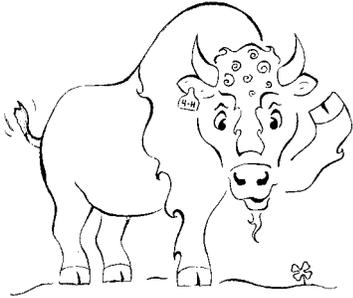


## Feeds for Bison



### Roll Call:

Name a feed ingredient used in a ration.

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### More about feeds for bison

Alberta Agriculture has many excellent resources on feeds and feeding beef, and the collection is growing for bison. Because the dietary needs of beef and bison are similar you can use the beef books as an excellent resource, but it is important to keep a few things in mind for adapting the diet to the needs of the bison. Remember the [www.bisoncentre.com](http://www.bisoncentre.com) website will provide you with a great deal of important information.

### Activity:

Contact the [bisoncentre.com](http://bisoncentre.com) website to find out what resources are available for you to use. Add to or start your club's bison reference library. You can do this at no or very little cost as many of the publications are free.



### Using Computers for Ration Formulation

Today, there are many computer programs available for formulating rations for livestock. 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 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 and could cause potential problems in the health and well doing of the animals.

By doing complete soil and feed analysis, livestock producers can make the best use of their feeds to maximize production. 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:

### Obtain necessary equipment.

You can contact your local Alberta Agriculture Food & Rural Development office to find out the labs used in your area. You may need to obtain sample boxes, information sheets and a core sampling tool (which you will need for baled roughages only).

### Take representative samples.

Sample each of your feeds before the feeding period begins so you can use the results to help you 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, and even 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

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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.

### **Fill out the information sheet**

Complete the information sheets and enclose the testing fees. There is a fee for the testing.

### **Label and package samples**

Seal each plastic bag with a twist tie, or use ziplock baggies, and place it in the sample box. Label each sample box completely and correctly.

### **Send the sample**

By contacting your local Alberta Agriculture office you can get a list of labs that would be available to analyze your feed.

You could email to [www.norwestlabs.com](http://www.norwestlabs.com) for assistance.

### **Results**

In approximately four weeks, you will receive your results.

### **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 a livestock specialist or contact Norwest Labs at 1-800-661-7645.

## Activities:

1. Find out more information about the benefits and uses of information from feed sampling. Talk to your 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?

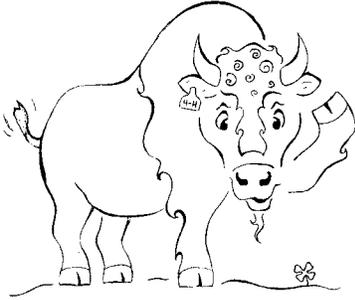


## Putting it all together

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 bison successfully.



# Parasites of the Bison



**Roll Call:**

Name a parasite. \_\_\_\_\_

## Parasite activities

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

Some of these methods include

1. Keep your corral areas clean and dry.
2. Don't overcrowd your animals.
3. Feed in clean feeders. Avoid feeding on the ground.
4. Use well drained pastures.
5. Don't allow your animals to wander in low-lying stagnant water areas.
6. Isolate new animals to the herd for at least three weeks.
7. Rotate your pastures.
8. Keep your water supplies fresh and clean.
9. Know how to identify parasites and pests in your herd.
10. 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.



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Limited research has been conducted to learn more about the levels of parasites in bison.

The following is a study that was conducted in the Peace River country. This information was obtained from the following website: [www.bisoncentre.com](http://www.bisoncentre.com)

Are Bison Deworming Practices Based on Sound Scientific Principals?

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### Summary

The majority of information on bison parasites originates from the United States. Many bison producers use this information to make their parasite control decisions. Geographical location greatly affects the type and numbers of parasites which are present. Parasite control programs should be based on the parasite situation in your geographic location.

This article presents the results of some studies we have conducted in the Peace River region of northern Alberta. We will point out where our findings differ from more southerly climates. In addition to reporting our findings, this article will also provide general parasite control information that should be considered when making decisions on parasite treatment.

### **What information is available on intestinal worms or worm egg counts in Canadian Bison?**

There is no information in Canadian scientific literature on worm egg counts in manure samples of bison. There is limited information on a few specific adult intestinal parasites in Canadian bison.

In addition to the lack of information on manure worm egg counts, problems occur in the interpretation of the significance of total egg counts. Only some types of parasites can be identified as to genus, based on the production of eggs that are sufficiently different to be recognized under the microscope.

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Unfortunately many of the common intestinal worms of bison produce eggs which are indistinguishable in appearance. These eggs will be referred to as trichostrongyle eggs in this article. Identification of the genus or species of Trichostrongyle worms requires hatching of the eggs followed by examination of their characteristic larvae. Because different intestinal worms vary greatly in their ability to cause disease, it is important to know what genus or species of Trichostrongyles are present in your herd or area.

### **What studies did we conduct?**

Most of the information in this article is based on a study conducted on a 250 cow/calf bison herd, located in the Peace River Region of north western Alberta. This study was designed to determine changes in worm egg counts, over a 12-month period, and to identify the species or genus of worms that contributed to these egg counts. It also contains preliminary information from a study, in progress, designed to obtain parasite information from other bison herds in the Peace River Region. In this project, to date we have examined representative samples from close to 1000 animals in 12 herds: Herds which we refer to as untreated in this study, have not been dewormed for at least 12 months before our collection. How were these studies conducted?

In the primary study, 35 individual manure samples were collected from the ground, immediately after a bowel movement, from both cows and calves on January 14/97. Two days later a pour-on dewormer was given to the cows and calves. Starting two weeks after deworming 10 random samples were collected from both cows and calves on a monthly basis. The last collection was made on January 6, 1998.

Yearlings in this herd were placed in a feedlot environment. They were not dewormed. Random fecal samples from % of these animals were collected on Jan 14/97 and September 15, 1997.

Total worm egg counts were determined on all samples collected over this time period. Following determination of the worm egg counts the monthly samples were mixed together and incubated to hatch the eggs so that the resulting larvae could be examined to determine the species or genus of worms contributing to the Trichostrongyle egg count. Separate pools of cow and calf samples were maintained to determine what differences there were, if any, in both groups.

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The study currently in progress involves the collection of rectal manure samples from 30% of the animals in each herd. Collections are being done when these herds are run through for Brucellosis or TB. Total worm egg counts and larval identification are being performed on these bison.

### **What did we find?**

In the primary study herd, the most common eggs encountered were in the Trichostrongyle group. There was an average of nine Trichostrongyle eggs per gram (epg) in the cows and 78 epg in the calves in the first samples collected before treatment (Fig.1). Average Trichostrongyle counts, in the samples collected two weeks after treatment were less than 1 epg in cows and 40 epg in calves. Over the next six months egg counts, in the cows gradually increased to pretreatment levels, while levels in the calves fluctuated between 40-72 epg. An overall decrease in epg was noted in both cows and calves between September and November then counts rose slightly in December and January.

Examination of the larvae revealed the presence of three species of Trichostrongyles, namely the small intestinal worm (Cooperia), the brown stomach worm (Ostertagia) and the small stomach worm (Trichostrongylus). Cooperia was by far the most common Trichostrongyle encountered. This worm accounted for 96% of all larvae identified in calves and 92% of larvae in cows. Ostertagia was only identified in a few collections. The highest numbers reached 4% in adults and 2% in calves (Fig.2). Trichostrongylus larvae were only detected in very low numbers, with an average of 3% to 6% infection rate over the year in both groups.

Other parasite eggs observed included the whip worm (Trichuris), capillary worm (Capillaria), thread necked worm (Nematodirus), threadworm (Strongyloides) and tapeworm (Moniezia). These were only present in a few animals and in very low numbers.

On June 18/98, 18 months after their last deworming, manure samples were examined to determine present parasite loads. Results from this examination revealed 18 Trichostrongyle/epg in the cows and 15 Trichostrongyle/epg in the calves.

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On Jan. 14/97, the yearling bison in the feedlot had an average of 39 Trichostrongyle/epg. On Sept. 15/97, one day before shipping, they had an average count of less than 2 Trichostrongyle/epg. This large decline in fecal egg count was attributed to poor conditions for parasite development in an area free of vegetation.

In our study of Brucellosis and TB tested herds, treated herds had a high of 78 Trichostrongyle/epg and a low of less than 1 epg. Samples from untreated herds had a high of 56 epg and a low of 2 epg.

### Activity:

1. Can you interpret the results of this study yourself and explain it to others?



**Develop a research proposal of your own. What components are needed in a good research project?**

### Developing the research proposal

Having decided on the research topic and defined a clear research question or set of questions, together with appropriate methods of seeking answers, you now need to convey your plan of research clearly in a research proposal.

### Research proposals serve a number of purposes. Among them:

They convince others that your research is worth undertaking.

They enable you to demonstrate expertise and competency in your particular area of study.

They may serve as a contract between the researcher and his/her funders.

They serve as a planning tool for the researcher.

A good problem for an inquiry is the key to a good proposal. Any problem can be turned into a question but not every question is a problem, and not every problem is a good problem. The same for purpose, topic, subject, etc. So - what is a problem? And what is a good problem? To answer that question, we have to consider the purpose of inquiry and the nature of problems that an inquiry should address.

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### **The purpose of inquiry**

An inquiry, investigation, research project, etc., are names given to action designed to make a contribution to knowledge. The activity must add to what is already known, not just to reshuffle the same old cards. Contributing to knowledge then becomes a task of testing, extending, or challenging what is known or supposed to be known.

A good theory is the most practical type of knowledge because, unlike a fact, it organizes and guides classes of activity. Therefore, testing, extending, or challenging a theory is the most useful contribution to knowledge.

The next task is to turn a problem statement into a proposal for a project. A proposal is an action plan that persuades the reader that the problem is real, urgent, and deserves attention, time, money, etc. Action cannot be general but must be specific in time, place, and direction. You cannot do much about generalities, though ultimately we can derive general principles and theories from specific actions.

### **The nature of a problem**

We have noted that every problem can be formulated as a question (or purpose or topic, etc.), but not every question is a problem. "How many bison are there in Alberta?" is a question. But until somebody comes up with a good reason why we need to know, it is not a problem. The word problem comes from the Greek *pro-*, before or forth, and *balein*, to throw, and used to mean the difficulty that life throws on your path. So in order to have a problem, (1) you must have a desirable direction, (2) you must have a difficulty to overcome in order to make progress or to avoid sliding back; and (3) eventually you must figure out a practical and promising way to deal with the difficulty, i.e. to illuminate it, understand it better, and to decide what should be done about it. The theory, hypothesis, or your belief or hunch to be tested, extended, or challenged should bear directly on such a specific problem.

### **What is a good problem?**

A good problem is not just what can be usefully addressed but what should be addressed in order to achieve or make progress toward a desirable goal or to avoid an undesirable event. It is something in which you are interested rather than something that is "done" or serves only the purposes of an academic exercise but is also of some general interest to bison producers. In other words, a good problem is

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an issue or difficulty of some significance, urgency and priority whose investigation will make a useful contribution to knowledge. (If you already know the answer, if the answer can be found by a simple search of existing studies, or if it is totally predictable, there is no need to do the study.)

### **Proposal:**

**Write a one page draft proposal covering briefly the points noted on the following page.**



**Title (substantive)**

### **What is the problem?**

Not “question” or “topic.” Problem addresses an issue, difficulty, or need that should be addressed.

### **Why is it a problem?**

Establish the reason for and significance of problem. Any theory being tested, extended, challenged? Not why it can be done, but why it should or must be done. Convince the reader that it is worth investing time, effort, etc.

### **Where?**

Determine where the research should be conducted for the study. (Policy, content, effects, interaction, etc.)

### **Who has done what about research on this problem?**

Make a reference to relevant studies and an explanation of their relevance. Note at least one and its relevance.

### **How?**

What original observations, documents, interviews, etc. will be involved? (Sample, case study, etc.)

### **Units of analysis.**

How will you be able to analyze the data obtained?

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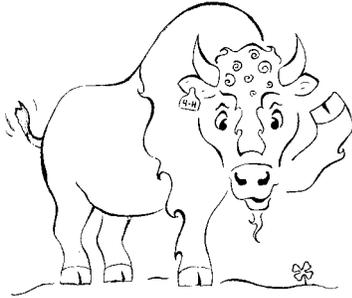
### **Instrument, plan of procedure.**

Because the bison industry is relatively young and there is very little published research you may have difficulty finding research papers to reference, but this reinforces the importance for doing such research.

In level one we discussed a number of internal and external parasites that affect bison. Level two focused on a number of diseases that are common in livestock and may have serious threats to bison. In level three you are challenged to research and learn more about parasites and diseases that may be affecting bison today. Because there is very limited information that pertains specifically to bison you will have to use your research skills to find accurate information.

Examples of suggested topics include: Pinkeye in Bison, Johne's Disease, Anthrax, etc.

## Bison Herd Health



### Roll Call:

Name one sign of a bison animal that is not healthy.

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### Diseases of bison

Placing bison in confined feeding areas will increase their susceptibility to many diseases. Take some time to consider a few of the diseases that were presented in Level Two. Research some of the diseases that affect feedlot beef animals and see if there is an potential for problems in the bison if they are placed in a feedlot or confinement feeding environment.

### 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.

There are two types of vaccines:

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

Killed vaccines contain dead organisms, such as bacteria, that 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.

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

Sometimes animals 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? Review the list of vaccines that could be helpful to bison (Level Two – Herd Health) and design a program with your situation in mind. Are you dealing with only cow / calf units or finishing animals? It is useful to talk to a veterinarian in your area to determine whether or not certain diseases are prevalent in your area.



## **Herd health and management calendar**

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

### **Precalving and calving season (early spring):**

- Identify cows with previous calving difficulties and cull them.
- Watch for abortions and send aborted fetuses for examination.
- Check for lice and treat infestations.
- With your veterinarian, discuss vaccinating your herd.
- Keep calving areas clean. Provide ample room and windbreak protection. Natural tree areas make the best shelter!

### **Prepare for calving and calving problems.**

- Have electrolytes and antibiotics ready for treating scours. We hope we will never need to assist, but being prepared will make the situation easier if you ever have to.

### **Watch for calf scours and pneumonia.**

- Identify calves and record immediately. Make a special note of those that cause problems, either due to sickness or calving difficulties.
- Re-assess nutrient requirements and performance of heifers and cows and make necessary changes.

## **Breeding season (early spring and early summer):**

- Check daily for scours and pneumonia in calves.
- Evaluate fertility of all breeding bulls
  - semen quality
  - physical examination
  - libido
- Have all breeding females with previous problems are either culled or examined by your veterinarian.
- Make sure you have an adequate bull to female ratio. This will vary based on environmental condition, age of bull, condition of bull, basic nutrition of the herd, etc.
- Thirty days before breeding you may wish to vaccinate cows for BVD.
- Check with your veterinarian about vaccinating all calves over two months of age, and at weight requirement, for blackleg.
- Dehorning may be done before weaning to reduce stress.

## Preweaning and weaning (fall):

- Prepare calves for weaning and preconditioning.
- Pregnancy test all cows and cull non-pregnant and unhealthy cows.
- Treat for any external parasites.
- Wean calves with as little stress as possible. This might involve keeping a dry cow in with the young bison calves to comfort the calves. Weaning in smaller groups will also be beneficial.
- Watch calves for pneumonia and treat immediately.
- You may wish to weigh calves and record weaning weights.
- Make your initial heifer and bull replacement selections.
- Vaccinate replacement heifer for BVD about three weeks after weaning.
- Evaluate performance of the breeding herd by calculating:
  - Percentage calf crop – Number of calves weaned divided by the number of cows bred X 100 Example:  $52 \text{ calves} / 63 \text{ cows bred} \times 100 = 83\%$
  - Average weaning weights – Total weight of all calves divided by the number of calves.
  - Calf survival rate – number of calves that are weaned divided the number of calves that were born X 100.
  - Length of Calving Season – what percent of calves were born in the first 6 weeks of calving season.
  - Net return per cow – Total combined expenses divided by the number of pounds of calf you had to market in the fall X 100.

## 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
- Remember it is critical for bison to have a weight loss period and their diets should provide this.
- Initial vaccinations for calf scours may be given in the fall instead of midwinter.
- Keep a distant eye on cows for signs of heat and potential breeding dates.
- Watch for abortions and send fetuses for examination.
- Increase your knowledge of the bison business through
  - research and extension publications
  - extension meetings and conferences
  - farm press and useful agricultural media
  - Alberta's Bison Centre of Excellence staff and website