

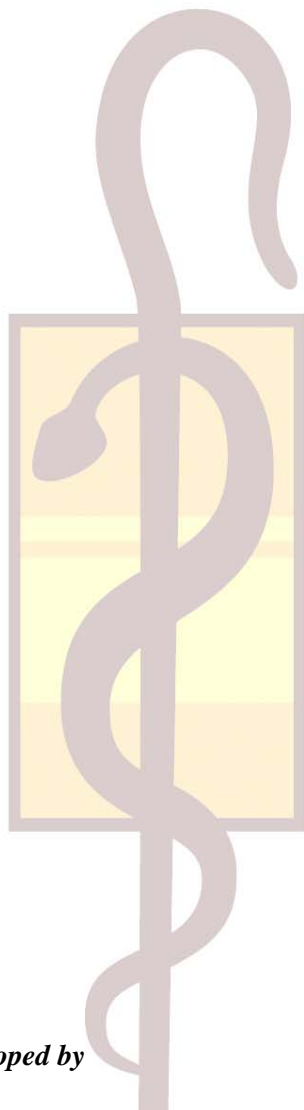
THE WESTERN CANADIAN

FLOCK HEALTH PROGRAM

2007

**Quality Health Care
For Canadian Producers**

Designed by Producers



Western Canadian Flock Health Program

Developed by

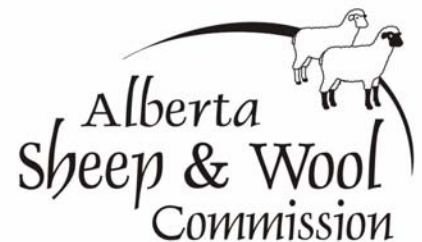
The Alberta Sheep & Wool Commission

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INTRODUCTION

The Concept

Western Canada takes a lot of pride in its ability to produce the best quality meat in the world. Our premium quality lamb is grown in the pristine agricultural lands unique to this area. Our clean air, sparkling water, rich feed grains and forages, plus our attention to sound animal management practices contribute to growing the best lamb in the world. For the same reasons that local beef is world-renowned as being the best (grain finishing and the clean environment), Western Canadian lamb is now increasingly recognized by today's best chefs for its tenderness and mild flavor.

Since Western Canada targets the high quality lamb market, it is very important that the provincial flock is healthy ... ensuring consumers have confidence in our product. Also, although many individual producers today do a very good job in maintaining healthy animals, it is very difficult to compare the relative risk of disease when buying animals from other flocks. The only way this can be done is through standardizing health practices and by objectively assessing the presence of disease ... in other words, through a flock health program.

Another reason many producers in Western Canada are interested in joining a flock health program is money. Animals that are unhealthy raise fewer lambs and simply cost more to have on the farm than they are worth. By being "intensive" about animal health, at the end of the day producers will put more money into their bank accounts instead of into problem animals.

The Process

The Alberta Sheep & Wool Commission, in partnership with Creating Tomorrow - Agriculture & Food Council with funding through the Canadian Adaptation Rural Development Fund, formed a "steering" committee made up of sheep industry stakeholders to set the parameters of the project. The steering committee was represented by: three purebred producers - including one "low risk" purebred producer, two commercial producers, one feedlot operator, two government veterinarians, a government researcher, one food processor, and a member of the Alberta Cattlemen's Commission.

The goals of the program as determined by the Steering Committee were to:

- Meet producer's needs (i.e. by saving producers money by reducing losses related to health problems)
- Be acceptable to international health and trade requirements
- Be voluntary and simple to use
- Give Western Canada a trade advantage through promoting a superior product
- Blend in with an active scrapie surveillance program

The list of diseases to be targeted were: Johne's, Maedi Visna, Caseous Lymphadenitis, Chlamydia psittaci abortion, Vibronic abortion, Foot rot, external and internal parasites, Brucellosis (epididymitis of Rams), and Scrapie. We have also included information on managing Malignant Catarrhal Fever, since this can be a disease of concern for mixed operations (and neighbors) raising cattle, bison, elk, and deer. Also, information on ORF is included for good management purposes.

Three contractors including a manager/editor and two veterinarians (who were also sheep producers), in

consultation with the Steering Committee then developed the details of the program. To prevent "reinventing the wheel", the first step involved assessing existing flock health programs in other jurisdictions, comparing their good and bad points, and incorporating the recommendations of the steering committee. The Western Canadian Flock Health Program (formerly the Assured Quality Flock Health program) represents a package that is practical for producers to use while incorporating some of the best concepts and practices in animal health.

Why Join?

In deciding whether or not to join this program, it is important to understand what the program can do for you. There are basically three things that you can do with any flock health program.

- First, you can use it to improve the overall health of your flock to make it more productive.
- Secondly, breeders can use the program as a marketing tool to sell sheep at potentially higher prices.
- And thirdly, buyers may use this program to help them decide which flocks to buy from.

The Western Canadian Flock Health Program was **not** designed to monitor flocks (this was done to keep costs down). In fact, it would be quite easy for a producer to “stretch the truth” regarding the health of their flock. For this reason, the Flock Health Program is not a reliable tool by itself as insurance for buyers – you still need to consider the reputation of the person you are buying from.

Many producers today already do a very good job managing the health of their flock, and they have built a solid reputation for their efforts. The main advantage for these producers to join the Western Canadian Flock Health Program, is that the program is sure to become recognized for providing a standard of animal health care in the industry – both locally and out of province. By joining the program, all other producers, feedlots, processing plants, and buyers will know that your operation meets this standard. Several other provinces already have, or soon will have, flock health programs in place, so joining the Western Canadian Flock Health Program will make it easier to sell animals out of province. Also, being on this program will make it easier to access grazing reserves in future years.

Program Structure

There are four “bio-security” levels that flocks can be certified at. These levels reflect the number and quality of management procedures you choose to keep your flock healthy. The bio-security levels are also an indication of how open your flock is to outside sources of infection.

- A bio-security status “BMP” flock follows basic, good management protocols.
- A status “B” flock would follow more detailed protocols designed to bring diseases in the flock under control.
- Lastly, a status “A” flock would follow very detailed and bio-secure protocols – designed to eliminate diseases and minimize sources of infection.
- Once a Level A flock has achieved a “minimal” risk for all diseases this program targets, it is categorized as Level AA, the top level attainable.

The chosen bio-security level – BMP, B, A, AA - is not necessarily related to the level of disease in a flock. Your flock’s risk of disease and disease levels are determined separately – based on flock history, testing, and bio-security protocols.

The following pages outline the requirements of the Western Canadian Flock Health Program. Please note that each level builds on the last, so that in most cases, “higher level” flocks will follow the protocols of the

lower levels as well.

Note1: For forestry grazing certified flocks please follow the Forestry Protocol in Appendix 3. These flocks will then be classified as Level B Forestry.

Note2: A handy overview describing the veterinarian visit is included in Appendix 11 - Veterinarian information.

Note 3: Any flock at Biosecurity Levels other than BMP must have annual inspections for the first 5 consecutive years of enrollment. Then the flock may move to certification inspections every other year as long as the Biosecurity Level is not changed. If you change the flock to a higher Biosecurity Level you must certify annually for a minimum of 2 consecutive years.

For example: A flock has been enrolled in the program at Level B for 4 years. On the 5th year the producer decides to move to Level A. The flock must be inspected for 2 consecutive years as an A flock before every other year inspections can begin. This means a total of 6 consecutive inspections for the flock.

For example: A flock has been at a Level B for 7 years, the first 5 inspections done annually, then alternate years for the 6th inspection. The producer decides to move to a Level A flock. The flock must be certified at Level A for 2 consecutive years before it can return to every other year inspections.

Note 4: Level AA certification requires only minimal changes in Biosecurity management so it can be achieved as before, after 5 years of minimal risk, at a Level A without additional inspection visits.

For questions on the flock health program please contact,

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SECTION 1: PROTOCOLS

Many producers are using the information in the WCFHP binder to improve the health and productivity of their flocks, without having a full veterinary certification of the flock. This is an excellent way to make use of the health and management information provided in the binder.

The ASWC Flock Health Committee would like to give recognition to the producers utilizing the binder in this way. Therefore there will be a new level on the Western Canadian Flock Health Program beginning 2006. "Level BMP", which stands for "Best Management Practices". This level will incorporate the requirements of the existing Level C, but no vet inspection will be required. This will allow producers to gain recognition for implementing the recommended Best Management Practices in the flock health binder.

Bio-security Level BMP (Best Management Practices)

Level BMP Protocols

- 1) There must be a valid Veterinary/Client Relationship (VCR) in place. The VCR is a legal requirement of all practicing veterinarians in Alberta, and it governs their ability to prescribe and sell drugs to producers. (For details on the VCR please refer to Appendix 8, pg 71)

This will help to ensure the following:

- proper use of drugs and vaccines
 - proper storage of drugs and vaccines
 - appropriate withdrawal times for off-label use
 - written instructions by the veterinarian are preferred
 - the most up to date veterinary information
- 2) An accurate and permanent animal identification and record keeping system must be in place. This is a basic requirement to ensure that animals can be individually tracked throughout their life on your farm. Systems will include:
 - Individual tags must be present on all sheep - unless they will be sold for slaughter in less than 180 days. (Note: individual tagging is still recommended for your own record keeping)
 - Individual treatment records must be kept for each breeding animal.
 - Group records are acceptable for group treatments (i.e. in the case of feedlot pens).
 - Recommend to keep invoices for medications to better account for what is done in the flock.
 - 3) An appropriate parasite control program must be in place to manage both internal and external parasites. This program should be designed and monitored by your flock veterinarian to ensure effective control.
 - 4) Lameness should have their feet trimmed, be evaluated for the presence of Foot Rot, and be treated as necessary (See Disease Section for procedure). Note: If Foot Rot is present, the flock shall be under

voluntary quarantine (please see page 17 for details).

- 5) All animals that are culled because they have (or are suspected to have) one of the diseases identified by this program are to be sold for slaughter or killed – not sold as breeding stock. This program requires producers to specify that the animal is to be sold for slaughter on the manifest and be clearly identified as a cull.
- 6) Rams should undergo a pre-breeding assessment prior to the start of the breeding season to help identify Brucellosis. Note: The producer can give this exam. (Please see Brucellosis in the Disease section).
- 7) A Clostridial Vaccine (i.e. 8-way with tetanus) must be routinely used as per veterinarian directions.

Note: Alberta law requires that dead animals be disposed of in accordance with the Disposal of Dead Animals regulations. Please see Appendix 9, pg 72, for a copy of these regulations.

Bio-security Level B (Disease Control)

Level B is designed for commercial lamb producers and sellers of breeding stock.

Level B Protocols

- 1) All Level BMP protocols.
- 2) An accurate and permanent animal identification and record keeping system must be in place. This is a basic requirement to ensure that animals can be individually tracked, and performance data recorded, throughout their life on your farm. Systems will include:
 - Individual tags must be present on all sheep - unless they will be sold for slaughter in less than 180 days. (Note: individual tagging is still recommended for your own record keeping)
 - Individual records must be kept for each breeding animal – including maternal parental lineage, offspring, and treatment history. (Maternal lineage records & offspring not a requirement for Level B Forestry)
 - Group records are acceptable for group treatments (i.e. in the case of feedlot pens).
 - Recommend to keep invoices for medications to better account for what is done in the flock.
- 3) Quarantine pen to isolate newly purchased animals prior to mixing with the rest of the flock. (See Appendix 4)
- 4) Animals returning from open shows or sales must be quarantined for 4 weeks as per quarantine protocol. (See Appendix 4)
- 5) Newly purchased animals must be quarantined for 4 weeks as per quarantine protocols -- except if purchased from AA, A or B flocks with a risk of disease at or lower than the level of your flock.
- 6) Animals with clinical CL must be isolated (or preferably culled) and treated to minimize the spread of infection. (See Disease Section)
- 7) Flock vaccination schedule to be followed against Caseous Lymphadenitis CL (See Disease Section).
- 8) Abortion protocol followed, and Abortion Incidence Form filled out yearly (See Contagious Abortions in the Disease section and Appendix 9 for the Abortion Incidence Form).
- 9) Rams found to have evidence of orchitis (testicular infection) during the routine "Pre-breeding Assessment" must be examined by a veterinarian and possibly tested for Brucellosis, or culled.

Note: If you are considering sending your flock for BC forestry grazing, see Appendix 3 for required protocols.

Bio-security Level A (Disease Eradication)

Level A is designed for breeders who are trying to sell very high health animals. There is a significant increase in required bio-security measures to attain this level – including restricted entry to the flock, testing, and performing autopsies on all sheep older than two years of age that die from an "unexplained" cause and, at the discretion of the flock veterinarian, for "thin ewe syndrome" culls. This will help to ensure that producers buying from these flocks are getting healthy sheep with minimal risk of purchasing an animal with a disease.

If you are considering moving to this level, your costs may be initially very high, especially if you presently have a lot of “thin ewe” culls and dead animals to deal with in your flock. Since Level A may require you to perform many autopsies, you may want to first reduce the level of disease in your flock by using the following procedure before trying to achieve full Level A status.

- For the first few years, stay at Level B but put in place all management procedures recommended for Level A except for the following;
 - i. Do not perform autopsies unless required for Level B or unless recommended by your flock veterinarian.
 - ii. Instead assume that all “thin ewes” and dead animals have the disease(s) you suspect and manage your flock accordingly as per recommendations in the Disease Section.
 - iii. Once the number of thin ewe cases and suspect animals is minimal implement the remaining Level A protocols.

Level A Protocols

- 1) All level B Protocols – vaccination for CL may be eliminated at this level if the flock Risk Level is at low or minimal for CL.
- 2) An accurate and permanent animal identification and record keeping system must be in place. This is a basic requirement to ensure that animals can be individually tracked, and performance data recorded, throughout their life on your farm. Systems will include:
 - Individual tags must be present on all sheep - unless they will be sold for slaughter in less than 180 days. (Note: individual tagging is still recommended for your own record keeping)
 - Individual records must be kept for each breeding animal – including parental lineage, offspring, blood testing, and treatment history.
 - Group records are acceptable for group treatments (i.e. in the case of feedlot pens).
 - Recommend to keep invoices for medications to better account for what is done in the flock.
- 3) Annual test/cull for OPP (Maedi Visna) (See Disease Section)
 - 2 annual full flock negative tests of all animals over 1 year of age
 - PLUS 3 consecutive years of negative test results in 25% of all animals over 1 year of age, or a minimum of 30 head per flock per year.
 - After the flock has had negative test results for 5 consecutive years, annual testing is reduced to 25% of all animals over 2 years of age.
 - After the flock has had negative test results for 5 consecutive years, testing will reduce to 25% of all animals over 2 years of age every other year with a minimum number of 30 and a maximum number of 100 head per test year.
 - If at anytime a positive test is confirmed, the flock must revert to full flock testing of all animals

- over 1 year and start the process again.
- In the case of suspect test results you may wish to consult with your veterinarian on re-testing.
 - **Purchased animals MUST** be included in the next flock test that they are chronologically eligible for regardless of previous flock status or testing protocol and as per quarantine protocols,
 - **Veterinarian recommendation:** ELISA test is also recommended (See Appendix 4)
- 4) Must have cull pen where sick or high-risk animals are housed. Once in this pen animals are to be sold to slaughter and must not return to the flock.
 - 5) Abortion protocol followed (See Disease Section).
 - 6) Animals purchased from a flock(s) with a Biosecurity level lower than yours or of unknown disease status must be quarantined for 8 weeks.
 - 7) Animals returning from open shows/sales must be quarantined for 8 weeks.
 - 8) All quarantined animals from lower status flocks must be:
 - Tested for OPP (Maedi Visna) at the end of the period.
 - Palpated for CL abscesses.
 - Feet trimmed and soaked prior to entry to the flock.
 - Treatment with antibiotics should be under vet consultation.
 - Checked and/or treated for the presence of internal and external parasites.
 - Rams tested for Brucellosis unless virgin animals.
 - Vaccinated for CL if part of flock protocol.
 - De-wormed
 - 9) Animals with suspected CL (i.e. abscesses) must be isolated in cull pen and removed from the flock (sold to slaughter, submitted for the Scrapie program etc.). If you do not want to cull, you must isolate the suspect animal and have your veterinarian culture the abscess to prove it is not CL.
 - 10) A postmortem exam is required for all sheep older than two years of age that die from an "unexplained" cause and, at the discretion of the flock veterinarian, for "thin ewe syndrome" culls.
 - 11) New needles must be used for each animal for vaccinating, de-worming, or medicating. Once the flock is at a minimal risk for OPP, needles may be used for multiple animals.
 - 12) Visitors from other sheep farms must wear your farm's footwear when entering the animal area.
 - 13) No direct mixing of sheep with cattle or goats unless appropriate testing protocols are in place for those species. (See Appendix 5, pg 67).

14) Bio-secure shearing practices including:

- Provide moccasins and shearing board for the shearer.
- Shearer's equipment must be disinfected before use (Chlorhexidine, Virkon).
- Shearer must wear clothes that have been washed after being exposed to other flocks.
- Shearing wounds must be disinfected immediately (i.e. iodine spray)
- Young stock should be shorn first, before older animals, to help prevent the spread of disease.

15) Management procedures for the control of Johne's Disease must be followed. (See Disease section)

16) Johne's Disease testing requirements:

- Testing for Johne's Disease is on a voluntary basis for Level A, and AA flocks only. Flocks enrolled in the Johne's portion of the program will receive **Level A – JD Eradication** on the Flock Assessment Form and Certificate of Achievement. ELISA test (Paracheck brand recommended) is required.
- 2 annual full flock negative tests of all animals over 2 years of age
- PLUS 3 consecutive years negative of testing 25% of all animals over 2 years of age, or a minimum of 30 head per year.
- When the flock has been negative for 5 consecutive years, testing will decrease to 25% of all animals over 2 years of age every other year, with a minimum number of 30 head, and a maximum number required of 100 head per test year.
- If at anytime a positive test is confirmed, the flock must revert to full flock testing of all animals over 2 years old and start on the process again.
- **Purchased animals MUST** be included in the next flock test that they are chronologically eligible for regardless of previous flock status or testing protocol.

Bio-security Level AA (Minimum Disease Risk Flock)

This level is the goal for Status A breeders. Once your flock has reached a minimal risk level for all diseases for 5 consecutive years, the flock can be assigned Bio-security Level AA. This is the top level attainable and will probably only be economically viable for breeders of purebred stock charging premium prices for their animals.

Level AA Protocols

- 1) All level-A protocols.
- 2) Flock must have 5 consecutive years on this program at level A, with minimum risk of disease for all target diseases.
- 3) Animals purchased from AA or equivalent flocks only.
- 4) Use of AI and ET as much as possible.
- 5) No return of animals from open shows or sales.
- 6) All visitors wear farm footwear and coveralls.

If at anytime the risk level (RL) increases above “minimal” for any disease, the flock’s assigned status level will revert to Bio-security Level A.

Advertising your Flock on the WCFHP

Being a member of the Western Canadian Flock Health Program has many advantages for participating producers. One of the main benefits is to advertise that you are taking appropriate steps to control, and/or eradicate the target diseases from your flock. This is a powerful marketing tool in today's industry with the current move towards "high health" status. The WCFHP program allows prospective purchasers to see an objective evaluation of your flock's health status and the biosecurity measures you have in place. A flock that implements blood testing, and culls positives is at a lower risk than a flock that does not test at all.

It is important to remember however that no flock can claim to be "disease-free". It does not matter if it is your first year on the program, or if you have been full flock testing for many years. Your veterinarian cannot sign off to your flock being disease-free. The lowest risk level allowed for in the program for any given disease is "minimal". This is because it is virtually impossible to guarantee that an animal is disease free. Some appropriate terms to use in farm advertising are "minimal disease" (if you have a minimal risk level for all target diseases) and "test negative" or that your flock is under a "test and cull" program. Please avoid the use of the term "disease-free", as it is incorrect and misleading.

Ileana Wenger DVM
Consultant, WCFHP

SECTION 2: DETERMINING RISK LEVELS FOR DISEASE

Clinical Prevalence

Clinical Prevalence (CP) of a disease is an objective assessment of the visible symptoms and indicators of disease in a flock. This will paint a fairly accurate picture of the level and severity of disease present in the flock. The greater the length of time since a confirmed clinical case, the less risk there is of the disease being present in the population.

The program's Flock Assessment Form breaks the CP of disease down into four categories, specifically: none, low, moderate, and high. Also, CP is defined for each of the diseases of concern in this program. Clinical Prevalence is then taken into account when determining the risk level for a certain disease in an individual flock.

Depending on the Bio-Security Level of the flock, this program makes use of some or all of the following types of diagnosis to determine Clinical Prevalence:

- Thin Ewe Syndrome cases – Includes all undiagnosed “wasting” illness.
- Clinical cases - A pattern of symptoms consistent with and indicating the presence of the disease in question.
- Laboratory Diagnosis – Includes serology (blood) testing, microscopic examination of tissues, and/or culturing the organism.
- Autopsy – The animal is dissected (by a certified veterinarian) to determine the presence of disease. Samples will be collected for laboratory diagnosis as necessary.

Risk Level

A flock's “Risk Level” (RL) allows a potential buyer to make an assessment of the chance, or risk of introducing a disease into their flock with the purchase of new animals. Risk Level is determined by objectively assessing both the CP and the Bio-security Level for the flock. It will be up to the buyer to compare a flock's Risk Level with their own flock and to determine whether or not there is a significant risk. A moderate risk level for a certain disease may be of no consequence to a flock that is also at moderate risk for that disease, or one that already has the disease in question. Conversely, the owner of a flock that is at a low risk for a specific disease may be better off avoiding purchasing animals with a higher risk level for that specific disease than their own flock.

The categories for RL are minimal, low, moderate and high. It is not considered possible to ever achieve a “no risk” level for these diseases. Also, it takes time to lower the CP and RL of flocks, therefore all flocks will be scored relatively high to begin with when first starting on the program. We expect these levels will decrease quickly with time, and with flock owners adhering to the WCFHP protocols. Also, at times a veterinarian may override these categories and assign a different CP or RL. An example of this would be buying a sheep that developed an abscess while still in quarantine on the farm. This would not necessarily affect the whole flock's status. These cases should be documented on paper to show to prospective buyers.

Johne's Disease

Clinical Prevalence

- None: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 3 years.
- Low: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.
- Moderate: The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.
- High: The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the last year.

Animals that clinically show signs consistent with Johne's (i.e. chronic weight loss, terminal diarrhea etc.) or are sero-positive will be considered to be infected with Johne's unless laboratory tests prove otherwise. It may be therefore, in the producer's interest to seek laboratory diagnosis in these cases.

Risk Level

- Minimal: - Clinical prevalence @ none and,
 - Level A flock (or AA) for at least 2 years.
- Low: - Clinical prevalence @ low and,
 - Level A flock
 Minimal if test and cull is in place for above criteria
- Moderate: - Clinical prevalence @ moderate and,
 - Level A flock or,
 - Level B flock for at least 1 year.
 Low if test and cull is in place for above criteria
- High: - Clinical prevalence @ high or,
 - Level B Flock for under one year
 Moderate if test and cull is in place for above criteria

Because of the nature of Johne's Disease (delayed onset of clinical signs), it will be difficult to eradicate the disease from your flock. This is why it will take a relatively long period of time to achieve a low risk level once the disease has been diagnosed. As diagnostic technology improves and becomes more accurate, these regulations will be updated.

Ovine Progressive Pneumonia (Maedi Visna)

Clinical Prevalence

- None: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 3 years.
- Low: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.
- Moderate: The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.
- High: The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the last year.

Animals that exhibit clinical signs consistent with Maedi Visna (i.e. chronic weight loss, chronic cough, hard-bag mastitis) will be considered to be infected with the Maedi Visna virus unless laboratory diagnosis proves otherwise. It maybe therefore in the producer’s interest to seek laboratory diagnosis in these cases.

Risk Levels

- Minimal: - Clinical prevalence @ none and,
- Level A (or AA) flock for at least 2 years.
- Low: - Clinical prevalence @ low and,
- Level A flock or,
- Level B flock with test and cull program in place for 2 years.
- Moderate: - Clinical prevalence @ moderate
- Highest level attainable by Level B Flock except as above
- High: - Clinical prevalence @ high

Caseous Lymphadenitis (CL)

Clinical Prevalence

- None: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis within the past 3 years and no positive autopsies within the past 4 years.
- Low: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis within the past 2 years, and no positive autopsies within the past 3 years.
- Moderate: No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis with the past year, and no positive autopsies within the past 2 years.
- High: The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.

Animals that exhibit clinical signs consistent with CL infection (i.e. chronic weight loss, chronic cough, superficial lymph node abscess), will be considered to be affected with the CL organism unless proven otherwise by PM or laboratory diagnosis. (Refer to the section on Diseases for more details.) Positive autopsies can also include slaughterhouse reports of condemnation due to CL.

Risk Levels

- Minimal: - Clinical prevalence @ none and,
- Level A or (AA) flock or,
- Level B flock with isolation/cull program for CL in place.
- Low: - Clinical prevalence @ low and,
- Level A flock or,
- Level B flock with an isolation/cull program for CL
- Moderate: - Clinical prevalence @ moderate
- Highest level attainable by Level B except as above
- High: - Clinical prevalence @ high

Contagious Abortions

This will include *Chlamydia*, *Campylobacter*, *Brucella*, and other organisms identified as contagious by laboratory analysis.

Clinical Prevalence

Note: Please refer to the flock's Abortion Incidence Report (Appendix 9) to complete this section

- None: No clinical cases, and/or laboratory diagnosed contagious abortions in the past 3 years.
- Low: No clinical cases, and/or laboratory diagnosed contagious abortions in the past 2 years.
- Moderate: A clinical case, and/or laboratory diagnosed contagious abortion(s) in the past 2 years.
- High: A clinical case, and/or laboratory diagnosed contagious abortion(s) in past year.

Ewes that abort will be considered to have suffered a clinical case of contagious abortion unless a veterinarian has determined with reasonable confidence that other factors caused the abortion(s).

For Level A and AA flocks - Post-mortem or laboratory diagnosis is preferred.

Risk Level

- Minimal: - Clinical prevalence @ None and,
- Level A or (AA) flock
- Low: - Clinical prevalence @ Low and,
- Level A or B flock
- Moderate: - Clinical prevalence @ Moderate
- High: - Clinical prevalence @ High

Foot Rot

Contagious Ovine Foot Rot is an exceptionally contagious and devastating disease – so great care should be taken not to introduce it into your flock. Prospective buyers should pay close attention to the Foot Rot Risk Level of a flock.

Clinical Prevalence

- None: Three or more years free of foot rot, and no evidence of foot rot at the time of flock inspection.
- Low: Two years free of foot rot, and no evidence of foot rot at the time of flock inspection.
- Moderate: One year free of foot rot, and no evidence of foot rot at the time of inspection.
- High: Clinical case(s) within the past year.

Risk Level

- Minimal: - Clinical prevalence @ none and,
 - Level AA, A, or B flock
- Low: - Clinical prevalence @ low and,
 - Level A or B flock
- Moderate: - Clinical prevalence @ moderate and,
 - Level A or B flock
- High: - Clinical prevalence @ high

Note: There is no longer a provincial government quarantine for foot rot. A flock with active Foot Rot is to be under voluntary quarantine and producers must not sell any animals except directly to an abattoir for immediate slaughter. The quarantine period shall not be lifted until certified clear of foot rot by a veterinarian.

(Also see Appendix 4).

Brucellosis

All rams should be examined and their testicles palpated yearly for signs of infection (this can be done by the producer). Any ram that shows evidence of orchitis or epididymitis should be further tested, (serology, culture) for Brucellosis. Any lab confirmation of Brucellosis will be accepted (i.e. abortion, swab, serology etc.).

Clinical Prevalence

- None: No clinical cases and/or laboratory diagnosis within the past 2 years.
- Low: No clinical cases, and/or laboratory diagnosis within the past year.
- High: Clinical cases and/or laboratory confirmation within the last year.

Any animal showing clinical signs consistent with Brucellosis (epididymitis, orchitis etc), will be considered to be infected with *Brucella* unless proven otherwise by lab diagnosis. Abortions caused by *Brucella sp.* will be dealt with under the “Contagious Abortions” section.

Risk Level

- Minimal: - Clinical prevalence @ none and,
 - Level AA, A or B flock
- Low: - Clinical prevalence @ low and,
 - Level A or B flock
- Moderate: - Clinical prevalence @ low and
- High: - Clinical prevalence @ high

Scrapie

Scrapie is a disease the sheep industry is taking extreme measures to control due to its perceived relationship to BSE in cattle, and CJD in humans. The goal of the WCFHP is to be consistent with the Federal Government Scrapie Control Program.

Clinical Prevalence

- None: No clinical cases and/or laboratory diagnosis within the past 5 years.
- Moderate: Flock is under Federal surveillance for Scrapie
- High: Laboratory diagnosis within the past 5 years, and flock is quarantined.

Risk Level

- Minimal: - Clinical prevalence @ none, and,
 - Level AA, A, or B flocks
- Low - Clinical prevalence @ none
- Moderate - Clinical prevalence @ moderate
- High - Clinical prevalence @ high

External and Internal Parasites

The annual WCFHP inspection will include an examination for external parasites. External parasites include Keds, lice, and mites – all of which are relatively easy to treat and eradicate from a flock. Internal parasites include coccidia and stomach worms.

Clinical Prevalence

- None: No evidence of external parasites at last WCFHP inspection.
- High: Presence of external parasites at last WCFHP inspection.

Risk Levels

- Minimal: - Clinical prevalence @ none and,
 - Level AA, A, or B flock and,
 - Adequate parasite control program in place for at least 1 year
- Moderate: - Clinical prevalence @ none
- High: - Clinical prevalence @ high

Internal parasites are difficult to control since all sheep, no matter how clean the flock, are susceptible. The biggest concern would be bringing in a resistant parasite when buying new animals or returning from open shows and spreading it to your sheep. Therefore quarantine protocols include de-worming and checking for external parasites prior to mixing.

Clinical Prevalence

- Determining Clinical Prevalence can only be accomplished by fecal examinations. Since this cost would be too high for the benefit, Clinical Prevalence for internal parasites will not be assessed. However it is highly recommended that producers work with their flock veterinarian to develop a control program for parasites that includes routine fecal analysis.

Risk Level

- Minimal: - Adequate and current financial invoices on hand for the control of internal parasites.
- High: - No adequate and current financial invoices on hand for the control of internal parasites.

SECTION 3: DESCRIPTIONS OF DISEASES

Johne's Disease

Introduction

Johne's Disease is characterized by chronic weight loss and occasionally, terminal diarrhea in sheep. Economic losses are due to lower milk production and early culling with decreased value for culls. It has been estimated at \$90/clinical case depending on the type of animal and production system. There is no cure or vaccination for Johne's Disease and once an animal develops clinical signs of it, the animal will eventually die.

Cause

Johne's Disease is caused by a bacteria called *Mycobacterium paratuberculosis*. It has several strains which can infect many ruminant species. Sheep can become infected from cattle, but the reverse is unusual. Recently, there have been some links made between Johne's Disease and Crohne's Disease in humans, but this has not been proven.

Young lambs are the most susceptible and become infected through contaminated feces from the ewe. As well, in heavily infected ewes, the organism can cross the placenta and lambs will be born infected.

Signs of Infection

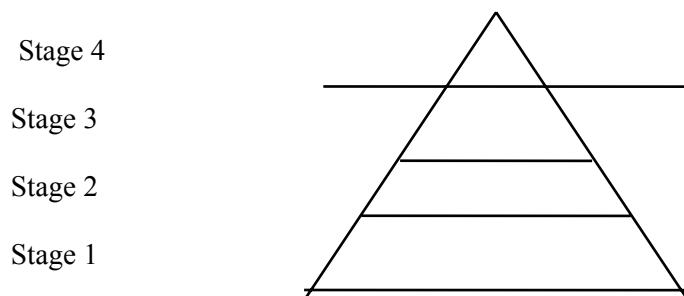
The clinical signs of Johne's – chronic weight loss and occasionally terminal diarrhea - are not seen for years after infection due to the very long incubation period.

It can take 2-7 years for clinical signs to appear, depending on the age of the animal when it was infected.

Diagnosis

Diagnosis is usually first made at an autopsy of a "thin ewe syndrome" sheep. Blood tests for Johne's are relatively inaccurate but can be used as a flock screening tool. Tools that will detect specific DNA for the bacteria in feces are being developed and are available at some labs.

By the time clinical signs appear, there is often widespread infection in the flock. This is known as the "iceberg" effect.



Stage 1 is the incubation stage and is undetectable by testing. Stage 2 is the sub-clinical stage where animals appear healthy but are shedding the organism in their feces. Blood testing detects less than 20% of these animals. Many sheep will never progress beyond this stage; however, they are still shedding into your flock but are undetectable to cull. Stage 3 is the early clinical stage where animals have a good appetite but

are starting to lose weight. Blood testing detects 50-80% of these animals. Stage 4 is the advanced clinical stage where large numbers of organisms are shed in the feces. Affected animals usually survive less than 1 month at this point. Blood testing detects 80-95% of these animals.

Control

The best way to prevent the disease is not to purchase infected animals. This can be very difficult due to the lack of accurate tests to identify clean sheep. Clinical signs may not appear for 5 or more years after introduction of the disease, so identifying the source becomes difficult.

Recommendations for controlling Johne's include:

- Do post mortems of all "thin ewe syndrome" culls. If the result is positive, cull all offspring of the ewe. If the result is negative, maintain the practice of post mortems.
- Decrease contamination of the lambs' environment. Crutch or shear ewes prior to lambing. Provide clean, dry pens for each lambing. Prevent fecal contamination of feed and water.
- Spread manure on cultivated land only, and only spread properly composted manure on pasture. Regularly remove manure from pens.
- Follow protocols for mixing sheep with cattle or goats. (See Appendix 5).
- Prevent access to manure piles and runoff.

Recommendations for eradicating Johne's Disease include:

- Control the disease as above.

As diagnostic technology improves, we will be updating these protocols to improve efficiency.

Ovine Progressive Pneumonia (Maedi Visna)

Introduction

Ovine Progressive Pneumonia (also known as OPP and Maedi-Visna) is a viral disease that affects sheep of all breeds. The virus has a worldwide distribution with the exception of Australia and New Zealand, and is very widespread in North America. OPP is closely related to the Caprine Arthritis Encephalitis virus found in goats – which can lead to some problems with eradication schemes when sheep are housed with goats. There is no known treatment or vaccine for this disease.

Production losses due to sub-clinical infection are the biggest economic impact of OPP. Infected sheep appear to be healthy, but they fail to thrive or raise lambs as they should, and they carry the virus spreading it to flock mates and offspring.

Several studies of the disease have shown that the most economically important problems associated with OPP are decreased milk production leading to poor lamb growth and early culling of ewes. Other effects of OPP in a flock are lower conception rates, lower birth weights and lower weaning weights. An American study estimated a loss of \$5.70 to \$7.50 US per ewe lambing based on weaned lamb weights from OPP tested negative versus OPP tested positive ewes. These results indicate that lambs from OPP positive ewes do not grow as well as lambs from OPP negative ewes, even though the ewes may *appear* perfectly healthy.

Cause

The most common form of transmission of the virus is from infected mother to nursing lambs via the colostrum and milk. Transmission to the lamb while still in the uterus is considered possible although rare. Adult to adult transmission does occur, especially in close confinement where respiratory secretions from coughing are easily contacted by another sheep. Fence-line contact and shared feed and water containers have been shown to allow for adult transmission of the virus. Using the same needle on many sheep when vaccinating or medicating is also a potential means of transmitting the virus via blood. It is considered possible to transmit venereally at breeding, as it can be potentially shed in the semen of infected rams.

The virus has a very long incubation period that can be up to 3 years. This means that a lamb exposed to the virus while suckling may not become infected with the virus for several years. To further complicate matters, an infected animal may not show clinical signs for several years. This makes detection of potentially infected animals difficult. Once infected, the virus will persist for the lifetime of the animal, and once clinical signs appear the disease is always fatal.

Signs of Infection

Most infected sheep never show clinical signs of the disease. Symptoms that you may see include exercise intolerance, labored breathing, coughing, weight loss, decreased milk production due to “hard bag”, arthritis, occasionally staggering and paralysis. Infected sheep are also more likely to succumb to other illnesses because the virus causes a suppression of the immune system.

Once a sheep is infected with the virus, that animal stays infected for its lifetime and serves as a carrier even in the presence of high levels of circulating antibodies. Note: 50% of OPP- sheep penned with OPP+ sheep were positive on blood tests within 13 months of exposure.

Diagnosis

Diagnosis of infection is made by identifying either the virus or antibodies to the virus in the blood of the animal. Control of OPP can be difficult because of the prolonged incubation period before the presence of the virus can be detected by a blood sample.

The most commonly used live-animal test to identify virus-infected animals is the Agar Gel Immunodiffusion test or AGID. It detects circulating antibodies to the virus. Since lambs may have colostrally-derived antibody, they should not be tested until they are at least 12 months old. Another test, the Enzyme Linked Immunosorbant Assay or ELISA test is more sensitive than the AGID test. The blood tests for OPP are relatively accurate, and can be used effectively in eradicating the disease.

Control

Currently, there is no effective treatment or vaccine for OPP; however, the OPP virus can be eradicated from flocks by either of two methods: testing and culling or separating lambs from ewes at birth before they nurse or are licked by the ewe.

An annual test and cull program requires that all sheep older than 1 year of age be blood tested, and all positive sheep culled to slaughter. All offspring of positive sheep must also be culled, whether they tested positive or not. This procedure must be repeated every 12 months until 2 consecutive annual whole-flock negative tests have been achieved. Then, only a percentage of the flock would need to be tested on an annual basis. Recommended procedures are as follows:

- Annual serological test of all sheep older than 1 year of age
- All positive animals are culled within 14 days or isolated and culled when possible.
- After 2 successive negative whole flock tests, a producer may begin percentage testing a statistically significant sample of the flock as long as new animals are not purchased from a flock with a moderate or high risk level.
- Offspring of ewes that test positive for OPP are also likely to be infected because of transmission routes and long incubation periods for this disease. Offspring should either be culled directly or they can remain in the flock as long as they are taken for slaughter by 180 days of age.
- Maintaining a closed flock will also decrease the amount of testing that would be required – it also minimizes the chance of introducing the disease.
- After two successive whole flock negative tests, 25% or 30 animals (which ever is greater) of the flock needs to be tested on an annual basis.

In high prevalence flocks where culling of all positive adults is not economically viable, the lambs may be artificially raised from birth and monitored for OPP status. They must be removed from their mothers prior to licking or nursing and reared in isolation. This method requires 24-hour lambing supervision in order to be successful. Lambs should be fed only pasteurized bovine or commercial colostrum and milk

Clean and infected animals would have to be managed as two distinct and separate flocks to prevent transmission by direct contact.

Another way to control the disease is to cull the existing flock and repopulate with tested clean sheep. The OPP virus will not survive outside the sheep for long so this is a very effective (although expensive) method of eradication.

It is important to remember that sheep exposed to goats that have Caprine Arthritis Encephalitis (CAE is very common in the goat population) may give a false positive result to the OPP blood test. Therefore goats must follow the same protocol for CAE eradication as your sheep do for OPP eradication

Caseous Lymphadenitis

Introduction

Caseous Lymphadenitis (CL) is a common and very contagious disease of the lymph nodes and internal organs of sheep. It is most commonly identified by abscessed lymph nodes on the head and neck of the animal. Abscessing of the internal organs (lungs, liver, & lymph nodes) commonly occurs, but this is difficult to detect. These abscesses are one of the major causes of carcass condemnation and carcass trim at slaughterhouses.

CL is another common cause of “thin ewe syndrome” which results in economic loss when the ewe dies. Other related losses can come from decreased productivity and increased culling rates. It becomes obvious how control and eventually eradication of CL in your flock will lead to higher productivity and better sales.

Cause

It is caused by the bacteria *Corynebacterium pseudotuberculosis*. Flock owners should be aware that the pus within CL abscesses is extremely contagious. It is estimated that a single abscess contains 50,000,000 bacteria – therefore the disease can become wide spread within your flock very quickly. The organism is also very resistant to extremes in the environment as the chart below shows.

Survival time of *C. pseudotuberculosis* in pus

Object	@ 25 degrees C.	@ 10 degrees C.
Wood	7 days	7 days
Feces	55 days	38 days
Straw	23 days	24 days
Soil	4-8 months	6-8 months
Tap Water	30 hours	48 hours

Transmission of the CL organism usually occurs from direct contact with pus from an animal with a ruptured abscess. Sheep with lung abscess shed organisms while coughing – these animals are also a major source of contamination. Shearing has been implicated as a major cause of the spread of CL, especially when abscesses are nicked. The bacteria can very easily enter shearing wounds, but it is also capable of invading intact skin. The close confinement of winter pens is also associated with a high rate of transmission of the disease. If an abscessed animal is introduced into a flock that has no history of CL, there will be a high incidence of abscesses in the flock in as little as 2-3 months.

Signs of Infection

The disease has a prolonged incubation period (months to years), so it is possible to buy an apparently healthy animal that develops abscesses at a later date. Abscesses usually occur around the head and neck, but can also occur at other sites.

Diagnosis

Sheep with external abscesses are easy to diagnose. Sheep that are apparently healthy, but have internal abscesses (especially in the lungs) are capable of transmitting the disease to flock-mates. It is detection of these animals that presents a challenge to an eradication program.

It is important to remember that not all abscesses on sheep are caused by CL, so check with your veterinarian for confirmation and/or culture the abscess.

Control

Prevention and control of this disease requires a combination of strategies.

- First, if you currently do not have CL in your flock, DO NOT bring it in by purchasing infected animals.
- Second, it is essential to reduce the contamination of the environment as much as possible.
- Third, vaccination programs are used to control disease in an infected flock when used in conjunction with treatment and/or cull protocols. Vaccination alone will have only a minimal effect on the incidence of this disease. A suggested vaccination schedule is as follows:
 - Replacement animals at 6, 10, and 14 weeks of age
 - Bred ewes at 1 month prior to lambing
 - Rams -- 2 initial doses 1 month apart
 - New stock -- 2 initial doses 1-month apart, then annual booster -- keep isolated until second dose given
 - A semi-annual booster should be administered in heavily infected flocks when the flock is brought in for winter housing. If CL is well controlled, then the schedule can be 8 and 12 weeks for replacements and annually for adults.
- Fourth, affected sheep should be culled from the flock if possible.
- Fifth, the requirement for CL vaccination may be waived if the certifying vet is satisfied that:
 - adequate flock history is known
 - no evidence of CL in flock at any time in vet client relationship
 - there are adequate biosecurity measures in place to prevent introduction of CL

Documentation to support this decision must be included in the veterinarian record of the certification visit.

Contagious Abortions

Introduction

All producers will experience an occasional abortion in their flock sooner or later. Unfortunately some of us will also experience an infectious abortion outbreak that can decimate a lamb crop and become an economic disaster. In some cases rates of abortions in a previously unexposed flock can reach levels of 30% or more.

The Flock Health Program is only concerned with contagious abortions. However any abortions that occur should be brought to the attention of your flock veterinarian for possible diagnosis.

Cause

There are many causes of abortion in our sheep flocks, ranging from idiopathic (no cause found), to highly contagious organisms such as *Chlamydia*. Ewes can abort because of rough handling in late pregnancy, rough shearers, dog attacks, travel in a vehicle, or over crowding at feeders, due to excessive pushing and fighting between the ewes. Contagious abortions on the other hand, are caused by *Campylobacter fetus*, *Chlamydia psittaci*, and *Brucella ovis* – as well as other organisms.

Campylobacter fetus is usually introduced into a flock through the purchase of infected animals, which shed the bacteria in their feces. This bacteria normally lives in the intestinal tract of many animals – it can also be harbored by carrion eating birds. If infected sheep are mixed with the flock during the last 2 months of gestation, abortions will generally start to occur within 2-3 weeks. Aborted fetuses and associated material are exceptionally contagious, and the lambing area quickly becomes contaminated for the rest of the ewes. Abortion levels of up to 70% have been reported. Once a ewe has aborted due to *Campylobacter fetus* she will generally remain immune for 3 years. However it is still good practice to cull a ewe that has aborted, because the ewe can potentially continue to shed the organism into the environment. Non-pregnant ewes exposed to the organism also develop good immunity.

The bacteria *Chlamydia psittaci* causes enzootic abortion in sheep. It is easily transmitted to other ruminants and can also cause abortions in women. Therefore extreme care should be taken when handling suspect cases and any aborted materials. Most ewes show no clinical signs until abortion occurs in the late stages of pregnancy. Some will give birth to weak or dead lambs. The associated tissues and fluids contain large numbers of infectious organisms and are the main source of contamination to the rest of the flock. It has recently been shown that once a ewe aborts from *C. psittaci*, she becomes a chronic shedder of the organism during subsequent estrus. Although affected ewes are capable of becoming pregnant in the next breeding season, there is evidence that the disease can be venereally transmitted. Affected ewes therefore, should be culled rather than risk spreading the disease via the breeding ram. Economic losses due to *C. psittaci* infection are primarily due to abortions and the birth of weak lambs with poor vitality. Persistent infection in the reproductive tract of ewes may also eventually decrease her productive breeding life, and lead to early culling.

Brucella ovis is a common cause of epididymitis in rams but can also cause abortion in ewes. It is venereally transmitted by carrier rams to ewes. Abortion levels of up to 35% have been reported, but stillbirths and weak lambs may also be seen. Ewes generally recover and usually do not become carrier animals in future years. Aborted materials are highly contagious.

Other organisms causing abortion can be identified by diagnostic laboratories, and while less common than *Chlamydia* and *Campylobacter*, they can be just as devastating to your flock. These can include *Coxiella brunetti*, *Toxoplasma gondii*, *Salmonella* spp., *Listeria monocytogenes*, *Brucella abortus*, and fungus. Your

flock veterinarian will help devise a control program if any of these causes are identified.

Signs of Infection

Aborted fetuses, afterbirth, and bloody discharge from the ewe may be seen. The ewe may be clinically ill but often seems to feel fine depending on the cause of the abortion. Infected ewes may also give birth to dead or weak lambs.

Diagnosis

The WCFHP requires a Veterinarian to complete an Abortion Incidence Report yearly for the annual flock inspection (levels AA, A, and B). This form is completed and signed by your veterinarian each lambing season -- even if no abortions occurred in that year. Your veterinarian should be informed of all abortions (as per the procedure below), and they will use their discretion as to whether lab analysis is required or not. This decision should be based on flock history, bio-security protocols, and management of the flock.

Every abortion that occurs should be considered infectious until proven otherwise, for the protection of the other ewes as well as the shepherds. **Many organisms that can cause abortions in sheep are also contagious to humans. For this reason, we strongly recommend that pregnant women not be involved with the flock during lambing, or if they must contact the sheep, to wear protective clothing and disposable gloves.**

When an abortion occurs, the following protocol should be followed:

First Abortion

- Assume a contagious cause
- Immediately isolate the ewe
- Collect a blood sample for freezing
- Collect the aborted material (*including as much of the placenta as possible*), and place in plastic bags and double wrap. Label all samples clearly with ewes ID, the date and freeze.
- Remove contaminated bedding and burn
- Wash hands, clothing and footwear
- Do not allow pregnant ewes into area if possible

Second Abortion:

- Repeat the procedure for the first abortion

Third Abortion:

- Call you Veterinarian. If he/she believes you may have a Contagious Abortion outbreak, follow the procedure below. Otherwise repeat the procedure above.
- Isolate this ewe as well.
- Collect the placenta and fetuses in plastic bags and label.
- Refrigerate or chill samples.
- Collect blood sample from all 3 ewes (will be able to test paired serum samples from the first two).
- Submit samples from all three abortions to a lab for analysis.

This procedure will give you the best chance of a diagnosis and therefore an appropriate treatment protocol before an abortion outbreak proceeds too far. If the third abortion does not occur, then destroy the previously collected samples by burning or burial.

Control

Any vaccination or treatment protocol should be developed with your flock veterinarian. It is an excellent practice to only mix new sheep with your flock prior to breeding and gestation to minimize the risk of introducing an abortion agent to your pregnant ewes.

Chlamydial abortion - Testing the flock for *Chlamydial psittaci* infection can be used as a flock-screening tool. However, since false positive reactions are possible due to an intestinal chlamydia (*C. pecorum*), we do not routinely recommend this procedure. There are currently no vaccines commercially available in Canada, although in the United States the vaccine Enzabort has been used extensively. Vaccination has the potential to decrease the level of abortion in a flock, but it does not appear to be effective in eliminating chronic infection in ewes. In fact, there is some evidence that vaccination may actually accelerate the development of problems in the reproductive tract and impair future pregnancies.

In other clinical tests, some flocks with endemic enzootic abortion had a decreased level of abortions when ewes were injected with long acting tetracycline (twice during pregnancy), but the results were inconsistent. The best time for injection seems to be 6-8 weeks prior to lambing, but this has not been experimentally proven. Feeding of tetracyclines during pregnancy may also help control abortions in flocks. Your flock veterinarian will be able to provide you with additional information. The efficacy of antibiotic treatments on “persistent” shedders in the flock is also not known. We would therefore recommend you cull any ewe that aborts unless lab diagnosis confirms it is not a contagious abortion.

Campylobacter Abortions - Vaccination can be used in flocks with an ongoing problem, and tetracyclines can be used to help control an outbreak.

Brucella Abortions - *Brucella* is transmissible to humans and can cause serious disease and abortions. Accurate screening for infected rams is difficult, so as a general practice, only virgin rams should be introduced into your flock. Rams should not be shared between flocks, nor should they be housed with rams from other flocks as ram to ram transmission can occur.

Foot Rot

Introduction

Foot rot is a contagious disease that infects the toes and hooves of sheep. It can lead to lameness and deformed feet.

Cause

Infectious foot rot is caused by infection with the bacteria *Dichelobacter nodus* in association with other bacteria. The bacteria survive for up to 2 weeks in the environment. Sheep that carry the disease introduce the infection to the rest of the flock and warm moist weather or wet areas (such as watering troughs) help spread the disease.

Signs of Infection

Initially, the area between the digits and the skin/hoof junction of the feet become infected. If not treated, the infection can become “deep”, leading to lameness and abscesses on the foot. Eventually, affected animals will either walk on their knees or refuse to stand. There may be a separation of the hoof from the underlying structures with a foul smell. Chronically affected animals may have deformed feet and may remain carriers.

Diagnosis

Diagnosis is made through examination of the hoof – usually when trimming. Swabs of "suspicious" feet can be sent to a lab for confirmation.

Control

Infection may regress and heal spontaneously if animals are exposed to warm, dry conditions, but some animals may retain the infection and act as a carrier of the bacteria in the next wet season.

Treatment involves the following steps:

- Do a thorough foot trim on the entire flock. Disinfect trimming shears between animals.
- Sort the flock into two groups: those with apparently sound healthy feet (the “exposed group”) and those that are lame, known to be infected, or have deformed feet (the “infected group”).
- Ideally, all animals in the infected group should be sent directly to slaughter. If this is not possible, isolate them and continue to treat until they can be sent to slaughter, or are confirmed free of foot rot.
- Foot bath the two groups with a 20% zinc sulphate solution, plus liquid laundry soap at one (1) cup (250 ml) to 30 gallons (135 liters) of solution according to the following schedule:

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Infected Group	1 hr foot soak X2	1 hr soak X2	1 hr soak X2	1 hr soak	1 hr soak	1 hr soak	1 hr soak	1 hr soak	1 hr soak
Exposed Group	1 hr soak X2	1 hr soak	1 hr soak						

Ensure that sheep stand in the bath for the full hour. As well, the zinc sulphate solution is poisonous, so make sure that the sheep do not drink it.

- After each treatment, the sheep should be turned out onto dry ground that has not had sheep on it for a minimum of two weeks.

Currently, vaccines for sheep foot rot will not eliminate the disease but they may provide protection from some of the symptoms. The use of a vaccine does not preclude the need to treat affected flocks with foot baths.

Guidelines for Spreading Zinc Sulphate Monohydrate Footbath Solution on Soil for Disposal
(Submitted by Alberta Agriculture – Animal Industry Division)

Assume

- ZnS04 is potentially toxic to crops at 500 – 700 lbs zinc/acre (D. Penney).
- Rates of 375 – 1450 lbs. zinc/acre have been applied without evidence of toxicity to plants (D. Penney).
- Safe to apply at 100 lbs. zinc/acre
- Solution weight approximately 12.5 lbs/gal
- ZnS04 . 1H20 = 35% zinc.

Calculations

- 20% solution – 12.5 lbs solution/gal X 20% = 2.5 lbs ZnS04 X 35% = 0.875 lbs Zn/gal
- 15% solution – 11.9 lbs solution/gal X 15% = 1.8 lbs ZnS04 X 35% = 0.623 lbs Zn/gal
- 10% solution – 11.6 lbs solution/gal X 10% = 1.1 lbs ZnS04 X 35% = 0.394 lbs Zn/gal

Application Rate

- 20% Solution – $\frac{100 \text{ lbs Zn/acre}}{0.875 \text{ lbs Zn/gal}}$ = 115 gals solution/acre
- 15% Solution – $\frac{100 \text{ lbs Zn/acre}}{0.623 \text{ lbs Zn/gal}}$ = 160 gals solution/acre
- 10% Solution – $\frac{100 \text{ lbs Zn/acre}}{0.394 \text{ lbs Zn/gal}}$ = 250 gals solution/acre

Note: Repeat applications should not be made for 5 to 10 years.

Brucellosis

Introduction

Brucellosis affects the reproductive organs of rams and causes abortion in pregnant ewes. *Brucella* is transmissible to humans and can cause serious disease and abortions.

Cause

Brucellosis is a contagious disease caused by bacteria of the *Brucella* group. *Brucella ovis* is a common cause of epididymitis in rams, but can also cause abortion in ewes. Rams may shed the bacteria in their semen, therefore *brucella* is venereally transmitted by carrier rams to ewes. Ram to ram transmission is also possible.

Signs of Infection

Examination of infected rams often reveals epididymitis. When infection becomes localized in the testicles or adjacent organs of the genital tract, the ram usually remains fertile, although fertility and libido may be reduced. Accurate screening for infected rams is difficult.

Diagnosis

Brucellosis can be detected through a "Visual Pre-Breeding Assessment". These examinations are usually done with the help of a veterinarian, and include the following:

- General physical exam for physical condition, lameness, and conformation.
- Examination of the genitalia including testicle evaluation; palpation of the epididymis; identification of obvious abnormalities like scars and adhesions; examination of the prepuce, sheath, and penis; and detection of erythema on the inner thigh (this reddening of the skin indicates appropriate hormonal changes to come into season).
- Semen evaluation if there is a history of reproductive problems or physical abnormalities.

Control

As a general practice, only virgin rams should be introduced to your flock. Rams should not be shared between flocks, nor should they be housed with rams from other flocks as ram to ram transmission can occur.

Scrapie

Introduction

The WCFHP is set up to complement the Federal Government Scrapie Control Program.

Scrapie is a naturally occurring disease of sheep, goats, and mouflon. It is a member of a family of diseases called Transmissible Spongiform Encephalopathies (TSEs). The disease was first reported in sheep over 200 years ago, and for the first time in Canada in 1938. Not all is known as to what causes the disease, but it is an infection agent. The following is what is currently believed to be true of scrapie:

Although most diseases are caused by viruses, bacteria, or fungal infections, scrapie is believed to be caused by an infectious protein called a prion. Researchers believe that transmission of scrapie occurs through a protein in the nervous system. The scrapie prion has the same genetic sequence as the normal nervous system protein but it is a different shape. If normal proteins come into contact with “dangerously” shaped prions, they are converted to the dangerous shape, and sickness and infection happen. The normal shaped proteins appear to be necessary to maintain certain brain cells (Purkinje cells) that are essential for balance and muscular function.

Once the nervous system is infected, it is thought that prions accumulate in cell structures called lysosomes. Then lysosomes can burst, damaging the cell. When the diseased cell dies prions are released to accumulate in other cells.

Clinical Signs

Clinical signs of scrapie are variable and slow to develop; it usually takes more than 18 months before infected animals show signs of the disease. The majority of cases occur in animals 2 to 5 years of age. Animals are infected for life.

The predominant signs of scrapie are:

- behavioral changes (apprehension, teeth grinding, biting and aggression);
- altered sensory functions (itching, excessive licking and rubbing, excoriation and inflammation of the skin, and a nibble reflex);
- tremors;
- abnormal posture and gait (staggering, "bunny hopping" and recumbency);
- loss of wool and weight.

A scrapie-infected animal can show only one or more of the above signs and, as a result, it is sometimes difficult to detect the disease in the herd.

Transmission

Experimentally, the most effective way to catch scrapie is to inject the prion form directly into the brain. Injection into the blood stream is less effective and eating the prion is less effective again. In natural outbreaks among sheep, the disease is maternally transmitted from ewe to lamb via an oral route.

Scrapie is usually spread from infected animals by birthing fluids and tissues (placentas) which contaminate pastures and bedding. Healthy animals become infected by eating or licking these materials.

Diagnosis/Treatment

At this time there is no treatment to cure an animal that has contracted the disease and there is no vaccine available that will prevent a sheep or goat from becoming infected with scrapie. Scrapie is diagnosed by examining brain and other tissues from suspect animals that have been destroyed

- As the agent appears to be shed by ewes at lambing and is present in fetal fluid and afterbirth, introduction of new animals during this period should be avoided.
- Affected animals must be quarantined and slaughtered as per Federal Government procedures.

Other diseases, which cause clinical signs that may be confused with scrapie, are: heavy infestations of ectoparasites (lice & mites), photosensitization, pregnancy toxemia, listeriosis, rabies, maedi-visna, and poisonings (organophosphates and copper).

A promising new test using a biopsy of the third eye-lid of the apparently healthy animal has recently been developed in the USA.

Scrapie Control Program

Scrapie is a reportable disease under the Health of Animals Act.

The present program is designed to control the spread of scrapie whenever clinical cases are disclosed, while preserving valuable bloodlines. The program is based on the legal requirements of the Health of Animals Act and on a recent Health Canada policy.

Health Canada stipulates that animals or animal products from animals infected with a TSE, must not enter the human or animal food chain. The same applies to animals that have been exposed to the disease.

The Scrapie Control Program for sheep was reviewed and agreed to by the sheep industry.

- If you require further detail on the Scrapie Control Program, please call the Canadian Food Inspection Agency at 292-4612.

Parasites

Introduction

Parasites can be a major cause of production loss in our sheep flocks in Western Canada. Fortunately, our harsh winter climate gives us a much-needed helping hand with control. There are two main classifications of important internal parasites in this area: coccidia and stomach worms. Sheep keds are the only external parasite of much concern, and are relatively easy to control.

Internal Parasites: Coccidiosis and Stomach Worms

Coccidiosis

Coccidia (*Eimeria sp.*) are microscopic protozoa that live and reproduce in the lining of the intestine. Adult sheep rarely show clinical signs but coccidiosis in lambs can be severe and even fatal. Clinical signs range from “poor doers” to straining, bloody diarrhea and even death. Sub-clinical production losses are probably the most important economic aspect of this disease. Fecal samples should be collected from lambs with diarrhea to be examined by a veterinarian for diagnosis.

Control

Infected sheep develop natural immunity or resistance with age, but will continue to shed oocysts (via feces) into the environment and become a source of infection for lambs. Transmission occurs by ingestion of the oocysts – which require moisture to become infective. Therefore, dirty, wet pens and contaminated feed and water containers are often associated with outbreaks in lambs. Good hygiene and management therefore, can play a key role in control. However, in some situations the use of specific drugs (anticoxidials) is the only way to control the disease. Several effective products are available with a veterinary prescription. Drugs used to de-worm sheep are not effective against coccidia.

The most important thing you can do to control coccidiosis in your lambs is to provide them with clean, dry, well-drained pens and eliminate fecal contamination of feed and water containers. Treating the ewes as a means to decrease the shedding of oocysts has not proven to be consistently effective.

Stomach Worms

There are several species of worms that can infect the gastrointestinal tract of sheep. The most important are *Haemonchus* and *Ostertagia*. *Haemonchus* likes relatively warm, humid conditions and so is more of a problem in BC and Ontario. *Ostertagia* on the other hand, can survive the cold and is therefore believed to be more of a concern here.

Winter kills approximately 90% of larvae left on the pasture in the fall. Once the spring thaw arrives, the larvae only have 3-5 weeks to be ingested by a sheep before their energy resources are depleted and they die. The reason we still have a substantial parasite problem here is the ability of the larvae to over-winter in the host animal. Springtime triggers the larvae to continue their development into worms. We know that at least part of the stimulus to develop is associated with the decrease in the immune status of the ewe during lambing, which extends from 2 weeks prior to lambing, to 8 weeks after lambing. By the time ewes and lambs are turned out to pasture, the larvae have developed into adult worms, ready to deposit 2,000-10,000 eggs daily. The potential for lambs to become heavily infected during a grazing season is tremendous.

Climatic conditions are very important for optimal survival of eggs and larvae on pasture. At less than 14 degrees C, eggs will not hatch and at more than 32 degrees C, the eggs will hatch but the larvae will not survive. When humidity and temperature conditions are just right for development (usually by June), the

eggs will hatch into larvae that crawl up blades of grass. The larvae are then consumed by the next unsuspecting grazing sheep.

Control

By the end of the summer grazing season, 95% of your farm's parasite load is on the pasture rather than in the sheep, so controlling stomach worms is a two pronged approach:

- Keep pasture contamination to a minimum
- Use effectively timed anthelmintics. For example, de-worm in the fall with a larvicidal product and de-worm again after 3-4 weeks of grazing in the spring.
- Do routine fecal tests to monitor the effectiveness of your treatment, preferably during the last 2 weeks of July

The main reasons for a poor response to de-worming include using the incorrect drug for the specific parasite, incorrect dosage, incorrect timing with respect to the parasite's lifecycle, rapid re-infection from pasture, and drug resistance by the parasite.

External Parasites: Keds

Keds are small, tick-like parasites that live near the skin in the wool of the sheep. The keds survive on the lanolin and dander from the skin and wool. They can seriously damage the wool and cause a significant loss of condition in the sheep. Sheep that are infected with keds become itchy and are often seen rubbing against fences, buildings and other objects. If the scratching is severe enough, they may develop bald spots where the wool has been rubbed off.

Keds are visible to the naked eye and can be detected by parting the wool and looking for ticks on the skin's surface. Often, flocks with low levels of keds are not diagnosed until the adult keds are seen at shearing.

Control

Keds are easily eliminated from the flock by topical treatment with a solution of Ectiban®. The entire flock must be treated at one time and the treatment repeated in 17-20 days. This allows time for the eggs to hatch and the new keds to be killed on the second treatment. Once a flock is free of keds, they can only be reintroduced by new sheep or by people carrying them on their clothing.

Ectiban® solution is 45ml of Ectiban®, 4 liters of water, and 6cc liquid dish soap. The solution is applied in a strip from the base of the head to the base of the tail, down the middle of the back. The fleece should be parted so that the Ectiban is applied to the skin. In an average size sheep, 50ml will cover this area. The amount can be adjusted for lambs or larger animals. It is not absorbed into the skin, so toxicity is not a problem.

Malignant Cattarhal Fever (MCF)

Although this is not a disease of particular economic concern to sheep operations, it has been known to cause problems with other species from time to time. We have included this information as a guide to help with good management practices for producers who mix sheep with other species, or live next to farms with other species (cattle, bison, deer or elk).

- MCF is a disease that can affect deer, elk, bison, and cattle.
- Deer are most susceptible, followed by elk, buffalo, and cattle.
- MCF is caused by the “OHV-2 virus” carried by sheep.
- 90% – 95% of sheep are infected with the OHV-2 virus, but they do not show clinical symptoms.
- In Bison, once infected, 60% of animals will probably die, and once the animal shows clinical signs of disease, it is fatal in nearly all cases.
- Can be diagnosed by Serology, PCR, and Histology. Typically surveillance shows about 2% of Bison positive using serology.
- Typical symptoms of MCF in Bison are:
 - Fever
 - Nasal discharge
 - Erosive mouth lesions
 - Inflammation of stomach & gut
 - Erosions in upper respiratory tract
 - Inflammation of the eye
 - Inflammation of the brain
 - Enlarged lymph nodes
- Incubation period is 3 – 8 weeks, with clinical signs of short duration (1 – 7 days).
- There is no known vaccine for this virus
- Does not transmit Bison to Bison, or Cattle to Cattle, etc.
- Does not affect humans
- Spread by direct contact, aerosol from cell-free nasal secretions, placenta.
- Mechanical transmission is possible but difficult, and the role of insects is unknown.
- Transmission via water drainage unlikely, but possible.
- Dead Sheep are not able to transmit the disease.
- Survival in the environment: days (some reports suggest hours)
- Stress appears to be a major factor re both transmission and susceptibility of animals to this disease.

This disease can be easily managed by understanding the facts on the previous page.

- 1) It is better to avoid directly pasturing cattle, bison, deer, or elk with your sheep. In fact, simply ensuring there is distance separating these species will eliminate most problems.
 - 2) Rotate your pastures instead of direct mixing. The OHV-2 virus dies readily in the environment, so prevention of the disease is possible by waiting a few days before rotating pastures. (You may see some reports that the virus dies in hours, but play it safe).
 - 3) Keep your animals healthy and stress free. This appears to be a major factor in the prevention of MCF. If your sheep are healthy, they will not shed as much virus into the environment (the sheep's immune system keeps it in check). Likewise, if your cattle, buffalo, deer, or elk are healthy, they should be able to fight off the disease.
 - 4) Also, please note ... this disease can only be spread directly from sheep to cattle, buffalo, deer, or elk. There is no evidence of risk of transmission cattle to cattle, cattle to buffalo, buffalo to buffalo, etc.
 - 5) Keep in mind this disease appears to be both rare, and difficult to transmit. It would be unusual to say the least, to be affected more than once ... especially if the above management practices are in place.
- We hope the incidence rate of MCF will become even lower in the future by educating producers on how to manage this disease. If you have more questions regarding MCF, Dr. Gerald Hauer at Alberta Agriculture Food and Rural Development will be able to answer your questions. You may contact Dr. Hauer at (780) 980 7595.

Contagious Ecthyma (ORF)

Although Orf is not a disease monitored by the WCFHP, producers should be aware of this disease for good management.

Orf is a highly contagious viral disease of sheep, goats and deer, and is transmissible to humans. It is common in Alberta flocks, most seriously affecting lambs, but older sheep can also become infected. Control of Orf is difficult because some sheep act as carriers of the virus, maintaining the virus in the flock.

The virus can remain viable in the environment for a prolonged period of time. Probably the most likely cause of repeat occurrences in a flock is the presence of undetected carrier animals that continue to shed the virus. Outbreaks have been associated with environments that damage the lining of the mouth and lips, such as thistles, or very coarse feedstuffs. Immunity to the disease is short-lived and animals can become re-infected.

Lambs will develop scabby lesions around the mouth and occasionally along the coronary bands. These clinical signs will appear about 8 days after infection and in uncomplicated cases will usually heal in about 1 month. In severe outbreaks lesions may become so painful that the lamb will refuse to suck. Ewes develop sores on their teats and may refuse to let the lambs nurse. This in turn can lead to mastitis in the ewes and starvation of the lamb(s). The most devastating outbreaks occur in flocks that have been exposed to the virus for the first time, usually through the purchase of infected sheep. Although not common, deaths may even occur in extreme cases.

Severely infected lambs will require good nursing care and tube feeding, and ewes may require treatment for secondary mastitis. Antibiotics may be required to control bacterial infections that develop in the lesions. Topical sprays of antiviral disinfectants (such as Virkon) have appeared to help decrease the incidence and severity of infection in an outbreak, but are not labeled for topical use (Be sure to consult with your veterinarian before using Virkon). In chronically infected flocks, vaccines can be used but generally have inconsistent results. It has been said that orf will go away with treatment in 14 days, or that it will clear up without treatment in 2 weeks!

It is important to remember that Orf is contagious to humans and can cause painful lesions that can take weeks to heal. Gloves should always be worn when treating or handling animals suspected of having Orf.

Appendix 1 - Flock Assessment Form - Sample

Owner: _____ Farm Name: _____

Address: _____

Phone: _____ Fax: _____ email: _____

ASWC Signature: _____

Assigned Bio-security Status Level: _____

Number of consecutive years at this level: _____ *(Note: if this is the 1st year, fill out 1)*

Start year on the FHP: _____ BC Forestry Certified? Yes/No

Disease	Date of last diagnosis	Type of diagnosis	Clinical Prevalence	Risk Level
Johne's				
OPP				
CLA				
Contagious Abortion				
Footrot				
Brucellosis				
Scrapie				
External Parasites				

Authorized Veterinarian Declaration

This flock has been inspected according to the guidelines set out by the Western Canadian Flock Health Program. Based on the feedback provided by the flock owner/manager and a physical inspection of the sheep and facilities, this certificate reasonably reflects the state of health of this flock and the owner's adherence to the specified management practices on the day of inspection.

Print: _____ Signature: _____ Date: _____

Owner/Manager Declaration

This is to certify that I have answered all questions regarding the health of my sheep and the management practices conducted on this farm as accurately as possible, and that the management practices conducted on this farm follow the guidelines of the Western Canadian Flock Health Program for the level at which the flock is certified.

Print: _____ Signature: _____ Date: _____

Appendix 2 Flock Questionnaire

<p>Identification Information</p> <p>Flock Owner _____ Date _____</p> <p>Veterinarian _____ Clinic _____</p>	
<p>ALL LEVELS</p> <p>Your flock needs to meet all protocols for the bio-security management level you have targeted. If you miss a point, you can still achieve the level after you resolve the problem.</p>	
<p>1. Veterinary/Client relationship</p> <p>a) Is there a valid VCR in place? _____</p> <p>b) Name of Veterinarian _____</p> <p>c) Name and Address of Clinic _____</p> <p>_____</p>	<p>Y – N</p>
<p>2. Records</p> <p>a) Is each animal in the flock uniquely identified (unless slaughtered in < 180 days)? _____</p> <p>b) Are individual treatment records kept for each breeding animal? _____</p> <p>c) Are group records kept for group treatments (i.e. as is often the case in feedlots)? _____</p>	<p>Y – N</p> <p>Y – N</p> <p>Y – N</p>
<p>3. Parasite Control</p> <p>a) Is an appropriate parasite control program in place? _____</p> <p>b) Has this program been in place for at least 1 year? _____</p>	<p>Y – N</p> <p>Y – N</p>
<p>4. Are all dogs on the premises with access to the sheep routinely de-wormed with a product that will kill the dog tapeworm (the cause of Cysticercosis in sheep page 68)?</p>	<p>Y – N</p>
<p>5. Culling</p> <p>When selling cull animals (those that have or are suspected of having one of the diseases identified by this program), does the owner/manager identify to the purchaser that the animals are be sold for slaughter only? If not, are the animals euthanized?</p>	<p>Y – N</p>
<p>6. Abortion</p>	

a) Is an Abortion Incidence report filled out yearly (see Appendix 9)	Y – N
9. Breeding Soundness	
a) Do Rams undergo a "Pre-breeding Assessment" prior to the start of the breeding season?	Y – N
10. Clostridial Vaccine	
a) Is a clostridial vaccine routinely used (i.e. 8-way + tetanus) as per veterinarian directions?	Y - N
If the score to this point is 100%, the flock has met protocol requirements for Level BMP. Have the requirements been met? Comments: _____ _____ _____ _____ _____	Y – N
ADDITIONAL REQUIREMENTS FOR LEVEL B	
11. Records	
a) Is each animal in the flock uniquely identified (unless slaughtered in < 180 days)?	Y – N
b) Are individual records kept for each breeding animal, including maternal parental lineage and treatment history? (Not a requirement for B Forestry)	Y – N
c) Are group records kept for group treatments (i.e. as is often the case in feedlots)?	Y – N
12. Quarantine	
a) Is there an appropriate quarantine facility (see Appendix 4)?	Y – N
b) Are all newly purchased animals from “uncertified” flocks, or animals returning from open shows, sales, or other farms quarantined for 4 weeks as per protocol in Appendix 4?	Y – N
c) Are all newly purchased animals from A, or B flocks with a Risk Level for disease <u>higher</u> than this flock quarantined for 4 weeks as per protocol in Appendix 4?	Y – N
d) If the flock of origin’s risk level for Parasites is high or unknown, are animals treated with an appropriate insecticide & examined for external parasites prior to mixing with the flock?	Y – N

e) If the flock of origin's risk level for Contagious Foot Rot is high or unknown, are animals foot-bathed for 30 minutes in 20% zinc sulfate & repeated in 5 days?	Y – N
f) If the flock of origin's risk level for Brucellosis is moderate, high, or unknown, are animals serologically tested negative prior to mixing with the flock?	Y – N
g) At the end of quarantine period (prior to mixing with the flock), are animals;	Y – N
- Palpated for CL abscesses prior to mixing with the flock?	Y – N
- Feet examined for the presence of Foot rot?	Y – N
- Examined and/or treated for the presence of parasites?	Y – N
- Are rams examined for the presence of Brucellosis?	Y – N
- Vaccinated for CLS if previously unvaccinated?	
13. Control of CL	
a) Are all animals with clinical CL isolated?	Y – N
b) Are abscesses treated as per treatment schedule in Disease section?	Y – N
c) Is the flock routinely vaccinated for CL as per vaccination schedule in Disease section?	Y – N
d) If no, is this a Level A flock with a Risk Level for CL at low or minimal?	Y – N
If the score to this point is 100%, the flock has met the protocol requirements for level B. Have the requirements been met? Comments:	Y – N

ADDITIONAL REQUIREMENTS FOR LEVEL A	
14. Records	
a) Is each animal in the flock uniquely identified (unless slaughtered in less than 180 days)?	Y – N
b) Are individual records kept for each breeding animal, including parental lineage and treatment history?	Y – N
c) Are group records kept for group treatments (i.e. as is often the case in feedlots)?	Y – N
15. Testing and Culling	
a) Is there an annual test for OPP (or % testing if flock has had 2 years of negative results)? Are OPP diagnosed animals isolated and/or culled within 14 days?	Y – N Y – N
16. Level A Abortion Protocols	

a) Does the flock follow the WCFHP abortion protocol (see disease section)?	Y – N
b) Are ewes which abort culled (unless lab diagnosis confirms it is not contagious abortion)?	Y – N
17. Level A Quarantine	
a) Are replacement animals purchased from only AA, A, or B flocks, or equivalent as determined by a certified veterinarian?	Y – N
b) Are animals purchased from lower level flocks quarantined for 3 months if the flock of origin's Risk Level for disease is moderate to high or unknown?	Y – N
c) Are all animals returning from open shows or sales quarantined for 3 months?	Y – N
d) Are animals purchased from flocks with a Risk Level for OPP at moderate, high, or unknown, tested (or dam tested if less than 1 year old) prior to mixing with the flock?	Y – N
e) Are animals purchased from flocks with a Risk Level for Contagious Abortions at moderate, high or unknown, injected with a long acting tetracycline prior to mixing with the flock (2 injections 10 days apart)?	Y – N
f) Have quarantined animals had their feet trimmed and have they had their feet soaked for foot-rot prior to mixing with the flock?	Y – N
18. Level A Control of CL	
a) Are animals with active abscesses isolated and culled?	Y – N
b) If no, is the animal isolated and the abscess cultured to prove it is not CL?	Y – N
19. Postmortem	
a) Is a postmortem done on all dead sheep older than two years of age that die of "unexplained causes" and on "thin ewe syndrome" culls at the discretion of the veterinarian?	Y – N
20. Level A Vaccinations	
a) Are new needles used for each animal while vaccinating or de-worming?	Y – N
21. Visitors	
a) Do visitors from other sheep farms wear this farm's footwear?	Y – N
22. Other livestock	
a) Are sheep prevented from directly mixing with cattle or goats?	Y – N
b) If they are mixed, are appropriate health protocols in place for the cattle and goats?	Y – N
23. Shearing	

<ul style="list-style-type: none"> a) Are moccasins and a shearing board provided for the shearer? b) Is the shearer's equipment disinfected prior to use? c) Does the shearer wear clean clothes? d) Are shearing wounds disinfected immediately? e) Are young animals sheared first, before older animals? 	<ul style="list-style-type: none"> Y – N Y – N Y – N Y – N Y – N
<p>24. Johne's Disease</p> <ul style="list-style-type: none"> a) Are the offspring of all positive diagnosed animals culled? b) Are sheep crutched or sheared prior to lambing? c) Are lambing pens clean and dry with no fecal contamination of feed or water? d) Is manure spread only on land under cultivation or composted if spread on pasture/hay land? e) Is manure regularly removed from pens? f) If sheep are mixed with cattle or goats, are protocols followed (see Appendix 5) g) Is access to manure piles and to runoff prevented? 	<ul style="list-style-type: none"> Y – N Y – N Y – N Y – N Y – N Y – N Y – N
<p>If the score to this point is 100%, the flock has met the protocol requirements for level A.</p> <p>Have the requirements been met?</p> <p>Comments:</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p>Y – N</p>
<p><i>Level AA Requirements</i></p>	
<p>25. Risk Level for Disease</p> <ul style="list-style-type: none"> a) Are <u>all</u> Risk Levels for disease at minimal? b) Has this flock been at level A for 5 consecutive years? 	<ul style="list-style-type: none"> Y – N Y – N
<p>26. Replacement animals</p> <ul style="list-style-type: none"> a) Are all new animals purchased from other AA (or equivalent) flocks? c) Are AI and ET used as much as possible? 	<ul style="list-style-type: none"> Y – N Y – N
<p>27. Return of Animals</p>	

a) Are animals <u>not</u> allowed to return to the farm from open shows or sales?	Y – N
28. Level AA Visitors	
a) Are all visitors required to wear this farm’s footwear and coveralls?	Y – N
<p>If the score to this point is 100%, the flock has met the protocol requirements for level AA.</p> <p>Have the requirements been met?</p> <p>Comments:</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	Y – N

RISK OF DISEASE (See Risk Levels for Disease Section 2, for tips on scoring)		
1. Thin Ewe Syndrome Number of years since last undiagnosed "thin ewe syndrome" cull or death in this flock.	_____	
2. Johne's Disease Date of last diagnosis: _____ Type of diagnosis (circle): Thin ewe – Clinical case – Lab diagnosis – Autopsy Date & details of Test: _____ a) Clinical Prevalence <ul style="list-style-type: none"> i. No "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 3 years. ii. No "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years iii. The presence of "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past two years. iv. The presence of "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the last year. b) Risk level <ul style="list-style-type: none"> i. No clinical prevalence <u>and</u>, level AA or A for at least 2 years ii. Low clinical prevalence <u>and</u>, a level A flock <u>or</u>, a level B flock <i>with a Johne's control program in place for at least 2 years</i> iii. Moderate clinical prevalence <u>and</u>, a Level A flock, <u>or</u> a level B flock for at least 1 year. iv. High clinical prevalence <u>or</u> level B flock for < 1 year <u>or a level C flock. - remove</u> 	None Low Mod High Min Low Mod High	If test & cull Min Min Low Mod
3. Ovine Progressive Pneumonia Date of last diagnosis: _____ Type of diagnosis (please circle) thin ewe - clinical case - lab diagnosis - autopsy a) Clinical prevalence <ul style="list-style-type: none"> i. No "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 3 years. ii. No "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years. iii. The presence of "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years. iv. The presence of "thin ewe syndrome" cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the last year. b) Risk level	None Low Mod High	

i. No clinical prevalence <u>and</u> , level AA or A for at least 2 years	Min
ii. Low clinical prevalence <u>and</u> , a level AA or A flock <u>or</u> , a level B flock <i>with a test and cull program in place for at least 2 years</i>	Low
iii. Moderate clinical prevalence. Note: highest level attainable by level B flocks except as above.	Mod
iv. High clinical prevalence.	High

4. Caseous Lymphadenitis	
Date of last diagnosis: _____	
Type of diagnosis(circle): Thin ewe, Clinical case, Lab diagnosis, Autopsy	
a) Clinical Prevalence	
i. No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis within the past 3 years and no positive autopsies within the past 4 years.	None
ii. No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis within the past 2 years, and no positive autopsies within the past 3 years.	Low
iii. No “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis with the past year, and no positive autopsies within the past 2 years.	Mod
iv. The presence of “thin ewe syndrome” cases, and/or clinical cases, and/or laboratory diagnosis, and/or positive autopsies within the past 2 years.	High
b) Risk Level	
i. No clinical prevalence <u>and</u> , level AA or A flock <u>or</u> , level B flock with an isolation/cull program for CL in place.	Min
ii. Low clinical prevalence <u>and</u> , a level A flock <u>or</u> , a level B flock with an isolation/cull program for CL in place.	Low
iii. Moderate clinical prevalence. Note: Highest attainable level for B flocks except as above.	Mod
iv. High clinical prevalence.	High

5. Contagious Abortion (Please see the Abortion Incidence Report to complete this section)	
Date of last diagnosis: _____	
Type of diagnosis (circle): Clinical case - Lab diagnosis	
a) Clinical Prevalence	
i. No clinical cases, and/or laboratory diagnosed contagious abortions in the past 3 years.	None
ii. No clinical cases, and/or laboratory diagnosed contagious abortions in the past 2 years.	Low
iii. A clinical case, and/or laboratory diagnosed contagious abortion(s) in the past 2 years.	Mod
iv. A clinical case, and/or laboratory diagnosed contagious abortion(s) in the past year.	High
b) Risk Level	
i. No clinical prevalence <u>and</u> , level AA or A flock.	Min
ii. Low clinical prevalence <u>and</u> , level A or B flock.	Low
iii. Moderate clinical prevalence	Mod
iv. High clinical prevalence	High

6. Ovine Foot Rot	
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<p>Date of last diagnosis: _____</p> <p>a) Clinical Prevalence</p> <ol style="list-style-type: none"> i. Three or more years free of foot rot and no evidence of foot rot at the time of flock inspection ii. Two years free of foot rot and no evidence of foot rot at the time of inspection iii. One year free of foot rot and no evidence of foot rot at the time of inspection. iv. A clinical case(s) within the past year. <p>b) Risk Level</p> <ol style="list-style-type: none"> i. Clinical prevalence @ none <u>and</u>, Level AA, A, or B flock ii. Clinical prevalence @ low <u>and</u>, Level A or B flock. iii. Clinical prevalence @ moderate <u>and</u>, Level A or B flock. iv. Clinical prevalence @ high. 	<p>None Low Mod High</p> <p>Min Low Mod High</p>
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<p>7. Brucellosis</p> <p>Date of last diagnosis: _____</p> <p>Type of diagnosis (circle): Clinical case – Lab diagnosis</p> <p>a) Clinical Prevalence</p> <ol style="list-style-type: none"> i. No clinical cases and/or lab diagnosis in the past 2 years. ii. No clinical cases and/or lab diagnosis in the past year. iii. Clinical case(s) and/or lab diagnosis within the last year <p>b) Risk Level</p> <ol style="list-style-type: none"> i. No clinical prevalence <u>and</u>, Level AA, A, or B flock. ii. Low clinical prevalence <u>and</u>, Level A or B flock. iii. High clinical prevalence 	<p>None Low High</p> <p>Min Low Mod High</p>
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<p>8. Scrapie</p> <p>Date of last diagnosis: _____</p> <p>Type of diagnosis (circle): Clinical case -- Lab diagnosis</p> <p>a) Clinical Prevalence</p> <ul style="list-style-type: none"> i. No clinical cases and/or laboratory diagnosis within the past 5 years. ii. Flock is under Federal surveillance for Scrapie. iii. Laboratory diagnosis within the past 5 years, and flock is quarantined. <p>b) Risk Level</p> <ul style="list-style-type: none"> i. Clinical prevalence @ none <u>and</u>, Level AA, A, or B flocks ii. Clinical prevalence @ moderate iii. Clinical prevalence @ high 	<p>None Mod High</p> <p>Min Mod High</p>
<p>9. External and Internal Parasites</p> <p>Date of last diagnosis: _____</p> <p>a) Clinical Prevalence</p> <ul style="list-style-type: none"> i. Is there evidence of parasites present in the flock? (No = None - Yes = High) <p>b) Risk Level (external parasites)</p> <ul style="list-style-type: none"> i. No clinical prevalence <u>and</u>, a level AA, A, or B flock <u>and</u>, adequate control program in place for at least one year. ii. No clinical prevalence and a level AA, A, or B without control program in place for at least one year. iii. High clinical prevalence <p>c) Risk Level (internal parasites)</p> <ul style="list-style-type: none"> i. Adequate and current financial invoices on hand for the control of internal parasites. ii. No adequate/current financial invoices on hand for the control of internal parasites. 	<p>None High</p> <p>Min Mod High</p> <p>Min High</p>

Sheep Vegetation Management Guidelines

Appendix 3. Health Protocol for Sheep

HEALTH CERTIFICATION PROTOCOL FOR SHEEP USED FOR VEGETATION MANAGEMENT IN BRITISH COLUMBIA

(Revised March 2007)

Background

The acceptance of sheep for managing vegetation on designated right-of-ways and forest sites is contingent on the assurance to maintain the health of both sheep and wildlife.

The attached Sheep Health Protocol has been developed by the Animal Industry Branch, Ministry of Agriculture and Lands (MAL) in consultation with Alberta Agriculture and Food (AAF), BC Ministries of Forests and Range (MOFR) and Environment (MOE) and with the cooperation of the BC Sheep Federation, the Alberta Sheep and Wool Commission, and the BC and Alberta Veterinary Medical Associations.

The protocol is intended to maximize the health of sheep and minimize the risks of disease to participating flocks and wildlife, predation, and welfare concerns. Only sheep meeting the criteria set out in the Sheep Health Protocol will be permitted on these areas. A system of "on-farm" inspections and "on site" monitoring will ensure that animals intended for these areas meet and maintain these standards.

On-Farm Sheep Health Certification

Introduction

MAL (Dr. M. Wetzstein, 1-888-221-7141 or 604-556-3013) with the assistance of AAF Dr G. Hauer (780-422-4844) will administer the Sheep Health Certification program. All inspecting veterinarians require MAFF or AAFRD approval prior to certifying sheep destined to BC vegetation management sites. Certificates, individual sheep identification records, paint brands and branding paint will be provided to the authorized veterinarians, who will then become responsible for their care.

All sheep must be inspected on the farm of origin and certified by an inspection team according to the current Sheep Health Protocol, within 30 days of the departure date. If smaller producers are moving sheep to a shared location for the flock certification, the inspecting veterinarian must ensure that all sheep on the original farm have been examined prior to movement for Sheep Footrot (SFR) and other clinical disease that would result in the entire flock being denied certification.

The "on-farm" inspection team must include a minimum of a veterinarian (authorized by MAL or AAF to inspect and certify sheep under this program) and the contractor or contractor's representative. Organizing inspection dates and visits will be the responsibility of the contractor and producer.

It is the producer's/owner's responsibility to ensure and provide adequate proof that all procedures identified in the Sheep Health Protocol have been completed. The producer/owner must sign the declaration that the "sheep have been prepared according to the current Sheep Health Protocol requirements". It is the producers' responsibility to ensure that all certified sheep maintain at least a body condition score of two (2) prior to departure to the grazing site.

It is the contractor's responsibility to ensure that the type and numbers of sheep are compatible with the quality

and quantity of palatable vegetation, geographic diversity and extremes in weather conditions of the site. It is the contractor's responsibility to care for all sheep on the project site. The contractor or the contractor's agent must sign a declaration of "suitability to site" at the time of inspection.

All certificates must be signed by the owner, contractor or contractor's agent and authorized veterinarian upon completion.

Only properly completed certificates will be accepted.

A legible copy of the completed Health Certificate and Individual Sheep Identification Record must be sent to Dr. M. Wetzstein, Food Safety and Quality, 1767 Angus Campbell Road, Abbotsford, BC V3G 2M3 or faxed to 604-556-3010, by the authorized veterinarian upon completion of the inspection.

One (1) legible copy of the Health Certificate, Individual Sheep Identification Record and Livestock Manifest must accompany the sheep to the project area, and be retained on the site. A copy of the Livestock Manifest(s) must accompany all sheep to the site. The contract officer in charge is required to send a copy of the manifest to Dr. M. Wetzstein, Food Safety and Quality, 1767 Angus Campbell Road, Abbotsford, BC V3G 2M3 or fax to 604-556-3010, within one week of the sheep arriving on the site.

Sheep Health Protocol (On-farm certification)

1.0 Lameness

1.1 All lame sheep must be **isolated** from the flock and available for inspection to ensure that Sheep Footrot (SFR) is not the cause of lameness. Lame sheep will not be certified.

2.0 Hoof Care

2.1 All hooves must be inspected and, if necessary, trimmed at least two weeks prior to inspection. Sheep with hooves that have been poorly trimmed or with severely deformed hooves will not be certified.

2.2 Foot-soaking

2.2.1 All sheep must be foot-soaked within 30 days of departure. The sheep must exit the foot-bath directly on to a "clean" area. With regards to SFR, "clean" is an area from which sheep or goats have been totally excluded for at least one month and where the temperature has remained above freezing.

2.2.2 The foot-soaking solution must be a 20% zinc sulfate solution (2 lb. zinc sulfate/gallon of water or 1kg./5 litres of water), with two cups of liquid laundry detergent per 300 litres of solution.

2.2.3 All sheep must be foot-soaked once for one hour.

2.2.3 Where "clean" pastures are not available the sheep must pass through an additional walk through foot-bath in the above zinc sulfate solution prior to departure.

3.0 Sheep with abscesses

3.1 Sheep with abscesses (including infected ear-tags) will be denied certification.

3.2 Sheep with healed abscess scars may be accepted at the discretion of the veterinarian.

3.3 Sheep with non-infected vaccine reactions will be accepted at the discretion of the veterinarian or inspection group.

4.0 Caseous Lymphadenitis (CLA)

4.2 Vaccination

4.2.1 All female sheep over 8 months of age, at time of inspection, must be vaccinated for CLA. This involves an initial and a booster vaccination, 4 weeks apart, with an annual booster one month prior to lambing.

4.2.2 A producer with a closed flock (not mixing with other sheep) and with a negative serological test may apply to MAF for an exemption from vaccination.

5.0 Clostridial Diseases

All sheep must have received two initial Clostridial vaccinations for Pulpy Kidney (CI. perfringens type D) and Tetanus (CI. tetani) according to the manufacturer's recommendations, followed thereafter by an annual vaccination four weeks prior to lambing.

6.0 Parasites

6.1 Internal Parasites

6.1.1 All sheep must be treated with one of the four anthelmintics listed below within six weeks prior to departure to the site.

- i. Levamisol group : Levamisole, Tetramisol, Pyrantel, Oxantel, Morantel
- ii. Macrocyclic lactone group: Ivomectin, Avermectin, Doramectin, Abamectin, Moxidectin, Milbemycin, Eprinomectin
- iii. Benzimidazole group: Albendazole, Thiabendazole, Fenbendazole, Mebendazole, Oxfendazole

6.1.2 Fecal analysis

If evidence of clinical parasitism is present then 5% of the flock, including the animals with clinical signs of internal parasites, should be sampled.

6.1.3

After sheep have been treated with one of the above anthelmintics they must be placed on an area designated as "clean". With regards to internal parasites "clean" refers to an area where sheep or goats have not been for at least one year. Producers without "clean" areas must repeat the above treatment within 48 hours of departure.

6.2 External Parasites

All flocks must be treated with an effective approved product for external parasites. This requires two treatments, 17-20 days apart. Sheep must be free of clinical disease due to external parasites at certification. Currently the following products are approved for the use on sheep:

- i) Permethrin (Ectiban)

7.0 Body Condition Score

All sheep must have a minimum body condition score of two (2) (see attachment regarding Body Condition scoring).

8.0 Lambs

- 8.1** Only lambs greater than 22 kg. body weight at time of certification will certified.
- 8.2** All weaned lambs must be put on roughage for a minimum of 2 weeks prior to the departure date.
- 8.3** All mandatory procedures must be completed and documented.

9. Contagious Ecthyma (ORF, Sore-Mouth)

Flocks containing sheep with active ORF lesions must not be sent out to vegetation management sites. The certification will be delayed until the ORF outbreak is resolved. The producer must inform the contractor and inspection veterinarian if an ORF outbreak has taken place in the flock within the past four months.

10. Physical Condition

- 10.1** Sheep over the age of four years must have all their incisors and must not have incisor or molar attrition. Sheep that do not meet these requirements will not be certified.
- 10.2** Sheep with impaired vision will not be certified.
- 10.3** Sheep with pendulous udders or active mastitis will not be certified.
- 10.4** Sheep with deformities that result in an abnormal gait and difficulty feeding will not be certified.

11. Isolation

- 11.1** Rams must be removed from the ewe flock before January 1st. Lambing or abortions are not permissible and pregnant ewes must not be certified.
- 11.2** Certified sheep must not have contact with non-certified sheep or goats. When either the ewe or her lamb(s) are not taking part in the project, and the producer prefers the ewe to continue nursing, both the ewe and her lamb(s) must meet the health protocol requirements. Failure to maintain isolation of the certified sheep will result in loss of the flock certification

12. Identification

- 12.1** All sheep must be identified with a specific flock/owner identification and individual animal identification consistent with the Canadian Sheep Identification Program (CSIP). Sheep with more than two ear-tags in one ear will not be accepted for certification.
- 12.2** All sheep meeting the requirements of the Sheep Health Protocol will be identified with a certified paint brand at the time of inspection by the inspecting veterinarian.

13. Bluetongue Requirements

Sheep from the Okanagan Valley must meet Canadian Food Inspection Agency (CFIA) guidelines from Bluetongue. Please contact your district CFIA office.

14. Transportation

Transportation of sheep must be in compliance with the CFIA transportation regulation of the Health of Animals Act.

SHEEP GRAZING PREPARATION SCHEDULE

(Original by Prince's Veterinary Centre, Raymond, AB)

This schedule is intended to serve as a guide to producers, contractors and authorized veterinarians. Planning sheep health management procedures several weeks in advance improves the likelihood of meeting certification requirements on the inspection visit.

Eight Weeks Prior To Certification:

1. In order for the ewe flock to be certified, rams must be removed prior to January 1st.
2. Monitor flock body condition scores. If the flock is thin evaluate the feeding program, parasite control and other wasting disease conditions. Sheep with a body condition score of less than two (2) will not be certified.
3. Identify the proposed departure date as some components of the preparation schedule must be organized around this date.
4. Ensure that your treatment log is in order and record all mandatory procedure records.

Four Weeks Prior to Certification:

1. Complete any surgical procedures e.g. castration, tail docking and de-horning. These surgical procedures must be healed before certification.
2. Ensure that your treatment log is in order and record all mandatory procedure records.
3. All shorn sheep must have at least one half inch of wool cover at time of certification. All adult sheep must have been shorn within the past nine months.
4. Vaccinate all sheep over two months of age, not previously immunized, with a clostridial product that contains at least Cl. perfringens type D and Cl. tetani.
5. Vaccinate all sheep over eight months of age, not previously immunized, with a caseous lymphadenitis product.
6. Arrange a time for the inspection visit (the inspection must be within 30 days of departure) with:
 - a. an (MAI or AAF) authorized Veterinarian; and,
 - b. the contractor
7. Check the flock for evidence of keds or lice. If present then treat with one of the following products:
 - a. Permethrin (Ectiban)Ivomec pour-on or injectable products are not recognized for this purpose.
8. Assemble foot-bathing facilities.

9. Calculate and stock adequate foot-soaking solution of 20% zinc sulfate and liquid laundry detergent.
10. Inspect all sheep hooves and, if necessary, trim at least two weeks prior to inspection. Sheep that are poorly trimmed or severely deformed will not be certified.
11. Ensure that all animals have been identified with a flock and individual animal identification:
 - Tags are the responsibility of the owner;
 - Tags should be in place early to allow proper healing; CFIA tags are mandatory for post mortem trace back purposes. It is recommended that owners also use plastic management tags if they are using ketchum type CFIA tags
 - Sheep flocks from the Okanagan Valley must meet the Canadian Food Inspection Agency guidelines for Blue Tongue. Currently, all sheep from this area must be identified with Canadian Food Inspection Agency ear-tags.
12. Record all individual animal identifications and have them sorted in alphanumeric order to expedite the inspection process.
13. Confirm the inspection date and arrange for any additional labor to assist in the process.

Two Weeks Prior to Certification:

1. Vaccinate all sheep requiring a booster vaccination.
2. Assemble the inspection and isolation facilities.
3. All individual animal identifications must be sorted to expedite the certification process.
4. Thin ewes, in the flock eligible for certification, must be managed in order to reach a body condition score of greater than two (2) at inspection.
5. All dry ewes destined for the grazing site must have their lambs weaned three weeks prior to departure. To successfully wean lambs they must be at least 30 days old and 22 Kg body weight.

Inspection Visit (within 30 days prior to departure)

1. Inspection team must include at least a MAFF or AAFRD authorized Veterinarian, a contractor or contractor's agent.
2. All records of flock vaccinations, internal and external parasite treatments and husbandry practices including administration dates must be provided to the authorized inspecting veterinarian. These records are required to complete the Sheep Health Certificates.
3. All sheep on the farm must be available for inspection. If the sheep are inspected and certified on a farm other than the farm of origin the veterinarian must inspect the rest of the flock at the farm of origin and sign the declaration stating that he has done so.
4. All animals to be certified must be identified with the flock and individual animal identification before inspection. Identification devices must be properly placed in the ear and the ear-tag sites healed.
5. Foot-soaking must commence during the inspection visit.
6. All required hoof trimming must have taken place at least two weeks prior to the inspection.

7. All sheep in contact with the sheep destined for the grazing site must be foot-soaked for 60 minutes in 20% zinc sulfate, with liquid laundry detergent added.
8. Upon completion animals must go to "clean" ground to await shipping. If a clean area is not available the flock will require an additional walk through foot-bathing at loading.
9. The presence of any of the following will result in the flock not being eligible for certification:
 - a. sheep which have clinical evidence of sheep footrot,
 - b. ORF outbreak,
 - c. failure to provide proof that mandatory procedures have been completed,
 - d. external parasites (hold certificate until the sheep have received two effective treatments),
 - e. a lack of flock identification or unacceptable identification method,
 - f. if greater than 50% of the flock is under a body condition score of two (2),
 - g. lack of one half an inch (1/2") of wool cover.
 - h. if there is clinical evidence of internal parasitism then 5% of the flock will require fecal analysis for internal parasites.
10. The presence of any of the following will result in the individual sheep not being eligible for certification:
 - a. Lameness
 - b. inadequate hoof trimming
 - c. inadequate wool cover
 - d. body condition score of less than two (2)
 - e. abscesses, lumps and bumps
 - f. pendulous udders, mastitis
 - g. non-healed wounds, surgical sites (castration, docking, de-horning sites),
 - h. broken mouths and dental attrition,
 - i. infected ear-tags
 - j. impaired vision, conjunctivitis,
 - k. visible signs of pregnancy
 - l. lack of proper identification and greater than two tags in one ear,
 - m) other conditions as determined by the contractor and veterinarian that would result in the sheep being unfit for the destined site.

11. Mandatory treatments (vaccinations, foot-bathing and anthelmintic treatments) must be documented including receipts of purchase. In absence of documentation, these procedures must be done at time of certification.

In the case of vaccinations that require two boosters, between 2 and 4 weeks apart, the departure date will be contingent on the animals having enough time (8 days) to respond to the vaccine before departure.

The veterinarian will record the earliest possible departure date on the health certificate.

After all mandatory procedures are completed, those sheep that were certified must:

1. have their individual identification number recorded,
2. receive an official paint brand,
3. be isolated and placed in a clean area to await shipping. No contact with any non-certified sheep or goats through fences or by common watering sources or pasture on common ground must occur. Failure to isolate sheep will nullify the certification.

The contractor or contractor's agent, veterinarian and owner must sign the personal declarations on the certificate.

The owner will receive a completed copy of the BC Sheep Health Certificate and Individual Sheep Identification Record.

One (1) copy of the completed BC Health Certificate and Individual Sheep Identification Record will be sent to the Animal Health Centre in Abbotsford, BC by the authorized inspecting veterinarian within one week of certification.

Three Weeks Pre-departure

1. All sheep must be on pasture or dry hay.
2. All weaned lambs destined for the grazing site must be put on roughage.

Two Weeks Pre-departure

1. Deadline for vaccination booster against:
 - a. Caseous lymphadenitis (CL)
 - b. Cl. perfringens type D
 - c. Cl. tetani
2. Deadline for second external parasite treatment.

One Week Pre-departure

1. Cull all animals under a body condition score of two.
2. Remove animals from the certified flock that have engorged udders or mastitis.
3. Remove lambs that weigh less than 22 kg.
4. Remove ewes that have developed abscesses typical of caseous lymphadenitis.

Departure

1. Take animals off grass and grain 24 hours prior to loading.
2. Take animals off water four hours prior to loading.
3. Provide hay at least five hours prior to loading.
4. If sheep were not kept on clean ground after inspection, they must:
 - a. be treated with one of the approved anthelmintics list in the BC Health Certification Protocol within 48 hours of departure,
 - b. pass through a sixteen (16) foot long foot-bath of 20% zinc sulfate with liquid laundry detergent, as they are loaded,
 - c. record the date of foot-bathing on the BC Sheep Health certificate and have the producer sign the declaration verifying this procedure.
5. One copy of the following forms must accompany the sheep to the site:

BC Health Certificate,

Individual Sheep Identification Record

Livestock Transportation Manifest

FACILITIES REQUIRED FOR INSPECTION AND FOOT-SOAKING

Pens, a race for restraining sheep, a sorting gate, a foot-bath and isolation space will be required. A smaller pen is required adjacent to a large holding corral. From this inspection pen, selected sheep will enter the race. Here they will be individually examined and the final selection made.

Foot-bath design will depend to a large extent on the number of sheep to be foot-soaked. The foot-bath should have the holding capacity for 10% of the flock at one time. Advice is available from the Animal Health Branch, Abbotsford.

The required foot-soak solution is 20% zinc sulfate with a wetting agent (liquid laundry detergent) added. Zinc sulfate monohydrate powder is available from feed supply stores, veterinary clinics and possibly through the contractor.

A 20% solution:

= 2 pounds in 1 imperial gallon of water

= 2 kg powder in 10 litres of water

To calculate water capacity: length x width x water depth = gallons of solution

280 cu. Inches/imperial gallon

Use inside measurements:

For example, a foot-bath **16 feet** long (192 inches) by 4 feet wide (48 inches) holding water 3 inches deep, has a capacity of $(192 \times 48 \times 3)/280 = \mathbf{91 \text{ gallons (409 liters)}}$.

This foot-bath would require **180 lb.** of zinc sulfate. Add liquid laundry detergent to the foot bath at one (1) cup (250 ml) to 30 gallons (135 liters) of solution or in this example **3 cups**. This acts as a wetting agent, enabling the solution to adhere and penetrate into the hooves.

ON-SITE HEALTH PROTOCOL

The acceptance of sheep for managing vegetation on designated right-of-ways and forest sites is contingent on the assurance of maintaining the health of both sheep and wildlife.

Sheep health and welfare

It is the sheep contractor's responsibility to ensure that the sheep are provided with adequate care, nutrition (feed, water, and mineral supplementation) and shelter.

Lameness

- All lame sheep must be evaluated for the cause of lameness. The contractor should immediately initiate treatment, **isolate** the lame sheep from the main grazing flock and enter the treatment in the treatment log. If the lame animal has not fully recovered within two weeks, the animal(s) must be removed from the grazing site. Animals removed from the site must be entered into the Daily Log Book

Sheep Footrot (SFR)

- All animals going to the cut blocks must be foot bathed using 20%Zinc Sulfate

Caseous Lymphadenitis (CL)

- Samples are to be submitted to the.MAL, Animal Health Branch. It is important to submit a brief history (owner, animal number, location of abscess, etc.) with the sample and request specifically for C. pseudotuberculosis (C. ovis) examination.
- Sheep identified as **CL positive** must be removed from the site and identified in the Sheep Health Form.

Internal parasites

- If sheep are showing clinical signs of gastrointestinal parasite infestation the contractor should take the appropriate samples to confirm the situation. Once confirmed, the contractor must treat the condition with one of the three groups of anthelmintics listed below:

- i. Levamisol group : Levamisole, Tetramisol, Pyrantel, Oxantel, Morantel
- ii. Macrocyclic lactone group: Ivermectin, Avermectin, Doramectin, Abamectin, Moxidectin, Milbemycin, Eprinomectin

- iii. Benzimidazole group: Albendazole, Thiabendazole, Fenbendazole, Mebendazole, Oxfendazole

Results, including the producer's name, must be forwarded to the MAL designated Veterinarian.

External parasites

- Sheep that have clinical evidence of external parasites must be treated with an effective product. This requires two treatments, 17-20 days apart. The name of the owners of the infected sheep must be forwarded to the MAL designated Veterinarian.

Body Condition Score

- All sheep with a body condition score of less than two (2) must be provided with supplemental feed. If the animals do not improve within two weeks they must be either removed from the grazing site or slaughtered.
- Lambs with a body weight of less than 22 kg must be either removed from the grazing site or slaughtered.

Contagious Ecthyma (ORF, sore-mouth)

- Animals on the site with ORF must be isolated to quarantine pens. Adequate grain, good quality forage, water and shelter must be provided. If the above requirements are not provided or if the animals continue to lose body condition, they must be removed from the site.

Lambing or abortions on the site

- Ewes that lamb or abort on the project site must be confined in a separate pen within 24 hours of aborting or lambing. The placenta and fetal tissue must be contained and disposed of within 24 hours. The ewe(s), including their lamb(s), which have lambed or aborted must be removed from the site within seven days.

Transportation of livestock

- All sheep must be transported according to the requirements set by Canadian Food Inspection Agency (see attached guidelines).

Guardian and herding dogs

- All dogs used on project areas have a current vaccination certificate for Parvovirus, Distemper (3year) and Rabies (3 year); and,
- All dogs to be treated with an effective **tapeworm** anthelmintic within two weeks prior to being used on the project site and within two weeks before returning home from the project area.

On Site Inspection

- A veterinarian authorized by MAL, may arrange an on-site inspection with the contractor. This inspection may be conducted at anytime during the grazing season. The contractor must supply the following:
 - adequate handling facilities;

- adequate personnel to assist in the inspection; and,
- all required documentation (**Livestock Manifests, Sheep Health Certificates, Individual Sheep Identification Records and Daily Logs** must be present at the site and available for review at the time of the inspection).

Reports and questions relating to Sheep Health or Sheep Health Certification should be sent to:

Dr. Merv Wetzstein
Manager
Health Management and Regulation
Ministry of Agriculture, Fisheries and Food Animal Health Branch
1716 Angus Campbell Road
Abbotsford, B.C. V3G 2M3
Phone: 604-556-3013; Fax: 604-556-3010
e-mail: Merv.Wetzstein@gov.bc.ca

Appendix 4 Quarantine Protocols

When new animals are purchased or stock returns from open shows or sales, there is always the risk of introducing disease into your flock. To minimize this risk, it is a good idea not to purchase animals from flocks with a higher risk of disease than your own. It is therefore very important to look closely at the Risk Levels of flocks you wish to buy from. Bringing animals home after mixing with sheep from farms of unknown status also carries similar risks of disease transmission. Note: We would caution you against buying animals from a flock with RL higher than your own for any given disease.

The following protocols must be followed for newly purchased animals, or returning stock.

Note: Sheep purchased from AA flocks, or sheep purchased from A or B flocks with a Risk Level of disease at or lower than your own flock would not have to be quarantined unless otherwise stated.

Bio-security Level BMP Flocks

No required quarantine procedures, but we would recommend you quarantine the animals as for bio-security level B if you can.

Bio-security Level B Flocks

The following protocols must be followed if stock is purchased from flocks of unknown status, or if stock is returning from open shows, sales, or other farms. Animals purchased from AA, A, or B flocks would not need to be quarantined if the flock of origin has a Risk Level for disease at the same level or lower than your own flock. If you are buying from a flock you believe to be safe (ie the owner has maintained a closed flock or is on another Flock Health Program), your flock veterinarian will be qualified to assess that flocks records and bio-security.

- Animal quarantined for a minimum period of 4 weeks (the longer the quarantine period the better).
- If animals are purchased from flocks with Risk Levels for disease at low or minimal, then the quarantine period alone is all that is required. We would however recommend (especially if your Risk Levels are low or minimal), to follow the following protocols to protect your own sheep.
- Animals must be palpated for abscesses prior to mixing with your flock.
- If risk level of External Parasites is high, animals must be treated with an appropriate insecticide (consult your flock Veterinarian) prior to mixing with flock.
- If Risk Level of Contagious Foot rot is moderate, high or unknown, animals must have their feet trimmed and foot-bathed for 30 minutes in 20% zinc sulphate. This procedure should be repeated in 5 days.
- If risk level of Brucellosis is moderate to high, animals must be serologically tested negative prior to mixing with flock. Rams should have their testicles palpated for abnormalities.

Bio-security Level A Flocks

- Animals purchased from Level A flocks, with Risk Levels of low or minimal may enter the flock directly, although an 8 week quarantine period would still be recommended for the safety of your own sheep.
- Animals purchased from Level B flocks, or Level A flocks with Risk Levels of moderate to high must undergo an 8 week quarantine and follow the protocols as outlined for level B Flocks above.
- If RL for Johne's or OPP is moderate or high the animal must be serologically tested (or dam tested if less than 1 year old) prior to mixing with your flock.
- If risk level of contagious abortion is moderate or high the animal must be injected with a long acting tetracycline prior to mixing with your flock. (2 injections 10 days apart)

Quarantine Pen Requirements

Quarantine pens are used to house animals during a quarantine period prior to entering the flock. There should be no fence-line contact with the flock (either a solid fence or at least 3 meters from another fence or other sheep). There can be no shared waterers or feeders.

Quarantine pens in barns should be cleaned between occupants. If a quarantined sheep develops any Western Canadian Flock Health program named diseases during the quarantine, the pen must be cleaned and be disinfected.

Cull Pen Requirements

Cull pens are used to temporarily house sheep with contagious diseases until they are sold to slaughter. Cull pens have the same requirements as quarantine pens but they cannot be the same pen.

Foot Baths

Source: Alberta Agriculture, "The control and eradication of sheep foot rot"

Sheep which have been quarantined for foot rot must have their feet trimmed and soaked in a zinc sulphate solution. Foot baths can be

- made of concrete and be a permanent part of the chute.
- consist of a series of troughs which will fit inside a chute.
- made of plywood and sized 4 X 8. This will hold approximately 10-12 sheep.

Troughs must be sturdy enough to stand up to prolonged use and to minimize the chance of damage when they are moved around. Use good quality ¾" plywood bottoms and 2"X6" planks for the sides. Use waterproof glue on all joints. Place wood screws through the plywood, into the 2"X6"s every 8 inches. Corner strapping is recommended. All joints must be caulked.

Placing solid side panels from the chute wall to the top inner edge of the bath will help keep sheep standing in the bath and will minimize the loss of chemical.

A non-slip floor is desirable. Slats work well but make the trough more difficult to clean. A removable metal grid might be suitable. Simply tossing sand on the floor will reduce slippage.

Construction of a drain board which will divert solution back into the bath as the sheep leave will help conserve chemical. The use of wash troughs, before entry into the foot bath are not recommended as the wash water will soon dilute the concentration of the foot bath.

Portable foot baths have the following advantages:

- Flow patterns can be changed within the same handling facility
- Treatment can be performed in different pens at home or out on pasture
- Foot baths can be moved to ground that has been free of sheep for at least two weeks
- Ease of cleaning and storage is facilitated
- You can minimize excessive contamination of the same environment with zinc sulphate

Foot baths should be located away from muddy areas if at all possible. Excessive mud and manure necessitates more frequent cleaning and changing of solution. The solution must contact the hooves to be effective.

Foot baths should be done in a 20% zinc sulphate solution. Please note that this solution is poisonous. The method to prepare this solution is as follows:

- Calculate the volume of the foot bath. Multiply the length by the width by the depth (all measurements should be inside measurements in inches) and divide by 280. (The multiplication gives you the volume of the foot bath in cubic inches. One imperial gallon of water fills approximately 280 cubic inches therefore dividing the volume in cubic inches by 280 will tell you how many gallons the foot bath will hold.)
- Use 2 pounds of zinc sulphate monohydrate powder for each gallon of water in the foot bath. Zinc Sulphate monohydrate powder can be purchased from veterinary clinics, feed supply stores, feed mills, and Canadian Co-operative Wool Growers outlets.
- Thoroughly mix the powder in the water. It can be difficult to dissolve in cold water and will form cement-like layers on the bottom if it is dumped straight in. Fan the powder over the water and shovel/rake the bottom to make sure it dissolves.
- Ensure that you have a 20% solution by measuring the specific gravity with a standard battery tester. A 20% solution will have a specific gravity of slightly more than 1.225.
- Add a liquid laundry detergent to the foot bath at a rate of 1 cup per 30 gallons of water. The detergent acts as a wetting agent and helps the solution stick to the hooves.
- The solution in the foot bath should be at least 3 inches deep. When the level falls to 2 inches, it should be topped up with more 20% solution. You can again test the specific gravity.

Appendix 5 Mixing Sheep With Other Species

We do not recommend that you mix your sheep directly with other species – although the program allows for it. This is because of the risk of transmission of Johne’s disease from cattle, and Malignant Catarrhal Fever (MCF) from sheep to cattle, bison, elk and deer. Sheep can also become infected with Johne’s and CL from Goats, and Goats can be infected with Caprine Arthritis Encephalitis virus (CAE) which is very similar to OPP in sheep. Sheep will not contract CAE, but if exposed to the virus, they may give a false positive test for OPP.

Note: If mixing with other species, these species must be on a flock/herd health program offering equivalent health and management practices for your level.

By direct mixing, we mean pasturing or housing sheep and other species together. If you want other species to make use of the same pasture, the sheep should be grazed first. If they must be grazed together, then we would recommend you test the cattle for Johne’s (the Johne’s test in cattle is much more accurate than in sheep).

Sheep and goats should not be pastured or housed together or maintained with fence-line contact due to the high risk of transmission of CL and CAE. Producers attempting to eradicate OPP through serology testing will want to avoid mixing sheep with goats, since exposure to goats infected with Caprine Arthritis Encephalitis (CAE) can affect the reliability of the OPP test. If you must keep your sheep and goats together, the goats must follow the same bio-security and testing protocols that your sheep do. Consult with your flock veterinarian, to design a program for you.

Although very rare, Malignant Catarrhal Fever can also be a concern for sheep producers with cattle, bison, elk, and/or deer. Although sheep do not become sick from MCF, cattle, bison, elk, and deer will die if they become infected. Since all sheep and goats are considered to be infected with MCF, you should follow the management practices outlined in the Disease Section if you wish to raise these animals alongside sheep.

Appendix 6 Cysticercosis in Sheep

Cysticercus ovis has been seen in increasing numbers in Alberta slaughter lambs. This parasite in sheep is the intermediate or larval stage of a dog tapeworm *Taenia ovis*

The adult stage of the tapeworm lives in the small intestine of dogs. The dog becomes infected by ingesting live cysts from uncooked sheep meat, most commonly when allowed access to sheep or lamb carcasses. As the tapeworm matures, eggs are passed in the feces of the dog, and shed onto pastures or feeding areas of the sheep. These eggs are then ingested by grazing sheep, hatch in the sheep's intestinal tract, and the larvae migrate throughout the body of the sheep. They localize in muscular tissues and develop into cysts approximately 9mm x 5mm in size. The most common locations to find the cysts at slaughter inspection are the cheek muscles, diaphragm, heart and skeletal muscles. It takes 7 to 10 weeks for the cysts to fully develop after the eggs are ingested by the sheep. The cysts will begin to degenerate and are often seen as calcified or caseous ("cheesy") nodules in the muscle tissues.

Carcasses that are only lightly infected can be trimmed and passed for human consumption. Animals that are heavily infected with cysts are condemned at the slaughterhouse.

Treatment of the cysts once the sheep is infected is very difficult, and control of the problem must be focused on the adult stage of the tapeworm in the dog. There are several dewormers for dogs that are very effective at controlling tapeworms, and the appropriate drug to use should be discussed with your veterinarian. Not all dewormers available for dogs will kill tapeworms. Cull sheep infected with *C. ovis* can be fed to dogs but the meat should be cooked thoroughly or frozen to -18°C for a minimum of 10 days.

There is another *Cysticercus* species seen less commonly, but with a similar lifecycle. *Cysticercus tenuicollis* cysts are found attached to the abdominal wall and the surface of the liver of the sheep. The adult stage of the tapeworm *Taenia hydatigena* lives in the dog's intestine, and can be controlled with adequate dewormers as well.

Routine deworming, every 2-3 months, of all dogs with access to your sheep flock is important to control these diseases. Do not feed raw sheep meat back to your dogs, and do not allow scavenging of sheep carcasses by dogs. There has been speculation about other carnivores acting as the primary host, to date there has been no evidence that foxes, carnivores or Tasmanian devils can carry the adult tape worm.

Appendix 7 Other ways to lower your risk of disease

- 1) Maintain an open relationship with your flock veterinarian, as this is your best source of relevant information.
- 2) It is important to realize that the method of transportation, and animal contacts on route to your farm may affect the health status of purchased animals and ultimately your own flock. Biosecurity precautions must be taken to maintain a health status, the animal will drop to the lowest status of any animal, or animal product it has come in contact with. Trucks must be disinfected prior to loading. There must not be any contact with other animals, manure, or contaminated footwear and clothing of handlers and transporters.
- 3) If you buy an animal through an open sale, in order to lower risk of disease all animals in the sale must have entered under the same health status, such as minimal flock status, blood tests, footdips etc.
- 4) Recommend that animals participating in open shows/sales not be allowed back into the flock.
- 5) Avoid mixing newly purchased animals with your flock during breeding or gestation. This will decrease the risk of introducing an infectious abortion agent and other diseases during the highest risk periods. It will also give you time to observe the new stock prior to mixing with the flock.
- 6) Do not mix sheep with cattle, bison, elk, deer, or goats – unless appropriate testing protocols and management procedures are in place. This will minimize the transmission of Johne's, MCF, CAE - OPP, between species, and will minimize the risk of spreading Malignant Catarrhal Fever from sheep. (See Disease Section). New genetics introduced via artificial insemination and embryo transplant as much as possible.
- 7) Do not purchase replacements from lower status flocks, and flocks with higher risk levels than yours.
- 8) Do not purchase replacements from auction marts.
- 9) All ewes (hair sheep excluded) should be crutched or shorn prior to lambing. This practice greatly decreases the potential of contamination and disease spread in the lamb's environment. This can also be effective in helping to control the spread of Johne's Disease, coccidiosis and neonatal diarrhea. Ewe lambs should be shorn first, prior to the older ewes, to help control the spread of CL.
- 10) Use a shearer that follows the Bio-security practices outlined under Bio-security Level-A requirements.
- 11) Use new needles for every ewe when vaccinating until flock is OPP negative.
- 12) Get postmortem exams done whenever possible on thin ewes or dead animals. This practice can be an invaluable source of information for management and production decisions. Ensure that farm dogs are not allowed access to the dead sheep.
- 13) Consider flock testing for OPP even if not required at your level. The tests are relatively accurate and inexpensive.
- 14) Excellent record keeping saves money, drugs and can increase productivity.

Appendix 8 Veterinarian/Client Relationship

(Adapted from the Alberta Veterinary Association brochure “If they’re important to you”)

A Veterinary Client Relationship is defined as a necessary working relationship between a veterinarian and you, the animal owner, concerning the health of your animals. For your benefit, a valid relationship requires that your veterinarian has information that is sufficiently “current, complete and relevant” about your animal(s) before making medical judgements; judgments such as making a diagnosis, suggesting a treatment recommendation, writing a prescription, etc.

Benefits of the Veterinary Client Relationship

The goal of the Veterinary Client Relationship is to enhance the level of animal care in the province of Alberta. This benefits the animals, their owners and, in the case of food producing animals, the public consumer.

Benefits achievable by a solid relationship with your veterinarian include:

- Diagnostic & Treatment Accuracy – Identifying and treating medical conditions must be based on sound medical principles to reduce the cost of losses and/or expense of medication.
- Food Safety/Quality Assurance – Consumers expect residue-free products from modern agriculture. Veterinarians have the most comprehensive training in animal pharmaceuticals to assist livestock producers with drug treatment protocols.
- Sustaining Export Markets – Agriculture in Canada cannot be maintained without exports. Preventing and controlling disease outbreaks is essential to maintain the integrity of Canada’s exports. Product quality is also critical to sustain foreign trade.
- Environmental Responsibility – Domestic animals impact the environment. Veterinarians can help animal owners to identify any negative environmental impacts of their management decisions.

Affect of the VCR

A Veterinary Client Relationship must be in place in order for producers to buy drugs or medication from a Veterinary Clinic. If the veterinarian does not feel he or she has enough “current, complete and relevant information” about the owner’s animal(s) to dispense the medication requested, the veterinarian will seek to meet the need by animal examination or some other means of gathering the required information. The intent of this safeguard is to ensure that veterinarians have enough information to make a sound medical judgement. Without the supporting information, there is no VCR or the relationship is no longer valid for that particular situation. The VCR should help reduce your operating costs and increase productivity by;

- avoiding inappropriate drug purchases and their use
- more immediate response to treatment
- reduced incidence of costly disease
- knowing when to avoid or discontinue treatment
- having more product to market

Program Requirements

It is largely up to the individual veterinarian to decide if a valid VCR exists between himself and a given producer. Depending on the situation, a valid VCR may exist based on as little as one visit per year plus phone contact. Please contact your flock veterinarian to ensure you meet this program requirement.

Appendix 9 Disposal of Dead Animals

The following regulation is the current Alberta Regulation 229/2000 and now allows for composting.

Definitions

In this Regulation,

- (a) "composting", in respect of a dead animal, means decomposing the dead animal or a part of it through a controlled bio-oxidation process that results in a stable humus-like material;
- (b) "dead animal" means
 - i. a domestic mammal or bird, or part of a domestic mammal or bird, that has died from a cause other than having been slaughtered for human consumption, and
 - ii. inedible offal or condemned material from animals slaughtered for human consumption;
- (c) "licensed", in respect of a rendering plant, means licensed under the Health of Animals Act (Canada);
- (d) "natural disposal", in respect of a dead animal, means disposing of the dead animal in order to allow scavenging;
- (e) "owner", in respect of a dead animal, means the owner of the dead animal or a person who is in possession or control of it;
- (f) "rendering plant" means a rendering plant as defined in the Health of Animals Act (Canada);
- (g) "reportable disease" means
 - (i) a disease designated as a reportable disease under the Health of Animals Act (Canada), or
 - (ii) a communicable disease referred to in section 1 of the Designated Communicable Diseases Regulation (AR 8/98).

Methods of disposal

- (1) The owner of a dead animal shall dispose of the animal within 48 hours of its death in accordance with this section.
- (2) When an animal is known or suspected to have died from an infectious disease or from a reportable disease, the owner of the animal shall dispose of it in accordance with the directions of an inspector appointed under the Health of Animals Act (Canada) or a veterinary inspector appointed under the Livestock Diseases Act, but in no case may the animal be disposed of by natural disposal.
- (3) The owner of a dead animal that has been euthanised with drugs or other chemical substances shall immediately take steps to prevent scavengers from gaining access to the dead animal between the time the animal is euthanised and the final disposal of the animal.
- (4) Subject to subsection (2), the owner of a dead animal shall dispose of it by
 - (a) burying it in a farm burial pit, if
 - (i) the weight of dead animals in the pit does not exceed 2500 kg, unless subsection (4.1) applies,
 - (ii) the pit is
 - (A) at least 100 metres from wells or other domestic water intakes, streams, creeks, ponds, springs and high water marks of lakes and at least 25 metres from the edge of a coulee, major cut or embankment,
 - (B) at least 100 metres from any residences,
 - (C) at least 100 metres from any livestock facilities, including pastures, situated on land owned or leased by another person,
 - (D) at least 300 metres from a primary highway,
 - (E) at least 100 metres from a secondary highway, and
 - (F) at least 50 metres from any other road allowance,
 - (iii) the pit is covered with

- (A) a minimum of one metre of compacted soil, or
- (B) a wooden or metal lid that is designed to exclude scavengers, if quicklime is applied to the dead animal in sufficient quantities to control flies and odour,

and

- (iv) the bottom of the pit is at least one metre above the seasonal highwater table,
- (b) burying it in a Class I or Class II landfill as defined in the Waste Control Regulation (AR 192/96), if the site has a full-time operator who agrees to immediately bury the dead animal,
- (c) burning it in accordance with
 - (i) the Substance Release Regulation (AR 124/93), or
 - (ii) the Code of Practice for Small Incinerators, published by the Department of Environment,
- (d) composting
 - (i) in a Class I compost facility as defined in the Waste Control Regulation (AR 192/96) that is designed, constructed and operated in accordance with sections 6 and 7 of the Code of Practice for Compost Facilities, published by the Department of Environment, or
 - (ii) subject to subsection (5), in a farm open compost pile that is
 - (A) located at least 100 metres from wells or other domestic water intakes, streams, creeks, ponds, springs and highwater marks of lakes and at least 25 metres from the edge of a coulee, major cut or embankment,
 - (B) located at least 100 metres from any residences,
 - (C) designed in a manner that will exclude scavengers, and
 - (D) at least 100 metres from any livestock facilities, including pastures, situated on land owned or leased by another person,
- (e) transporting it to a licensed rendering plant for disposal, or
- (f) subject to subsection (6), natural disposal

(4.1) Where because of flood, fire, starvation or other similar disaster there are multiple deaths of animals and the weight of the dead animals exceeds 2500kg, the animals may be buried in a farm pit subject to the approval and in accordance with the direction of a veterinary inspector appointed under the Livestock Diseases Act

- (5) Where under subsection (4)(d)(ii) animals are to be composted in a farm open compost pile,
 - (a) each animal or part of it must not exceed 100 kilograms,
 - (b) the maximum volume of the animals or parts of them must not exceed 25% of the total compost pile, and
 - (c) the animals or parts of them must be covered by at least 15 cm of composting material.
- (6) Subject to subsection (2), a dead animal, other than inedible offal or condemned material, may be disposed of by natural disposal if
 - (a) the animal is disposed of on property owned or leased by the owner of the animal,
 - (b) the animal was not euthanised with drugs or other chemical substances,
 - (c) the total weight of the animals being disposed of at any one site does not exceed 1000 kg,
 - (d) there is a distance of at least 500 metres between disposal sites,
 - (e) the disposal site is

- (i) at least 500 metres from wells or other domestic water intakes, streams, creeks, ponds, water wells, springs and high water marks of lakes and at least 25 metres from the edge of a coulee, major cut or embankment,
- (ii) at least 400 metres from any livestock facilities, including pastures, situated on land owned or leased by another person,
- (iii) at least 400 metres from any residences,
- (iv) at least 400 metres from any road allowance, and
- (v) at least 400 metres from any provincial park, recreation area, natural area, ecological reserve, wilderness area or forest recreation area, and
- (f) disposing by natural disposal does not create a nuisance.

(7) Notwithstanding subsection (1), the owner of a dead animal may store the dead animal for more than 48 hours after its death if it is stored

- (a) for not more than one week in an enclosed structure with impervious walls and floors that have been constructed for the storage of dead animals,
- (b) outside during winter months when the ambient temperature is low enough to keep the dead animal completely frozen, or
- (c) in a freezer unit, or
- (d) in accordance with the directions of an inspector appointed under the Health of Animals Act (Canada) or under the Livestock Diseases Act.

AR229/2000 s2: 238/2002; 255/2004

Rendering plant

(1) The owner or operator of a rendering plant shall ensure that

- (a) a dead animal rendered at the plant is subjected to such temperature and pressure as is necessary to render every portion of the carcass free from all viable pathogenic organisms, and
- (b) microbiological quality assurance processes are in place to prevent the occurrence of viable pathogenic organisms.

(2) The owner or operator of a rendering plant when shipping material from a dead animal to another rendering plant shall ensure that

- (a) the material is shipped in such a manner so as to prevent
 - (i) any dissemination of pathogenic organisms into the environment from the leakage of blood or other body fluids, and
 - (ii) the contamination of any animal or human food,
- (b) the other rendering plant will render the material free of all viable pathogenic organisms, and
- (c) a complete record is kept of the shipment, including the date of shipment, method of transport and the name and address of the rendering plant to which it was shipped.

Diagnosis of animal diseases

Nothing in this Regulation prohibits the collection and transport of a dead animal as may be required by a veterinarian or the owner of the dead animal for the diagnosis of animal diseases.

Dead animal as food

No person shall feed a dead animal to other food producing animals unless

(a) the material from the dead animal has been properly rendered at a licensed rendering plant and the prohibition to feed prohibited material to ruminants under the Health of Animals Regulation (Canada) is complied with, or

(b) the feeding of the material is a recognized means of stimulating natural immunity for specific disease conditions and the prohibition to feed prohibited material to ruminants under the Health of Animals Regulation (Canada) is complied with.

Advisory committee

The Minister may appoint an advisory committee under section 7 of the Government Organization Act consisting of both government and industry representatives to oversee the implementation of this Regulation.

Repeal

The Regulations Regarding the Destruction and Disposal of Dead Animals (AR 128/66) are repealed.

Expiry

For the purpose of ensuring that this Regulation is reviewed for ongoing relevancy and necessity, with the option that it may be re-passed in its present or an amended form following a review this Regulation expires on November 30, 2009.

AR229/2000 s8; 354/2003

Appendix 10 - Abortion Incidence Report - Sample

This form must be completed at the annual WCFHP certification visit

Owner _____

Farm Name _____

WCFHP Bio-security management level _____

Number bred ewes in group _____ no. aborted _____

Number bred ewe lambs in group _____ no. aborted _____

Date of start of lambing season _____ date of 1st abortion _____

PME of aborted fetuses..... Y/N

Comments: _____

Serology from aborted ewes..... Y/N

Comments: _____

Clinical illness in aborted ewes..... Y/N

Comments: _____

Related history (dog attack, new sheep mixed, etc.) _____

How would you rate the risk of contagious abortion in this flock (min – mod – high)

Veterinarian _____

Address _____

Phone _____ Fax _____

SIGNATURE _____ DATE _____

Appendix 11 WCFHP Certified Veterinarians – May 2007

ALBERTA

Name	Address	Phone	Clinic
Ileana Wenger 1999/2003/2005	Box 615, Bowden AB T0M 0K0	403 224 2463	OC Flock Livestock Reproductive Services
Christine Bredin 2000/2003	Box 750, Breton AB T0C 0P0	780 696 3787	Breton Animal H & M Services
Corry Mortensen 2000/2003	Box 339, Brooks AB T1R 1B4	403 362 3273	Newell Veterinary Clinic
Andy Strang 1999/2003/2005	Box 160 Cardston AB T0K 0K0	403 653 4424	Foothills Veterinary Clinic
Conny Fancy 2002/2005	Box 2350, Claresholm AB T0L 0T0	403 625 3677	Claresholm Veterinary Services
Gerry Smith 2000/2003	Box 1330, Cochrane AB T4C 2C7	403 932 6160	Big Hill Veterinary Clinic
Heather Van Esch 2006	Box 456, Cremona AB T0M 0R0	403 637 3928	Cremona Veterinary Clinic
Denis Nagel 1999/2003	Box 298, Crossfield AB T0M 0S0	403 946 4567	Nagel & Company
Sharron Oakey 1999/2003	Box 6870, Drayton Valley AB T7A 1S2	780 542 2144	Rocky Rapids Veterinary Services
Rick Faintuck 1999/2003	Box 1240, 5301 127 Ave, Edmonton AB T5J 2M7	780 475 0075	Stockyards Veterinary Services
Richard McWatt 1999/2003	Box 64, Fairview AB T0H 1L0	780 835 2750	North Peace Animal Hospital
Bill Lichtenberger 1999/2003	Box 1390, Fort Macleod AB T0L 0Z0	403 553 4887	Fort Macleod Veterinary Clinic
Dave Dempsey 1999/2003	Box 5385, High River AB T1V 1M5	403 652 1300	High View Animal Clinic
Sheryll Hudye 2006	Box 869, High Prairie AB T0G 1E0	780 523 3826	
Cynthia Marks 2001/2003/2005	RR # 1, Lacombe AB T0C 1S0	403 782 2058	
Laverne Sieb 1999/2003	RR # 3, Lacombe AB T0C 1S0	403 782 2225	Crestomere Veterinary Services
Wilma den Ousten 2001/2003	RR # 3, Lacombe AB T0C 1S0	403 782 2225	Crestomere Veterinary Services
Larry Spitzke 1999/2003	Box 895, Lethbridge AB T1J 3Z8	403 327 8660	Green Acres Animal Hospital
Will Lindeman 2001/2003/2005	Box 327, Milk River AB T0K 1M0	403 647 2040	
Susan Cunningham 2002/2005	RR # 2, Millet AB T0C 1Z0	403 387 5029	
Carol Kamieniecki 1999/2003	Box 24, North Star AB T0H 2T0	780 836 2678	Rivers Edge Veterinary Services

Darlene Donszelmann 1999/2003	4601 70 Ave., Olds AB T4H 1L7	403 556 6414	Chinook Country Vet Clinic
Harvey Cole 1999/2003	5100 58 St., Olds AB T4H 1P3	403 556 1608	Harvey Cole Veterinary Services
Kevin Breker 1999/2003	Box 7138 Stn Main, Peace River AB T8S 1S8	780 624 3011	Peace River Veterinary Clinic
Lynn Tait 1999/2003	RR # 1, Red Deer AB T4N 5E1	403 748 3657	OC Flock Livestock Reproductive Services
Tammy Dalzell 2000/2003	RR # 2, Site 16, Box 5, Red Deer AB T4N 5E2	403 358 3372	
Tammy Nay 2001/2003	Box 42, Riviere Qui Barre AB T0G 1Y0	780 939 4941	
Denise Schlingman 2000/2003	265,52307 RR 213, Sherwood Park AB T8G1C1	780 922 5447	Uncas Veterinary Clinic
Don Ronaghan 2006	5902 – 44 Ave, St. Paul AB T0A 3A0	780 645 6077	
Jim Mailer 1999/2003/2005	Box 1120, Stettler AB T0C 2L0	403 742 3338	Stettler Veterinary Clinic
Michael Wilson 2002/2005	Box 569, Sundre AB T0M 1X0	403 638 3774	Pioneer Veterinary Services
Heather Braconnier 2000/2003/2005	Box 115, Three Hills AB T0M 2A0	403 443 2030	Kneehill Vet Services
Kathy Parker 1999/2003	Box 338, Three Hills , AB T0M 2A0	403 443 7440	Valley Vet Clinic
Les Byers 1999/2003	5014, Maple St., Vegreville AB T9C 1N6	780 632 2515	Vegreville Veterinary Clinic
Barbara Wilhelm 1999/2003	Box 3339, Vermilion AB T9X 2B3	780 853 4594	Thorncliffe Veterinary Services
Glenn Nordstrom 2002/2005	Box 277, Viking AB T0B 4N0	780 336 4048	Viking Veterinary Clinic
Trevor Jackson 1999/2003	10819 104 Ave., Westlock AB T7P 1B3	780 349 3663	Westlock Veterinary Clinic
Roxy Bell 2002/2003/2005	RR # 5, Wetaskiwin AB T9A 1X2	780 352 8483	Bell Vet Services
Greg Davis 2006	RR # 1, Wetaskiwin AB T9A 1W8	7803525740	Davis Veterinary Services
Bogdan Zygadlo 1999/2003	Box 1769, Whitecourt AB T7S 1P5	780 778 5767	Whitecourt Veterinary Clinic

SASKATCHEWAN

Sheri-Lyn Berry 2000/2003	10020 Thatcher Ave., North Battleford , SK S9A 3L8	306 445 3757	Lakeland Veterinary Services
Bogdan Zygadlo 1999/2003	Box 1769, Whitecourt AB T7S 1P5	780 778 5767	Whitecourt Veterinary Clinic

Appendix 12 Veterinarian Information

The first thing to keep in mind about the Western Canadian Flock Health Program is that it is designed to almost run itself. The producer and their veterinarian are basically in complete control over the program in the field, while the Alberta Sheep & Wool Commission plays a support, development, and administrative role. The ASWC will only keep basic records of who is participating in the program, while the producer keeps all flock and certification records. Also, the certifying veterinarian will keep a copy of the Flock Assessment Form and Abortion Incidence Form for his or her own records.

Although the program has now been thoroughly tested, we anticipate that there will be the odd glitch that needs to be corrected. If there is confusion in any area, it is up to the veterinarian to interpret the "spirit" of the program and decide on how to proceed. Any problems should be passed on to the ASWC office so that appropriate corrections can be made to the program. We plan to send producers registered in the program yearly updates as needed, while veterinarians will receive updates to the program on an ongoing basis. For this reason, the veterinarian's package will always be the most up to date and valid.

Certification & Training

Veterinarians must have attended 76 of this binder. Note: WCFHP training sessions have also now replaced the old "Forestry Grazing Certification" that Alberta Agriculture used to provide. Certification for the WCFHP therefore will allow veterinarians to certify flocks for Forestry Grazing as well, in fact, the two programs have now been combined into one to help lower costs for all. Future veterinary training sessions will be held periodically, please advise any veterinarians who are interested in taking the course to call the ASWC office, this will help us to arrange the most convenient dates and locations.

Registering

Both producers and veterinarians will need to be registered with the Alberta Sheep & Wool Commission in order to participate in the Western Canadian Flock Health Program. **Producers** will register with the Alberta Sheep & Wool Commission yearly by paying their annual \$25.00 participation fee before the anniversary of their flock inspection.

Note: Veterinarians are only authorized to certify producer flocks that are registered with the Alberta Sheep & Wool Commission. Please ask the producer if they are registered with the Alberta Sheep & Wool Commission. i.e. have the current year's registration forms, for this program prior to arranging the flock inspection. Registration can also be confirmed by calling the ASWC office (948-8533).

Flock Certification Visit

Participants on level B or above are required to call a certified veterinarian every year to administer the Flock Questionnaire (sample - Appendix 2), the Flock Assessment Form (sample - Appendix 1), and fill out the abortion incidence report (sample - Appendix 9) – the timing of this meeting is up to the producer.

Please note; if you are not the regular veterinarian for this flock, you may need to contact the regular veterinarian for additional feedback and information. Ideally, the veterinarian doing the flock inspection will have a valid VCR in place and will be familiar with the flock. Also, producers and veterinarians should keep a record of every year's Flock Assessment Form so there is an ongoing record of flock health improvement.

Note: The period between inspections must be no greater than 15 months to keep certification valid.

How long the certification inspection takes will depend on a number of things including:

- How well do you know the owner and the flock?
- What Level is the flock being certified at?
- The size of the flock.
- Is this the first inspection you have done at this farm?

Example of Veterinarian Inspection Visit

As a certified veterinarian, here is how you may proceed with a typical visit:

- 1) Ask what Level the owner is trying to certify the flock at. Options include B Forestry, B, A, & AA
- 2) Administer the Flock Questionnaire “Level” section to the appropriate level (i.e. if the flock is targeting level B or B Forestry, ask only level B questions)
- 3) Administer the Flock Questionnaire “Risk of Disease” section.
- 4) Inspect the farm facilities (i.e. to ensure that isolation pens, etc. meet level requirements)
- 5) Inspect a sample number of sheep (this number will be based on the table in Appendix 13)
Note: Also, an “A” flock will need to be more heavily scrutinized than a “B” flock.
- 6) Fill out **all sections** of the Flock Assessment Form and Abortion Incidence Form
- 7) Keep pink copy of the Flock Assessment form for your records
- 8) Fill out the "Western Canadian Flock Health Program" certificate. The producer can use this new form for promotions and display purposes.
- 9) The producer should send the yellow copy of the Flock Assessment form to the ASWC office.
 - If you run into a problem during an inspection visit, you can either make a judgment call yourself, or you can call our office to clarify what to do. If we are not available, you can complete the Flock Assessment Form later, and mail it to the producer once it is complete.

Veterinary discretion and updates

The certifying veterinarian is the best qualified to help the producer make decisions about flock biosecurity and health protocols to fit with the Flock Health Program. There will be many flocks that present a “gray zone” and may not fit the specific requirements at a given biosecurity level exactly. The veterinarian has the leeway to use his/her discretion in such cases. After careful examination and documentation of the situation the vet can certify a flock that may not otherwise meet all the requirements. Written documentation of the reasons must be included in the veterinarian’s medical record of the flock certification visit. See page 25 for an example of this situation regarding

vaccination schedules.

Appendix 13 Good Reference Books

- 1) "Western Canadian Sheep Production Manual" by Alberta Sheep & Wool Commission, Alberta Agriculture Food & Rural Development, Saskatchewan Wool Growers Association, available through the Alberta Sheep & Wool Commission office.
- 2) Sheep Housing & Equipment Handbook – by MidWest Plan Service – Available through Cee-Der Sheep Products. 403-327-2242
- 3) “The Veterinary Book for Sheep Farmers” by Dr. David Henderson, (hardcover & video – Lamb Survival) – Available through Canadian Cooperative Wool Growers.
- 4) “A Practical Guide To Sheep Disease Management” by Dr. Norman Gates, 1985, News-Review Publishing Co., Moscow, Idaho.
- 5) “Practical Lambing” by Andrew Eales & Hohn Small, 1986, Longman Group Ltd, Longman House, Burnt Hill, Harlow, Essex, CM20 2JE, England.
- 6) “Merck Veterinary Manual” – 1973, Merck & Co. Ltd., Rahway, NJ, USA
- 7) “Sheep & Goat Research Journal” Box 51267, Bowling Green, KY 42102-5567
- 8) “Sheep Production Handbook” American Sheep Industry, 6911 Yosemite Street, Englewood, Colorado 80112.

Appendix 14 Flock Sample Size

The following table provides a statistically sound basis for determining the minimum size of the sample you need to inspect in performing the flock inspection.

Size of Ewe Flock	Level B	Level A
10	10	10
20	20	20
30	30	30
40	40	40
50	48	50
60	55	60
70	62	70
80	68	79
90	73	87
100	78	96
120	86	110
140	92	124
160	97	136
180	101	146
200	105	155
250	112	175
300	117	189
350	121	201
400	124	211
450	127	218
500	129	225
600	132	235
700	134	243
800	136	249
900	137	254
1000	138	258
1200	140	264
1400	141	269
1600	142	272

Level B - 95% certain of at least one positive if the level of disease in the flock is 2%.

Level A - 95% certain of at least one positive if the level of disease in the flock is 1%.

Note: If you are testing close to 100% of your flock it may be wise to test all members.

Note2: (Level A) - OPP testing percentages should follow Disease Section guidelines.

Appendix 15 Producer Feedback Form

The WCFHP will change over time based on your recommendations, industry changes, government legislation, and because of the evolving nature of animal health in general. We have set aside this page so that you can send us your comments on the program (what you like, what you don't like, etc). The one thing we would really appreciate, is that if you do not like something about the program, please give us your best solution.

Likes: _____

Dislikes: _____

Solutions: _____

Please send your comments to:

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