

# OPP Eradication Trial Update

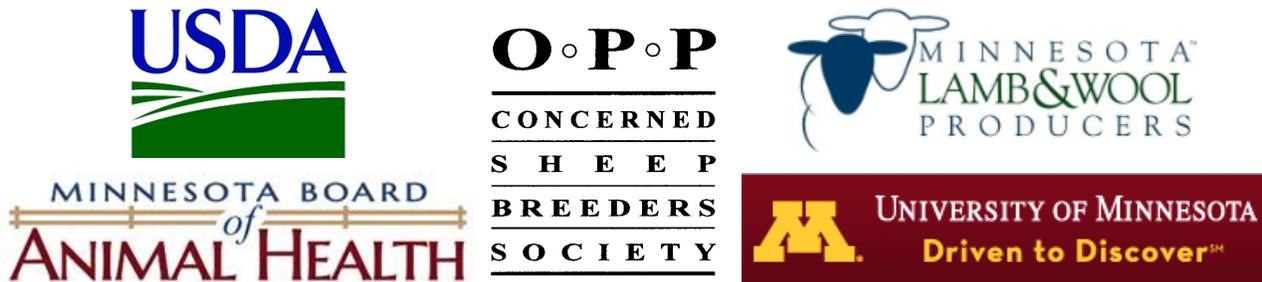
*New strategy works — no more orphaning!*

Judy Lewman with Holly Neaton, DVM

## Background:

The pieces of this puzzle have finally come together. Following the lead of OSU's Dr. Bill Shulaw, we both eradicated OPP nearly 20 years ago by simply shifting emphasis to the testing of young lambs. Holly's Polypay flock had become 75% infected following purchase of a "test-negative" ram, while Judy's Border Leicesters, initially 100% test-positive, remained heavily infected in spite of seven years of test-and-cull combined with orphan rearing.

Unfortunately, Bill's OPP project involving sequential testing of very young lambs was cut short by a dog attack. But his work piqued our curiosity and, having nothing to lose, we started testing lambs at 3-4 months of age. To our amazement, this was our ticket out of the OPP woods. By early removal of the few lambs that came up AGID positive, we were able to establish new 100% test-negative flocks within 12-18 months. Granted, we had continued to remove lambs for orphaning. But then . . .



Fast forward to 2007, when research by USDA's Dr. Lynn Herrmann-Hoesing strongly suggested that dams *do not* transmit the OPP virus (OPPV) to lambs via milk and colostrum. Lynn's finding was supported six years later by USDA's Dr. Kreg Leymaster, who concluded in a 2013 paper that the primary cause of infection (70-90%) in a flock of mature ewes is likely due to non-maternal exposure that occurs *after young ewes join the infected breeding flock*. So the secret to eradication was just as we'd done, but without orphaning.

## Working Together:

In the Fall of 2013, encouraged by USDA Sheep & Goat Epidemiologist Dr. Chuck Gaiser and with Minnesota's OPP Pilot Program\* no longer piggybacked on the Scrapie Flock Certification Program, we approached the Minnesota Lamb & Wool Producers about the feasibility of a three-year OPP eradication trial. Leadership quickly signed on to match producer costs; the Minnesota Board of Animal Health and USDA-Veterinary Services agreed to visit flocks/collect samples; and the University of Minnesota Veterinary Diagnostic Laboratory offered to waive accession charges and discount test fees for trial flocks. The trial was on!

## New ELISA Test at the University of Minnesota:

Shortly before the start of the trial, the U of M Veterinary Diagnostic Laboratory imported the 'Elitest' ELISA and we have used this test throughout the trial. Of more than 30 ELISAs noted for detection of OPP and CAE, the related goat disease, 'Elitest' is the only one validated to standards of the World Organization for Animal Health (OIE). This test was developed through a collaborative effort by laboratories in the U.K., Spain, Italy and Belgium, and is used in control and eradication programs worldwide, including Ontario and Minnesota.

## New Eradication Strategy:

The protocol we've used is simple and can easily be applied by anyone. Breeding ewes in the infected flock are managed as a single unit, *regardless of test status*, and allowed to birth and raise all lambs to weaning. Offspring selected for replacements and found to be OPPV negative post-weaning, but prior to 12 months of age, are permanently segregated and re-tested annually to confirm continuing test-negative status. This creates the base for

a 100% test-negative flock, with all test-positive adults culled once adequate test-negative replacements have been retained.

**15 Flocks Tested:**

All Minnesota Lamb & Wool Producers members were invited to apply for the trial and 15 did so. To determine eligibility, all 15 flocks completed an initial test run in late 2013/early 2014. Two flocks were completely free of OPPV; two more were minimally infected; two dropped out voluntarily; and three were unable to follow trial protocol. The six flocks remaining range from 24 to 400 ewes and represent a wide variety of breeds, facilities, and management styles.

**Results to Date:**

With test reports in for 2013, 2014, and 2015 lamb crops from five of six flocks remaining in the trial, one producer has already achieved a 100% test-negative flock more than equal in size to the original “Parent Flock,” which was >60% infected when first tested. This producer was also able to retain several 3- to 7-year-old animals that have remained test-negative throughout the trial. After passing another Elitest ELISA run nearly a year after all test-positives had been culled, these older test-negatives were allowed to join the young test-negative replacements. Current data for all six flocks:

2013 Baseline OPPV %	Status of Six Trial Flocks as of December 2015 (replacements born in 2013, 2014 and 2015)
93%	12.5% pos: adequate neg replacements; ALL pos now culled
64%	5.5% pos: multiple groups; building one neg group at a time
61%	100% neg: and 17% of current ewes “rescued” from originals
35%	17.5% pos: struggling but determined; 2015’s only 11% pos
*21%	8.6% pos: adequate neg replacements; ALL pos now culled
*14%	4.3% pos: adequate neg replacements; will soon cull all pos

*Baseline represents highest OPPV% in lamb or adult subset from each flock*  
*\*Several animals culled on symptoms and/or serology prior to initial screening test*

**Genetic Testing for OPPV Susceptibility:**

While not included in our original trial proposal, the Minnesota Lamb & Wool Producers requested a genetic component and has covered all costs for DNA testing, with one ram eligible annually per 25 ewes. Of all rams genotyped for the trial so far, >50% have been of the favored less susceptible *TMEM154* diplotype 1,1. However, in two of the trial flocks a purchased test-negative 1,1 ram has seroconverted following breeding season exposure to test-positive ewes, one at three years of age and the second at four years. Ram testing is now on hold, and for the remainder of the trial some producers will be testing oldest ewes. To date, DNA and corresponding serology results for four 11-year-old ewes are as follows: *TMEM154* diplotype 1,1 and 1,4 ewes remain test-negative, while 1,1 and 1,2 ewes are test-positive. Genetic susceptibility research is ongoing, and interested readers may follow updates on the ‘News’ and ‘Library’ pages at [www.OPPsociety.org](http://www.OPPsociety.org)

*\* Minnesota’s voluntary OPP Test & Control Pilot Program, the first in the U.S., was implemented in 2006 as an add-on to USDA’s voluntary Scrapie Flock Certification Program. Now a stand-alone program administered by the Minnesota Board of Animal Health and coordinated by OPP Society volunteers, the OPP Pilot is open to any Minnesota flock. To apply, or for more information, see <https://www.bah.state.mn.us>*