



Ontario Maedi Visna Flock Status Program

Definitions and protocols governing the program and additional information

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**ONTARIO
VETERINARY COLLEGE**

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Table of Contents

Overview of the Ontario Maedi Visna Flock Status Program	3
Whole Flock Program (Appendix 1)	3
Monitored Low-Risk Program (Appendix 2)	3
Protocols of the Ontario Maedi Visna Flock Status Program	5
A. How to enroll your flock	5
B. Definitions	6
C. Protocols	8
D. Whole Flock Program (Appendix 1)	15
E. Monitored Low-Risk MV Flock Program	19
F. Moving from the Monitored or Monitored Low-Risk Program to the Whole Flock Program 20	
G. Transfer of flock status when selling or purchasing sheep	21
H. Advertising of MV Flock status	21
Appendix 1 Whole Flock Program	22
Appendix 2 Monitored Low-Risk Program	23
Appendix 3 Interpretation of Individual Maedi Visna Test Results	24
Appendix 4 Interpretation of Isolation Group Test Results	25
Appendix 5 Testing a random number of sheep for the OMFVSP	26
How to Perform the Random Flock Test	26
Random number table	27
Appendix 6 Qualifying Test for “B” Status	28
Appendix 7 Qualifying Test for “A” Status	29



Overview of the Ontario Maedi Visna Flock Status Program

The Ontario Maedi Visna Flock Status Program (OMVFSP) is a voluntary program managed by Ontario Sheep Farmers. The program's purpose is to identify flocks and animals infected with Maedi Visna¹ virus (MVV), and to lower the risk of MVV infection in those flocks. It accomplishes this through the use of protocols that include testing, identification and removal of infected sheep, biosecurity practices to reduce risk of infection, and continued surveillance to demonstrate low-risk of MVV in the flock. To enroll in the program, the producer must be willing to follow the rules of the program, permanently and uniquely identify all sheep in the flock, and follow specific biosecurity requirements.

Whole Flock Program (Appendix 1)

At the first qualifying test, all sheep and goats residing on the premises and that are 180 days of age (six months) and older have a blood sample drawn and are serologically tested. For the purposes of this program, goats are considered to be sheep, as goats may also be infected with MVV.

All sheep that are test Positive are removed from the flock. The flock test is then POSITIVE and the status of the flock is then **ENROLLED**. The flock is eligible for testing 90 to 180 days after the previous flock test. If any animal has a Positive test, the flock test is POSITIVE and the status remains as **ENROLLED**.

If all the results from the animals tested are Negative, the flock test is NEGATIVE and the status of the flock will be **ENROLLED - NEGATIVE**, indicating a lower risk status.

The flock is eligible for testing 180 (maximum 395) days after the previous flock test. If at this test, all the results from the animals tested are Negative, the flock test is NEGATIVE and the status of the flock will be "B", indicating a lower risk status.

A minimum of 180 (maximum 395) days after the second NEGATIVE flock test the flock then qualifies to have only a random proportion of the total flock aged 365 days of age and older (i.e., ≥ 1 year of age) tested. If all results are Negative from the sample of animals tested, i.e., representing a third consecutive NEGATIVE flock test, the flock status will be "A", designating the lowest risk level.

This status is then maintained through annual testing (every 365-395 days) of a random proportion of the flock, with all test results remaining Negative and so the flock test remaining NEGATIVE.

The biosecurity requirements (Supplement 5) must also be followed to maintain flock status.

The benefits of this program may be realized through increased productivity associated with not being infected with the virus (lamb growth, milk production, losses from pneumonia and early culling) and increased breeding sales opportunities due to the low risk MV status of the flock.

Monitored Low-Risk Program (Appendix 2)

Producers may choose to enroll in the Monitored LOW-RISK program. This program is suitable for large flocks where it is believed that the flock is not infected with MVV and where the flock owner wishes to

¹ Also known as ovine progressive pneumonia (OPP)



establish their flock as low-risk of infection. **The low-risk status achieved through this program is NOT equivalent to “A” status.**

Biosecurity requirements are the same as the Whole Flock program and are available in [Supplement 5](#).

A random sample of total flock 365 days of age and older will be sampled. If all sample results are Negative, then the flock test is NEGATIVE and the flock is MV **MONITORED**. To maintain this status, testing must be performed a minimum of 180 (maximum 395) days apart. If one or more sample results is Positive, the flock test is POSITIVE and the flock is considered to be infected with MVV and has no status.

Those flocks that have a NEGATIVE flock test on a minimum of three consecutive annual flock tests performed as described above, will acquire a status of MV **MONITORED LOW-RISK**.

Flocks with MV MONITORED status can at any time switch to the Whole Flock program starting at the qualifying test for ENROLLED status. Flocks achieving MV MONITORED - LOW RISK status, may after receiving a whole flock NEGATIVE test of all sheep \geq to 180 days of age, enter the Whole Flock MV program at “B” status.



Protocols of the Ontario Maedi Visna Flock Status Program

A. How to enroll your flock

1. You must first be willing to follow the program protocols and agree to fulfill the minimum biosecurity requirements.
2. It is strongly recommended to enroll in a flock health management program with your flock veterinarian to control other important production-limiting diseases.
3. Enrollment forms are available from the **OMVFSP Coordinator** at the Ontario Sheep Farmers' office.
Contact:
P: 519.836.0043
E: admin@ontariosheep.org
4. Website: www.OntarioSheep.org Indicate on the form whether enrolling in the Whole Flock program or the Monitored program.
5. To qualify for enrollment in the **Whole Flock program**, the producer must agree to the following:
 - a. All sheep and goats must be uniquely and permanently identified as defined by the [OMVFSP protocols](#).
 - b. All sheep and goats residing on the farm have a blood sample collected by a veterinarian licensed to practice in the province in which the flock resides, or by a technician under the veterinarian's direction, as defined by the OMVFSP protocols described in [Section C1](#).
 - c. Meet and maintain all biosecurity requirements as defined by the [OMVFSP protocols](#).
 - d. Agree to promptly pay to Ontario Sheep Farmers (OSF) the testing costs as assessed by the veterinary diagnostic laboratory that has carried out the approved MVV diagnostic test. OSF will report laboratory results to the producer within one business day of receiving them from the veterinary diagnostic laboratory.
 - e. The University of Guelph AHL will send the reports to OSF who will forward the results to the producer and vet. All MVV results received by the OSF as part of the administration of the OMVFSP, will be kept confidential.
 - f. Participating flocks in good standing, can request to have their names and/or contact information and flock status published in the Ontario Sheep News magazine and on the OSF website.
6. To qualify for the **Monitored Low-Risk program**, the producer must agree to the following:
 - a. All sheep and goats residing on the premises have a blood sample collected by a veterinarian licensed to practice in the province in which the flock resides, or a technician under the veterinarian's direction, as defined by the OMVFSP protocols described in [Section C1](#).
 - b. Agree to promptly pay to OSF the testing costs as assessed by an approved Animal Diagnostic Laboratory. OSF will report laboratory results to the producer within one business day of receiving them from the veterinary diagnostic laboratory.
 - c. All. The University of Guelph AHL will send the reports to OSF who will forward the results to the producer and vet. All MVV results received by the OSF as part of the administration of the OMVFSP, will be kept confidential.



- d. Participating flocks in good standing, can request to have their names and/or contact information and flock status published in the Ontario Sheep News magazine and on the OSF website.
7. Appeals
The owner in conjunction with their veterinarian can appeal a status assignment in writing to the OMVFSP Committee. Each case will be considered on individual merits and additional testing may be requested. Contact the OMVFSP Coordinator to register this appeal.

B. Definitions

1. **Maedi Visna** (MV), also called ovine progressive pneumonia (OPP) is a viral disease of sheep and is caused by infection with **Maedi Visna Virus (MVV)**. Detailed information regarding MV, the cause, how it is transmitted, clinical signs and economic impact can be found in the [supplementary document “Maedi Visna, What does it mean to your flock”](#). An animated video explaining MV / OPP is available [here on Vimeo](#).
2. **Must** means that the owner of the flock, or their designated agent, is required (obliged) to carry out the stated activity as described, i.e., it is not voluntary.
3. A **sheep** is a ram, ewe, or wether (castrated male). Usually, a sheep is ≥ 365 day of age, but for parts of this program, this term may be used for sheep ≥ 180 days of age.
4. All **goats** residing in the flock are required to be subjected to the same testing and removal protocols as sheep. Therefore, when the protocol says “sheep”, it also applies to any goats in the flock or housed anywhere on the flock premises where there is a risk of contact.
5. A **lamb** is a ram, ewe or wether < 180 days of age and is the offspring of both the birth dam (natural mother or embryo recipient) and of the foster dam (if the lamb was fostered or fed milk from a ewe that is not its birth mother).
6. A **flock** for purposes of this program, is a population of sheep and goats that at any time during the year are managed together or share facilities or equipment.
7. A **flock premises** is comprised of all buildings, dry lots, paddocks/corrals, and pastures occupied at any time of the year, by the flock.
8. To **remove** from the flock suggests that the MVV test positive sheep are to be sold directly to slaughter for meat and not as breeding stock. This is a *STRONG RECOMMENDATION*. However, this program does not enforce the actual disposal fate of the animals.
9. The **sample date** is the date that the samples were taken from the sheep, not the date that the results were received.
10. . The [Hyphen-Biomed - Elitest MVV/CAEV](#) (Elitest) is the approved diagnostic test for the OMVFSP. Results from other diagnostic tests are not accepted by the OMVFSP. Veterinary diagnostic laboratories that currently offer the Elitest in Canada are:
 - a. [Animal Health Laboratory, University of Guelph](#)
 - b. [Laboratoire de Santé Animale \(LSA\), MAPAQ Quebec](#)
 - c. [Sample submission to any other veterinary diagnostic laboratory must first be approved by the OSF to confirm the results are acceptable to the OMVFSP.](#)



11. Interpretation of Individual MV Test Results ([Appendix 3](#)). The following applies to results for individual sheep and their interpretation by the OMVFSP:
- a. **A Negative Individual Maedi Visna (MV) Test**
If, when using an approved test listed in [Section B.10](#), the result is negative, then the test is reported as Negative.
 - b. **A Suspect Individual MV Test Result**
If, when using an approved test listed in [Section B.10](#), the result is Suspect, then the sheep *must* be either immediately removed, or isolated and re-sampled within 28 days of the test date. If on re-sample and test,
 - i. The test result is negative, the individual test is reported as Negative.
 - ii. The test result is positive, the individual test is reported as Positive.
 - iii. The test result is suspect, the individual test is reported as Positive.
 - c. **A Positive Individual MV Test Result**
If, when using an approved test listed in [Section B.10](#), the result is positive, then the individual test is reported as Positive.
12. Interpretation of Flock Level MV Test Results
- a. **A NEGATIVE Whole Flock Test Result requires that**
 - i. All sheep \geq 180 days of age in the flock were sampled within the same time frame (**within 7 days of each other**) and found to test either all as negative either initially. or on re-sampling if Suspect ([B.11.b](#))
 - ii. If one or more animals in the flock receives a Positive test either initially or on re-sampling (i.e., one or more sheep receives a Positive test), then the flock test is not considered NEGATIVE, but is a POSITIVE flock test result.
 - b. **A NEGATIVE Monitored, Monitored Low-Risk, or “A” Status Flock Test Result requires that**
 - i. A random sample of sheep \geq 365 days of age in the flock were sampled within the same time frame (**within 7 days of each other**) and found to test either all as Negative either initially. or on re-sampling if Suspect ([B.11.b](#))
 - ii. If one or more animals receive a Positive test result either initially or on re-sampling, then the flock test is not considered NEGATIVE, but is a POSITIVE flock test result.
13. Interpretation of Isolation Group MV Test Results
- a. An **Isolation Group** is a group of sheep (and lambs if present) that enters the Isolation Facility at one time. For purposes of this program, these animals should all be tested at the same time and will have the status of the group test result (see below).
 - b. A **Qualifying Isolation Group Test Result** is an MV test administered within the same time frame (**within 7 days of each other**) of all sheep \geq 180 days of age that are in the Isolation Group. ([Appendix 4](#)).
 - c. A **NEGATIVE Qualifying Isolation Group Test Result** requires that all test results are Negative either initially or on re-sampling if Suspect ([B.11.b](#)).
 - i. If one or more animals fail to receive a Negative test either initially or on re-sampling, then the Isolation Group test is POSITIVE.



- d. A **POSITIVE Qualifying Isolation Group Test Result** occurs when one or more animals receive a Positive test result either initially or on re-sampling if Suspect (B.11.b).
 - i. In this case, any animal within the Isolation Group with a Negative test result, is considered exposed to a positive animal and requires two Negative test results 8 to 12 weeks apart, in which the entire Isolation Group test is NEGATIVE both times.
14. **Isolation Facility** means a facility that sheep are housed in for a specific period of time during which they *must* have no direct contact with other sheep, shared feeders or watering equipment. The isolation facility *must* be:
- a. Separately ventilated or be located at least 5 meters (16.25 feet) away from all locations where the higher status flock resides, to minimize the risk of aerosol transmission of the MV virus.
 - b. Have no direct inside communication with the main flock, unless
 - c. If within the same building, have a solid partition – which may include a lockable door - between the facility and the main flock so there can be no movement of animals or air from the isolation flock to the higher status flock.
 - d. Inspected and approved by a veterinarian licensed in the province in which the flock resides.

C. Protocols

1. An **official OMVFSP test** requires the following:
 - a. All official serological samples for any MV testing must be collected by, or their collection supervised by one of the following:
 - i. A veterinarian licensed in the province in which the flock resides.
 - ii. A technician employed by and supervised by a veterinarian licensed in the province in which the flock resides. This supervision may be indirect, i.e., the veterinarian need not be on the premises during sampling but must sign the paperwork and is responsible for all the requirements of the program.
 - iii. Not the owner or manager, spouse, immediate relative or employee of the owner or manager of the flock, even if he or she is a licensed veterinarian may supervise the collection of the samples, although they may participate in the sample collection if supervised by an individual as described in C.1.i or C.1.ii.
 - b. That the antibody test used be one of those listed in Section B.10.
2. Sample collection and record keeping:
 - a. **“Whole Flock”** program: all sheep and goats \geq 180 days of age that reside at the flock premises on the date of the test must be sampled.
 - i. Sheep that are isolated from the flock and will be sold within 28 days of the test date need not be sampled.
 1. E.g., market lambs intended for slaughter and \geq 180 days of age.
 2. E.g., adults marked for culling.
 3. Animals sold for breeding purposes and \geq 180 days of age.
 4. The program *strongly recommends* that animals that are high risk of being test positive (e.g., from a flock with diagnosed MVV infection or are themselves test positive), not be



sold for breeding purposes.

- b. **Monitored Low-Risk or Whole Flock – “A” Status** program: a random sample selected from all sheep and goats \geq 365 days of age that reside at the flock premises on the date of the test, must be sampled.
 - c. A minimum of 5 mL of whole clotted blood or 1 mL serum or plasma to be collected by venipuncture per animal tested.
 - i. Each tube *must* be clearly and uniquely identified and correspond to the animal’s unique and permanent identification.
 - ii. Milk may be used if allowed by the diagnostic laboratory and the diagnostic kit has validated its use.
 - iii. Pooling of serological or milk samples is **not permitted** (i.e., combining of samples from more than one animal).
 - d. Ensure correct identification of the sheep and lambs and record this ID with the corresponding correct tube number on an official OMVFSP sample submission form (**MV AHL Test Sample Form**).
 - e. Complete the OMVFSP sample submission form entirely and properly.
 - i. The form that is currently available from OSF is specifically for use in the AHL, University of Guelph. Other veterinary diagnostic laboratories that offer the Elitest, must be contacted by the veterinarian regarding instructions for submission of samples. See **Section B.10** for more information on diagnostic tests and veterinary diagnostic laboratories.
 - f. Transportation of the samples to the official laboratory should be done quickly to protect the quality of the results.
 - i. Coagulated blood or milk should be transported within 24 hours and kept chilled, not frozen, during transport.
 - ii. If serum is separated prior to shipping, it may be frozen, and shipping delayed if needed. However, action on the test results must still occur within 14 days of the date the animals were sampled, i.e., test date.
 - iii. Proper documents must accompany all samples.
 - iv. In situations where the flock is sampled over up to 7 days, let the laboratory know that more samples will be following.
 - g. Sheep not sampled. All sheep NOT sampled that reside at that premises on the date of the Official Test must be counted and that number provided to OSF.
 - i. Sheep not sampled includes lambs $<$ 180 days of age and sheep \geq 180 days of age that will leave the flock in the next 28 days. (refer to C.2.a).
3. **A declaration form (MV Sample Declaration Form)** *must* be signed by the supervising licensed veterinarian and submitted to OSF at each MV test. See Section C.6 for information to be included on the declaration form.
 4. The samples must be sent to a laboratory that offers the diagnostic tests identified in **Section B.10**, and is recognized by the Ontario Sheep Farmers in the OMVFSP. At this point, only two laboratories in Canada offer this test.



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5. The identification information *must* be maintained by the flock owner / manager:
 - a. The identification must be a permanent ID. This ID may be one or more of the following:
 - i. Ear tag (metal or plastic dangle, button, or any combination). Double tagging is preferred, i.e., one tag in each ear but not required.
 - ii. Legible tattoo - ideally backed up with an ear tag.
 - iii. Official CSIP or ATQ identification.
 - b. Baseline information must be provided on the sample submission form including.
 - i. Age (years)
 - ii. Sex (ram, ewe, wether).
 - iii. Breed, breed type or other information is optional.
 - c. The non-CSIP or non-ATQ identification used in the OMVFSP must be unique within the flock. This means:
 - i. Each animal currently residing in the flock is uniquely identified.
 - d. The **identification must be clearly legible to the reader.**
6. On the declaration form, to be submitted at each flock test, the following information must be included:
 - a. Enrolled and “B” status whole flock tests
 - i. A count of sheep \geq 180 days of age being tested.
 - ii. A count of sheep \geq 180 of age and not tested because being sold for breeding or slaughter within the next 28 days.
 - b. “A” status, Monitored and Monitored Low-Risk flock tests
 - i. A count of sheep \geq 365 days of age; this includes sheep selected for testing by random sample, sheep tested as new entries or returns to the flock, and sheep not selected for testing.
 - c. All flock tests.
 Sheep that are new additions to the flock, or sheep that left and returned to the flock (e.g., attended shows, lent for breeding purposes).



- i. An inventory of all sheep that have been added to the flock since the last flock test must be submitted to OSF at the flock test.
- ii. An inventory of all sheep that have left and returned to the flock must be submitted to OSF at the flock test.
- iii. Information that *must* be included with this inventory is:
 - 1. Animal CSIP / ATQ ID
 - 2. All test results since arriving at / returning to the flock
 - 3. Date of arrival at / returning to the flock
 - 4. If procured from an “A” status flock, vendor’s contact information
 - 5. If procured from outside of Ontario, indicate where they come from and if from Quebec what status the flock is and vendor’s contact information.
 - 6. If returning, indicate exposure to other sheep and / or goats including during transportation.

7. Biosecurity requirements (Supplement 5)

To minimize the risk of spread or reintroduction of MVV infection to the flock, the following biosecurity precautions are *REQUIRED* or are *STRONGLY RECOMMENDED* as indicated:

- a. **Surgical and treatment equipment** (e.g., syringes, dose guns, shearing equipment)
 - i. It is *REQUIRED* that they must not be shared between animals without first being disinfected².
 - ii. “A” status flock, this is *STRONGLY RECOMMENDED*.
- b. **Single-use needles**
 - i. Are *STRONGLY RECOMMENDED*.
- c. **All personnel** working with the flock visitors to the flock premises
 - i. It is *REQUIRED* to wear clean clothing that has had no contact with sheep infected with MVV or sheep of unknown MV status.
 - 1. This includes sheep in an Isolation Facility.
 - 2. Clothing includes all outerwear, coats, gloves, and hats.
 - ii. It is *REQUIRED* that all protective footwear be cleaned and disinfected prior to entering the flock premises (e.g., by vigorous scrubbing with a suitable disinfectant soap and fresh water).

²Disinfection of equipment can be done with sodium hypochlorite (6% bleach) by mixing 1 part bleach to 2 parts water for a final solution of 2% sodium hypochlorite OR sodium hydroxide by mixing 80 grams of sodium hydroxide crystals with 1 litre of water to make a 2 molar solution. These agents are effective against most viruses, bacteria and the scrapie agent. Both can be used for disinfection of surgical equipment, docking and tattoo equipment, multi-dose syringes and work surfaces. Minimum contact time should be 10 seconds with the product being rinsed or wiped off after disinfecting.

Chlorhexadine solution or soap is effective for disinfecting shearing blades.



- iii. It is *REQUIRED* that hands be washed with a suitable disinfectant soap prior to handling sheep.
 - iv. It is *STRONGLY RECOMMENDED* to wear protective rubber gloves when handling sheep.
- 8. Transportation of sheep, it is *REQUIRED* that
 - a. Livestock handlers wear clean coveralls and boots as described in [C.7.c.](#).
 - b. All livestock carriers are cleaned and disinfected with a suitable disinfectant before sheep are loaded.
 - c. Sheep are to be transported so that:
 - i. There is no contact with sheep of unknown or lower status.
 - ii. The sheep are not unloaded at any other livestock facility with sheep of unknown or lower status en route to their destination.
- 9. **Sheep leaving and returning to the flock** where there may be contact with unknown or lower status sheep (e.g., from shows, demonstrations, sales barns or shared pastures), it is *REQUIRED* that upon return
 - a. Be housed in an approved Isolation Facility, and
 - b. Have two negative MV tests; the first may be on return and the second between 8 and 12 weeks after the first test date, and
 - c. The negative test results be obtained prior to being released from the Isolation Facility to the flock.
 - d. On the next scheduled flock test, it is *REQUIRED* that those animals be included in the flock test.
 - i. **If an “A” status test, they *must* be tested in addition to the random sample.**
- 10. **New additions to flocks** enrolled in the OMVFSP, it is *REQUIRED* that
 - a. All sheep entering regardless of OMVFSP status of originating flock, be accompanied by an OMVFSP Transfer form ([MV Animal Transfer Form](#)).
 - b. Sheep added from an “A” status flock must have one (1) negative test while in an approved Isolation Facility and prior to entering a OMVFSP flock.
 - c. Sheep from any other flock have two (2) **NEGATIVE** tests while in an approved Isolation Facility prior to entering a OMVFSP flock; the first may be on entry and the second between 8 and 12 weeks after the first test date.
 - i. MV tests conducted prior to entry are not eligible unless performed while the sheep were in an approved Isolation Facility in a flock enrolled in the OMVFSP, and all biosecurity requirements were met while in transport between flocks.
 - d. On the next scheduled flock test it is *REQUIRED* that those animals be included in the flock test.
 - i. **If an “A” status test, they *must* be tested in addition to the random sample.**
- 11. **Qualifying of sheep to enter the flock** from the Isolation Facility: ([Appendix 4](#))
 - a. Sheep enter isolation for the following reasons:
 - i. New additions to the flock.



- ii. Sheep leaving and returning to the flock.
- iii. Sheep being resampled after a Suspect or low-prevalence Positive MV test result (see Section 11.e).
 - 1. This group must be kept separate from new entries and those returning to the flock.
- b. All sheep in the Isolation Facility are treated as a group. The status of the Isolation Group is the same as status of the lowest status animal in the group.
 - i. When animals enter the Isolation Facility, no new animals *must* be added to the group until testing protocols are completed for the Isolation Group.
 - ii. The initial Isolation Group Test is done when all animals have entered the Isolation Facility for that group
 - iii. An Isolation Group test *must* include all sheep in the Isolation Facility that are ≥ 180 days of age or become ≥ 180 days of age while in isolation; lambs < 180 days do not require testing.
- c. Entry – Results of the Initial Qualifying Test – All NEGATIVE:
If the Isolation Group Test is NEGATIVE, i.e., all individual test results are Negative,
 - i. Then the group remains in isolation and must undergo a second group test in 8 to 12 weeks.
 - ii. If all animals in the Isolation Group Test were from “A” status flocks, then no second test is required.
 - iii. If the second test is NEGATIVE, i.e., all individual test results were Negative, and there have been no animals added to the Isolation Group in the meantime, then the group is eligible to enter the main flock.
- d. Entry –Qualifying Tests – POSITIVE, i.e., one or more individual test results were Positive either initially, at the second test 8 to 12 weeks later, or was Positive on resampling after a Suspect test,
 - i. The Positive sheep *must* be removed
 - ii. The remainder of the group that tested Negative *must* remain in isolation and be resampled and tested in 8 to 12 weeks after the date on which the last Positive sheep was removed from the group.
 - iii. If the entire Isolation Group is then found to be NEGATIVE on this subsequent test, the group may enter the flock.
 - iv. However, if one or more sheep test POSITIVE on this subsequent test, the testing protocol *must* start again at [Section C.11.d.i](#).
- e. SUSPECT Isolation Group Test from a flock test. If all sheep in the Isolation Group are there as a result of a Suspect test on a flock test, and
 - i. All sheep receive a subsequent NEGATIVE test on the retest within 28 days of the flock test, the group of sheep can return to the flock immediately upon receipt of the test.
 - ii. If one or more sheep in the Isolation Group receives a Positive test result ([Section B.11.b.](#)), then the group test is considered POSITIVE and the protocol at [Section C.11.d](#) *must* be followed.



12. **Embryo status:** All embryos being implanted in recipients located in the enrolled flock *must* have
- Either originated from donors located in a Status “A” flock, or
 - Were handled in accordance with the protocol set out by the International Embryo Transfer Society³ for the sanitary handling of embryos.
13. **Semen status:** All semen (fresh or frozen) being used in artificial insemination programs within the flock *must* have
- Originated from rams located in Status “A” flocks, or
 - From countries declared free of Maedi Visna virus infection by the World Association of Animal Health (OIE), or
 - From rams collected in a Canadian Food Inspection Agency accredited AI Centre (ensuring that they have had at least one negative MV test prior to semen collection)⁴.
14. **Lambs of Positive ewes:**
- Weaned lambs < 180 days of age and born from and/or raised by Positive ewes (natural or recipient or foster dams) or fed milk from Positive ewes.
 - It is *STRONGLY RECOMMENDED* to market these animals so as to reduce risk of MVV infection to the NEGATIVE flock.
15. **Random Sample Flock Test** - how to select sheep for sampling:
- For “A” status or Monitored or Monitored Low-Risk flock test.
 - All sheep ≥ 365 days of age are eligible for testing.
 - The number of sheep to be tested is determined by the table in [Appendix 5](#).
 - This number is determined to detect MV infection at a prevalence of ≥ 5% of the flock with 95% confidence that this level of flock infection is detected. The example given in the appendix is for use when the test has a sensitivity of 99% and specificity of 100%
 - i.e., if at least 5 of every 100 sheep in the flock are Positive, then there is a 95% chance that at least one infected animal will be found on the random test.
 - It will not reliably detect a prevalence of MV infection < 5% and will not reliably detect infection if the test used is less sensitive.
 - The animals selected for testing *must* be randomly selected to ensure an accurate flock test.
 - Recommendations on how to randomly select sheep for testing are outlined in [Appendix 5](#).
16. **Recommendations to avoid false Negative or false Positive test results.**
- It is *STRONGLY RECOMMENDED* to avoid sampling the flock around the time of lambing (4 weeks prior and 4 weeks after lambing). It is understood that this will be a challenge in flocks with multiple lambing groups in a year. Please consult with your veterinarian to select the best time to schedule the flock test within the required testing periods of the OMVFSP.

³ <https://www.iets.org/Publications/IETS-Manual>

⁴ <http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/accredited-veterinarian-s-manual/chapter-10/eng/1345478300520/1345478379509?chap=1>



There is evidence that infected pregnant or heavily lactating ewes may not test POSITIVE within one month of lambing (before and after) due to lowered immune function associated with the stresses of pregnancy and lactation. Sheep severely debilitated for any reason, may fail to test positive when infected with MVV.

- b. It is *STRONGLY RECOMMENDED* to avoid sampling within three weeks after vaccination. Please consult with your veterinarian when planning times for vaccination and sampling for Maedi Visna.

There is evidence that a strong stimulation of the immune system, e.g., vaccination – may increase the chance of sheep testing Positive, when not infected with MVV. This is because the immune system is generally activated. There are no issues with scheduling vaccination and sampling at the same time. There are no issues with other treatments being administered before or at the same time as sampling, e.g., deworming.

D. Whole Flock Program (Appendix 1)

1. Qualifying test for “ENROLLED” or “ENROLLED – NEGATIVE” or “B” Status

- a. All sheep \geq 180 days of age within the flock must be sampled (see [Section C](#) for specifics).
- b. All sheep \geq 180 days of age must be tested within 7 days of each other.
- c. All sheep $<$ 180 days within the enrolled flock must be counted and reported on the Declaration Form as described in [Section C](#).
- d. As of the date of the initial Qualifying Test, all biosecurity requirements *must* be followed.
- e. No pre-screening of samples is permitted prior to submission of samples to the OMVFSP.
 - i. Pre-screening means first submitting samples for non-official testing, removing the Positive samples and submitting the rest of the samples for official testing.

2. Results from the Qualifying Test for “ENROLLED” or “ENROLLED - NEGATIVE” Status

- a. If all animals test Negative, then the flock Qualifying Test is NEGATIVE and flock status can be designated as “ENROLLED – NEGATIVE”.
 - i. If the flock test is NEGATIVE go to [Section D.4](#), Qualifying Test for “B” Status
- b. If one or more animal tests Positive initially or on resample, then the flock Qualifying Test is POSITIVE and flock status is “ENROLLED” ([Appendix 3](#))
 - i. All sheep with a Positive test must be removed within 28 days of the test date.
 - ii. All sheep with a Suspect test may be immediately removed.
 - 1. If they are not, it is *STRONGLY RECOMMENDED* they must be held in an Isolation Facility and must be either removed or be retested within 28 days (4 weeks) of the test date. Follow the protocol at [Section B.11.b](#).
- c. If \leq 2% of individual sheep results are Positive or Suspect on the Qualifying Test, the option for retest of those animals may be taken
 - i. The owner may request that all animals that had a Positive or Suspect test be resampled not less than 14 days (2 weeks) and not more than 28 days (4 weeks) after the initial test



date.

1. For purposes of this resample, these animals will be called “initial reactors”.
 2. It is *STRONGLY RECOMMENDED* to isolate all initial reactor animals in an Isolation Facility until results are received.
 3. Resampling requires that a blood sample be drawn from all initial reactor animals. Samples must be drawn as set out in [Section C.1](#).
 4. The sample will be analyzed using a diagnostic test acceptable to the OMVFSP. Refer to [Section B.10.a.i](#).
- ii. If one or more of the samples have a Positive or Suspect test result, then all initial reactor animals are considered to be Positive and must be removed within 14 days (2 weeks) of the resample test date. Status is “ENROLLED”.
1. Go to [Section D.3](#) and follow the protocol.
- iii. If all retest samples are Negative, then 8 to 12 weeks after the initial resampling, all initial reactors must be sampled again. This is the second retest.
1. It is *STRONGLY RECOMMENDED* to isolate all initial reactor animals in an Isolation Facility until results are known.
- iv. If all the second retest samples are Negative, the Qualifying Test is considered NEGATIVE and the flock status is “ENROLLED-NEGATIVE”.
- v. If one or more of the second retest samples are Suspect or Positive, then all initial reactor animals are considered to be Positive and must be removed within 14 days (2 weeks) of the second retest date.
1. Status is “ENROLLED”
 2. Go to [Section D.3](#) and follow the protocol
 3. It is *STRONGLY RECOMMENDED* that the owner schedule a visit with the flock veterinarian to review biosecurity practices. See [Supplement 5](#) for biosecurity requirements and recommendations.
3. **Follow-up Qualifying Test after a POSITIVE Whole Flock test, i.e., status is “ENROLLED”.**
- a. *Must* be scheduled between 90 and 180 days after the date of the initial Qualifying test date.
 - b. If all animals test Negative, then the flock test is NEGATIVE and the status is “ENROLLED – NEGATIVE”. Go to [Section D.4](#) - Qualifying Test for “B” Status.
 - c. If one or more animals test Positive initially or on resample, the flock test is POSITIVE, then the status is “ENROLLED”. Go to [Section D.2](#).
 - i. If $\leq 2\%$ of samples are Positive, then the option of following [Section D.2.c](#) may be taken.
4. **Results from the Qualifying Test for “B” status - Whole Flock Test**
- a. To achieve “B” status, the flock must receive two consecutive NEGATIVE whole flock tests 180 (no more than 395) days apart.
 - b. If all animals test Negative, then the flock Qualifying Test for “B” status is NEGATIVE



- i. Go to [Section D.5](#) and follow the protocol for Qualifying Test for “A” status.
- c. If one or more samples are Positive, then the flock Qualifying test for “B” status is POSITIVE.
 - i. Status is “ENROLLED”
 - ii. It is STRONGLY RECOMMENDED that the owner schedule a visit with the flock veterinarian to discuss where the program may have broken down (e.g. possible biosecurity break). See [supplement 5](#) for biosecurity requirements and recommendations.
 - iii. Go to [Section D.1](#) and follow the protocol.
- d. If $\leq 2\%$ of individual sheep results are Positive or Suspect, then an option to resample those animals may be taken. Follow the protocol at [D.2.c](#).
 - i. If on retest, following [D.2.c.](#), all test results are Negative, then the Qualifying Test for “B” status is NEGATIVE
 - 1. Otherwise the Qualifying Test for “B” status is POSITIVE
 - 2. Go to [Section D.3](#). and follow the protocol
- e. If this option is not taken, then the Qualifying Test for “B” status is POSITIVE
 - i. Go to [Section D.3](#) and follow the protocol.
- f. All biosecurity requirements *must* be followed.

5. Qualifying Test for “A” status - Random Sample Test

- a. To achieve “A” status, the flock must receive
 - i. Two (2) consecutive NEGATIVE whole flock tests 180 (no more than 395) days apart, and
 - ii. An additional NEGATIVE random sample flock test 180 (no more than 395) days later.
- b. A minimum of 180 (no more than 395) days after the second consecutive NEGATIVE flock test, a randomly selected proportion of all sheep ≥ 365 days of age must be tested (note change of age requirement). Follow the protocols at Section C.15 for selecting these sheep.
- c. The statistically derived sample of sheep will be randomly selected and be large enough to detect MV infection at a prevalence of $\geq 5\%$ with a 95% confidence interval ([Appendix 5](#)).
 - i. This sample size assumes a sensitivity of 99% and a specificity of 100%.
- d. In addition to the randomly selected animals,
 - i. Any sheep leaving and returning to the flock since the previous flock test, must be sampled. (See [Section C.9.d](#))
 - ii. Any new entries since the previous flock test, must be sampled. (See [Section C.10.d](#))
- e. Follow the protocols for record keeping and the declaration form at [Section C.6](#).
- f. If all sheep tested receive a Negative test result, then the Qualifying Test for “A” status is NEGATIVE and the flock will be awarded “A” status.
- g. If one (1) or more sheep receives a Positive test initially or on resample (i.e., prevalence of MVV is $\geq 5\%$), then there is an option to resample those animals.
 - i. If this option is not taken, then the flock test is POSITIVE and the flock status is



- “ENROLLED”); go to [Section D.3](#).
- ii. If this option is taken, follow the protocol at [Section D.6](#)
 - h. All biosecurity requirements *must* be followed.
6. **If one or more animal tests Positive or Suspect on the Qualifying Test for “A” status, and the option for retest of those animals is taken:**
- a. Request that the animals that tested positive or suspect be resampled not less than 14 days (2 weeks) and not more than 28 days (4 weeks) after the initial test date.
 - i. For purposes of this resample, these animals will be called “initial reactors”.
 - ii. Strongly recommend isolation of this (these) initial reactor animal(s) until results are known of second sample.
 - iii. Samples must be drawn as set out in [Section C.1](#).
 - iv. The sample will be analyzed using a diagnostic test acceptable to the OMVFSP. Refer to [Section B.10](#).
 1. Only results from samples submitted through the OMVFSP will be considered when assessing status.
 - b. If any sample is Positive or Suspect, then all of the initial reactor animals are considered to be Positive and must be removed within 14 days of the resample test date. The Qualifying Test for “A” status is POSITIVE. Flock status is “ENROLLED”.
 - i. Go to [Section D.3](#) and follow the protocol.
 - ii. It is recommended that the owner schedule a visit with the flock veterinarian to discuss where the program may have broken down (e.g. possible biosecurity break). See [supplement 5](#) for biosecurity requirements and recommendations.
 - c. If all sample results are Negative, then the flock qualifies for an “**A Status Requalifying**” Test.
 - i. This requires that the flock test be conducted within 21 days (3 weeks) of the resample test day, and not more than 7 weeks (49 days) of the “A” status qualifying test.
 - ii. The purpose of this test is to detect infection in the flock at $\geq 2\%$ prevalence.
 - iii. Animals ≥ 365 days of age are eligible for this test.
 1. The owner will notify the OMVFSP administrator of the flock number eligible for testing as of the date of the test.
 - iv. Animals selected in the initial “A” status qualifying test AND that tested Negative on the initial test, do not need to be retested. Their Negative results will be considered as part of the “A” Status Requalifying test
 - v. It is REQUIRED that when selecting animals for sampling,
 1. That all animals with an initial Positive or Suspect test on the “A” status qualifying test, be sampled at the “A” status requalifying test.
 2. That all additional animals be selected from those not sampled on the “A” status qualifying test.



3. The number to be sampled will be provided by the OMVFSP program administrator and will be based on the number of animals \geq 365 days of age at the time of the Qualifying “A” status test.
4. Follow the protocols for random selection ([Appendix 5](#)).
- vi. If all animals sampled have a Negative test result, then the “A Status Requalifying” Test is NEGATIVE.
 1. Flock status is “A”.
- vii. If one or more animals test Positive, then the “A Status Requalifying” Test is POSITIVE.
 1. Flock status is “ENROLLED”. Go to [Section D.3](#) and follow the protocols.
 2. It is recommended that the owner schedule a visit with the flock veterinarian to discuss where the program may have broken down (e.g. possible biosecurity break). See [supplement 5](#) for biosecurity requirements and recommendations.
7. **To maintain “A” status**, the producer *must*
 - a. Perform an annual random flock test a minimum of 365 (no longer than 395) days after the previous NEGATIVE flock test, following the protocol as outlined in [Section D.5](#).
 - b. All biosecurity requirements must be followed.
 - c. Failure to do so without indicating extenuating circumstance in writing to the OMVFSP Coordinator⁵ may result in a loss of status.

E. Monitored Low-Risk MV Flock Program

1. The purpose of “MONITORED LOW-RISK” status is to allow large flocks to demonstrate low-risk of infection with MVV with reduced requirements for animal testing. It will not allow the flock to eradicate MVV infection if present. The flock would firstly achieve “MONITORED” status and work towards “MONITORED LOW-RISK” status. The program is of most use to the following flocks:
 - a. Large flocks where the producer wishes to determine the status of MVV infection in the flock without testing all animals \geq 180 days of age. This test will detect infection if the prevalence is \geq 5% with 95% probability.
 - b. Large flocks where the producer believes that there is no MVV infection present and wishes to obtain low-risk MV status without entering the Whole Flock program.
2. Record keeping and information to be provided on the declaration form requirements are indicated in [Section C.6 \(MV Sample Declaration Form\)](#).
3. In addition to the randomly selected animals,
 - a. Any sheep leaving and returning to the flock since the previous flock test, must be sampled. (See [Section C.9.d](#))
 - b. Any new entries since the previous flock test, must be sampled. (See [Section C.10.d](#))

⁵ This person is the OMVFSP Coordinator at the Ontario Sheep Farmers 130 Malcolm Rd, Guelph, ON N1K 1B1.



4. Biosecurity requirements are as indicated in [Section C.7 \(supplement 5\)](#).
5. Qualifying test for “MONITORED” status.
 - a. A random proportion of all sheep in the flock that are ≥ 365 days of age are selected for testing.
 - b. The statistically derived sample of sheep will be randomly selected and be large enough to detect MV infection at a prevalence of $\geq 5\%$ with a 95% confidence interval ([Appendix 5](#)).
6. In the event of a NEGATIVE flock test, the flock will be awarded “MONITORED” status for a time period not exceeding 395 days from the date of the test.
 - a. This requires that all animals sampled test Negative. There is no provision for resampling animals that test Positive or Suspect.
 - b. The random flock test must be repeated annually (minimum of 180 to not more than 395 days) to maintain “MONITORED” status.
 - c. Failure to do so will result in loss of status.
7. A flock with a POSITIVE flock test, i.e., one or more animals test Positive or Suspect, has no status.
 - a. To eradicate MVV, it is recommended that the owner enroll the flock in the Whole Flock Program.
8. Qualification for “MONITORED LOW-RISK” status requires the following:
 - a. The flock has achieved “MONITORED” status on three consecutive negative Monitored tests, as described above, as long as
 - i. Biosecurity requirements have been continuously met.
 - ii. All other requirements have been continuously met.
 - b. “MONITORED LOW-RISK” status is valid for no longer than 395 days from the date of the last test.
 - c. This status implies that the flock is at low risk of being infected with MVV; however, “A” status and “MONITORED LOW-RISK” status are not equivalent in risk, with “A” status flocks being at lower risk of MV infection than “MONITORED LOW-RISK”.
 - d. Sheep may not transfer from a “MONITORED LOW-RISK” flock to an “A” flock without testing and isolation as per [Section C](#).

F. Moving from the Monitored or Monitored Low-Risk Program to the Whole Flock Program

1. For flocks with “MONITORED” status, at any time the producer may opt to join the MV Flock Status Whole Flock program but must start at [Section D.1 - Initial Qualifying Test for Enrolled Status](#), at which time all rules will apply.
2. Flocks with “MONITORED LOW-RISK” status may opt to enter the Whole Flock program at any time.
 - a. If the initial whole flock qualifying test is NEGATIVE, then the flock will be awarded “B” status rather than “ENROLLED – NEGATIVE”.
 - b. If the flock test is POSITIVE, then after the test Positive sheep are removed, the flock will be awarded “ENROLLED” status.



G. Transfer of flock status when selling or purchasing sheep

If a producer purchases sheep from a flock enrolled in the OMVFSP, those sheep will only retain the status of the originating flock if:

1. The purchased sheep
 - a. Do not contact sheep of lower or unknown status on route to the new location, and
 - b. Are the only sheep to be housed at the new location which has either:
 - i. Not housed sheep for at least 28 days, or
 - ii. Has been clean and disinfected; OR
 - c. The purchased sheep are housed in an Isolation Facility
2. It is important to remember that if sheep are mixed, the status will immediately change to the lowest status of the mixed group. The purchaser of the sheep assumes all health risks once the sheep have left the premises of origin.
3. Transferring flock status should require each purchased sheep to have 1 negative test within 28 days of transfer to the new farm.

H. Advertising of MV Flock status

1. Producers are encouraged to advertise the OMVSP status of their flocks.
2. However, there are restrictions on what can be said or implied.
 - a. Only the official name of the program may be used, specifically "The Ontario Maedi Visna Flock Status Program".
 - b. The names of the Ontario Sheep Farmers and the University of Guelph can be used only in reference to their role as program administrators or collaborators.
 - c. Only the terms of "ENROLLED", "ENROLLED-NEGATIVE", "B", "A", "MONITORED", or "MONITORED LOW-RISK" MV status, can be used and must be used only if the status is in good standing.
 - d. No reference should be made as to the flock being "free" of Maedi Visna infection but only "Low Risk".

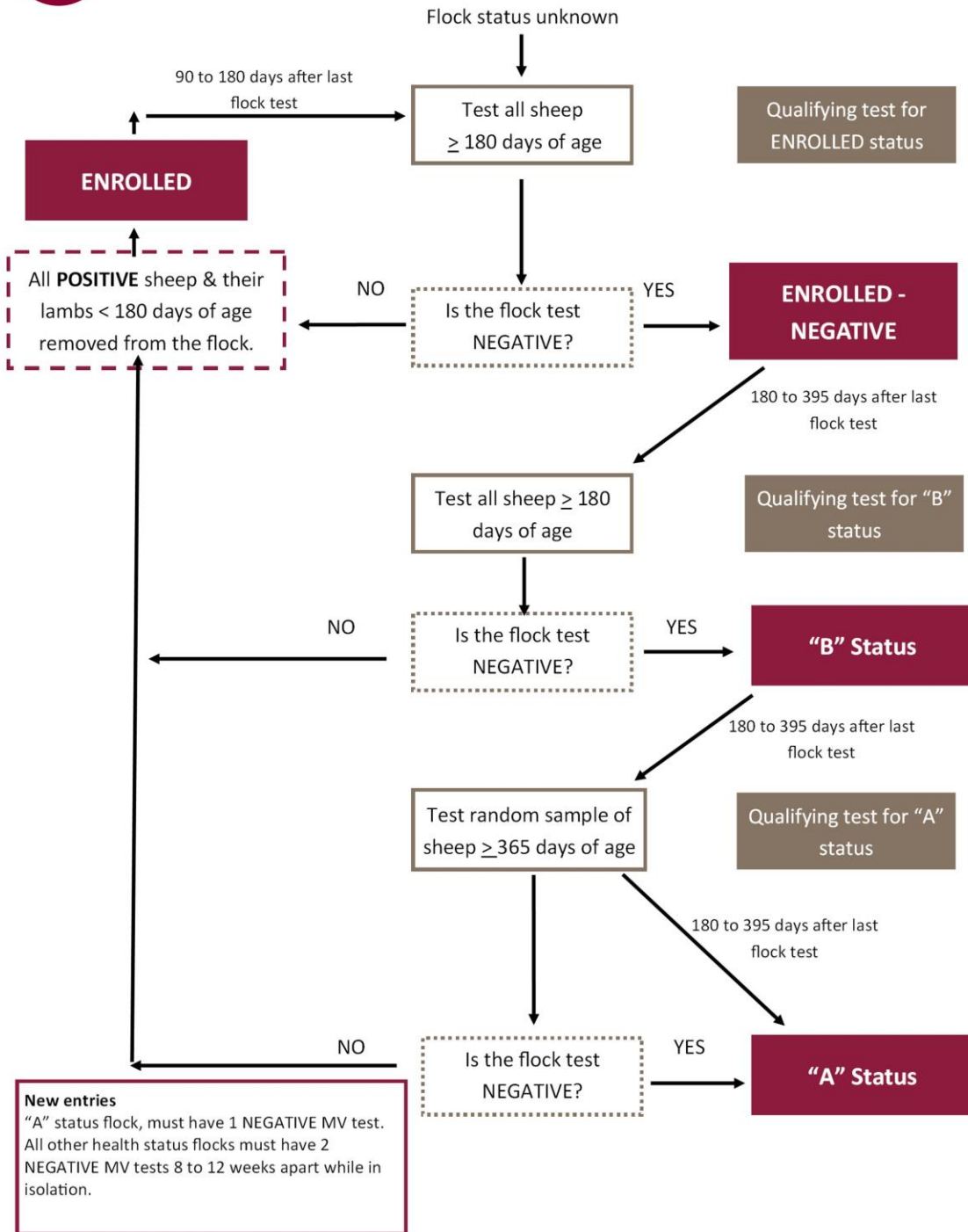


Appendix 1 Whole Flock Program



Ontario Maedi Visna
Flock Status Program

Whole Flock

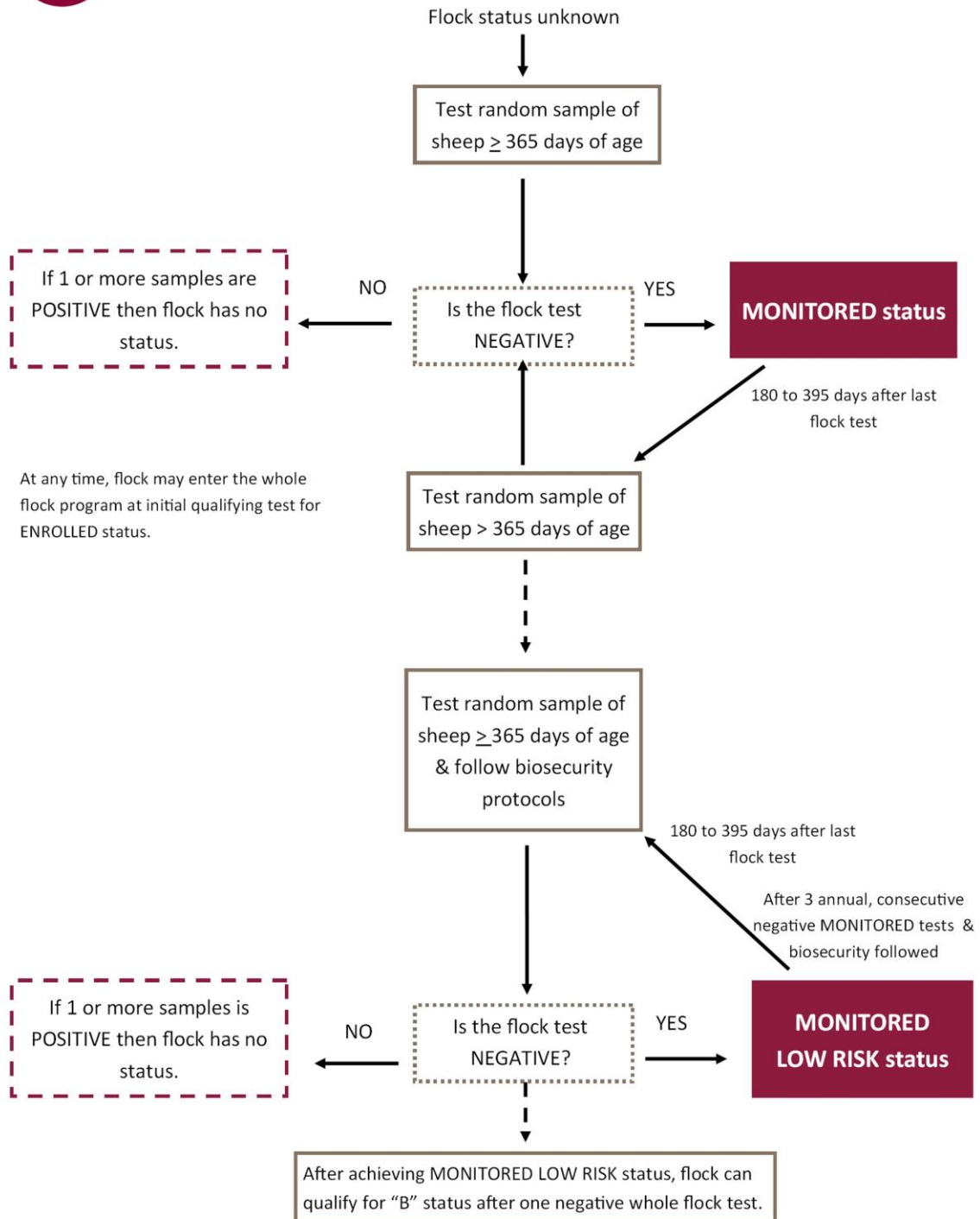


Appendix 2 Monitored Low-Risk Program



Ontario Maedi Visna
Flock Status Program

Monitored Low-Risk

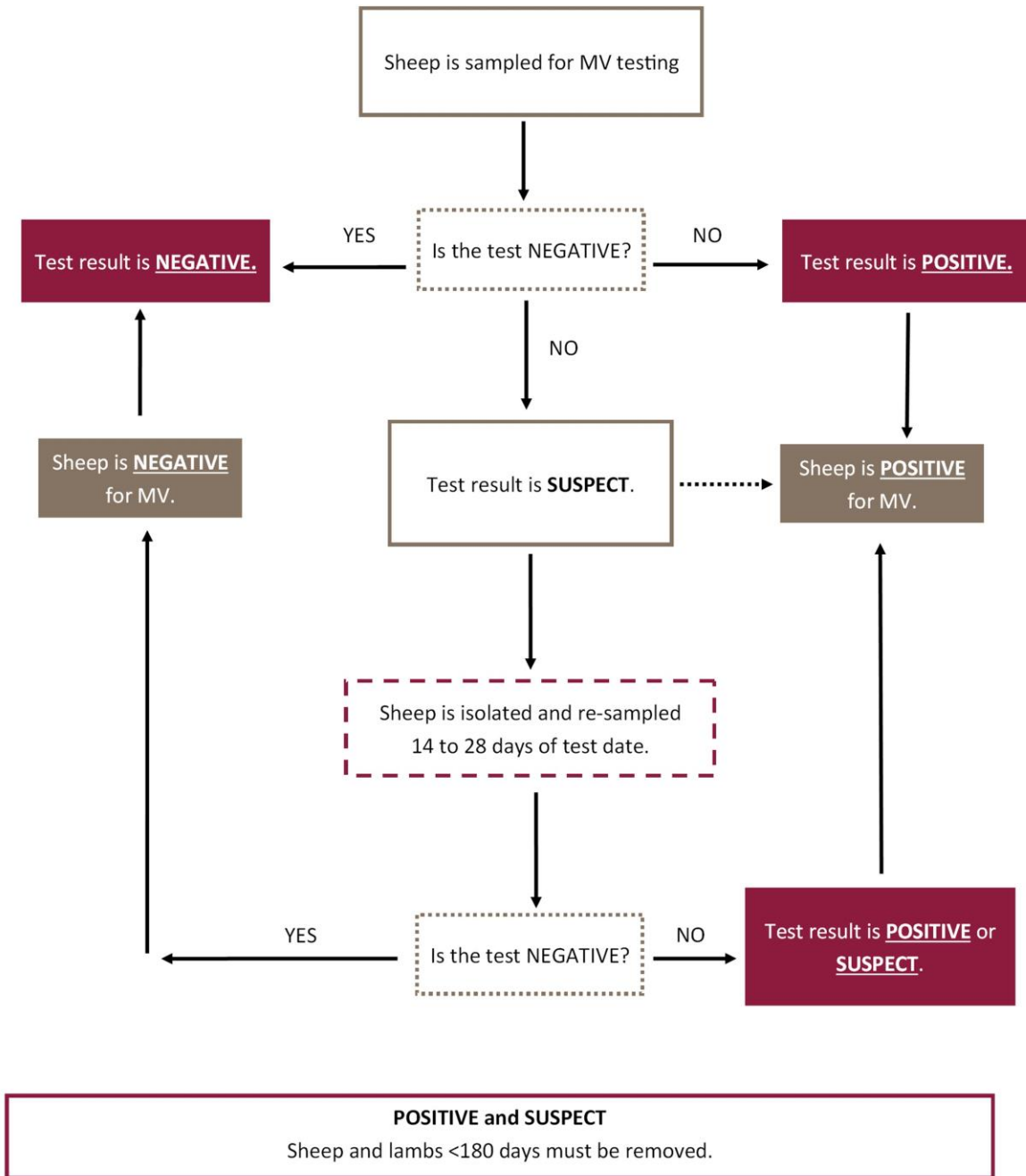


Appendix 3 Interpretation of Individual Maedi Visna Test Results



Ontario Maedi Visna
Flock Status Program

Interpretation of individual Maedi Visna test results

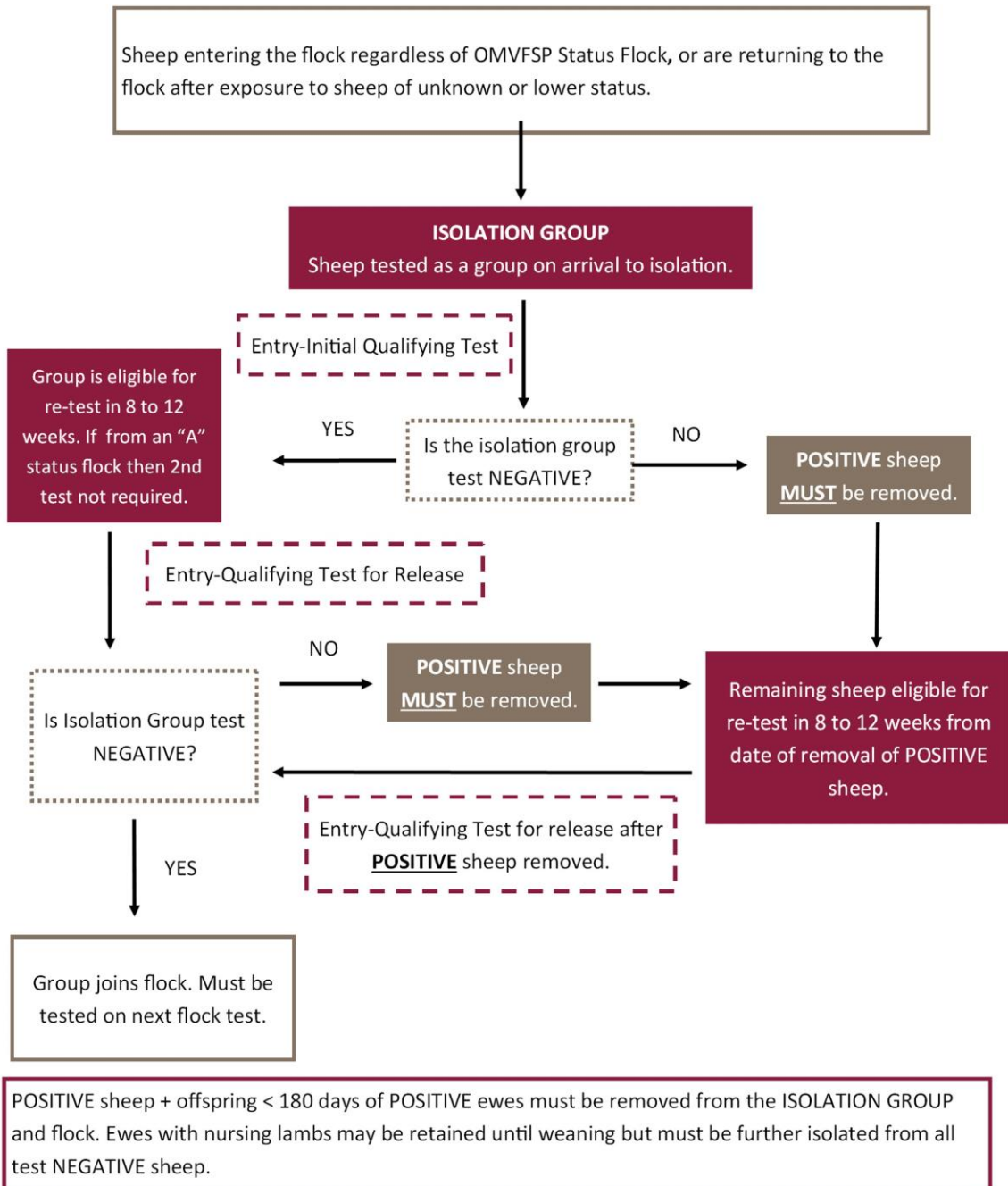


Appendix 4 Interpretation of Isolation Group Test Results



Ontario Maedi Visna
Flock Status Program

Interpretation of isolation group test results



Appendix 5 Testing a random number of sheep for the OMVFSP

The purpose of this is to test sufficient animals to detect infection at a prevalence of \geq (greater than or equal to) 5%. To be used for “A” status, “MONITORED” and “MONITORED LOW-RISK” status flock tests. Number of sheep \geq 365 days of age (i.e., 1 year of age), to be randomly selected and tested in order to be 95% confident of detecting at least one positive animal if 5% or more of the flock is infected. Assuming the test has 99% sensitivity and 100% specificity. Using a test with poorer sensitivity will require a higher sample size.

Number of sheep \geq 365 days of age = flock size under consideration.

If actual number of sheep lies between two flock sizes, use the higher sample size.

Table 1. Determining the number of sheep to be sampled for a random flock test

Flock size	Sample size	Flock size	Sample size	Flock size	Sample size	Flock size	Sample size
10	10	80	42	200	52	600	57
20	20	90	42	250	53	700	57
30	24	100	45	300	54	800	57
40	31	120	47	350	54	900	58
50	32	140	49	400	55	1,000	58
60	38	160	50	450	55	2,000	59
70	39	180	51	500	56	5,000	59

How to Perform the Random Flock Test

What is NOT RANDOM: testing the first animals down the chute or the first animals caught – not acceptable! Only testing animals from one production group - all groups must be appropriately represented - not acceptable!

Make a list of all sheep in the flock that are eligible for testing, i.e. \geq 365 days of age. Number the sheep on the list 1, 2, 3... etc to the last sheep on the list.

Consult the table above to determine how many of those sheep must be tested.
E.g. if 200 adult sheep are eligible for testing, then 52 sheep must be tested.

Use a random number table or generator to create a list of randomly selected numbers.

The producer can pre-sort the selected animals and have them ready for testing on the day.

A second way to use the random number list is to use this list to select animals as they run down the chute.

Random number tables are available as appendices in statistics texts. One is included in the table below. For more options, consult the Rand Corporation - A Million Random Digits with



100,000 Normal Deviates⁶. The PDF “Table of Random Digits” can be downloaded for free or use the table provided below.

Random number table

To use Table 2, read numbers from the table in any order (up, down, right, left or diagonal) and use the numbers to correspond to animal selection. E.g., if needing to select 39 animals from a list of 70 – you need to pick 39 numbers from 1 to 70 (without duplication) from this table. If starting at the top left of this table and reading from left to right – the first 5 numbers selected are: 52; 68; 73; 64; 66. These numbers can refer to e.g. the order of the ID in the flock; the order they come down the chute; the order in which they are caught (tough because that means you have to catch them all to get the right ones!).

Table 2. Random number table for randomizing selection of sheep for random flock test.

52687	36466	31250	10750	81154	76239	02937	00804	14571	35636	99891	39300	20363	81053
87126	68315	66018	99258	23050	51628	95686	65633	03927	49542	62015	76279	30667	47457
08370	55493	80297	42941	53954	89751	81720	75500	52079	18983	09517	54467	43840	05978
64461	88503	13868	38579	51074	06421	11489	91794	58253	16172	43289	36508	92507	19955
47069	69382	72355	41264	76842	44975	72445	60619	76206	78458	57261	20480	14159	77540
11049	93629	75978	09284	74560	35337	41350	19829	72905	81083	18417	09269	04931	02875
66460	78901	90850	56802	64686	00483	84721	02891	04851	28690	78929	55718	76640	34683
24470	72028	81587	94552	19714	14725	30418	50040	10905	21456	96274	21497	71360	84488
27826	38847	42635	00011	44324	87077	86266	36286	52016	02138	99081	33774	60456	86-051
92892	00108	80450	08016	34409	63265	03569	53389	94802	78443	14874	34622	01461	12809
75493	85249	68259	78254	04969	90573	80572	22936	75494	65843	54777	82846	07602	12542
13438	38729	51739	21464	23261	50418	88106	84632	13687	13245	91385	54043	49706	01643
92906	70078	94555	90339	44937	93688	03769	35063	29841	00717	55934	92701	55639	92813
52547	32590	50596	85757	17311	50801	05721	06699	59503	06371	57022	46540	51404	87963
87201	72295	93739	92461	86958	93697	84126	18507	15149	68452	10995	18637	63589	10291
34068	50072	01118	19281	78744	46676	26528	60506	84982	55870	85367	84104	62187	75449
71417	95366	24359	76252	95341	59073	91119	15355	25554	72685	71664	41397	85554	18196
80180	91959	07223	59851	13118	7,8283	55640	89046	36486	58435	91206	29737	73846	81192
03205	96028	75043	51927	06520	35374	13506	86271	17397	38235	89714	63479	99097	57960
64607	89019	08505	68026	46860	04838	47212	07890	53116	61106	64073	75536	37865	65796

Some web-based random number generators:

<http://www.random.org/integers/>

<http://www.randomizer.org>

When using these web sites to create a list, make sure each selected number is unique.

⁶ Rand Corporation - A Million Random Digits with 100,000 Normal Deviates

<http://www.rand.org/publications/classics/randomdigits>

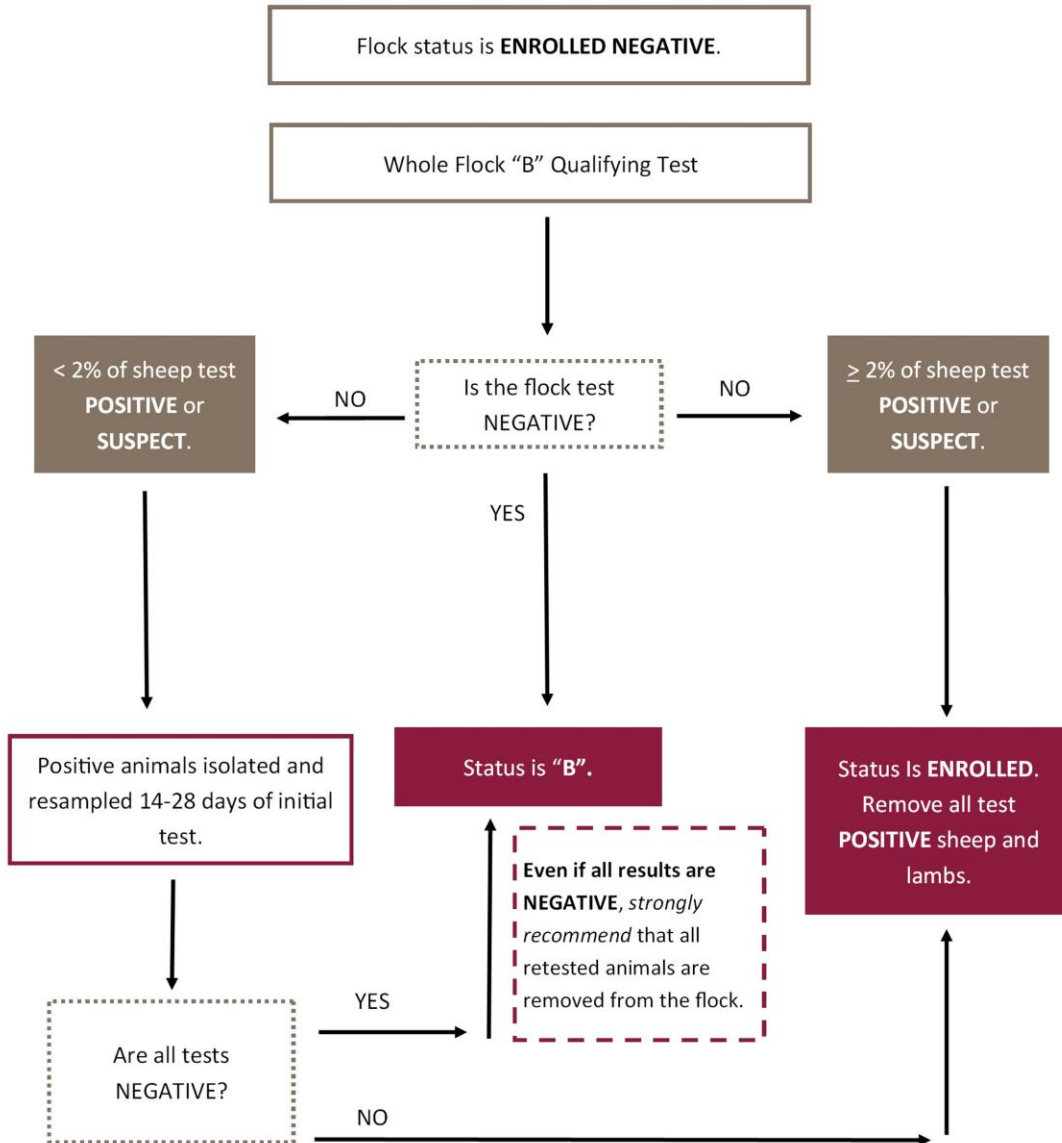


Appendix 6 Qualifying Test for “B” Status



Ontario Maedi Visna
Flock Status Program

Qualifying Test for “B” Status



Appendix 7 Qualifying Test for "A" Status



Ontario Maedi Visna
Flock Status Program

Qualifying Test for "A" Status

