

## The 4-H Motto

“Learn to Do by Doing.”

## The 4-H Pledge

I pledge

My **Head** to clearer thinking,

My **Heart** to greater loyalty,

My **Hands** to larger service,

My **Health** to better living,

For my club, my community and my country.



## The 4-H Grace

(Tune of Auld Lang Syne)

We thank thee, Lord, for blessings great  
on this, our own fair land.

Teach us to serve thee joyfully,  
with head, heart, health and hand.

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## 4-H Beef Project

# Level Three

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**Unit One****Welcome to the 4-H Beef Project**

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**Dear  
4-H Beef  
Member:**

- Hi!** We're glad that you chose to become a member of the 4-H Level Three Beef Project. The material in this Level Three section is designed to help you...
- learn more about some of the new and interesting topics about beef production.
  - make choices. Within each unit are several individual topics and activities. You are **not** required to complete all of the activities and topics in each unit. Choose the activities which interest you and complete them.
  - develop your leadership skills. Many of the activities in the senior section require that you share your work with other members. How you share this information is up to you - use your imagination!
  - think! We have designed this material to be challenging. As senior members, you already have a good knowledge of the beef industry. Now we are challenging you to use this knowledge!
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**About the  
Beef Project  
Material**

In each Level Three unit of project material, there are several topics. You are **not** expected to learn about all of these. Choose topics which interest you and learn more about them.

There is much more information available than we could ever provide for you. Use what other sources you can find to supplement this material.

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**About Your  
Record Book**

You will be using the livestock record book. The project portion of the book that you complete depends on if you have a steer or heifer. Since you are an experienced member, you are expected to fill out all the summary calculations. Spaces are there to add pictures, newspaper, or magazine clippings you have of yourself, your farm, or your beef project.

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**Achievement  
Day  
Requirements**

For Achievement Day you should:

- exhibit your beef project.
- take part in the showmanship and judging classes.
- display your record book that is completed to date.
- participate in club activities.

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## Ideas for Sharing Information

In many of the activities in this project, we ask you to share information with other members in your club. Here are a few ideas to help you along:

- Be organized.
  - Keep it short and simple.
  - Make it fun.
  - Use visual aids. “A picture is worth a thousand words”.
  - There are lots of people who can help you - leaders, parents, and Regional 4-H Specialists. Use them!
- 

## Other Opportunities in 4-H

Your beef project is only a part of 4-H. Many activities are offered at club, district, regional, and provincial levels. You take part in club fund-raising, social events, meetings, tours, and many more activities. Your district and regional 4-H councils sponsor workshops, sports days, public speaking competitions, and project shows. Attend a provincial program this year or take part in the Provincial 4-H Beef Heifer Show. Your leader will give you a 4-H program booklet each spring and fall. It includes application forms for all the provincial 4-H events.

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## Some Other Beef Project Options

The Feedlot Unit or pen project is where you raise at least three head of animals for market. Members fed either heifers, cows, or steers and then marketed their project at an achievement day or through available selling systems. 4-Hers can use one of these animals as the fed-calf unit animal or as a carcass competition entry.

Some senior members, who are fifteen and over, are in the Senior Opportunities Project and develop their own project. Projects can vary from buying some scrub cows and fattening them out to doing a study on the digestive system of the beef animal. Members develop their own record system with their leader. Your leader has a list of suggestions that you could explore.

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## Weighing Your Animal

It is not always possible to use a scale when weighing your animal(s). Using a scale is the best method to get an accurate weight of your animal. However, if you do not have scales on your farm, borrow from a neighbour if possible. Remember that trucking your animal over to his farm is good practice for you and your animal.

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## 4-H Livestock Project Requirements

These requirements apply to all 4-H livestock projects.

### A. 4-H Member Requirements

In order for a 4-H member to receive credit for a club year, the member must

- ❖ Complete project records and have them signed by the club or project leader.
- ❖ Attend a minimum of 70% of club activities.
- ❖ Complete a communication activity.
- ❖ Participate in their 4-H Club Achievement Event.

**B. 4-H Livestock Project Minimum Requirements**

- ❖ Animals must be registered with the club.
- ❖ Animals must be identified as the 4-H member's project either by a 4-H tag, CCIA tag, breed registration tattoo, or brand, and a bill of sale to or a lease agreement in the name of the member.
- ❖ Replacement of animals can only be done with permission of the achievement sale committee.
- ❖ 4-H members must personally provide the major part of the feeding, care, and management for their animals. (check with you sale committee for any further definition)
- ❖ The use of tranquilizing products on 4-H animals, immediately proceeding or at any 4-H project event is prohibited. (Tranquilizing products give the handler an unfair advantage in displaying their livestock handling and control skills). Any animal that is tranquilized cannot be shown or sold at a 4-H event.
- ❖ Drugs and some feed additives have withdrawal periods listed on their labels according to the dosage given. It is the legal responsibility of the owner of the animal, to be sold for slaughter, to insure that the withdrawal period has passed. If withdrawal period(s) have not passed at the time of sale, it is the responsibility of the member to tell the 4-H sale committee and the responsibility of the sale committee to communicate this to the potential buyers. Animals that show drug residues at time of slaughter are condemned.

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**C. Local or Interclub Project Regulations**

- ❖ In addition to these basic provincial minimum requirements there may be additional regulations from the local or interclub project committees. It is your responsibility to know these rules and regulations.

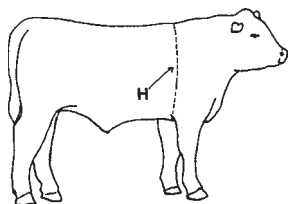
**Any one violating any of the above requirements will not be able to advance with that project to any 4-H project event, during the remainder of the project year.**

**Tape Measuring**

One method which you can use to estimate the weight of your animal is the tape measure. Any tape measure may be used, but there are specially marked tape measures which you can purchase at most livestock and farm supply outlets.

Remember that it only gives you an estimate of the animal's weight. Variations from the actual weight may be due to the length of the body and, or the legs.

To use the measuring tape, measure the circumference of the heart girth as indicated in the diagram below. Stand the animal with the head in the normal position and the four legs set squarely under the body. Pass the tape tightly around the body just back of the shoulders at the smallest circumference.



“H” is the heart girth.

Use one of the following charts to estimate the weight of your project. Record the weight in your record book. Weigh your animal around the same day each month.

## Values to Use When Estimating the Weight of Beef Animals By Heart Girth

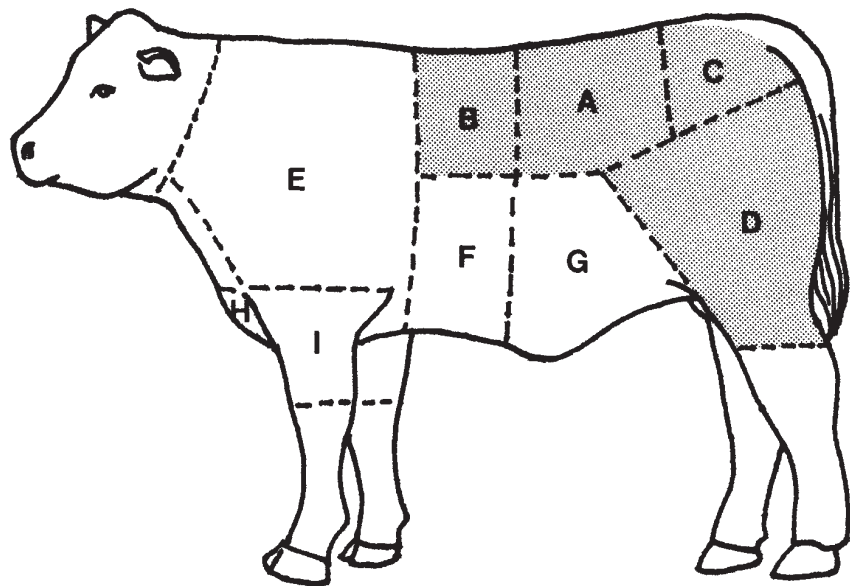
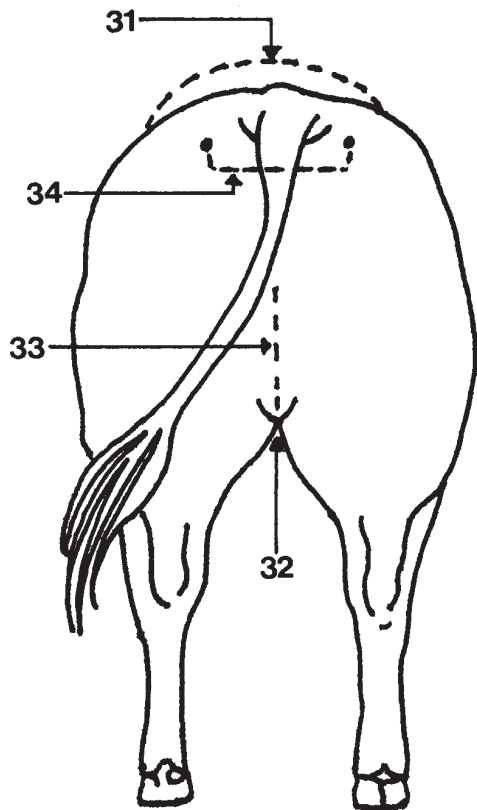
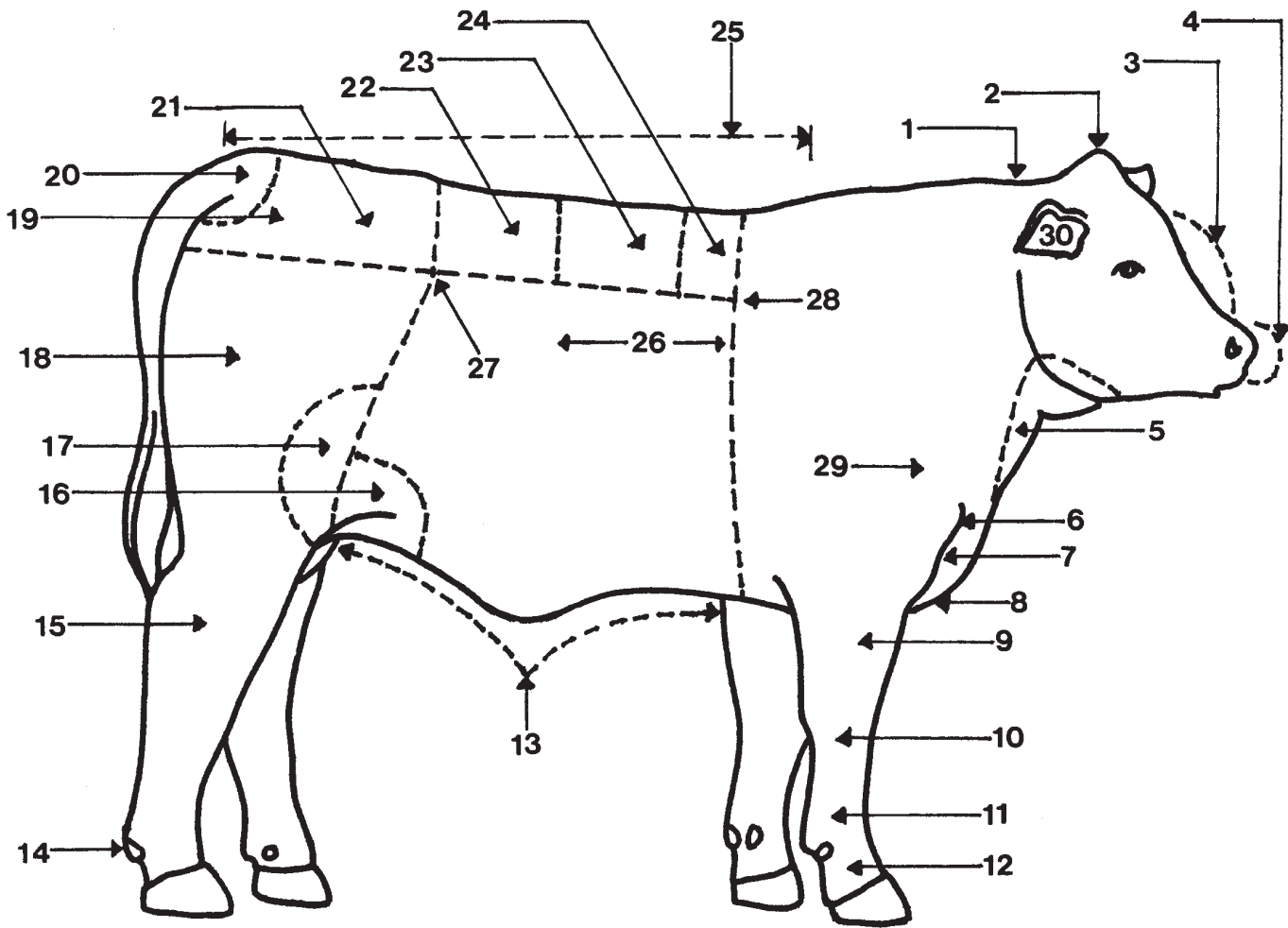
Metric Measurements:

Heart Girth (cm)	Weight (kg)	Heart Girth (cm)	Weight (kg)	Heart Girth (cm)	Weight (kg)	Heart Girth (cm)	Weight (kg)	Heart Girth (cm)	Weight (kg)
76.2	41.3	106.7	107.0	137.2	219.5	167.6	378.3	198.1	584.2
77.5	43.1	108.0	110.7	138.4	225.0	168.9	385.6	199.4	594.2
78.7	44.9	109.2	114.8	139.7	230.9	170.2	394.2	200.7	604.2
80.0	46.7	110.5	118.8	141.0	236.8	171.5	401.9	201.9	613.7
81.3	49.0	111.8	122.9	142.2	242.7	172.7	409.6	203.2	623.2
82.6	51.3	113.0	126.6	143.5	248.6	174.0	417.8	204.5	633.2
83.8	53.5	114.3	130.6	144.8	254.9	175.3	425.9	205.7	643.2
85.1	55.8	115.6	134.7	146.1	260.8	176.5	434.1	207.0	653.2
86.4	58.1	116.8	138.2	147.4	266.6	177.8	447.2	208.3	663.6
87.6	60.3	118.1	143.8	148.6	272.5	179.1	450.4	209.6	673.6
88.9	63.0	119.4	148.3	149.9	280.3	180.3	458.6	210.8	684.0
90.2	65.8	120.7	152.9	151.1	286.7	181.6	467.2	212.1	694.4
91.4	68.5	121.9	157.4	152.4	293.5	182.9	475.8	213.4	705.3
92.7	71.2	123.2	162.4	153.7	299.8	184.2	484.4	214.6	715.8
94.0	73.9	124.5	168.4	154.9	306.6	185.4	493.1	215.9	726.2
95.3	76.7	125.7	171.9	156.2	313.4	186.7	502.1	217.2	736.6
96.5	79.8	127.0	176.9	157.5	320.7	188.0	511.2	218.4	747.5
97.8	83.0	128.3	181.9	158.8	327.5	189.2	520.3	219.7	758.4
99.1	86.2	129.5	186.9	160.0	334.3	190.5	529.3	221.0	769.7
100.3	89.4	130.8	192.3	161.3	341.6	191.8	539.0	222.3	780.6
101.6	93.0	132.1	197.8	162.6	349.3	193.0	546.6	223.5	791.5
102.9	96.2	133.4	203.2	163.8	356.5	194.3	556.1	224.8	802.9
104.1	99.8	134.6	208.7	165.1	363.8	195.6	565.6	226.1	814.7
105.4	103.4	135.9	214.1	166.4	371.0	196.9	574.7	227.3	826.0

**Imperial Measurements**

Heart Girth (in)	Weight (lb)	Heart Girth (in)	Weight (lb)	Heart Girth (in)	Weight (lb)	Heart Girth (in)	Weight (lb)	Heart Girth (in)	Weight (lb)
30	91	42	236	54	484	66	834	78	1,288
30.5	95	42.5	244	54.5	496	66.5	850	78.5	1,310
31	99	43	253	55	509	67	869	79	1,332
31.5	103	43.5	262	55.5	522	67.5	886	79.5	1,353
32	108	44	271	56	535	68	903	80	1,374
32.5	113	44.5	279	56.5	548	68.5	921	80.5	1,396
33	118	45	288	57	562	69	939	81	1,418
33.5	123	45.5	297	57.5	575	69.5	957	81.5	1,440
34	128	46	307	58	589	70	975	82	1,463
34.5	133	46.5	317	58.5	603	70.5	993	82.5	1,485
35	139	47	327	59	618	71	1,011	83	1,508
35.5	145	47.5	337	59.5	632	71.5	1,030	83.5	1,531
36	151	48	347	60	647	72	1,049	84	1,555
36.5	157	48.5	358	60.5	661	72.5	1,068	84.5	1,578
37	163	49	369	61	676	73	1,087	85	1,601
37.5	169	49.5	379	61.5	691	73.5	1,107	85.5	1,624
38	176	50	390	62	707	74	1,127	86	1,648
38.5	183	50.5	401	62.5	722	74.5	1,147	86.5	1,672
39	190	51	412	63	737	75	1,167	87	1,697
39.5	197	51.5	424	63.5	753	75.5	1,186	87.5	1,721
40	205	52	436	64	770	76	1,205	88	1,745
40.5	212	52.5	448	64.5	786	76.5	1,226	88.5	1,770
41	220	53	460	65	802	77	1,247	89	1,796
41.5	228	53.5	472	65.5	818	77.5	1,267	89.5	1,821





**Part  
Identification**

**Identify the following beef animal parts.**

1 \_\_\_\_\_ 12 \_\_\_\_\_ 23 \_\_\_\_\_

2 \_\_\_\_\_ 13 \_\_\_\_\_ 24 \_\_\_\_\_

3 \_\_\_\_\_ 14 \_\_\_\_\_ 25 \_\_\_\_\_

4 \_\_\_\_\_ 15 \_\_\_\_\_ 26 \_\_\_\_\_

5 \_\_\_\_\_ 16 \_\_\_\_\_ 27 \_\_\_\_\_

6 \_\_\_\_\_ 17 \_\_\_\_\_ 28 \_\_\_\_\_

7 \_\_\_\_\_ 18 \_\_\_\_\_ 29 \_\_\_\_\_

8 \_\_\_\_\_ 19 \_\_\_\_\_ 31 \_\_\_\_\_

9 \_\_\_\_\_ 20 \_\_\_\_\_ 32 \_\_\_\_\_

10 \_\_\_\_\_ 21 \_\_\_\_\_ 33 \_\_\_\_\_

11 \_\_\_\_\_ 22 \_\_\_\_\_ 34 \_\_\_\_\_

**Identify the following meat cut areas.**

A \_\_\_\_\_ E \_\_\_\_\_ H \_\_\_\_\_

B \_\_\_\_\_ F \_\_\_\_\_ I \_\_\_\_\_

C \_\_\_\_\_ G \_\_\_\_\_ J \_\_\_\_\_

D \_\_\_\_\_

## Transportation Regulations

When you transport your livestock, you must carry a **Livestock Manifest** completed according to the regulations. Make sure that you complete this manifest before the vehicle leaves your property whenever you transport any livestock.

The owner of the livestock or his agent must complete the manifest with this information:

- date the livestock is transported
- name and address of the owner of the livestock
- consignee's name and address
- number of livestock
- color of the livestock
- kind of livestock
- the proper description and location of the brand and other marks of ownership on each head of livestock
- sign the manifest

The operator of the vehicle transporting the livestock or the driver of the livestock must complete the manifest with this information:

- name and address of the person who is operating the vehicle or driver of the livestock
- licence number of the vehicle used to transport the livestock
- transportation charges, if any
- sign the manifest.

Livestock manifest books are available from your leader, local brand inspector or market.

## The Use of Agricultural and Veterinary Chemicals

More and more farm chemicals are being labelled in metric units (mL, cc). The use of “cc” will be discontinued and cm will replace it. Items such as vaccines and oral medications will be applied directly at rates given as:

- grams(g) per kilogram (kg) of bodyweight
- milligrams (mg) per kg of bodyweight
- millilitres (mL) per kg of bodyweight

Concentrated products such as horticultural, crop and pasture sprays will require dilution as:

mL/L or mL/100 L or L/100 L

g/L or g/100 L or kg/100 L

Application will be as mL/ha, L/ha, mL/m and so forth. Standard prepacked products (to avoid weighing from bulk supplies) will eventually be labelled as one pack for a certain number of litres (L) instead of one pack for 100 gallons. Animal remedies will rely on dosage rates based on live bodyweight in: millilitres per kilogram (mL/kg). Only experience will enable you to estimate live bodyweight in metric units. You will have to compare your estimates with actual measurements for example at stockyards. Some animal remedies will be on a per animal basis and will not require knowledge of live bodyweight.

Think metric and read all labels and instructions carefully. If you use tranquilizers read the **label** to find out what the withdrawal regulations are.



**Unit Two****You And Your Beef Project****Roll Call**

How did you choose your 4-H beef project animal?

**Sharing 4-H  
Beef Club  
Hints**

As level three members in 4-H, you have experienced several project years. You are familiar with some of the do's and don'ts of working with your project animal. You each have different experiences and advice you could share with beginning members.

**Activities:**

Prepare a 5 minute skit or presentation with another member(s) describing a situation you have seen in 4-H. Your goal should be to let the younger members see some of the things they should or should not be doing when working with their project animal.

- Hazards of not having safety footwear
- Working with the untrained calf
- Choosing the wrong animal
- Tying your calf
- Selecting a healthy calf
- Going to the auction mart

Don't feel you have to use one of these subjects. Choose your own and have fun with it!

**Understanding  
Animal  
Behaviour**

Each species of animals has its own distinctive behaviour pattern. Cattle behave differently than horses or chickens.

**Activities:**

1. Observe any group of beef animals for 10 minutes. Record their activities and behaviours and try to explain why they did these things.
2. Observe and record your project animal's behavior and activities for 5 minutes. Now put it with other animal(s). Record the changes in behaviour. How do you explain these changes?

**What's In It For Me?**

Participants in any activity want to know what benefits there are for them to take part. As a level three member in 4-H, you know the advantages of being a beef club member.

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**Activity:**

With a partner, prepare a summary of the benefits of belonging to a 4-H beef club. It may include anything from working with the calf to preparing for your future in the beef business to becoming a competent public speaker.

**Unit Three**

**Digestion in the Beef Animal**

**Roll Call**

Name an animal.

Is this animal ruminant or monogastric?

Try to come up with an unusual animal!

**Welcome to digestion in the beef animal.**

This is one of the most fascinating topics in beef production. There are so many things going on inside your project animal, and digestion is definitely one of the most complicated.

Your beef animal, like any other living thing, has many processes occurring at one time. These processes are interacting and dependant upon one another. In this unit, we provide information on several topics for you to examine more closely. Just picture all of these things going on at once, each with their own cycle. Most importantly, try to appreciate the complexity of the procedures.

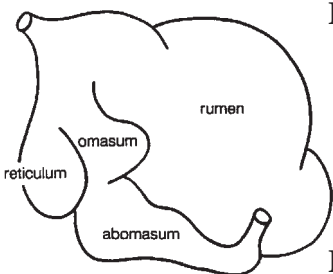
**Development of the Ruminant Stomach**

The ruminant stomach is very unique in the way in which it develops. There are several special features the ruminant has which enable it to digest roughages and other materials.

As we have already learned, the mature ruminant stomach has 4 compartments, each with a specific function.

**Let's review**

**The Ruminant Stomach**



**Rumen** or “paunch”

- largest stomach compartment in the mature ruminant animal
- bacteria and microbes found here begin to break down the food, attacking the fibre in the roughages
- separated from the reticulum by the rumeno-reticular fold

**Reticulum** or “honeycomb”

- lined with many honeycomb-like compartments
- liquid and finer material is moved to the next compartment
- coarser material is returned to the mouth for more chewing



- any foreign objects the animal takes in will lodge here
- this is where a magnet rests

#### **Omasum** or “manyplies”

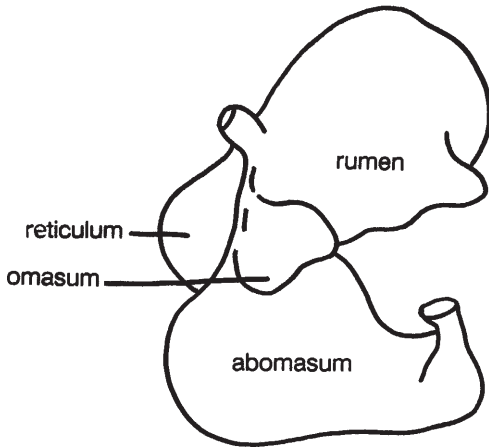
- often referred to as the “bible” because of its many leaves
- the contractions squeeze out more fluid, grind, and move the contents to the abomasum

#### **Abomasum** or “true stomach”

- most similar to the simple stomach found in other animals
- digestive juices are secreted here. They break down the food material further, getting it ready for nutrients to be absorbed into the blood stream.

At birth, the ruminant stomach looks quite different.

### **The Stomach of a Newborn Calf**



In the newborn calf, the rumen is smaller in comparison to the other stomach compartments.

The **Esophageal Groove** is a unique feature in the stomach of the newborn ruminant.

#### **What is it?**

The esophageal groove is a tunnel created in the digestive system which allows milk to bypass the rumen.

How does it work?

When the calf sucks, reflex causes the heavy muscular folds of the rumen and the reticulum to meet. This creates the tunnel.

#### **What is its purpose?**

This tunnel leads from the esophagus to the abomasum. Liquids which the calf takes in will bypass the rumen and go directly into the abomasum.

#### **How can you make sure it works?**

Don't try to feed the newborn from a pail. If your calf is not nursing, make sure the calf suckles from a nipple pail or bottle. It is the suckling action and the sensitivity of the nerves to the milk which create the esophageal groove.

If the esophageal groove is not closing properly, the milk will enter the rumen. Bacteria in the rumen will begin to ferment the milk. This will cause the production of gas. Because the belching mechanism is not yet working in the calf, the calf cannot expel the gas properly. Calves with this problem will become paunchy or “pot-bellied”.

At birth, the rumen and reticulum have only a few microbes, so the calf cannot yet digest solid foods. Shortly after birth, once the calf begins to nurse and explore its environment, the microbes will multiply.

You should begin to provide some solid food at a few weeks of age. This will help the development of the rumen microbes. Since the esophageal groove closes only with sucking and liquid feeding, solid food goes directly into the rumen. Once you have started feeding solid food, you can speed up the development of the stomach by increasing the amount of solids fed.

Between birth and maturity, the rumen and reticulum increase ten times in size in relation to the abomasum.

**Compartment Size as a Percentage of the Size of the Stomach**

	<u>At Birth</u>	<u>At Maturity</u>
Rumen	25%	80%
Reticulum	25%	6%
Omasum	10%	3%
Abomasum	40%	11%

**Special Features of the Mature Ruminant Stomach**

**Eructation or “Belching”**

Microbes work in the rumen producing large amounts of gas. This gas needs to be eliminated. The rumen contracts and the gas is forced upward and out through the esophagus. The cow “belches”.

**Rumination or “Chewing the Cud”**

Rumination allows the beef animal to take in food quickly, and complete the chewing later. Once the animal is finished eating, the reticulum will force “cuds” or balls of coarser material back up to the mouth for more chewing. The animal chews leisurely on its cud before swallowing it again. The cow spends about eight hours per day ruminating or “chewing its cud”. This is 1/3 of its life!



**Activities:**

Share your findings from one of these activities with other members in your club:

1. Find out as much as you can about the oesophageal groove. Talk to your veterinarian, district agriculturalist, a local feed company salesman or nutritionist. They can provide you with further information about how this important little tunnel works and why.
2. You all know what a happy, suckling calf looks like. Draw up a chart which compares the appearance of a calf whose oesophageal groove is working well with one whose milk is going into the rumen.
3. Summarize the changes which occur in the ruminant stomach as the animal matures.

**Factors Affecting Feed Intake**

There is much variation in the feed intake between animals. Let’s look at some of the different factors which can affect how much your steer or heifer will eat.

**Palatability**

Palatability is the overall acceptance of the animal to the feedstuff or ration. It is actually determined by many factors which affect the locating and consuming of the food. These include appearance, odour, texture, taste and temperature.

## **Appetite**

Appetite includes those internal factors which stimulate hunger in the animal.

How the appetite is regulated is very complex and poorly understood. Animals have a physiological method of controlling or regulating their food intake. The hunger and satiety, or satisfaction, centres are found in the hypothalamus of the brain.

It is the acids which are produced in the rumen during fermentation which affect the appetite of the ruminant animal. If the rumen is active, it will produce more acids, and this will cause the hunger centres in the brain to send messages that the animal is no longer hungry.

Generally, animals eat to meet their energy needs. The animal has some built in mechanism which adjusts energy intake to meet the needs the animal has for energy. This is true as long as no other problems, such as disease or nutrient deficiencies, exist.

## **Body Weight**

The energy requirements of animals are closely related to their body weights. If your animal increases from 400 kgs to 440 kgs, the energy requirements do not increase by 10%, but actually by a lesser amount, 7.4%. This is because body weight to the 0.75 power gives a close estimate of the surface area of the animal. Remember that the heat loss and heat production are directly related to the surface area.

## **Individuality**

The individuality of the animal affects the intake differences from one animal to the next. However, because we are attempting to deal with large numbers of animals and still be economically efficient, it is difficult for us to pay individual attention to animals.

## **Type and Level of Production**

Young animals need their nutrients for growth. Pregnancy and lactation require nutrients for reproduction. Steers need nutrients for production, and dry cows require their nutrients only for maintenance. Therefore, the type and level of production directly affects the nutrient requirements of the animal.

## **Miscellaneous Factors**

Temperature extremes, general health of the animal and stress conditions will affect feed intake. Cleanliness of feed and water, availability of water and feeder design will also affect feed intake.



### **Activity:**

Take one factor which can affect the feed intake of your beef animal and find out more about it. Study your animals. Talk to local producers and your veterinarian. How seriously can this factor actually affect feed intake? Share your findings with others in your club.

**Unit Four**

**Nutrient Requirements of Beef**

**Roll Call**

Name a nutrient.

Name a feed item which is a good source of this nutrient.

Welcome to the level three section of Nutrient Requirements of Beef Cattle. This is one of the most interesting and most important topics you will cover in your study of the beef animal.

By now you have learned plenty about beef nutrition. In this section we challenge you to take what you already know, combine it with some of the information we have presented for you and share your knowledge with other members in the club.

**Vitamin and Mineral Deficiencies**

In order for your beef animal to perform to its potential, it must receive adequate amounts of all the essential nutrients. Underfeeding of vitamins and minerals will create a deficiency. Overfeeding may lead to toxicity.

The charts following provide a summary of the symptoms which may occur as a result of a deficiency of a particular vitamin or mineral. Note that many of the symptoms are similar for different minerals or vitamins. Keep in mind that these vitamins and minerals will often interact with one another.

<b>Vitamin</b>	<b>Deficiency Symptoms</b>
A	night blindness, weakness, reproductive failure, reduced growth, increased susceptibility to disease
D	rickets, weakness, symptoms similar to calcium phosphorus deficiency
E	nutritional muscular dystrophy, staggering gait, symptoms similar to selenium deficiency
K	hemorrhaging, reduced blood clotting time, weakness, anemia
thiamine	reduced growth, diarrhea
riboflavin	leg paralysis, neural degeneration, reduced growth, diarrhea
niacin	lesions on the tongue, lips and mouth, dermatitis, reduced growth
pyridoxine	staggering gait, convulsions, reduced growth

<b>Mineral</b>	<b>Deficiency Symptoms</b>
calcium (Ca)	rickets in younger animals, osteomalacia in older animals, bones bend or break easily
chlorine (Cl)	deficiency is very rare
magnesium (Mg)	tetany - symptoms are unusual alertness and nervousness, muscle twitching, staggering, convulsions
phosphorus (P)	rickets, pica (depraved appetite, chewing on wood), stiffness in hindquarters, poor reproductive performance, reduced fertility
potassium (K)	hind leg stiffness, reduced feed intake, lethargy, in extreme cases - coma
sodium (Na)	deficiency is rare, emaciation, reduced appetite, rough hair coat, staggered gait
cobalt (Co)	pale skin, loss of appetite, watery eyes, anemic, listlessness, showing signs of starvation although food is plentiful
copper (Cu)	related to Molybdenum deficiency, diarrhea, hind leg paralysis, loss of hair color, rough hair coat, infertility, cardiac failure
iron (Fe)	unthriftiness, reduced growth, anemia
iodine (I)	goitre, birth of hairless calves
manganese (Mn)	enlarged joints, poor locomotion, poor reproduction, deformed legs, overall physical weakness, lower fertility, increased incidence of retained placenta
selenium (Se)	nutritional muscular dystrophy, skeletal and cardiac muscle degeneration
zinc (Zn)	skin lesions, rough hair coat, swollen joints, parakeratosis or mange like condition
salt (Na & Cl)	salivation, thirst, muscular spasms, scouring, prostration, upsets the tissue/water balance in the body and may lead to death

**Activities:**

1. Take one of these vitamins or minerals and find out all that you can about its action in the body of the beef animal. Share your findings with your club.
2. Develop a game or activity to teach this information to the other members of your club. Keep it simple and keep it fun.

## “I’ve Made a Feed”

A complete feed is one which contains adequate amounts of all of the nutrients required by the animal being fed. This is a very important point for everyone to understand.



### Activity:

Your leader has a card game called “I’ve Made a Feed”. Your task is to assist him or her in playing this game with all members in the club. Ensure that all members understand the importance of a complete feed.

## Understanding Energy

The importance of energy to an animal cannot be overemphasized. Energy is defined as the ability to do work. All energy originates from the sun. Plants trap energy using photosynthesis. Animals transform this energy from the plants into heat or body products such as milk or meat.

We measure the amount of energy in megacalories (Mcal).

**1Mcal**

= 1,000,000  
calories

or

= 1,000 kilocalories

You may have learned in school about the “first law of thermodynamics”. It states that energy can neither be created nor destroyed; it is only changed from one form to another. Thus, energy in feeds which is not digested is eliminated from the body. Energy in feeds which is digested and not incorporated into the body products is lost as heat.

There are many types of energy. It is important that you understand what these types are and how you can use the information they give you.

### Gross Energy (GE)

If we were to burn a feed and measure the total amount of energy released, we would obtain a gross or total energy value.

These values would be obtained through scientific experimentation. These values do not tell us how much energy an animal can get from its feed because an animal digests its feed. Digestion is a slower process than burning.

### Digestible Energy (DE)

Digestible energy is the most popular way to express the energy values of feeds and the energy requirements of the animal.

Digestible energy of a feed is the gross energy consumed by the animal minus the energy lost in the feces. The fecal energy may be as high as 10 to 70 percent of the energy consumed by the animal. It is the largest loss of energy in digestion.

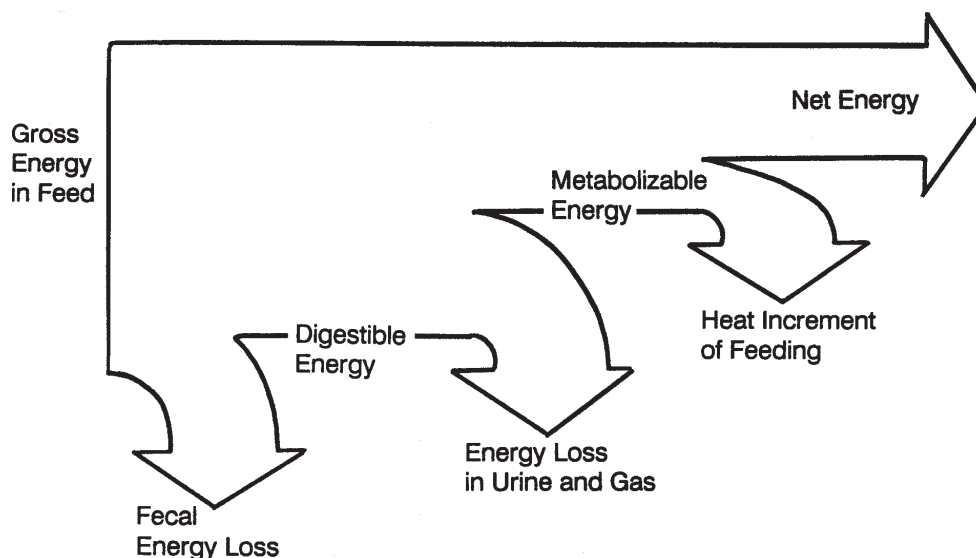
Cattle digest 60 to 90 percent of the energy in grains and high quality forages. In low quality forages such as straw, they digest only 40 to 50 percent of the energy.

#### Estimated Energy Values of Some Alberta Feeds (Dry Matter Basis)(Mcal/kg)

Hay		Grains		Greenfeed	
Alfalfa	2.77	Barley	3.65	Barley	2.90
Alfalfa-grass	2.72	Oats	3.34	Oats	2.75
Native	2.61	Wheat	3.87		
Brome	2.54				
		Silage		Straw	
		Barley	2.72	Barley	1.98
		Oats	2.65	Oats	2.16
				Wheat	1.80

The following diagram will help you understand how the gross energy of feeds is utilized by the animal.

#### Division of Energy Losses



#### Metabolizable Energy (ME)

- The metabolizable energy is equal to the digestible energy minus the energy in urine and gaseous products of digestion. The cow loses 4 to 5 percent of the gross energy through the urine and approximately 7 percent through the production of methane gas in the urine.

#### Net Energy (NE)

Net energy is equal to the metabolizable energy minus the heat increment. The heat increment is the heat which is produced when feed is taken in and digested.

## Total Digestible Nutrients (TDN)

TDN is an old system of measuring the available energy of feeds and the requirements of animals. It is hard to measure, inaccurate, and very confusing.

The formula for the calculation of TDN is:

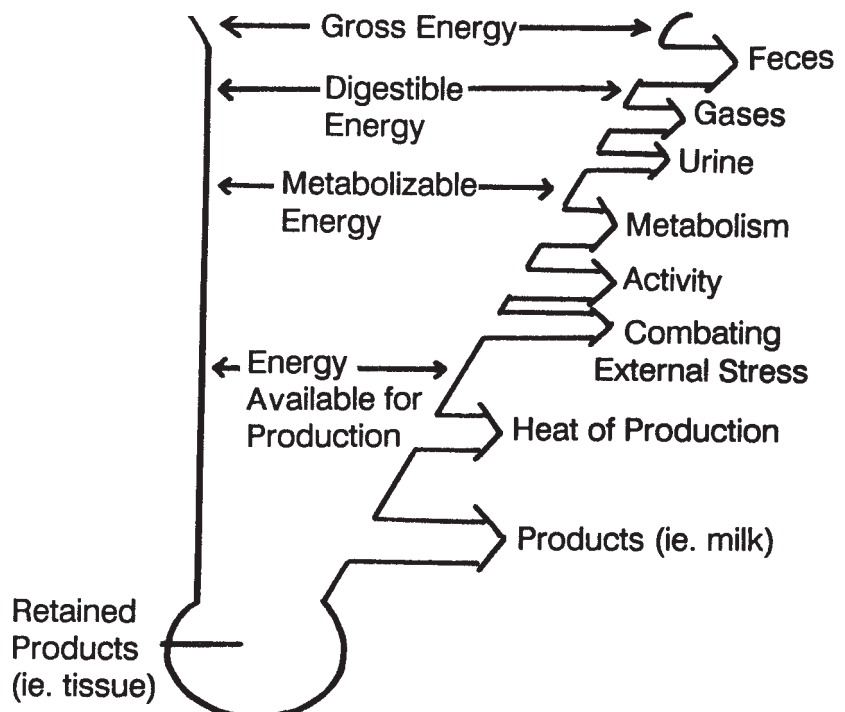
$$\begin{aligned}
 \text{TDN}\% = & \\
 & (\% \text{Crude Protein} \times \% \text{Digestibility}) \\
 & + \\
 & (\% \text{Crude Fiber} \times \% \text{Digestibility}) \\
 & + \\
 & (\% \text{Nitrogen-free Extract} \times \% \text{Digestibility}) \\
 & + \\
 & (\% \text{Ether Extract} \times \% \text{Digestibility} \times 2.25)
 \end{aligned}$$

## Using Energy

All of the energy consumed is made into one of these:

- wastes - feces, gas, urine
- heat
- body products - milk, meat, offspring
- fat

The following diagram summarizes the manner in which the gross energy is used by the animal.





In summary, digestible energy is the value most commonly used as it is the easiest to determine and understand. However, it is important that you understand all of the values and how they are derived.

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**Activity:**

Now that you understand energy, explain the concept to others in your club.

**Unit Five**

**Feeds for Beef**

**Roll Call**

Name a feed ingredient which is used in a ration.

**More About Feeds For Beef**

Alberta Agriculture has many excellent resources on feeds and feeding beef. These are available to you. Your local district agriculture office has more information.



**Activity:**

Visit your local district agriculture office and find out what resources are available for you to use. Add to or start your club's beef reference library.

**Using Computers for Ration Formulation**

Today, there are many computer programs available for formulating rations for beef cattle. These programs are constantly being revised and updated as new information and technology become available.



**Activity:**

Find a computer program for ration formulation and try it out. Talk to your district agriculturalist, local producers, feed company representatives, livestock specialists or agrologists.

**Feed Sampling**

In order for you to make the best use of your feeds, you need to know exactly what is in each feed. Underfeeding livestock will limit their production potential. Overfeeding livestock will waste your valuable resources.

Local feed analysis labs will analyze feeds so livestock producers can make the best use of their feeds. Feed test results will help you determine the type and amount of supplements you need to provide your animal with its required nutrients.

**How to Submit Your Feed Samples**

**1. Obtain Necessary Equipment.**

Obtain sample boxes, information sheets and a core sampling tool (which you will need for baled roughages only) from your local feed analysis lab. A core sampling tool is also available from your district agriculture office.

**2. Take Representative Samples.**

Sample each of your feeds before the feeding period begins so you can use the results to develop the best feeding program possible. Whenever possible, sample your feeds at harvest time. Each type of feed you will use should be analyzed separately because different forage species, mixtures and cuttings, grains and forages from different fields, vary in nutrient content.

*Baled Roughages* - Using the core sampling tool, take subsamples from at least 20 different bales or places in the stack. Place all samples directly into one bag.

*Silage or Loose Roughages* - By hand, take subsamples from at least 20 places in the stack or silo. Put them in a pail and mix thoroughly. Then take a sample from the pail and put it into the plastic bag. If possible, freeze before mailing to minimize moisture loss.

*Grains or Complete Feeds* - Again, take at least 20 subsamples from different locations in the bin. Put the samples in a pail and mix thoroughly. Take a sample from the pail and place it in a plastic sample bag.

**3. Fill Out the Information Sheet**

Complete the information sheets and enclose the testing fees.

**4. Label and Package Samples**

Seal each plastic bag with a twist tie and place it in the sample box. Label each sample box completely and correctly.

**5. Send the Sample**

Send your samples by mail, bus or courier to the feed analysis laboratory.

**6. Results**

In approximately two to four weeks, you will receive your results. The laboratory also keeps a copy.

## What is analyzed?

A regular analysis of your sample will give this information

- moisture content
- pH (acidity of silage materials)
- crude protein content
- calcium content
- phosphorus content
- acid detergent fibre content (roughages only)
- nitrate content (roughages only)
- bushel weight (grains only)

If you suspect a problem, for an additional charge, you may also have other items analyzed. These include the minerals.

For further information on the feed sampling procedure, talk to your district agriculturalist or your local feed company salesman.



### Activities:

1. Find out more information about the benefits and uses of information from feed sampling. Talk to your district agriculturalist, livestock specialist, local producer or feed company representative.
2. Sample the feeds on your farm. Prepare a summary. Mention how, when, where and why you sampled these feeds. Use the results from the tests. How did you use these results?

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## Putting It All Together

In these last three units, we have learned more about the digestive system, nutrient requirements and feeds for beef. Your ultimate challenge is to take everything you know about nutrition and put it all together. You need to understand how the animal works, how the feeds work and how you work - only then can you produce beef successfully.



### Activity:

Summarize the key points about beef nutrition. Make these points into a list which you would be able to use as a beef producer.



**Unit Six****Parasites of Beef Cattle**

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**Roll Call**

Name a parasite.

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**Warble Flies**

Warble flies are a common pest of cattle. They create losses due to reduced weight gain and milk production caused by cattle gadding and grub movement through the animal's body. Meat and hides are also damaged by the grubs.

**The Life Cycle**

In the spring, the grubs drop from the cattle. The grubs develop into warble flies, which look like bumble bees. The flies are active on sunny days, and do not bite, sting or chase cattle in the shade or water. The female fly lays tiny eggs on the lower part of the animals' body. Cattle react to this egg laying by gadding or running with their tails in the air. Each female adult fly can lay as many as 400 to 800 eggs.

In two to seven days, tiny larvae hatch from the eggs. They crawl to the base of the hair where they burrow through the skin into the animal's system. The larvae move through the body tissue during the fall and the winter, reaching the back of the animal in the spring, March or April. They cut holes for breathing through the hide and remain there for four to ten weeks.

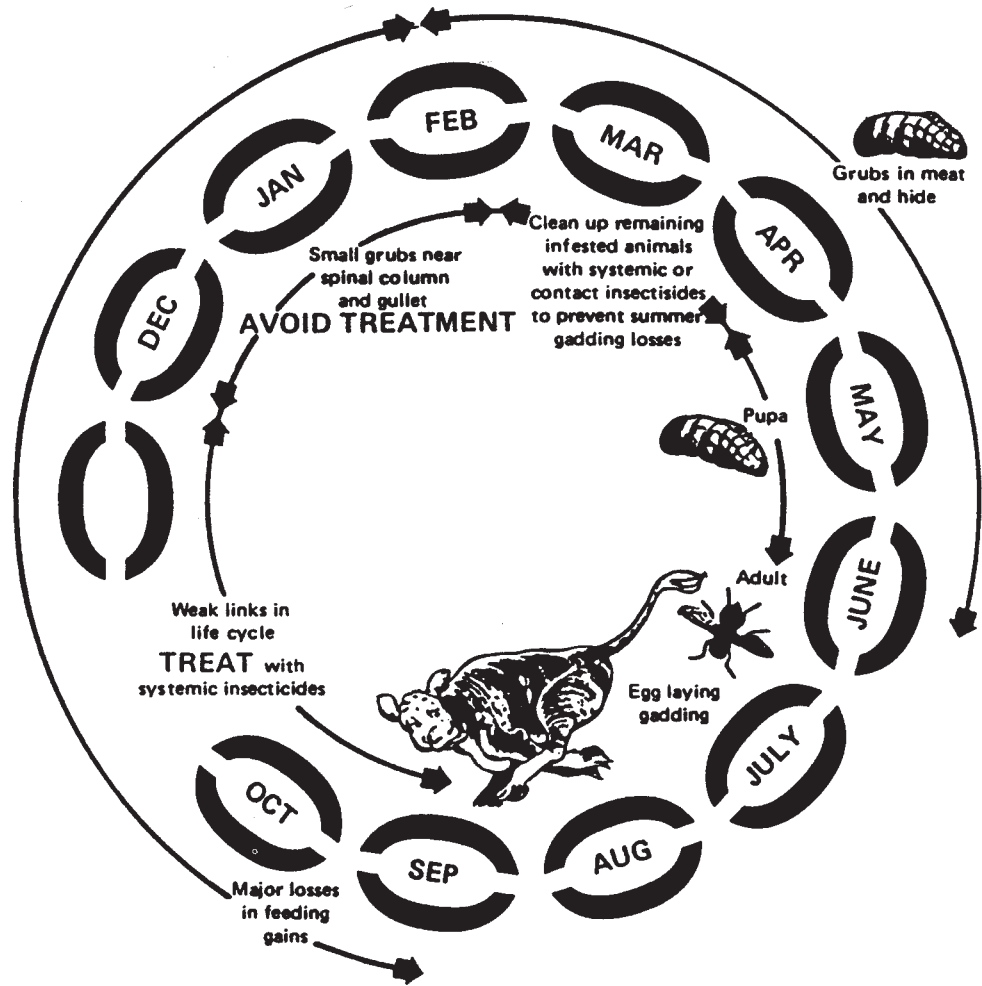
The grubs crawl out of the hole, fall to the ground and develop into a pupa during April, May or June. In one to three months, the adult flies come out of the pupa. They begin laying their eggs from late April through September.

There are two species of warble flies in Canada - the common and the northern. The common lays groups of eggs on the lower part of the animal's body. The northern cattle grub adults, also called heel or gad flies, dart at the animals, attaching single, tiny eggs on the legs above the hooves. While moving through the animals, the common grub moves into the oesophagus. The northern grub gathers around the spinal cord.

**Controlling Warble Flies**

Systemic and contact insecticides are available for grub control. Systemic insecticides are absorbed into the animal's bloodstream when applied to the skin, killing grubs wherever they are in the animal. Contact insecticides must come in direct contact with the grubs. They must be scrubbed or sprayed into the warble opening in the hide during the spring.

Fall is the best time to treat since grubs are killed before they cause major damage. Spring treatment is considered to be the clean up treatment.



It is the responsibility of every livestock producer to control warbles and their larvae. This is for his own benefit as well as the benefit of his neighbours and the livestock industry.



**Activity:**

There are many insecticides available for treating warble flies. Contact your district agriculture office, veterinarian or farm supply dealer for information on controlling warble flies. Design a warble treatment schedule for your herd.

**Horn Flies**

The horn fly is a small, irritating, blood-sucking fly that reduces the productivity of cattle, particularly those in pastures. The horn fly usually rests on the withers, back or underline of cattle, those areas that cannot be reached by the tail or the head. It is attracted to dark colours.

Horn flies feed on adult cattle and are not attracted to calves under four or five months of age. Both female and male flies bite and feed on cattle. Fly bites develop into sores as the flies feed around the edges of previous bites. Scabs develop.

**The Life Cycle**

The female lives for about 10 minutes at a time to lay eggs under the edges of fresh cattle droppings. Within 24 hours, the eggs hatch and larvae crawl under the droppings. Four to 10 days later pupae develop. Five to 13 days later new adults emerge.



As many as four generations of horn flies may be produced in a season with peak activity occurring in July and August. Mature larvae and pupae will overwinter in the manure.

Losses caused by horn flies include lower milk production, lower weaning weights and lower weight gains. Horn fly infestation is also associated with the incidence of pinkeye disease in cattle.

**Activity:**

Several insecticides are effective in controlling horn flies. These may be dusts, sprays or self treatment devices. Find out all you can about how you can control horn flies on your farm.

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**Methods of Parasite Control**

There are several general methods of controlling parasites on your farm. These involve management. Some of these are:

- Keep your corral areas clean and dry.
- Don't overcrowd your animals.
- Put feed in clean feeders. Avoid feeding on the ground.
- Use well drained pastures.
- Don't allow your animals to wander in low lying areas.
- Isolate new animals to the herd for at least three weeks.
- Rotate your pastures.
- Keep your water supplies fresh and clean.
- Know how to identify parasites and pests in your herd.
- Learn how to control and eliminate parasites and pests.

**Activity:**

Put together a summary of controlling and preventing parasites. Share this with your club members.





**Unit Seven**

**Beef Herd Health**

**Roll Call**

Name one sign a beef animal shows when it is not healthy.

**Diseases of Feedlot Cattle**

Cattle placed in feedlots are susceptible to many diseases. Let's look at some of the common problems.

<b>Foot Rot</b>	
<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• bacteria in the soil invade cuts, scratches or injuries in the foot</li> <li>• most common in wet areas</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• infection and/or swelling in soft tissues of the foot</li> <li>• foul smelling discharge from the foot</li> <li>• sudden severe lameness</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• examine foot to make sure there is no other problem such as an injury</li> <li>• antibiotics</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• provide good drainage of feedlots</li> <li>• provide solid, dry footage around feeders and waterers</li> <li>• use footbaths</li> </ul>

<b>Grain Overload</b>	
<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• consuming large amounts of grain before rumen has adjusted with bacteria</li> <li>• rapid fermentation</li> <li>• acid is absorbed into the blood and can kill animal</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• develop in 12-18 hours</li> <li>• mild-off feed, stands alone, watery diarrhea</li> <li>• moderate-weak, dehydrated staggering</li> <li>• severe-down, shock, cold, coma, death may be rapid</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• mild-alkalizer</li> <li>• moderate-empty the rumen, give fluids</li> <li>• severe-slaughter</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• start cattle slowly on grain</li> <li>• at least 10% of diet should always be roughage</li> <li>• mix feed properly</li> </ul>

<b>Enterotoxemia, Sudden Death or Feedlot Disease</b>	
<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• bacteria, which is always present in the intestine, multiplies, producing a toxin which can kill animal</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• temperature is lower than normal</li> <li>• diarrhea</li> <li>• death</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• isolate sick calves</li> <li>• ask advice from your veterinarian</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• vaccinate cattle before they begin on full feed</li> <li>• follow with a booster injection 90 days later</li> </ul>

<b>Pink Eye</b>	
<p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• bacteria</li> <li>• susceptible if stressed</li> <li>• dust wind</li> <li>• irritation by flies</li> <li>• vitamin A deficiency</li> <li>• eye injuries</li> <li>• stress due to sunlight</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• tearing, discharge from eye</li> <li>• lining of eye is swollen</li> <li>• cloudiness or whitening of cornea or eye surface</li> <li>• severe-eyeball may rupture</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• very contagious</li> <li>• mastitis ointment in the eye</li> <li>• severe-injections in the eye</li> <li>• recovered animals may remain disease carriers</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• control face flies</li> <li>• make sure rations supply adequate vitamin A</li> <li>• isolate infected animals in a dust free, dark area</li> </ul>

<b>Shipping Fever</b>	
<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• bacteria</li> <li>• susceptible if stressed</li> <li>• changes in weather</li> <li>• inadequate feed intake</li> <li>• mixing of animals</li> <li>• different feed and water</li> <li>• dehorning, castration, etc.</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• fever</li> <li>• depressed, doesn't move</li> <li>• no appetite</li> <li>• runny nose and eyes, coughing</li> <li>• rapid breathing</li> <li>• diarrhea</li> <li>• high temperature</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• antibiotics</li> <li>• keep sick animals away from healthy ones</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• avoid stress</li> <li>• isolate new animals</li> <li>• purchase healthy animals</li> <li>• preconditioning</li> </ul>

<b>Hardware Disease</b>	
<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• metal objects such as nails or wire are swallowed and lodge in the reticulum, often</li> <li>• puncturing the wall</li> <li>• object may also puncture the heart and, or diaphragm.</li> </ul>	<p><b>Symptoms</b></p> <ul style="list-style-type: none"> <li>• uncomfortable</li> <li>• stands humped up</li> <li>• moves slowly</li> <li>• grunts</li> <li>• uncomfortable passing manure or urinating</li> <li>• fever</li> <li>• off feed</li> </ul>
<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• put a magnet in the stomach to hold the object</li> <li>• call your veterinarian to see if anything more can be done</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• keep your yards free from nails, wire, and sharp objects which the animal may eat</li> <li>• use a heavy magnet in the intake of grinders, rollers or hammer mills to attract foreign objects</li> </ul>

**Activity:**

Look more closely at one of these diseases. Gather all the information you can find about it. Talk to local producers, your veterinarian, district agriculturalist or beef specialist.

**Vaccinations**

When we vaccinate, we deliberately introduce infectious organisms into the body of the animal. By doing this, we hope that the animal will produce antibodies. Antibodies help the animal fight the disease and become immune to it. If the animal ever comes into contact with the disease, it will be protected against it.

**Types of Vaccines****Live**

Live vaccines contain live disease causing organisms. These organisms have usually been modified in some way so they cannot actually produce the disease.

**Killed**

These vaccines contain dead organisms, such as bacteria, which have been added to a liquid carrier.

Always follow the directions for vaccinating. Before using any vaccine, read the label carefully. Check for:

- dosage or amount to give
- way to give the vaccine (subcutaneous or intramuscular)
- expiration date.

Handle vaccines with care. Store them under refrigeration, but not frozen. Keep them out of the sunlight.

Sometimes cattle are allergic to the vaccines we give them. Signs of allergies will usually appear within an hour of vaccination. Watch for some or all of these symptoms of an allergic reaction:

- difficulty breathing
- staggering
- swollen eyes
- bloat
- swelling of the vulva

If you see any of these signs, call your veterinarian.

**Activity:**

The goal of any vaccination program is to prevent diseases from affecting your animals. What do you vaccinate against in your (or a neighbour's) herd? Why would you vaccinate against these diseases?

## **Herd Health and Management Calendar**

A complete herd health program can make your cattle healthier, more efficient and more productive. A preventative herd health program, such as the one below, that focuses on disease and management problems which can cause economic losses would be effective.

### **Precalving and Calving Season**

*(Early spring)*

- Identify cows with vaginal prolapses for culling.
- Watch for abortions and send aborted fetuses for examination.
- Check for lice and treat infestations.
- With your veterinarian, discuss vaccinating the cow herd for scours.
- Keep calving areas clean, dry and well bedded.
- Prepare for calving and calving problems.
- Have electrolytes and antibiotics ready for treating scours.
- Inject calves with vitamin E and selenium and/or vitamins A, D and E if necessary.
- Watch for calf scours and pneumonia.
- Identify calves and record birth dates and calf weights immediately.
- Re-assess nutrient requirements and performance of heifers and cows and make necessary changes.

### **Breeding Season**

*(Early spring and early summer)*

- Check calves for scours and pneumonia.
- Evaluate fertility of all breeding bulls:
  - semen quality
  - physical examination
  - libido
- Have all breeding females with previous problems examined by your veterinarian.
- Make sure you have an adequate bull to female ratio.
- Prepare teaser animals if practising AI.
- 30 days before breeding, vaccinate all replacement heifers for IBR, BVD and vibriosis if necessary.
- Two weeks before breeding, vaccinate cows for vibriosis if necessary.
- Vaccinate all calves over two months of age for blackleg.
- Castrate, dehorn and implant calves.

## Preweaning and Weaning

(Fall)

- Prepare calves for weaning and preconditioning.
- Pregnancy test all cows and cull nonpregnant and unhealthy cows.
- Treat for warbles and external parasites.
- Wean calves with as little stress as possible.
- Treat calves with pneumonia immediately.
- Weigh calves and record weaning weights.
- Make your initial heifer and bull replacement selections.
- Evaluate performance of the breeding herd by calculating:
  - percentage calf crop
  - weaning weights
  - death loss percentage
  - cost per pound of calf marketed
- Vaccinate replacement heifer for BVD about three weeks after weaning.

## Wintering Period

- Take inventory of feeds available and have feeds analyzed.
- Work out rations for different classes:
  - pregnant heifers
  - pregnant cows
  - heifer replacements
  - bull replacements
  - breeding bulls
  - feeder calves
- Initial vaccinations for calf scours may be given in the fall instead of midwinter.
- Check cows daily for signs of heat and external parasites.
- Watch for abortions and send fetuses for examination.
- Increase your knowledge of the beef business through:
  - research and extension publications
  - extension meetings
  - farm press
  - commercial firms and consultants
  - nutrition and managements programs



### Activity:

Look at your (or a neighbour's) annual herd health program. In what areas is it strong or weak? What could you do to improve the overall health of the herd?

**Unit Eight****Managing Your Market Steer**

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**Roll Call**

What is the most important part of managing your market steer?

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**Preconditioning**

Preconditioning is a producer program designed to reduce economic losses caused by stress and disease during shipment of calves from their home to the feedlot. In recent years, preconditioning has become widely used.

Under normal feedlot conditions, losses are 1-2%. It may take healthy calves three weeks to gain the weight loss while they adjust to the feedlot conditions. Preconditioning helps to reduce these losses.

Consider these points:

- Calves are weaned earlier now than they have been in the past. This means that their immune system is not as well developed.
- Calves are exposed to more diseases and parasites when they are shipped or sold.
- Calves from heavy milking cows eat less than calves from poor milkers, so they are not used to eating as much solid feed as calves from the poor milkers.
- The rate of gain is higher for preconditioned calves than for calves that are weaned the day of shipping.
- Death losses can be reduced to 0.5% with a preconditioning program.
- Preconditioning requires extra feed and bedding costs. Weaning facilities are needed.
- As a buyer, you will likely have more success with preconditioned calves because they are under less stress. Stressful practices such as castration, vaccination and dehorning will have all been done well before you receive the calf.



Alberta has a recognized preconditioning program. This ensures that you will receive what you pay for. In order to sell calves under the Alberta Certified Preconditioned Feeder Program, the owner of the calves must meet these conditions:

- Seller must own the calves for 60 days prior to sale.
- The calves must have been weaned 30 days before sale.
- Castration and dehorning must be done at least three weeks before sale.
- Calves must be at least four months old before they are vaccinated.
- Calves are given 8-way clostridial vaccine at least three weeks before sale.
- Calves are given IBR-PI3 vaccine at least three weeks before sale, under the supervision of a licensed veterinarian.
- Warble treatment must be done at least three weeks before sale.
- The calves are eartagged, under supervision of a veterinarian, with an official A.C.P.F. (Alberta Certified Preconditioned Feeder Program) green tag.
- Calves have an official A.C.P.F. certificate signed by the veterinarian and the owner.

If the calves have a white ear tag, all of the above have been done but the calves have not been weaned 30 days prior to shipping.

In order for a preconditioning program to be successful, both the buyer and the seller must profit. The feedlot owner, or buyer, wants the calves to pay for themselves through better performance — improved weight gains, health, and so on. The calf producer, or seller, wants to sell his or her calves at a higher price to cover the extra time and money spent to precondition the calves.

Does preconditioning pay? Studies show that, in most cases, preconditioning will pay off for both the buyer and the seller. However, this depends on the purchase price, the labour involved, condition of the calves and the interest rates. The producer whose fall pasture is poor will gain more from preconditioning because calves weaned early and fed preconditioning diet will gain more than calves left on pasture with their mothers.



### Activities:

1. What are two reasons for preconditioning?

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2. Determine the cost of preconditioning a calf. Use your calf weight and price.

<b>Initial Value of Weaned Calf</b>	
calf weight _____ at \$ _____ per _____	Date
<b>TOTAL A</b>	

<b>Cost of Calf for 30 days</b>	
death loss 1% of purchase price	
poor calves 0.5% of purchase price	
interest for 30 days at _____% per annum	
yardage for 30 days at \$ _____/day	
bedding	
antibiotics	
<b>TOTAL B</b>	

<b>Vaccination and Parasite Control</b>	
para influenza - 1 dose	
IBR	
malignant edema and blackleg	
BVD	
grub and lice control	
worm control	
spraying or dipping	
handling (veterinary costs)	
<b>TOTAL C</b>	

<b>Feed Costs for 30 Days</b>	
____ kg supplement/day at \$_____/kg X 30 days	
____ kg concentrate/day at \$_____/kg X 30 days	
____ kg roughage/day at \$_____/kg X 30 days	
mineral costs for 30 days	
<b>TOTAL D</b>	

<b>Value of Calf After Preconditioning</b>	
Initial Value of Weaned Calf (Total A)	
Cost of Calf for 30 Days (Total B)	
Vaccination and Parasite Control (Total C)	
Feed Costs (Total D)	
<b>TOTAL E</b>	

<b>Value of Calf at Sale Date</b>	
calf weight ____ kg at \$_____/kg	
<b>TOTAL F</b>	

<b>Difference</b>	
Value of calf at sale time - Value after preconditioning (Total F - Total E)	
<b>TOTAL</b>	

3. Would you expect the calf to have a better rate of gain than other calves brought in for feeding. Why or why not?

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4. How much more is being charged for preconditioned calves in your area. What are the costs?

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5. Is preconditioning worth the extra cost to you? Why or why not?

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6. Suppose you purchase several hundred calves each year for your feedlot. How much preference will you give for A.C.P.F. tagged calves. Explain.

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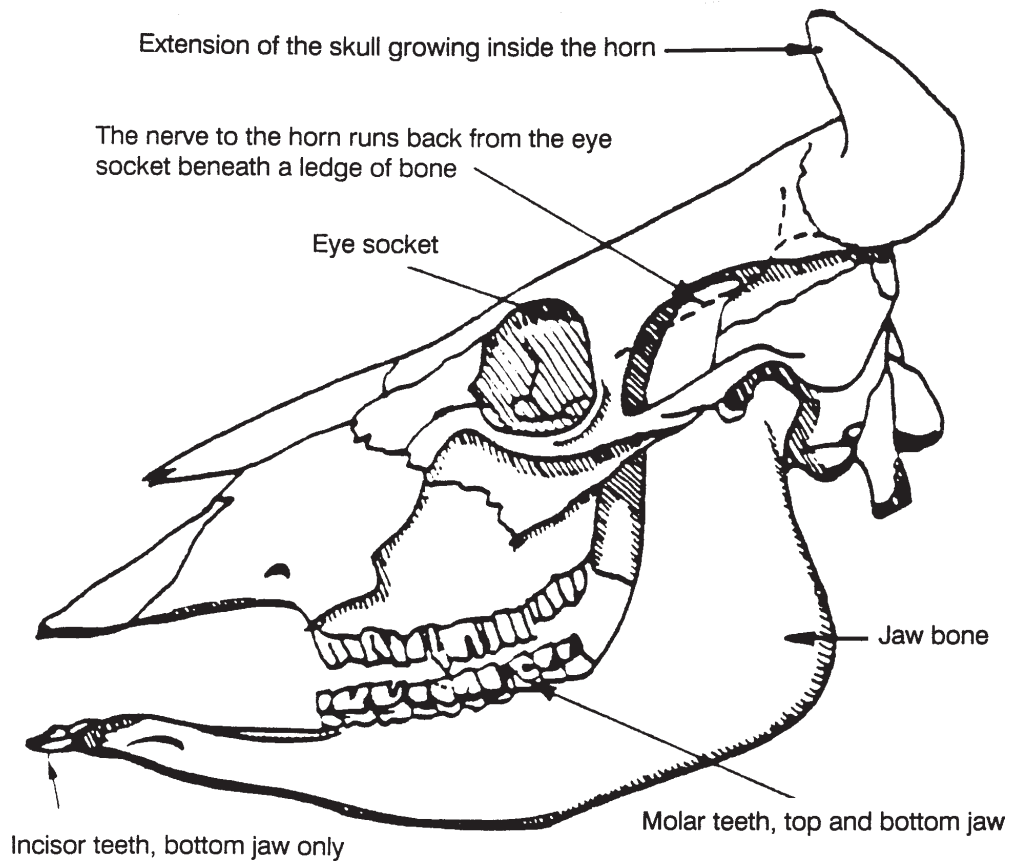
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### More About the Horns

The cornual nerve runs from immediately behind the eye to supply sensation to the horn. It lies beside a vein and artery behind an overhanging ledge of bone, which is part of the skull. You can feel this ledge if you press your fingers lightly on the skull in front and to the side of the horn.

### The Skull of the Beef Animal



Anaesthesia may be used when dehorning. It creates a loss of sensation, similar to when the dentist freezes a tooth before working on it. Anaesthesia is most commonly used by a veterinarian when dehorning older cattle.

### **Procedure**

1. Restrain the calf
2. Using your fingers, palpate to find the nerve. You will be able to feel the vein and artery beside it. This is the injection site and is about 1 to 1.5 inches from the base of the horn.
3. Disinfect the area with rubbing alcohol on a cotton swab.
4. Use a 20 gauge needle which is 1 to 1.5 inches long and a 6 cc syringe containing 3 to 5 ml of 2% lidocaine or a similar anesthetic.
5. Insert the needle just through the skin. If blood appears in the syringe, you have punctured a blood vessel. Remove the needle and insert again in a slightly different location.
6. Deposit 1 cc of the solution.
7. Insert the needle to about half of its length below the bony ridge.
8. Deposit the remaining solution.
9. Wait 5 to 10 minutes for anaesthesia to take place. The loss of sensation will last for about one hour.