

REPORT OF THE COMMITTEE ON JOHNE'S DISEASE

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The Committee met on November 14, 2010 at the Minneapolis Hilton Hotel in Minneapolis, Minn., from 12:30-5:30 pm. There were 33 members and 23 guests present. Self introductions were made by all in attendance.

The National Johne's Working Group also met on November 14, 2010 at the Minneapolis Hilton Hotel in Minneapolis, Minn., from 8:30-11:30 am. A complete report from that meeting is provided at the end of this report.

Status of 2009 Resolutions and Recommendations

RESOLUTION NUMBER 1: Program Standard Revision with Updated Herd Classification System

RESOLUTION:

The United States Animal Health Association (USAHA) requests the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) adopt the draft Program Standards for the Voluntary Bovine Johne's Disease Control Program including the new Herd Classification System. Additionally, USAHA requests USDA-APHIS-VS develop associated educational materials for the Johne's Program to inform producers about the new program standards including changes and transition to the new Herd Classification System.

RESPONSE:

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (VS) has adopted the concept of the new herd classification system by incorporating it into the Program Standards for the Voluntary Bovine Johne's Disease Control Program. The changes went into effect in September 2010. VS has developed presentation materials that State and Area offices can use to describe the changes that were made to the program standards. Additionally, VS will continue to work through the National Johne's Disease Education Initiative to develop materials to prepare producers and veterinarians for changes to the program standards. Materials produced by the education initiative include a brochure that discusses the changes, and one of the quarterly newsletters to beef and dairy industry members included an article pertaining to the revised standards. VS will also be working with the University of Wisconsin's School of Veterinary Medicine to revise the certification material for the Veterinary Continuing Education Online training.

Time-Specific Paper

Michael Collins, University of Wisconsin-School of Veterinary Medicine, presented a time-specific paper on Multi-level interpretation of the new IDEXX M. paratuberculosis ELISA on serum and milk based on likelihood ratio analysis. An abstract of the paper is included at the end of this report.

United States Johne's disease Program Updates FY 2010

Michael Carter, Ruminant Program Coordinator, USDA-APHIS-VS.

In FY 2010, State reported activities included 149,770 cattle tested by ELISA and 11,631 cattle tested by fecal culture or PCR, 3,787 enrolled herds (2,945 dairy and 842 beef) of which 375 are test negative herds (189 dairy and 186 beef). Herds enrolled as test negative herds are progressing through to level 4. There are 102 Johne's program level 1 (38 dairy and 64 beef), 129 Johne's program level 2 (66 dairy and 63 beef), 20 Johne's program level 3 (4 dairy and 16 beef), and 124 Johne's program level 4 herds (81 dairy and 43 beef). This represents a significant decrease in all categories.

In FY 2010 USDA-APHIS-VS receive \$6.8 Million. In FY 2010 VS made the National Johne's Demonstration Project a priority and continued funding the data collection in an attempt to see that all herd enrolled in the project had at least 7 years worth of data. In FY 2010 USDA-APHIS-VS stop the data collection portion of the National Johne's disease Demonstration Herd Project and only supported data analysis. In the future, USDA-APHIS-VS is looking to bring the Johne's disease control program into alignment with the VS 2015 vision. This brings about a shift in the focus by USDA-APHIS-VS maintaining the herd classification portion of the program while reducing the direct support provided to producers in favor of that effort being pick up by the State and Industry stakeholders.

The latest revision to the Uniform Program Standards for the Voluntary Bovine Johne's Disease Control Program went into effect on September 2010. Program standard changes included reducing the frequency of risk assessments to every three years, the use of milk ELISA and the guidelines to allow States to allow DHIA technicians or other competent personnel to collect samples for program herd classification. The major revision to the program was changing the herd classification program to 6 levels with levels 1-3 based on the prevalence of a herd and levels 4-6 are test negative herds. Herd classification is determined by the size of the herd, the type of test used and the test positive rate and statistic probability of 95 percent confidence that the true within herd prevalence is below a theoretical value for each level. The latest revision maintains the goal that the higher a herd goes within the program the lower the risk is that the herd is actually infected by *M. paratuberculosis*.

JDIP Education Update

Michael Collins (for Jeannette McDonald), University of Wisconsin-School of Veterinary Medicine.

With funding from a variety of sources (Wisconsin Department of Agriculture, Trade, and Consumer Protection; Johne's Disease Integrated Program; US Department of Agriculture; University of Wisconsin Division of Instructional Technology), we have created a very comprehensive array of educational opportunities for veterinarians and producers. We are currently creating educational modules for Dairy Herd Improvement field and laboratory technicians. All current education modules can be accessed through the online Johne's Disease education portal: <http://vetmedce.vetmed.wisc.edu/JDVCP/>

The online Johne's disease education effort started with the Johne's Disease Veterinary Certificate Program. The certificate program is accepted by 44 states and Puerto Rico and has had over 1100 registrants. It is currently being updated with the new program standards. An update module was added about 3 years ago as a refresher course for recertification. This too will be updated with the new program standards.

Other education for veterinarians includes 4 virtual farms, modules for sheep, goats, cervidae, and our newest – a Johne's simulation that lets veterinarians practice doing risk assessments and management plans with customized feedback and expert reviews.

For producers we've created a variety of education for different audiences: dairy (including a module in Spanish), beef, goat, sheep, and deer and elk. There's also a video to increase awareness and encourage action: <http://www.youtube.com/watch?v=CItYlkQwoaw>

And finally, in the past year, USDA has approved the use of milk ELISAs for Johne's testing for the national control program, with sample collection and testing to be done by Dairy Herd Information Association (DHIA) personnel. We are currently developing online Johne's disease certification programs for DHIA field and laboratory technicians that satisfies national program guidelines and requirements for milk ELISA testing, as well as DHIA Quality Certification Services requirements.

Assessment of the Food Safety Importance of *Mycobacterium avium* subspecies *paratuberculosis* (MAP)

Donald Zink, Food and Drug Administration

The National Advisory Committee on Microbiological Criteria for Foods assessed the importance of food as a source of exposure to *Mycobacterium avium* subspecies *paratuberculosis* (MAP). MAP is the causative agent of Johne's disease, which affects primarily the small intestine of all ruminants. The significance of MAP as a human pathogen is unknown and is being investigated by several research groups. This document also reviews the efficacy of current detection methods, processing interventions, and MAP inactivation. Research needs related to MAP are provided. The Committee reached the following conclusions: current methods for detection of MAP have significant limitations, and a standard method for the detection of viable MAP cells is needed. Aside from MAP-infected domestic ruminant animals, the organism is found infrequently. If MAP in cattle is controlled, the source of MAP in other animals, food, and water may largely be eliminated. Milk, particularly raw milk, may be a likely food source for human exposure to MAP. Given the prevalence of MAP in U.S. cattle herds, ground beef may be a potential source of MAP. Although humans may be exposed to MAP through a variety of routes, including food and the environment, the frequency and amount of exposure will require additional research. *J Food Prot.* 2010 Jul;73(7):1357-97.

National Johne's Education Initiative Update

Teres Lambert, National Johne's Education Initiative Coordinator, NIAA
Complete report provided at the end of this report.

JDIP Producer Outreach Survey

Ken Olson, JDIP

A National Dairy Producer Johne's survey, funded by the Johne's Disease Integrated Program (JDIP) and led by Penn State University has recently been completed. The survey, which was mailed to approximately 15% of the dairy producers in each state, sought to identify barriers to and incentives for participation in the Voluntary Bovine Johne's Disease Control Program. Over 2,000 surveys were returned. Results are being analyzed in detail, but several preliminary results are of special interest.

- Approximately 50% of those responding have had Johne's disease diagnosed or have seen clinical signs of the disease in their herd
- Approximately 1/3 did not know if their state had a Johne's program
- Concern over Johne's was the primary reason identified for participating in the program. Financial incentives, such as reduced testing cost and Risk Assessments, were positive factors.
- Over 80% listed Farm magazines and Veterinarians as primary Johne's Information sources. Veterinarians, farm magazines and extension were the most reliable sources of information

Additional details will be available at <http://vetextension.psu.edu> and <http://www.jdip.org/> and through upcoming publications.

National Demonstration Herd Project Update

Katherine Marshall (for Charles Fossler), USDA-APHIS-VS-CEAH

The National Johne's Demonstration Herd Project (NJDDHP) in the United States was initiated to evaluate the long-term feasibility and effectiveness of management-related practices designed to control Johne's disease on dairy and beef cattle operations. The NJDDHP was started in 2003, but final herd enrollment numbers were not reached until 2005. Participation required a risk assessment and herd testing to be completed for each herd on an annual basis. The NJDDHP included 62 dairy herds and 20 beef herds in 17 states. Data collection for all herds ended in September 2010. Results to date indicate that, for both beef and dairy herds, prevalence of *Mycobacterium avium* subspecies *paratuberculosis* (MAP) in the third through seventh years of participation was significantly lower than prevalence during the first year of participation. Analysis using Poisson regression was undertaken to identify areas from the risk assessment most important with regard to MAP prevalence in beef and dairy herds. A previous analysis on dairy operations showed that high risk scores for multiple animal use, manure soiling of udders and legs, and presence of Johne's disease clinical or suspect animals in the calving area were associated with a greater risk for cattle to be MAP-positive. A similar analysis was recently done for beef herds, which found that high risk scores for cow/calf pairs being kept with Johne's clinical or suspect animals, possible manure contamination of water for preweaned heifers, and direct access to

accumulated or stored manure for cows were associated with a greater risk for cattle to be MAP-positive. These results suggest that management efforts initiated since the beginning of the project have been effective in reducing MAP prevalence. Results also suggest that making sure udders and legs of cows in the calving area are clean, using individual animal calving areas (or allowing fewer animals in the calving area), and preventing Johne's disease clinical or suspect animals from entering the calving area should receive primary consideration with regard to control of Johne's disease on dairy operations. On beef operations, separating cow/calf pairs from Johne's clinical or suspect cattle, and preventing cow access to accumulated or stored manure should receive primary consideration with regard to control of Johne's disease on beef operations.

JDIP Vaccination and Diagnostics Studies Updates

Scott Wells, University of Minnesota for Vivek Kapur, Penn State University

The mission of JDIP is to promote animal biosecurity through the development and support of projects that are designed specifically to enhance knowledge, promote education, develop real-world solutions and mitigate losses associated with JD. The JDIP approach is to promote efficiencies through collaborative research and the sharing of intellectual and physical resources. JDIP, a USDA-NIFA funded CAP project, is a consortium of ~220 scientists from > 70 academic institutes, govt. agencies, and industry established in fall of 2004, and continues to expand membership, establish international collaborations, and develop links with industry.

Major Accomplishments

1. Development, establishment and nurturing of a community of scientists with a shared vision and focused resources and directed at enhanced food security and safety and reduction of economic losses through the prevention and control of JD. Currently has over 220 members, 76 institutions, (58 in US and Canada) and 18 international countries. Uses an annual RFA process and has developmental "seed" awards. Also communicates through an annual meeting and JDIP Newsletters.
2. Development of a translational pipeline linking basic science to its application. Examples include Management practices, Diagnostics, Vaccines program etc.
3. Establishment of standards for research (eg. animal models) or practice (eg. diagnostic tests and reporting) that are community developed and widely accepted.
4. Development and widespread delivery of education, training, and extension programs and materials for stakeholders across the continuum (producers through regulatory agencies and policy makers).
5. Development of programs that ensure high visibility amongst producer groups and extension agents.
6. Establishment of a rapid response, flexible funding model with rigorous peer-review and oversight from stakeholders.
7. Development of strong international linkages, particularly with major milk/beef producing areas (including EU, Australia New Zealand, and India).

Vaccine development program

1. Invited investigators to a special meeting to develop criteria for vaccine mutant selection, agree upon in vitro assays and most appropriate animal models, determine "gates" to pass through prior to testing in ruminants, and identify approaches to better coordinate program and leverage resources to evaluate vaccine candidates in a rational, standardized, and cost-effective manner.
2. Agreed upon stage-gated approach to evaluate candidates
 1. In-vitro gates
 - o Attenuated / modified live vaccines, reduced survival in macrophages (attachment to target epithelial cells); Subunit / DNA / Inactivated vaccines, serologic and cellular (macrophage and T-cell) reactivity in infected or sensitized animals.
 - o Ex-vivo stimulation of appropriate immune response in cattle B and T-cells.
 2. In-vivo gates
 - o Mouse – survival of mutant, elicitation of a specific immune response, protection against challenge.
 - o Baby goats – same as above.
3. Coordination of program

- Investigators would submit their best candidates (est. ~ 21) for evaluation to a “neutral” lab for blinding.
- Blinded candidates distributed to two or more labs for in vitro evaluation.
- Results sent to JDIP core 1 for analysis, identification of top candidates (through peer-review); and blind broken.
- Top candidates (~10) re-blinded and sent to two labs for mouse studies.
- Top candidates (~5) from mouse studies sent to one lab for studies in goats.

Focus in the coming year

1. Continue candidate vaccine evaluation program.
2. Initiate Diagnostics Standards Program.
 - a. Developed STAndards for Reporting Animal Disease diagnostic Accuracy (S)tudies (STRADA).
 - b. Protocols prepared for standardization and head-to-head comparison of diagnostic tests – ready to implement.
3. RFA – in process (see jdip.org).
4. Prepare for transition to next phase.

NVSL Check Test Results **Beth Harris, NVSL, USDA-APHIS**

National Veterinary Services Laboratory (NVSL) Report of Approved Laboratories was given by Beth Harris, NVSL. Proficiency panels for Johne’s disease organism detection (culture and direct PCR) were mailed to participants in March, 2010. Combined summary results from both panels are as follows: A total of 61 laboratories, (52 USA laboratories, 9 international; Canada -3, European Union – 3, New Zealand -1) participated in the 2010 Johne’s disease proficiency panel, with 117 individual panels and 60 pooling panels being distributed overall. Kit were assembled using fecal samples from 14 animals residing in 7 different herds, from the following states; ND, OH, IA NY and ID.

A total of 58 laboratories participated using Direct PCR; 50 laboratories passed, 1 did not submit results, and 7 laboratories did not meet the criteria for passing. A total of 26 laboratories participated using HEY media; 22 laboratories passed, 2 laboratories did not pass and 2 laboratories did not submit results

Forty-three laboratories participated using liquid media systems. This was the first year that no laboratories used Bactec 460. Twenty-three laboratories used ESP with 23 passing, and nine used MGIT 960 with 6 passing. The top three reasons for laboratories not passing the individual fecal culture panel were; 1) misclassifying a negative sample as positive (3 kits), missing more than the allowed number of positive low/moderate shedders (2 kits), and misclassifying a critical high shedding sample as negative (2 kits).

Fifty-one laboratories participated in the pooling proficiency panel. Thirty-four laboratories used direct PCR with 29 passing, 4 not passing, and one laboratory not submitting results. Five of 6 laboratories passed using HEY solid media. Twenty laboratories used a liquid media system with 18 passing and two not meeting the criteria for passing. Reasons for failing the pooling kit were; identifying the negative pool as positive (2 kits), identifying a high shedding pool as negative (4 kits), and identifying both low shedding pools as negative (1 kit).

Individual detailed results and statistics for each fecal panel were provided to individual participating laboratories by October 20, 2010, with certificates for approval being mailed in November.

Test panels containing 25 sera samples for the Johne’s ELISA serology proficiency test were distributed in June, 2010, with 74 U.S. laboratories and 9 international laboratories participating (Canada, Chile, Netherlands, and Northern Ireland). Several laboratories requested multiple panels as follows; Prionics - 58 panels/44 laboratories, IDEXX®/Pourquier - 45 panels/38 laboratories, IDEXX® - 10 panels/8 laboratories, Other – 2 panels/2 labs.

With retest scores pending as of November 3, 2010, 97.7 % of laboratories taking the Prionics ELISA panel received passing scores, and 100% of laboratories using the IDEXX®/Pourquier or the IDEXX ELISA passed. Neither of the 2 laboratories using other ELISA methods received a passing score. Results for individual panels are; 52/58 (89.7%) received a passing score using the Prionics ELISA method, 44/45 (97.8%) passed using the IDEXX®/Pourquier method, an additional 10/10 passed using the IDEXX® method, and 2 kits did not receive a passing score using an alternative ELISA method.

A milk ELISA proficiency panel consisting of 25 samples (4 strong positive, 4 negative, remaining weak positive) was also offered and distributed in June 2010. A total of 53 laboratories participated in this panel, with 51 (94.4%) receiving a passing score after retesting was completed. 35/35 laboratories passed using the Prionics method, 15/15 laboratories passed using the IDEXX®/Pourquier method, and 1/3 laboratories passed using an in-house ELISA. 54 individual panels were taken, with 52 (96.3%) overall receiving a passing score. For the individual panels, 35/35 received a passing score using the Prionics method, 15/16 (93.8%) passed using the Pourquier ELISA, and 1/3 panels (33.3%) passed using another milk ELISA method.

NAHMS Goat Study Update
Suelee Robb-Austerman, USDA-APHIS

APHIS-VS National Johne's Program supported diagnostic testing for paratuberculosis. Producers collected environmental samples and submitted them to NVSL from September of 2009 through October of 2010 for direct PCR and culture. While final results are pending, preliminary data suggest that MAP is present in goat herds throughout the USA.

Scientific Advisory Committee Report
Suelee Robb-Austerman

The scientific advisory committee evaluated data presented from NVSL and NADC evaluating the specificity of ISMAP02 as a target for diagnosing paratuberculosis. The ISMAP02 target sequence has recently been associated with a false positive PCR results in tissues from exotic deer with disseminated *M. avium* infection. ISMAP02 gene has not been validated for use in tissue samples and or small ruminant, wild ruminant, or exotic ruminant fecal material. Disseminated *M. avium* infections have been observed more commonly in these ruminant species. As the target sequence of commercially available MAP reagents marketed by Applied Biosystems (Ambion), use of these reagents may result in false positive test results. Therefore we recommend that the Ambion reagents be limited to cattle fecal samples as long as these reagents target ISMAP02. A secondary confirmation test should be conducted for results that significantly impact herd status.

Ohio's Experience with the Tetracore PCR for *Mycobacterium avium* subsp. *paratuberculosis*
William Shulaw, Extension Veterinarian, Ohio State University, College of Veterinary Medicine

In 2007 we sought to compare results from the Tetracore VetAlert™ Johne's Real-Time PCR testing with those of fecal culture using the TREK ESP® Culture System, followed by the ODA in-house PCR confirmation of results, using samples collected as part of Ohio's Johne's Disease Demonstration Herd Project. Tetracore PCR was performed in duplicate on samples collected in 2007. The comparison was continued in 2008 in these herds, and a similar comparison was also conducted on samples submitted to the ODA ADDL from animals believed by veterinarians to have the disease, from animals with previous positive ELISA tests, and from animals that had previous positive cultures whose owners were appealing the results of those tests. Samples were processed and tests conducted according to each manufacturer's instructions and normal laboratory procedures. Following preliminary inspection and analysis of the results, samples were collected in late 2009 and in 2010 from animals on four Ohio farms at the time of their annual testing for participation in Ohio's Johne's Disease Test Negative Status Program. This program requires negative results of whole herd ELISA testing followed by whole herd individual animal fecal cultures (animals over 24 months of age) to reach levels 1 and 2 respectively. This procedure is repeated in years 2 and 4, and either whole herd ELISA testing or pooled fecal cultures are required annually for continued participation in the program. These herds were two dairy and two beef cattle herds, and all had been initially enrolled in the program during the years 1996-2001. Samples from two of the three Demonstration Project herds were also collected in 2009 and tested by Tetracore PCR and ESP culture/confirmatory PCR.

Results and Discussion: A total of 1447 samples from the Demonstration herds were obtained from 2007-2009. Results on duplicate PCR testing in 2007 showed good correlation for those samples with Ct values of 36 or below but were much less correlated at the higher Ct values. The USDA reporting classification scheme for the Demonstration Herd Project was used to tabulate culture results. Of these, 3 were heavy shedders (<21 days-to-positive (DTP)); 6 were moderate shedders (22-28 DTP); 9 were low

shedders (29-35 DTP); 54 were very low shedders (36-42 DTP); and 1375 samples were culture-negative. Using a Ct value of 40 as the cutoff for declaring a sample positive in the Tetracore PCR assay, the percentages of the culture positive animals detected were 100%, 83%, 44%, and 24% respectively. Fifty-six (4%) of the 1375 culture-negative samples were positive in the Tetracore PCR. Fifty-six of 81 positive PCR results were from animals that were culture-negative. The correlation between DTP and Ct value (negative results excluded) was 0.501 (Spearman Rank-Order Correlation).

A total of 366 samples were submitted by veterinarians to the laboratory from suspect animals for culture in 2008. Of these, only 30 (8%) were culture-negative. Of the culture-positive samples, there were 94 classed as heavy shedders, 56 as moderate shedders, 70 as low shedders, and 116 as very low shedders. The percentages of culture-positive samples detected by Tetracore PCR were 99%, 88%, 46%, and 25% respectively. Four (13%) of the 30 culture-negative samples were PCR positive. The correlation between DTP and Ct value (negative results excluded) on this set of largely culture-positive samples was 0.779 (Spearman Rank-Order Correlation). A total of 486 samples were collected from the two dairy and two beef cattle herds enrolled in the Test Negative program. All samples were negative on both culture and Tetracore PCR.

Duplicate well test results were well correlated at low Ct values. As Ct values increased the correlation decreased remarkably. Overall, there appeared correlation between Ct value and culture DTP although this was not high in samples classed as coming from low and very low shedders. Overall, PCR identified >80% of heavy and moderate shedders at a cutoff of Ct < or =40. However, at this Ct cutoff value, PCR identified less than 50% of the low and very low shedding animals, and 56 of the 81 samples that were PCR-positive (69%) were culture-negative in the Demonstration Herds. In the Test Negative Status Herds believed to be uninfected and having all negative cultures, all PCR results were negative. We believe that in known infected herds, positive PCR results with relatively high Ct values need to be interpreted with caution. These results may represent a truly infected animal that happened to be culture-negative on a single sampling (likely a low shedder). However, they may also be detecting "pass through" of MAP DNA from environmental sources, unculturable strains of MAP, environmental mycobacteria or others with similar DNA sequences, and perhaps other unknown factors.

Committee Business

Action Item #1. Johne's Committee will establish a sub-committee to draft recommendations on the use of an alternative milk ELISA proficiency testing program, administered through Quality Certification Services. Certification through this testing program would certify a laboratory as approved to perform Johne's disease program ELISA testing. This sub-committee will include Johne's Committee members from USDA-APHIS-VS-NVSL. Recommendation will be presented at the 2011 USAHA meeting for discussion during the Johne's Committee meeting.

REPORT OF THE NATIONAL JOHNE'S WORKING GROUP

The meeting was well attended with over 50 members and guests present. The focus of the session was on the current status of the Johne's program, including the impact of budget cuts and industry lead efforts to address the disease.

Ken Olson reported results from a survey of DJC's and industry groups to assess the impact of Johne's education and outreach efforts. Over two thirds of the states reporting indicated that cuts in federal funding had resulted in fewer samples run, fewer Risk Assessments and Management Plans (RAMP's) completed, fewer educational activities and fewer veterinary certification. A positive was that half of the states reported that some state funding was provided for the program. Another positive was industry involvement. DHIA reported a 10% increase in milk ELISA samples run with over 207,000 samples run in the past year. A concern noted was lack of discussion between state program leader and industry relative to the Johne's Strategic Plan and program priorities in the state with limited funding.

Bill Hartmann reported on the Minnesota experience. State funds have been reduced to some extent in addition to substantial cuts in federal program funds. It has resulted in a significant reduction in the number of status herds as many producers are not recognizing adequate return on investment to maintain their status. There is good producer awareness of the disease and a desire by producers to maintain the program, but not a clear direction on how to do it. An area of involvement and cooperation is that MN DHIA is running the milk ELISA samples for the state.

Ken Olson reported on work of the "Marketing Group". They had met via conference call, but struggled with exactly what was to be "marketed" the VBJDC Program, testing, management practices of something else. Results from recent national surveys had shown that incentives played a role, but the primary reason producers joined the program was concern over Johne's in their herd. Veterinarians and farm publications were primary sources of information followed by extension. All have good credibility with veterinarians rated highest. Based on surveys and small focus group input messages focused on their operation with as personal a delivery as possible are preferred. Personal contact, meeting and flyers were best. Hard copy was preferred to electronic delivery. Including Johne's within a broader health/biosecurity program was preferred.

Kathy Finnerty reported on the New York State Cattle Health Program (NYSCHP) program, a broad based program that has evolved out of initial Johne's program efforts. It includes about 900 herds with approximately 35% of the cows in the state. The primary focus for producers in recent years has been on survival. This is impacted by many factors. Herd health is just one item of many and Johne's is one part of the health package. This does impact producer priorities which need to be recognized for the program to be successful. The program uses a structured, team approach to address each herd. A valid vet-client relationship is required as well as animal ID. A herd health status survey, available on the website, is used to develop a herd plan. An annual evaluation is done. Strong producer support has helped to maintain state funding of \$1.5 m.

Producer Group Initiatives

Betsy Flores reported on National Dairy FARM, a QA program coordinated through National Milk Producers Federation (NMPF). It includes three components, education, on- farm evaluation and third-party verification. The first portion is focused on animal care. Plans are to add a Johne's component as part of a biosecurity section. Fifty trainers are in place and 300+ evaluators. Some funding for the initial section came from check-off funds. Additional sections and verification costs are paid by producers or sponsors. Information is available on-line, with much of it in both English and Spanish. Input is welcome. Social media is being used together with DMI.

Elizabeth Parker provided an update on the Beef Quality Assurance program. It originated out of a concern over injection site lesions, but now covers all aspects of production and all segments of the industry. It seeks broad based input and so is consistently being updated. It has a diverse cliental, so needs flexibility. The dairy portion includes biosecurity, which is where Johne's related items are included. Herd security seems better understood by producers, so is used rather than biosecurity. Materials are available on the web.

Todd Byrem reported on DHIA activities. Milk ELISA has been incorporated into the system and is now available in most areas. Use is growing with 300,000 samples expected in North America for 2010. Most data is now stored in the dairy records processing centers (DRPCs), so they are the likely place future information on use. DRPCs are looking to incorporate the data into reports and management

packages. Tech training is provided for lab and field personnel, with a new effort underway with JDIP for development of additional materials. Canada DHIA is also providing the test and the two most recent lab additions are state labs. DHIA labs are checked monthly through the Quality Certification Service program that also does other components. There is strong interest in being able to use the monthly QCS evaluation, rather than the annual NVSL evaluation, to meet Johne's program standards.

Cindy Wolf reported on sheep and goat activities. Show animals are the current drivers for sheep prices. The meat goat industry is growing substantially. In producing material for either sheep or goats, it is important to take cattle out of the picture as producers want to focus on their species. We need to assume that veterinarians have limited knowledge of Johne's in either sheep or goats, so provide them with information. Capitalize on the Scrapie program and utilize what was learned there. Utilize livestock markets for information distribution and use producers to tell other producers about it.

Kristin Paul reported on Jersey funding for research. The Jersey Research Foundation has provided a total of about \$850,000 in research funding over several years. Approximately 1/3 of their research funding for 2009-10 will go to two projects looking at genetic markers for Johne's disease. One project is at the University of Wisconsin – Madison and the other at Washington State University. One other item of interest is that Jersey Marketing required a negative Johne's test for all animals over 24 months of age who go into their sales. There is strong producer interest in the disease and information about it. Charlie Brown reported on activities of ABS Global and other AI organizations relative to Johne's disease. While the risk of spread from semen is seen as low, they seek to minimize any risk and there are international trade requirements to meet. They work with source herds to provide information and avoid the purchase of animals from herds with no Johne's management program and test all young bulls entering the program at about 10.5 months of age and a second about two months later. Positive animals are isolated eliminated from the program. Resident bulls are tested one or two times annually by fecal culture or PCR and twice by serology.

Robert Hagevoort reported on the New Mexico Dairy Quality Assurance Program. The program was developed in response to producer requests to have available a tool to help them be prepared to address consumer concerns. It includes herd health, animal care and image components. Extension worked with the Dairy Producers of New Mexico and the Livestock Board to develop the program. The program, based initially in the Johne's RA, begins with an on-line assessment and includes all components of the Dairy FARM program and the DFA Gold Standard program, so participants will be able to send the required information to those programs. This will allow them to qualify for those programs as well. It also includes all information required by the TB program so can be used to address the data needs of that program. The on-farm evaluation, that is a part of the program, is being done by one graduate student to assure accuracy and consistency. Evaluations are just beginning. It has strong support from the milk producer association and the milk buyers in the region as well as the state veterinarian.

There was good interest in all of the programs, but no further action was taken by the group.

MULTI-LEVEL INTERPRETATION OF THE NEW IDEXX *M. PARATUBERCULOSIS* ELISA ON SERUM AND MILK BASED ON LIKELIHOOD RATIO ANALYSIS

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Introduction:

The new IDEXX ELISA for paratuberculosis measures the concentration of antibody in clinical samples, serum, plasma or milk. ELISA reader results, measured as optical density (OD) units, are transformed to S/P (sample/positive) ratios. Conventional ELISA interpretations employ a single cutoff for interpretation of S/P values as either negative (below the cutoff) or positive (above the cutoff). Prior studies demonstrated a strong correlation of S/P values with the probability animals are shedding *Mycobacterium avium* subsp. *paratuberculosis* (MAP) in fecal samples collected at the same time as serum samples by likelihood ratio (LR) analysis highlighting the clinical value of knowing the magnitude of S/P or equivalent transformed ELISA OD values (Collins et al. 2005).

Methods:

LR analysis was performed for data generated using the new IDEXX ELISA kit for paratuberculosis on both bovine serum or plasma samples and milk samples. Bovine serum/plasma samples originated from 221 non-infected and 331 fecal culture-positive dairy cattle. Bovine milk samples came from 649 non-infected and 248 fecal culture-positive dairy cattle. Roughly half of all samples originated from cattle in Europe and the others from cattle in the US.

Results:

Table 1. LR analysis results on IDEXX ELISA S/P values for serum or plasma samples. Serum/Plasma S/P Range	Percentage of Non-infected Cows	Percentage of Infected Cows	Likelihood Ratio (LR)
0.00 – 0.099	87.68%	22.66%	0.26
0.10 – 0.199	7.58%	12.39%	1.63
0.20 – 0.499	3.79%	9.06%	2.39
0.50 – 0.999	0.47%	7.85%	16.57
≥ 1.00	0.47%	48.04%	101.36
Totals	100.0%	100.0%	

National Johne's Education Initiative Report

Teres Lambert
National Institute for Animal Agriculture

November 2010

Through a National Disease Eradication Program Grant, the National Institute for Animal Agriculture oversees the National Johne's Education Initiative and provides professional support to Johne's disease education efforts on a national scope. In line with this effort, NIAA submits an annual work plan that identifies communication strategies and tactics to help educate producers and veterinarians with the ultimate goal of helping to reduce the incidence of Johne's disease in the United States. The approved work plan is then implemented.

This year's budget for start-to-finish implementation of all National Johne's Education Initiative tactics was \$50,000.

Communication Tactic #1: National Johne's Education Initiative Web Site

NIAA maintains and updates the National Johne's Education Initiative web site and implement tactics to draw traffic to the web site and the information on it. A key tactic is that each news release and collateral piece includes the web site address.

Between April 1 and Oct. 30, 2010, the NJEI web site received 247,812 total hits averaging 256 visitors per day. If the same number of people visited the web site over a 12-month period as the April-October seven-month time frame, then the number of hits during a 12-month time frame would be 424,654.

The web site is the avenue by which individuals learn about Johne's disease, find out the contact info of their State Designated Johne's Coordinator, order Johne's disease brochures/booklets, pose questions, etc.

Communication Tactic #2: Beef and Dairy Risk Assessment Prevention, Control Brochures & Joint Testing Brochure

Three brochures were developed during FY2008, and these brochures continue to be disseminated. The brochures include a risk assessment prevention and control piece targeting dairy producers, a risk assessment prevention and control piece targeting beef producers and a joint dairy and beef producer brochure about testing for Johne's disease.

The first 10,000 of the beef risk assessment prevention and control brochure were disseminated, necessitating a second printing in 2010. The piece continues to be popular.

The first 10,000 of the dairy risk assessment prevention and control brochure were disseminated, necessitating a second printing in 2009. This brochure is now on its third printing and is once again low on supply. A fourth printing will be needed in the next fiscal year.

Producers and veterinarians may order up to 100 copies of all three booklets at no cost.

Communication Tactic #3: Bovine Q&A Booklet

A four-color, 16-page Q&A booklet about Johne's disease in bovine was created the end of FY2009 and disseminated throughout 2010. All DJCs were provided 100 free copies, with additional copies provided at print cost plus shipping. Numerous beef and dairy extension specialists also requested up to 100 complimentary copies.

This piece has proven to be extremely popular, with 10,000 copies disseminated in less than six months. A second printing occurred in 2010.

Producers and veterinarians may order up to 100 copies at no cost.

Communication Tactic #4: Goat Q&A Booklet

In FY2010, NJEI partnered with the Wisconsin Department of Agriculture, Trade and Consumer Protection to develop and print a four-color, 16-page Q&A booklet about Johne's disease in sheep. Significant input regarding content was provided by Dr. Elisabeth Patton, Wisconsin DJC and chairman of USAHA Johne's Disease committee, and Dr. Becky Manning, Senior Scientist, Johne's Disease Information Center, School of Veterinary Medicine, University of Wisconsin.

State DJCs were given up to 100 complimentary copies, with the option of ordering additional copies at print cost. National and state goat associations also ordered up to 100 comp copies, with two goat industry influencers provided up to 300 copies at no cost.

Producers and veterinarians may order up to 100 copies at no cost.

Communication Tactic #5: Sheep Q&A Booklet

In FY2010, NJEI partnered with the Wisconsin Department of Agriculture, Trade and Consumer Protection to develop and print a four-color, 16-page Q&A booklet about Johne's disease in sheep. Dr. Elisabeth Patton, Wisconsin DJC and chairman of USAHA Johne's Disease committee, and Dr. Becky Manning, Senior Scientist, Johne's Disease Information Center, School of Veterinary Medicine, University of Wisconsin, provided significant input regarding content of the booklet.

State DJCs were given up to 100 complimentary copies, with the option of ordering additional copies at print cost. The American Sheep Industry was provided 1,000 copies of the booklet at no cost to disseminate to its membership.

The National Animal Health Monitoring Systems has requested as many of the Sheep Q&A booklets as NJEI can provide for dissemination to sheep owners who participate in the national sheep health/management survey. At minimum this will be 600 complimentary copies.

Producers and veterinarians may order up to 100 copies at no cost.

Communication Tactic #6: 'Cost of Johne's Disease to Dairy Producers' booklet

During FY2010, IDEXX funded the production and printing of a four-color, 16-page booklet about the cost of Johne's disease to dairy producers, a booklet that was high on the request list of the industry. NJEI approved all content and design of the piece and serves as the contact for dissemination for the booklet.

State DJCs were given up to 100 complimentary copies, with the option of ordering additional copies at print cost.

Producers and veterinarians may order up to 100 copies at no cost.

Communication Tactic #7: 'Cost of Johne's Disease to Dairy Producers' booklet translated to Spanish

During FY2010, IDEXX also funded the production and printing of a Spanish version of the four-color, 16-page booklet about the cost of Johne's disease to dairy producers. NJEI serves as the dissemination contact for the booklet.

Producers and veterinarians may order up to 100 copies at no cost.

Communication Tactic #8: 'Johne's Disease Control Program for Dairy and Beef Producers (Voluntary Bovine Johne's Disease Control Program) Booklet

NJIEI partnered with the Wisconsin Department of Agriculture, Trade and Consumer Protection to develop and print a four-color, 16-page "Johne's Disease Control Program for Dairy and Beef Producers" which summarized the revised Voluntary Bovine Johne's Disease Control Program. Wisconsin DATCP provided funding for the content and design of the booklet with NJEI funding the printing of 10,000 copies of the booklet. Additional funding from USDA-APHIS-VS allowed each State DJC to have 500 complimentary copies of the booklet.

Producers and veterinarians may order up to 100 copies of the booklet at no cost.

Communication Tactic #9: News Releases

Seven news releases were written and disseminated to date to beef-specific and dairy-specific publications as well as general livestock magazines and newspapers and radio.

Individual news releases alerted readers to the availability of the five new booklets: Beef Q&A booklet, Goat Q&A booklet, Sheep Q&A booklet, 'Cost of Johne's Disease to Dairy Producers' booklet and Spanish version of the 'Cost of Johne's Disease to Dairy Producers' booklet.

A news release was also written and disseminated about the revised Voluntary Bovine Johne's Disease Control Program, and another news release was written and disseminated about the 16-page booklet that summarizes the Voluntary Bovine Johne's Disease Control Program.

The NJEI office can always tell when a news release has been printed or shared online as request for brochures/booklets increase dramatically and questions from producers pour in.

An interesting note is that numerous media people report that receiving a news release often reminds them that it's time to write an article about Johne's disease in their respective publication. Cases in point: Geni Wren, editor of Bovine Veterinarian, and Dennis Halladay, Hoard's West.

Communication Tactic #10: Dairy Johne's Disease Newsletter

The quarterly Dairy Johne's Disease e-Newsletter that made its debut July 2009 continues to be extremely popular among State DJCs and national organizations. This communication tool delivers four pages of information about Johne's disease, prevention and control practices and testing—and often includes a producer feature.

The dairy Johne's disease e-newsletter has four issues: Spring, Summer, Fall and Winter.

Due to limited state budgets and the desire to assist states with their communication efforts, the dairy newsletter has 50 editions per issue:

- One national edition
- 49 customized state editions—same content with change in contact information.

The national edition is disseminated to eight national dairy breed associations, the National Milk Producers Federation (for dissemination to its 31 member cooperatives) and the general press.

Customized state editions are emailed to:

- Respective DJC
- 450-plus State dairy extension specialists and state veterinarians
- 13 state dairy organizations such as Professional Dairy Producers of Wisconsin
- DHIA groups

Response to the newsletter continues to be overwhelmingly positive. Recipients report that the newsletter is being forwarded to dairy producers, sometimes printed and disseminated and/or articles are being cherry picked for further use.

Communication Tactic #11: Beef Johne's Disease Newsletter

The beef Johne's disease newsletter is similar to the dairy Johne's disease newsletter but with all articles in the 2- to 4-page issues targeting beef producers. The beef Johne's disease newsletter debuted in July 2009 and has four issue per fiscal year: Spring, Summer, Fall and Winter.

To provide communication tools that meet national objectives while helping states that have limited budgets with their outreach efforts, customized state editions of each beef Johne's disease newsletter are created and disseminated:

- 49 customized editions for individual state DJCs
- 44 customized editions include Beef Quality Assurance coordinator contact info in addition to the state-specific DJC contact info

The national edition is disseminated to

- Three national beef organizations: National Cattlemen's Beef Association, US Cattlemen's Association and R-CALF
- 15 national beef breed associations
- Several organizations post the most issue online for their membership

The 15 national breed associations have a total reach exceeding 75,000 seedstock producers and include

- American Angus Association
- American Blonde d'Aquitaine Association
- American British White Park Association
- American Chianina Association
- American Gelbvieh Association
- American Hereford Association
- American International Charolais Association
- American Maine-Anjou Association
- American Salers Association
- American Simmental Association
- Braunvieh Association of America
- International Brangus Breeders Association

- North American South Devon Association
- Red Angus Association of America
- Santa Gertrudis Breeders International

Communication Tactic #12: Attend Producer Events

Events attended during FY2010 included the National Cattlemen's Convention, National Western Stock Show (beef, sheep and goats), Beef Improvement Federation, National Institute for Animal Agriculture annual business conference (dairy, beef, sheep and goats), Academy of Veterinary Consultants and Managers Academy (dairy). These events are ideal for disseminating information, obtaining input for educational material needed and identifying producers for e-newsletter features.

Communication Tactic #13: Interact with Media

NJEI staff person serves as the contact person for the media and directs the media to appropriate sources as needed. During FY2010, more than 10 media interview requests were responded to. An NJEI person also attended the 2010 Agricultural Media Summit and interacted with livestock and general ag writers, editors and contract writers.

Communication Tactic #14: Additional Outreach

During FY2010, Dr. Elisabeth Patton and Teres Lambert co-presented at the Academy of Veterinary Consultants meeting in Texas. The presentation explained Johne's disease and the revised Voluntary Bovine Johne's Disease Control Program and highlighted available educational material for veterinarians to share with their clients.

Acknowledgement

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