stress on cattle. There is a higher incidence of stress and injury to both stock and handlers in a poorly constructed facility. The basic element of design is to allow for good stock flow. The larger the facility and the more diverse the livestock history, the more important it is to correctly design the facility. This is equally true for sale yards, feedlots and abattoirs.

The handler must be close enough to the animal to make it move, but not so close as to cause it to panic and flee. If the cattle start moving too fast, the handler must retreat. Cattle look in the direction they are about to go and the position of an animal's head will determine the way it will turn. Cattle move most effectively if they can see the handler at all times. Experienced handlers use the point of balance of an animal to move it. Looking from a side view, this means behind the shoulder; from in front, it is from the center of the head as shown in Figure below . An animal is best driven when the handler is situated at a 45–60° angle from a line perpendicular to an animal's shoulder.

Figure 2.1 its fast movement suggests that this animal is becoming stressed by the handler’s close presence.

To handle cattle correctly, an understanding of animal behavior is essential. In fact, the greater the handler's knowledge of cattle behavior, the better their ability to predict an animal's response. And the better the ability to predict animal responses, the quicker and easier the job and the lower the probability of injury to animals or people.

Cattle, because of their size, strength, speed and potential for aggression, need to be handled thoughtfully and with confidence.

The most important aspect of handling any livestock is to be able to recognize and interpret an animal's reactions. The beast's 'body language' will indicate its probable actions.

Self-check 3	Written test

Name_____ ID_____ Date_____

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

Test I: Say true or false (2 points each)

1. Correct handling of cattle is a dynamic component of quality food production and good animal welfare
2. It is not essential to know animal's behavior in good animals handling.

Test II: Short Answer Questions (4 point)

1. List the three basic elements of animal handling

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

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

Information sheet 4- Explaining the consequences of incorrect identification

In handling the diseased and injured livestock's in the holding pens and quarantine area incorrect identification, segregation and managing to cure them or euthanizing them safely to avoid their severity is very essential. In addition to this the stress can be minimized in cattle if handled properly.

Low stress livestock handling has productivity benefits for farming enterprises. It will deliver improved livestock health and production, and better meat quality to the customer. It will also improve occupational health & safety.

Stress can be minimized by:

- Keeping animal handling to the minimum level necessary for health management and productivity.
- Designing handling facilities to minimize the risk of injury and to take advantage of natural cattle, sheep or goat behavior.
- Maintaining handling facilities in good working order and completing repairs well before major husbandry practices are carried out.
- Ensuring livestock handlers are competent.
- Avoiding sudden jerking movements and loud noises.
- Behaving in a calm and controlled manner.
- Applying optimal pressure rather than excessive pressure by taking advantage of the 'flight zone' (extensively managed livestock that are not familiar with people have a larger flight zone than livestock handled more often).
- Calmly speaking to livestock while you work with them can have a calming effect (avoid shouting, yelling or other sudden loud noises).
- Avoiding rushing livestock, give them time to assess a situation.
- Using dogs carefully (muzzle dogs that bite and tie them up when they are not working).
- Preventing overcrowding in confined spaces.

- Avoiding handling livestock during extreme weather conditions.

Cattle Identification

Livestock are marked using assorted marks, in a number of different ways and for various reasons, including:

- Marks used to establish ownership of an animal.
- Especially in larger herds, marking makes it possible to distinguish animals from one another.

Animal identification is influenced by a number of factors:

- A farmer's goals have a significant effect on identification. Thus, where a farmer intends to concentrate on commercial beef farming, identification procedures will be very different compared to the situation where a farmer decides to run a stud operation.
- The size of the farming operation as well as the amount of management input available will play a role. On very large farms where there is only one manager and more than one enterprise, much less time can be spent marking animals compared to a small herd where beef is the only enterprise.
- The extent of record keeping, and the use the records are put to, will have an effect.
- The length of time a mark is needed for (how permanent the mark must be) as well as ease of application must be considered.
- Stress to animals and damage that can cause financial losses are important. If identification involves continued pain to animals, the stress will adversely affect production. Damage to hides by brands is known to cause considerable financial losses.
- The availability of the necessary tools for marking must be considered. If metal ear tags are to be used, and these are only available from an overseas country, obvious problems will arise.

- A farmer must decide at what stage of an animal's life the mark must be applied. Thus, branding at a young age requires a smaller brand than when the brand is applied when the animal is fully grown.

Consequence

- Poor health and husbandry management
- Low production of animals by products
- Poor quality of meat
- Low market share on the industry
- Less competent in computing industry
- Low level of income

Self-check 4	Written test

Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain the term stress in livestock's (2 point)
2. List at least two important impacts of stress on livestock's. (4 point)

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

Note: **Satisfactory rating - 4 points** **Unsatisfactory - below 4 points**

LG #23	LO #5 Identify and explain requirements for dealing with sick and injured stock

Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Explaining workplace and regulatory requirements • Describing humane destruction (euthanizing) arrangements This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to: • Explain workplace and regulatory requirements • Describe humane destruction (euthanizing) arrangements
Learning Instructions:
1. Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them. 4. Accomplish the “Self-checks” which are placed following all information sheets. 5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information sheet 1- Explaining workplace and regulatory requirements

Individuals whose work involves substantial exposure to or handling of animals and animal tissues, body fluids, and cell cultures should be aware of the possibility of the illnesses that may be transmitted by contact with animals. In the zoonosis training module, at-risk individuals are informed of laboratory-acquired zoonosis, causative microorganisms, animals most commonly in contact with humans, appropriate animal handling procedures, personal hygiene, and protective equipment specific to the animal type and use.

Hazard and Risk Assessment

- Identifies hazardous biological, chemical, or physical agents
- Identifies potential hazards that are inherent to animal work, such as animal bites, chemical cleaning agents, allergens, or zoonosis
- Assesses extent and level of participation in occupational health and safety training program on the hazards posed by the animals and materials used; the exposure intensity, duration, or frequency; the susceptibility of the personnel; and the history of occupational illness or injury in the particular workplace
- PI or supervisor completes the Hazard and Risk Assessment for those who have substantial contact with animals, provides a copy to the individuals and sends copy to the Safety Office

Personal Hygiene

- Set high standards for personnel cleanliness and hygiene
- Require suitable clothing, gloves, masks, head covers, coats, coveralls, shoe covers, etc.
- Require hand-washing and changing clothes where necessary

- Make certain that all laboratory personnel, including service and custodial staff and visitors, understand the chemical and biological dangers associated with the lab or facility
- Affix biohazard signs on doors outside laboratories where biohazardous material is handled or stored (available from the University Police and Safety Office). The protocol to be followed in case of a spill of the biohazardous materials should be posted in a visible location in the laboratory or facility
- Restrict laboratory or facility access and keep doors locked when unattended
- Keep the facility clean and free of clutter. Make certain that emergency safety devices (fire extinguishers, eye washes, etc.) are easily accessible and in working order
- Make certain that all personnel, students and visitors wear protective clothing such as lab coats, gloves and safety glasses. Remove lab coats or gowns before leaving the laboratory or facility
- Do not eat, drink, smoke, store food and food utensils, apply cosmetics or lip balm, or insert or remove contact lenses while in the facility or laboratory
- Restrain long hair. Avoid wearing loose clothing or jewelry, shorts, open-toed shoes or sandals.
- Carry out procedures so as to minimize risks of splashes, spills, and generation of aerosols
- Pipetting by mouth is not allowed
- Use hypodermic needles only when absolutely necessary. Do not bend, break, shear or recap used needles. Use the appropriate sharps containers
- Use a two-person team to inoculate animals when appropriate
- Wash hands after handling infectious material and before leaving the laboratory
- Decontaminate all contaminated materials before disposal or reuse
- Decontaminate laboratory surfaces following any spill of biohazardous materials and at the end of each workday.

- Report all spills, accidents, and incidents immediately (as required by the NDSU Safety and Risk Management Program 24 hour reporting requirement)

Facilities, Procedures, and Monitoring

- Maintain cleanliness of facilities and supplies
- Consider ergonomics and request for assessments
- Inspect, maintain, and repair equipment
- Dispose of contaminated bedding properly

Personal Protection

- Obtain required clothing, shoes, shoe covers, gloves, arm protectors, masks, face shields, hearing protection, respirators, etc. from your supervisors Medical Evaluation and Preventive Medicine for Personnel:
- Comply with required medical evaluations for high risk positions and those with substantial contact with animals
- Comply with required immunizations, and vaccinations for particular individuals
- Inform personnel how to report accidents, injuries, illnesses, exposures and property damage

Animal Workplace Hazards & Risks

Types of Hazards The following chart outlines some, but not all categories and types of potential hazards that may be present in work with animals.

Table 2.1.Types of Hazards that May be Present during Work on Animal Protocols.

Types	Examples
Physical Hazards	Bites, sprains, scratches, sharps, lasers, machinery, slips, falls
Chemical Hazards	Burns, skin irritations, inhalation, ingestion
Zoonosis	Human diseases acquired from animals
Allergens	Allergies to rodents, cats, dogs (urine, contaminated litter, dander, hair)
Ergonomics	Heavy lifting, repetitive motion, body mechanics, posture
Infectious Agents	Bacteria, fungi, parasites, protozoa, rickettsia, viruses, blood-borne pathogens

Self-check 1	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (2 points each)

1. Of the following one not a physical hazards in handling animals in meat Industry
   A. Burns
   B. Bites
   C. Scratches
   D. Bites

Test I: Short Answer Questions (2 points each)

1. List at least 3 important Hazard and Risk Assessment
2. Elaborate at least two facilities, Procedures, and Monitoring

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

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

Information sheet 2. Describing humane destruction (euthanizing) arrangements

Euthanasia is humane death occurring without pain and suffering, it should be utilized when an animal's condition is such that additional treatment options will not be effective. The decision to euthanize an animal should consider the animal's welfare. The producer will most likely perform on-farm euthanasia because a veterinarian may not be immediately available to perform the service. Persons who perform this task must be technically proficient and have an understanding of the relevant anatomical landmarks and the protocols used for humane euthanasia of animals.

Euthanasia involves more than ending an animal's life. It is a process that combines compassion and scientific consideration while providing each animal with a death that is free of pain and stress. Along with the technical skills required, there must be compassion and a sense of solemnity, reverence, and respect for the animals.

Humane euthanasia of an animal requires five basic elements

1. Compassion.
2. Knowledge.
3. Technical skills developed through training and experience.
4. Appropriate application of the most state-of-the-art drugs, equipment, and techniques available.
5. Wisdom to know when euthanasia should, and should not, be performed

The 14 general criteria of humane euthanasia

1. Ability to induce loss of consciousness and death with a minimum of pain and distress;
2. Time required to induce loss of consciousness
3. Reliability
4. Safety of personnel
5. Irreversibility
6. Compatibility with intended animal use and purpose

7. Documented emotional effect on observers or operators
8. Compatibility with subsequent evaluation, examination, or use of tissue
9. Drug availability and human abuse potential
10. Compatibility with species, age, and health status
11. Ability to maintain equipment in proper working order
12. Safety for predators or scavengers should the animal's remains be consumed
13. Legal requirements; and
14. Environmental impacts of the method or disposition of the animal's remains.

When euthanasia is necessary, an excellent reference is the BQA Euthanasia of Cattle and Calves guidelines.

Reasons for euthanasia include:

- Fractures of the legs, hip or spine that are not repairable and result in immobility or inability to stand
- Emergency medical conditions that result in excruciating pain that cannot be relieved by treatment
- Animals that are too weak to be transported due to debilitation from disease or injury • Paralysis from traumatic injuries or disease that result in immobility
- Disease conditions where no effective treatment is known, prognosis is terminal, or a significant threat to human health is present.

Firearms for Conducting Euthanasia in Cattle

Gunshot is the most common method used for on-farm euthanasia of cattle. Effectiveness depends upon selection of the appropriate caliber of firearm, type of bullet or shot/shell, and accuracy of aim.

Table 2.2.species of animals and types of gunshot use for euthanasia

Animal/ Firearm	Handgun	Rifle	Shotgun
Calves	.32 to .45 caliber Solid-point bullet	.22 LR caliber or larger Solid-point bullet	410 to 12 gauge #4-6 birdshot or slug
Adult	.38 to .45 caliber Solid-point bullet	.22 magnum or higher caliber1 Solid-point bullet	20 to 12 gauge #4-6 birdshot or slug (within 3 feet)

Indications of Unconsciousness

When conducting euthanasia procedures one should always observe animals for the following behaviors:

- Animal collapses immediately when shot and makes no attempt to right itself.
- Body and muscles become rigid immediately upon collapse followed by relaxation of the body, brief tetanic spasms and eventually uncoordinated hind limb movements
- An absence of vocalization
- An absence of eye reflexes and eyelids remain open facing straight forward
- Immediate and sustained cessation of rhythmic breathing

Steps for Verifying Death

First: Ensure that the animal has neither a blink reflex nor a toe pinch reflex

Second: Use a stethoscope to verify that respiration has stopped.

Third: Perform a cardiac stick or verify the onset of rigor mortis.

Self-check 2	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (2 points each)

1. Of the following one is the requirement humane euthanasia of an animal

   A. Compassion
   B. Knowledge
   C. Technical skills
   D. All

Test II: Short Answer Questions

1. Write at least 6 general criteria of Humane euthanasia (4 point)
2. Write the three Steps for Verifying Death during Humane euthanasia (4 point

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

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

LG #24	LO #6 Apply animal welfare and handling techniques

Instruction sheet

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

- Handling animals to minimizing stress
- Maintaining the flow of stock
- Handling sick and injured animals
- Record keeping and documentation

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Handle animals to minimizing stress
- Maintain the flow of stock
- Handle sick and injured animals
- Record keeping and documentation

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
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”.

Information Sheet 1- Handling animals to minimizing stress

Practicing good animal husbandry ensures that the basic needs of animals are met and is essential for maintaining acceptable animal welfare standards.

Good animal husbandry must ensure

- A level of nutrition adequate to sustain good health and welfare
- Access to sufficient water of suitable quality and quantity to meet physiological needs
- Social contact with other livestock of the same species
- Sufficient space to stand, lie and stretch limbs, adequate opportunity to move freely and exhibit normal patterns of behavior
- The facilities, equipment, husbandry and handling procedures used minimize the stress to livestock
- The risk of pain, injury or disease is minimized
- Provision of appropriate treatment including euthanasia if necessary
- Provision of reasonable precautions against extremes of weather or natural disasters

Preparing animals for transport

Correctly preparing livestock for transport is a vital part of any journey. Well prepared animals travel better, are less stressed and animal welfare issues are less likely to occur.

Effective practices for preparing for the transport of livestock include

- Resting recently mustered livestock prior to loading
- Co-mingling of animals from different mobs well in advance of the journey
- Recording and communicating the date and times livestock last had access to feed and water
- Competent selection of livestock prior to loading

- Performing husbandry practices (e.g. Horn tipping) well in advance of the journey
- Planning the journey with consideration given to the length of the journey and weather conditions
- Utilization of appropriate loading facilities that are fit for purpose according to the
- Knowing who to contact in case of an emergency.

Reducing stress and improving restraint

If the stunning box and any restraint is working well the majority of cattle should enter the box willingly and there will be little need for the use of electric goads. Whilst in the box cattle should not vocalize and the total time from entry to stun should be short.

However, handling cattle at this point in the system is often the most difficult as effectively they are being separated from the herd, moving into the different environment of the slaughterhouse and into what may appear to them as a closed box.

To reduce the stress, animals must go into any box willingly. Stress levels increase if an animal stops and refuses to enter or several attempts are required to restrain it. Cortisol levels increase the longer it takes to restrain the animal.

There are a number of key factors which need to be right

- The stunning pen needs to be fully enclosed. Solid sides all round so that cattle can see no movement or distractions from operators or activity in the slaughter hall. The most common problem is usually small gaps at the bottom of the pen where cattle roll out. Cattle will stop and put their head down rather than walking in.
- The floor of the box needs to be non-slip. Steps and slopes designed to improve roll out from the box can be counter-productive as cattle scramble to get their
- Where there are additional devices to restrain or position the animal these must be operated and applied smoothly. Their principle action is to hold the animal in place once it has voluntarily stood in approximately the right position, not to force the animal into position.

- Controls can be pneumatic or hydraulic (the latter are quieter), but in either case it should be possible to apply the restraint smoothly rather than with jerky bumping movements.
- Cattle are calmer in restraint when only mild to moderate pressure is applied to hold the animal rather than to squeeze it tightly. Excessive pressure may cause injury and animals tend to fight against it.
- The box needs to be well lit, but not in a way that light shines directly into the animal's eyes or creates reflections and shadows. In many slaughterhouses where there are natural lighting conditions these change through the day and during the seasons. Having a number of different lights on separate circuits which can be used by the slaughter team can help cope with the variation.
- When cattle move from the raceway to the box there is often too much contrast and change, for example moving from concrete floors and sides to an all metal stunning box. In this case simply running sheeting on one side of the race and on the floor will make the change less abrupt.
- The box must not look like a dead end. Field studies demonstrate that cattle will stop about 0.75m from a solid wall so the box needs to create an illusion to the animal that there is somewhere to go. A gap or a false front works, provided this is blocked off from activity in the slaughter hall.
- It is difficult to eliminate all noise from the environment around the stunning box but keep it to a minimum. Maintenance of the box is essential to reduce banging and noise from air leaks or similar.
- The box must be free of any sharp angles or projections that might cause injury. There should be no abrupt angles on any of the restraint devices that can create pressure points when applied.

Inversion

Methods which invert cattle and turn them on their back in order to limit movement are not acceptable methods of restraint. Positioning turning an animal in the lateral side position prior stunning or bleeding is stressful and as a method of restraint is not

recommended. Cattle show reduced stress levels when held in a comfortable upright position. When held on their back or side they will struggle and attempt to right (stand up) themselves

Self-check 1	Written test

Name_____ ID_____ Date_____

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

Test I: Say true or false (2 points each)

1. Stress levels increase if an animal stops and refuses to enter or several attempts are required to restrain it

Test II: Short Answer Questions

1. Least at least 4 good animal husbandry points (3 points each)
2. Elaborate at least 5 Effective practices for preparing livestock for transport (4 point)

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

Note: **Satisfactory rating - 7 points** **Unsatisfactory - below 7 points**

Information Sheet 2- Maintaining the flow of stock

Maintaining the flow of stock in cattle production play vital role in risk reduction both on animals and on the handler's. To handle the cattle appropriately an individual should equipped in understanding cattle behavior and welfare requirements results animals to stress when managed un properly. Cattle have minds of their own, a huge weight advantage and move surprisingly fast. Agitated cattle are a particular risk. It takes skill and practice to handle them safely. Even skilled cattle handlers take knocks or kicks during their careers. Every year, many people are hurt by cattle, mostly when cattle kick or crush them. Some get serious injuries, like broken bones, and people have been killed.

Peoples are more likely to be injured:

- When you don't have the experience to assess the risks
- When you don't have the agility or ability to get out of the way
- With bulls
- With bad-tempered or irritable cattle
- With cattle that are not handled by humans very often, e.g run cattle
- In a new environment for cattle, e.g entering the milking shed for the first time
- Handling cattle at close quarters, like in a race or a crush loading and unloading cattle for transport
- When you are tired, like during calving season when farmers work long hours with broken sleep.
- Older farmers (over 65 years) and children are most at risk of injury.

Key points

- Anyone working with cattle must be appropriately trained and experienced for the task
- Keep yards tidy and well maintained

- Plan an escape route in advance when working with cattle in the yards
- Never get in the race with large cattle. Don't put your arms or legs through the race walls
- Don't try to move a dangerous bull on foot or alone
- Always wash and dry your hands after working with cattle

Animal Welfare Principles

The medical authority for the health and welfare of animals, offers the following eight integrated principles for developing and evaluating animal welfare policies, resolutions, and actions.

- The responsible use of animals for human purposes, such as companionship, food, fiber, recreation, work, education, exhibition, and research conducted for the benefit of both humans and animals, is consistent with the Veterinarian's Oath.
- Decisions regarding animal care, use, and welfare shall be made by balancing scientific knowledge and professional judgment with consideration of ethical and societal values.
- Animals must be provided water, food, proper handling, health care, and an environment appropriate to their care and use, with thoughtful consideration for their species-typical biology and behavior.
- Animals should be cared for in ways that minimize fear, pain, stress, and suffering.
- Procedures related to animal housing, management, care, and use should be continuously evaluated, and when indicated, refined or replaced.
- Conservation and management of animal populations should be humane, socially responsible, and scientifically prudent.
- Animals shall be treated with respect and dignity throughout their lives and, when necessary, provided a humane death.
- The veterinary profession shall continually strive to improve animal health and welfare through scientific research, education, collaboration, advocacy, and the development of legislation and regulations.

Recognizing danger signs

Agitated cattle often bellow loudly and paw the ground with their hooves. The head and tail positions of cattle also give clues as to the animal's state of mind. Be on the lookout for these danger signs.

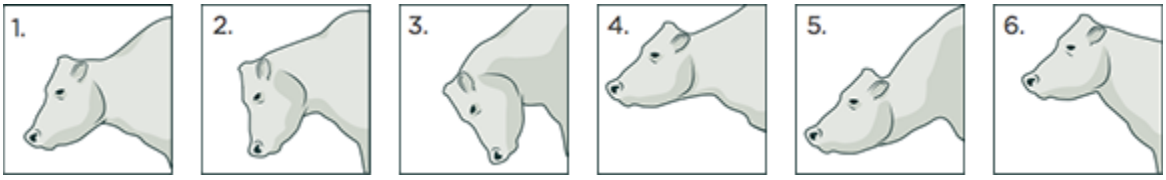

Figure 2.1. Common head positions

Common head positions:

- Neutral position
- Slightly antagonistic position
- Highly antagonistic position
- Confident approach
- Submissive approach
- Alert before flight position

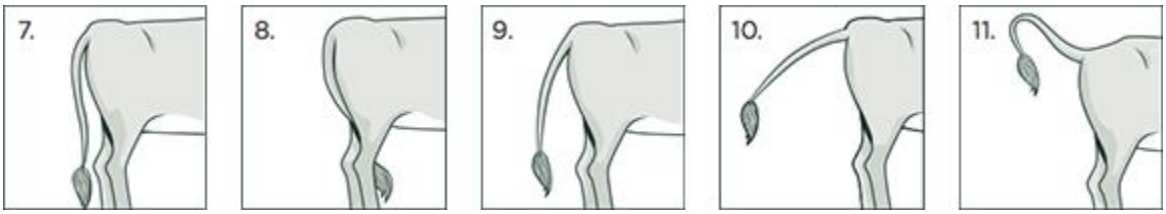

Figure 2.2: Common tail positions

Common tail positions:

- Grazing or walking
- Cold, ill or frightened
- Threatening, curiosity or sexual excitement
- Galloping
- Kicking or playing

Self-check 2	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (2 points each)

1. Of the following one is not included under the Five Freedoms:
    A. Freedom from Hunger and Thirst
    B. Freedom from Discomfort
    C. Freedom from Pain, Injury or Disease
    D. None

Test II: Short Answer Questions

1. Least at least 4 points the poor likely handling of cattle(4 point)
2. Least at least 4 points in the principles of animals welfare principle. (4 point)

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

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

Information Sheet 3- Handling sick and injured animals

3.1. Identifying Injured Cattle

Injuries in cattle may be minor or severe. Some injuries are relatively easy to detect upon observation, such as injuries that result in lameness or inability to stand up or walk (a non-ambulatory or “downer” animal). These types of injuries can prevent marketing an animal or result in market discounts. Other injuries are more subtle, including bruising and internal organ injuries such as hardware disease. Suspect these types of injuries when cattle display behavioral changes such as appetite changes or reluctance to move.

Examine the animal’s environment for potential hazards or conditions that may have caused an injury. Horns contribute to bruising in animals housed together. Injuries to breeding animals often occur during the breeding season as a result of mounting behavior. Inadequate feed through space increases competition for feed and chance of injury. Sharp objects such as wire and nails in pastures or handling areas also contribute to cattle injuries.

Inspect cattle closely during feeding and animal handling to identify injuries that are not easily seen in pasture settings. Foot injuries, eye injuries, mouth injuries, minor lacerations (cuts), hematomas (blood vessel rupture and blood pooling under the hide), penis injuries, and biting insect damage are examples of injuries that sometimes require close inspection to identify. By identifying injuries during animal handling, animals can be treated while restrained.

3.2. Casualty cattle and sheep

A casualty animal is one that is walking but is otherwise in good health except for a minor, non-acute condition; this may include conditions such as minor wounds, minor lameness and animals that are small or lack condition.

For public health and operational reasons, these animals may need to be slaughtered and dressed at the end of a shift and therefore specific periods should be set aside during the day's kill for them to be dealt with.

During the day lairage staff must inspect casualty animals frequently and where the condition of any individual is deteriorating, these animals should be moved for immediate slaughter or killed in the pen.

Immediate emergency slaughter

Animals suffering from severe open injuries must be killed humanely as soon as possible.

It is recommended that the emergency slaughter is carried at the sanitary slaughter room, or depending on the severity of animal's injury at the place where animal is (i.e. on the lorry) The veterinarian is responsible for proper situational assessment.

Figure 3.1 Casualty cattle and sheep

Immediate emergency slaughter

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It is recommended that the emergency slaughter is carried at the sanitary slaughter room, or depending on the severity of animal's injury at the place where animal is (i.e. on the lorry) The veterinarian is responsible for proper situational assessment.

Figure 3 .2. Cattle severely injured must be assigned to immediate emergency slaughter.

Figure 3.3. Dragging animal that is unable to walk is unacceptable.

Animal to be slaughter under emergency slaughter procedures should be slaughtered on the spot or moved to sanitary slaughter room. Animal can be moved only if the suitable trolley is available and the moving would not cause any additional pain or suffering to sick or injured animal. Any dragging by rope or pushing is unacceptable.

When conditions impose safety risks for the operator, animal restraint must be performed as quickly as possible using ropes or other restraining devices. It is important to eliminate any risks of injuring and strangulating the animal.

Emergency slaughter shall be carried out by bleeding. If stunning gun is available animal should be stunned prior bleeding.

The 'risk to welfare of livestock' is the potential for a factor(s) to affect the wellbeing of livestock in a way that causes pain, injury or distress. Poor welfare outcomes could include sunburn, hypothermia, heat stress, dehydration, exhaustion, abortion, injury, metabolic disease or death. Protection from pain, injury or distress is central to achieving positive welfare outcomes for animals.

If the 'person in charge' prepares to transport or transports an animal that is unfit, that person commits an act of cruelty upon that animal, and may be liable to prosecution under state or territory legislation. As such, it is also unacceptable for any party to coerce or intimidate the 'person in charge' into loading an animal that is not fit for the journey

Lameness and other abnormality in animals can be easy or difficult to detect depending on causal factors and the site of the injury or condition. Animals that cannot walk or stand normally are unfit to load. Signs of lameness include:

- Bunny hopping or head bobbing
- Knuckling over
- Carrying one leg when standing or walking
- Reluctance/refusal to stand or walk.

Figure 3.4. Long claws may cause lameness and an arched back may indicate the animal is in pain.

Figure 3.5. Sheep that have severe scabby mouth disease should not be loaded or transported.

Figure 3.6. Panting may indicate the animal is in pain. Animals in heavy lactation with full udders should not be transported

Self-check 3	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (2 points each)

1. Of the following one is not the signs of lameness animals not selected for slaughter
   A. Bunny hopping
   B. Knuckling over
   C. Refusal to stand or walk
   D. Correct walk or stand

Test II: Say true or false (3 points)

1. Animals suffering from severe open injuries must be killed humanely as soon as possible.

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

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

Information Sheet 4- Record keeping and documentation

Record-Keeping Requirements A detailed log recording the exact use of controlled substances for euthanizing individual animals is also required to be maintained by shelters. These records should be kept in a bound logbook with numbered pages rather than in anything with detachable pages, like a loose-leaf binder. To keep records is simply to collect relevant information that can help you to take good decisions and to keep track of activities, production and important events on a farm. Records can be about any performance of the animals, economic development, or any activity of the farmer or veterinarian. It is important to keep record keeping simple, and to keep records systematic. If records should be of use for the farmer, than they must be complete (none missing), they should be true (collected carefully). When record can't be trusted because they are not complete or true, time should not be spent on it at all.

The records can

- Be used in determining profitability of various techniques used at the farm
- Be used to keep your memory on what you did and/or what happened
- Be used in decision making, especially on a strategic level
- Be used to compare the efficiency of use of inputs, such as land, labour and capital, for example when implementing a new / alternative systems
- Help the farmer / investor in improving the efficiency of farm's operations

If a farmer wants to build a financially successful livestock enterprise, record keeping is a must. The records can be used to further develop the farm and the herd, and thereby the sector in the country. For many farmers, it helps to think of their farm as a business, and to see that good care and good management actually also influences the production and profitability of the farm.

Records are important in (animal) farming because:

- To keep track of all animals (Identification records)

- Evaluation of livestock for selection (breeding records; financial records; production records)
- Control of inbreeding and aid in breeding planning (breeding records)
- Aid in selecting animals with the right characteristics for breeding (production, health, feed efficiency) to improve the herd or flock
- To rationalize labor
- Aids in feed planning and management
- Aids in disease management; keeping track about treatment (disease records)
- Aids in finding the effective treatments
- To assess profitability/losses (financial records)
- Improves bargaining power on products, because you can see the investment and the price of the production (financial records)
- Credit/loan access (financial records)

Types of Records

The major types of records which are all described below:

- Identification
- Breeding
- Production
- Feeding
- Disease and treatment records
- Financial records

Self-check 4	Written test

Name_____ ID_____ Date_____

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

Test I: Choose the best answer (1 points each)

1. Of the following one cannot categorized under record type
   A. Identification
   B. Production
   C. Financial records
   D. Organization

Test II: Short Answer Questions

1. List at least 5 important records in animal farming (4 point)
2. Elaborate at least 2 important use of records (2 point)

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

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

Reference Materials

Book:

AN introduction to HACCP Bulletin No 71/2002

Food Quality and Food Safety

Creating new foods , products design and process development

Handbook on Food Labelling to Protecting Consumers, Food and Agriculture Organization of the United Nations Rome, 2016

Web sites

https://www.animalsheltering.org/sites/default/files/documents/euthanasia-reference-manual.pdf

https://www.mla.com.au/research-and-development/animal-health-welfare-and-biosecurity/husbandry/animal-handling/

http://www.thecattlesite.com/articles/2038/identifying-sick-or-injured-cattle/

https://www.kzndard.gov.za/images/Documents/RESOURCE_CENTRE/GUIDELINE_DOCUMENTS/PRODUCTION_GUIDELINES/Beef_Production/Cattle%20Identification.pd

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