OPP CONCERNED SHEEP BREEDERS SOCIETY

— Summer 2015 Update for Members and Friends —

Welcome!

The enclosed 2015 directory includes complete listings for the following new members.

Anne Camper (MT) Don and Betsy Ross Heller (MN) Cindy and Mark Mackenzie (WI)
Glen and Kathy Parker (AB) Geri and Jay Parsons (CO)

Finances:

The OPP Society is an all volunteer organization, funded entirely by member dues which currently generate ~$950 annually. This just about covers our monthly ads in The Shepherd, plus website hosting, directories, and misc. printing and postage. Our ads in ASI's Sheep Industry News are complimentary, for which we are sincerely appreciative. Dues paid in advance for multiple years are held in escrow, leaving us with a typical running balance of plus/minus $1K.

You can help us grow:

Simply offering a brochure or member directory to your veterinarian and your buyers may be all that it takes. If you'd like to have a few extra directories on hand, just let us know. Color brochures can be printed from the Library page at OPPsociety.org

3-year OPP Eradication Trial continues in Minnesota:

With results in for 2013- and 2014-born lambs, producers have now begun testing 2015 lambs. Good news is that two of the most heavily infected flocks have retained adequate test-negative replacements allowing dispersal of all positives. These producers will continue with 'Elitest' serology in order to confirm their flocks' ongoing 100% negative status. Disappointing for two others was the seroconversion, at 3 and 4 years of age, of purchased test-negative TMEM154 diplotype 1,1 rams following breeding season exposure to positive ewes. For the remainder of the trial, we are recommending that producers consider genetic TMEM154 testing of oldest ewes. To date, DNA and corresponding results for four 11-year-old ewes are as follows: 1,1 and 1,4 ewes remain test-negative; 1,1 and 1,2 are test-positive. Interested readers may follow updates on the OPPsociety.org News page.

It's getting easier to make OPP a thing of the past:

by Mark Lelli DVM

I don't need to emphasize the slow, economically debilitating nature of this disease. When put to paper, reductions with respect to percentage of lambs at weaning and decreases in lamb gain along with reduced ewe longevity, it's not hard to recognize how OPP can undercut the bottom line in an infected flock. Historically, eradication of this SRLV (small ruminant lentivirus, the cause of OPP) from individual flocks has been labor intensive, costly and time consuming. Fortunately, new research directed toward a better understanding of OPP transmission and the discovery of a genetic basis behind susceptibility to infection has led to new strategies that can streamline the path to disease eradication for infected flocks.

Until recently, it was thought that transmission within an infected flock occurred primarily when lambs nursed from their infected dam. We now know that the vast majority of new infections occur when yearling ewes are allowed to continuously commingle with older infected adult ewes. That discovery was a game changer when it came to the adaptation of more user-friendly management strategies that are highly effective at reducing virus transmission. Based on this premise, Minnesota began a three-year voluntary OPP eradication trial in 2013 utilizing simple flock management and testing strategies (related note above). With results now in for the 2013 and 2014 lamb crops from seven individual flocks, this simple, relatively low-cost OPP eradication strategy appears to be working for those producers who have been able to follow the protocol. Details of this new eradication method, which can easily be applied in any flock, can be found on the Minnesota Board of Animal Health website: www.bah.state.mn.us With the improvement in surveillance testing and the relatively simple and straightforward protocol to become a test-negative flock, I can't imagine why any purebred sheep producer wouldn't make sure they have a test-negative flock. It's just a matter of testing a few of your older animals and if this virus is present, utilize this protocol and get rid of it. It's quite simple and straightforward.

In addition to this new management strategy, a genetic component to susceptibility was reported in 2012 by researchers at USMARC. The discovery that genetic variations in the ovine transmembrane protein 154 gene (TMEM154) can influence susceptibility to infection has given way to yet another tool that can be used in conjunction with AGID or 'Elitest' ELISA serology and sorting to reduce transmission levels. Working in collaboration, USMARC researchers and GeneSeek scientists in Lincoln, Nebraska (www.neogen.com) developed a DNA test for susceptibility to the OPP virus. An easy-to-read 2012 review of this initial genetic work can be found on the 'Library' page of the OPP Society website: www.OPPsociety.org

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GeneSeek's new TMEM154 test for OPP susceptibility has been commercially available since 2013, and OPP research at USMARC is still in progress. Therefore, analyzing data from as many breeds as possible is critical in order to give scientists the information needed to hone in on this new genetic management tool as well as help explain variations in breed susceptibility. For highly susceptible breeds, this type of information may be even more useful in advancing the productivity of the breed. In order to do this, much more data are needed. This can be done with the help of producers submitting their GeneSeek results to the OPP Society at TMEM154@OPPsociety.org making sure to include breed type. Results will be compiled by breed and posted anonymously on the 'News' page at OPPsociety.org (see below for preliminary report).

It is important to note that the infection of sheep with certain TMEM154 diplotypes is associated with specific strains of OPP virus. Additionally, there is at least one strain of the OPP virus that can infect sheep regardless of their TMEM154 diplotype. A March 2015 paper from USMARC, published in the journal Veterinary Research, reports the identification of this strain and shows the current known associations of OPP strains with sheep TMEM154 diplotypes. It seems once you unlock the door to one room you enter a room that has more doors to be unlocked before you finally get to the room with the treasure. Once again, the more data that can be obtained from flocks in this country, the sooner we will have better tools to effectively manage this disease at the genetic level of both the host and the pathogen.

At the end of the day, this work not only helps improve productivity, it increases the overall quality of life and longevity of our livestock. After all, healthy sheep are happy sheep!

Many thanks to Drs. Mike Clawson, Mike Heaton, and Kreg Leymaster at USMARC for taking the time to review and for helpful edits.
The Society also thanks the editors of "The Shepherd" magazine and AASRP's "Wool & Wattles" newsletter for earlier publication.

How to Interpret This Report:

This TMEM154 breed-specific genetic information is presented in the interest of science, not as a ranking of best to worst regarding OPP.

Genetically speaking, each sheep has a "diplotype" which identifies that animal's relative susceptibility to infection with the OPP virus; and each diplotype consists of two "haplotypes." **Reported here is the frequency distribution of haplotypes discovered to date for various U.S. breeds, with data from published USDA studies listed separately.**

Haplotypes are numbered in the order discovered, and those deemed insignificant are deleted, thus the "missing" numbers. **Most breeds carry a mixture of Haplotypes 1, 2, and 3** (with 2 and 3 found to be dominant and most susceptible). Haplotype 4 is found less frequently, while numbers 6 and beyond are rare and unstudied to date.

Haplotype frequencies can vary, even within a breed, depending on many factors. This becomes especially apparent when comparing data between flocks that eradicated the OPP virus many years ago (thereby retaining the more susceptible genotypes) vs. infected flocks in which animals were simply removed as they developed symptoms.

It's important to also note the recent discovery that **variants of the OPP virus have adapted to infect animals with the "least susceptible" Haplotype 1, as well as those carrying the "earlier-suspected-to-be-somewhat-resistant" Haplotype 4.** Research is ongoing and we will report more as it becomes known.

Eradication of the virus remains the surest way to eliminate the effects of OPP, therefore the new TMEM154 test does not replace the need for AGID or 'Elitest' ELISA testing. While some may opt to employ the DNA testing in their OPP control efforts, **at this time the OPP Society does not advocate genetic selection as a route to eradication**.

In summary, ALL breeds are susceptible to infection with the OPP virus, so ALL shepherds need to be aware of this risk and the related need for biosecurity.

Babydoll Southdown (n = 13)
- 1 0.69
- 2 0.31

Border Leicester (n = 16)
- 1 0.50
- 2 0.16
- 3 0.31
- 4 0.03

Columbia / USDA (n = 208)
- 1 0.995
- 3 0.005

Columbia / Other U.S. (n = 48)
- 1 0.999
- 4 0.010

Dorper / USDA (n = 18)
- 1 0.389
- 2 0.361
- 3 0.250

Dorset / USDA (n = 74)
- 1 0.86
- 2 0.14

Dorset / Other U.S. (n = 130)
- 1 0.873
- 2 0.104
- 3 0.023

Finnsheep / USDA (n = 133)
- 1 0.70
- 2 0.20
- 3 0.102

Finnsheep / Other U.S. (n = 9)
- 1 0.28
- 2 0.67
- 3 0.05

Hampshire (n = 165)
- 1 0.618
- 2 0.209
- 4 0.173

Katahdin / USDA (n = 36)
- 1 0.53
- 2 0.04
- 3 0.25
- 4 0.15
- 9 0.03

Katahdin / Other U.S. (n = 107)
- 1 0.61
- 2 0.13
- 3 0.15
- 4 0.09
- 9 0.02

Lincoln (n = 9)
- 1 0.39
- 2 0.44
- 4 0.17

Montadale (n = 15)
- 1 0.97
- 3 0.03

Polypay / USDA (n = 814)
- 1 0.888
- 2 0.031
- 3 0.071
- 4 0.003
- 10 0.006
- 11 0.001

Polypay / Other U.S. (n = 202)
- 1 0.884
- 2 0.03
- 3 0.074
- 4 0.012

Rambouillet / USDA (n = 541)
- 1 0.953
- 2 0.006
- 3 0.030
- 4 0.005
- 10 0.006

Rambouillet / Other U.S. (n = 207)
- 1 0.92
- 2 0.01
- 3 0.06
- 4 0.002
- 10 0.01

Romanov / USDA (n = 370)
- 1 0.39
- 2 0.08
- 3 0.54

Shropshire (n = 99)
- 1 0.606
- 2 0.091
- 4 0.298
- 8 0.005

Southdown (n = 6)
- 1 0.59
- 2 0.08
- 6 0.33

Suffolk / USDA (n =180)
- 1 0.69
- 2 0.16
- 4 0.13
- 6 0.02

Suffolk / Other U.S. (n = 90)
- 1 0.75
- 2 0.16
- 3 0.01
- 4 0.08

Texel / USDA (n = 60)
- 1 0.26
- 2 0.51
- 3 0.23