

REPORT OF THE COMMITTEE ON SCRAPIE

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Vice Chair: Dr. Joe D. Ross, Sonora, TX

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The Committee met on November 9, 2005, from 8:00am until 11:55am, Hershey Lodge and Convention Center, Hershey, Pennsylvania. The meeting was called to order by Dr. Jim Logan, chair, with vice chairman Dr. Joe D. Ross attending. There were 74 people in attendance.

The Scrapie Program Update was provided by Dr. Diane Sutton, National Scrapie Program Coordinator, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Services (APHIS), Veterinary Services (VS). The complete text of the Status Report is included in these Proceedings.

Dr. Patricia Meinhardt, USDA-APHIS-VS-National Veterinary Services Laboratory (NVSL) gave the Update on Genotyping Labs and Discrepancies in Results. NVSL conducts investigations into discrepancies on genotype testing results associated with the Scrapie Eradication Program. It is the policy of the Program to conduct a second genotype test at a second laboratory on certain individual animals. Occasionally, there are discrepancies in those results. The NVSL conducts follow-up on these situations through additional testing on additional samples from the field and archive samples from the testing laboratories.

For the period of time from January 1, 2005, until October 15, 2005, there were 23 instances of discrepancies in results from 35 flocks. Of those 23 instances, 14 were caused by laboratory error (paperwork or sample mix-up), 3 results from field error, 5 were not completely resolved, and 1 originated from the use of a non-approved laboratory for the first test. As a result of inconsistencies, one laboratory's certification was revoked by APHIS-VS.

To reduce/eliminate these problems, the Program has placed additional quality requirements on the testing laboratories: additional review of final reports, additional coding systems for testing operations, strict follow-up and reports to NVSL on corrective actions, dual data entry systems, and more frequent inspections.

The Agricultural Research Services (ARS) Scrapie Research Update was given by Janet Alverson, USDA- ARS. Dr. Alverson reported on the effect of multiple births and fetal position within the uterus on PrP-Sc accumulation in fetal cotyledons. Fetal cotyledons of fetuses with

resistant genotypes can accumulate PrP-Sc when positioned next to a fetus of susceptible genotype with cotyledons positive for PrP-Sc accumulation.

Scrapie Surveillance Evaluation Working Group Update was presented by Tracey Lynn, Epidemiologist with the National Surveillance Unit, Center for Epidemiology and Animal Health (CEAH). The presentation provided a background on evaluation, a quick review of analyses completed to date by the scrapie surveillance evaluation working group, and some of the preliminary findings. The process of surveillance system evaluation is undertaken to assist a disease control program with identifying possible improvements to their surveillance system, and includes an assessment of the overall utility of the system, identification of potential gaps in coverage, and an evaluation of the overall performance of the system. The scrapie surveillance evaluation working group reviewed the structure and processes of the scrapie surveillance program, as well as various quality and effectiveness measures.

Overall, 98-99% of surveillance samples come from the Regulatory Scrapie Surveillance System (RSSS), so the RSSS system has been the primary focus of the evaluation process. The working group developed a flow chart indicating the flow of sheep through RSSS, which identified potential gaps in surveillance coverage, including custom kill plants and sheep being exported to Mexico. Spatial analyses can assist in identifying areas with high density sheep populations with lower levels of RSSS sampling. Identification compliance is being evaluated by reviewing reports from slaughter plants on the proportion of animals with appropriate identification. Additional analyses remain, including defining the most appropriate economic analyses, and comparing the surveillance system with developing surveillance standards. The working group hopes to have a draft written report for review by the end of the year.

Giving the Update on Scrapie Diagnostics and Susceptibility was Katherine O’Roarke, Research Microbiologist, USDA-ARS. “What’s New in Scrapie” -- Biopsy sampling of the third eyelid or tonsillar lymphoid tissue is a useful live animal test for scrapie. The biopsy sample is examined for accumulation of the abnormal prion protein using immunohistochemistry. A joint project conducted by the Veterinary Laboratory Agencies and the Moredun Institute in the United Kingdom has developed an alternative technique in which tissue is collected from the narrow band of lymphoid tissue near the rectal-anal junction. The morphology of the lymphoid follicles is similar in the tonsil, retropharyngeal lymph nodes, third eyelid, and rectal-anal mucosal tissue. A report on more than 300 sheep in the United Kingdom (UK), prepared by Drs. Lorenzo Gonzalez and Jeffrey Martin, will describe the sensitivity, specificity, and optimal collection interval for this technique in a variety of breeds of British sheep. ARS has done a preliminary evaluation of the technique in US sheep. Samples of third eyelid and rectal-mucosal tissue were collected from 56 sheep. Forty-two (42) sheep had negative biopsies at both sites; most of these sheep have been necropsied and no PrP-d was found in retropharyngeal lymph node or tonsil, showing good agreement with the antemortem biopsies. Fourteen (14) sheep had positive rectal biopsy samples; of those, only 12 had positive eyelid biopsies. These sheep will be monitored for disease development. However, the protocol is identical for all samples and it is probable that these sheep represent false negative third eyelid results. Abstracts of reports on the UK studies indicate that sensitivity of the test was 70% in the UK; similar large scale testing on US sheep is necessary. The biopsy tissue is somewhat difficult to handle in the tissue processing laboratory and adaptation to an ELISA format may improve test performance.

Alexia McKnight, Assistant Professor of Radiology, University of Pennsylvania, reviewed magnetic resonance imaging (MRI) diagnostics before the committee. A synopsis containing references is attached at the end of this report. Dr. McKnight asked the question, "could MRI be a cost-effective screening test, estimated at \$25-30 each with results immediately available." The committee feels that it is not practical as compared to other alternatives currently available. However, the committee expressed interest in future reference to this technology.

Dr. Diane Sutton lead the Uniform Methods and Rules (UM&R) and Regulatory Issues Discussion. Several modifications to the UM&R were discussed. Eight issues were identified and communicated to the APHIS scrapie program coordinator. The committee acknowledged that APHIS and the industry is adequately addressing the year-to-year industry concerns.

Dr. Kris Petrini representing the North Central United States Animal Health Association District presented five recommendations to the Committee. During the discussions regarding these recommendations it was evident that all five issues had been addressed during the year at this Committee meeting.

The Committee approved a recommendation that USDA-APHIS-VS continue to provide indemnity funds for animals that have been designated for testing in Flocks Under Investigation as an alternative to third eyelid testing after consultation with the designated Scrapie Epidemiologist (DSE) and the Regional Area Epidemiologist (RAE).

The 2004 Resolutions along with their responses were reviewed by the Committee.

A Resolution concerning premises registration and identification was approved by the Committee and forwarded to the Committee on Nominations and Resolutions.

Committee on Scrapie
Status Report-Fiscal Year 2005: Cooperative State-Federal Scrapie Eradication Program

Submitted by Diane Sutton, DVM and Gary Ross, DVM
National Center for Animal Health Programs, APHIS, USDA

In Fiscal Year 2005 the Scrapie Eradication Program focused on: (1) utilization of a genetic based approach to flock clean-up plans; (2) cleaning up infected and source flocks; (3) tracing and testing exposed animals and flocks; (4) expansion of regulatory slaughter surveillance (RSSS); (5) conducting consistent state reviews, (6) producer education; (7) upgrading of the Scrapie National Generic Database and (8) publishing the updated Scrapie Eradication Uniform Methods and Rules (UM&R). The current Scrapie Eradication UM&R is posted at <http://www.aphis.usda.gov/vs/naahps/scrapie/umr-scrapie-erad.pdf>.

Consistent State Reviews

States must meet the requirements in 9 CFR 79.6 in order to move sheep and goats in interstate commerce with minimal restrictions. Twenty seven states have enacted the required identification rules, the remaining states have submitted a work plan that describes the steps that will be taken to comply and provided a timeline for completing significant milestones. USDA is conducting onsite scrapie program consistent state reviews and has completed reviews in 12 states. States must be in full compliance by the end of their current rule making cycle. States not in full compliance at that time will be removed from the consistent state list. Removal from the list would create a significant impact on the interstate movement of sheep and goats from those States.

Scrapie Flock Certification Program

As of September 30, 2005, there were 1,961 flocks participating in the Scrapie Flock Certification Program (SFCP). Of these flocks 188 were certified flocks, 1,770 were complete monitored flocks, and 3 were selective monitored flocks (figure 2). There were 209 flocks newly enrolled and 53 newly certified (13 with status dates in FY 2005 and 40 with status dates in previous years) in FY 2005 (figure 3).

Infected and Source Flocks

As of September 30, 2005, there were 105 scrapie infected and source flocks. There were a total of 165** new infected and source flocks reported for FY 2005. The total infected and source flocks that have been released in FY 2005 was 128. The ratio of infected and source flocks cleaned up or placed on clean up plans vs. new infected and source flocks discovered in FY 2005 was 1.03 : 1*. In addition 622 scrapie cases were confirmed and reported by the National Veterinary Services Laboratories (NVSL) in FY 2005, of which 130 were RSSS cases. Fifteen cases of scrapie in goats have been reported since 1990. The last goat case was reported in May 2005. Approximately 5,626 animals were indemnified comprised of 49% non-registered sheep, 45% registered sheep, 1.4% non-registered goats and 4.6% registered goats.

Regulatory Scrapie Slaughter Surveillance (RSSS)

RSSS was designed to utilize the findings of the Center for Epidemiology and Animal Health (CEAH) Scrapie: Ovine Slaughter Surveillance (SOSS) study. The results of SOSS can be found at <http://www.aphis.usda.gov/vs/ceah/cahm/Sheep/sheep.htm>. RSSS started April 1,

2003. It is a targeted slaughter surveillance program which is designed to identify infected flocks for clean-up. During FY 2005 collections increased by 32% overall and by 90% for black and mottled faced sheep improving overall program effectiveness and efficiency as demonstrated by the 26% decrease in percent positive black faced sheep compared to FY 2004. Samples have been collected from 62,864 sheep since April 1, 2003, of which results have been reported for 59,105 of which 209 were confirmed positive. During FY 2005, 33,137 samples were collected from 81 plants. There have been 130 NVSL confirmed positive cases (30 collected in FY 2004 and confirmed in FY 2005 and 100 collected and confirmed in FY 2005) in FY 2005. Face colors of these positives were 114 black, 14 mottled, 1 white and 1 unknown. The percent positive by face color is shown in the chart below.

Scrapie Testing

In FY 2005, 35,845 animals have been tested for scrapie: 30,192 RSSS; 4,742 regulatory field cases; 772 regulatory third eyelid biopsies; 10 third eyelid validations; and 129 necropsy validations (chart 9).

Animal ID

As of October 04, 2005, 103,580 sheep and goat premises have been assigned identification numbers in the Scrapie National Generic Database. Official eartags have been issued to 73,807 of these premises.

*This number based on an adjusted 12 month interval to accommodate the 60 day period for setting up flock plans.

Percent of Samples Positive by Face Color FY '04 & '05

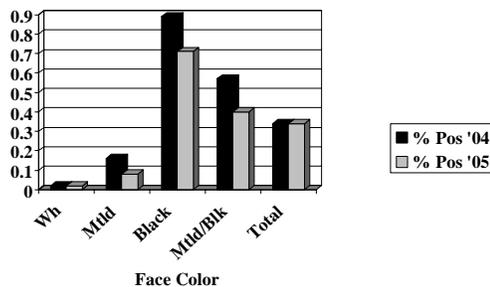


Chart (7)