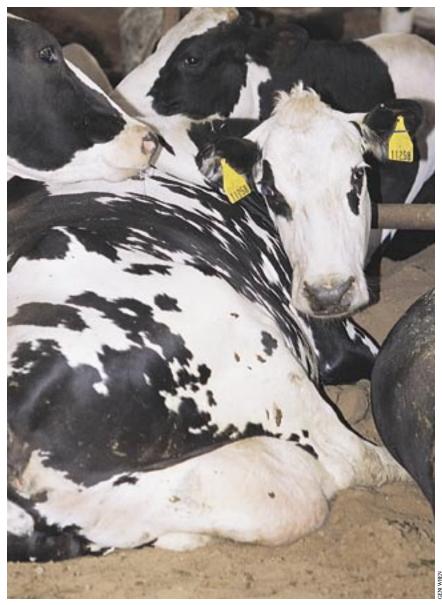
Working through **Johne's** disease

New information about Johne's disease may help you get clients on the right track for getting and keeping it out of their herds.

By Maureen Hanson



Is she infected with Johne's? Helping clients put programs in place can help you find and make better decisions.

It's a formidable foe, but not an impossible one. Practitioners across the country are counseling clients on how to battle Johne's disease, and together, they're winning the fight. These three veterinarians explain the steps they have taken with producers to beat back Johne's in their herds.

Bird's-eye view in Wisconsin

During his 35-plus years in practice, Vic Eggleston, DVM, saw his share of herds with Johne's disease. But, most of his experience was confined to his own practice area in east-central Wisconsin.

Now retired from practice, Eggleston helps dairy producers fight Johne's from a broader view, as project coordinator of the Wisconsin Johne's Disease Demonstration Project. The project, started in 2002, is funded by the Wisconsin Milk Marketing Board and the USDA. Its goal is to prove that the

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University of Wisconsin and National Johne's Working Group (NJWG) recommendations to eliminate the disease really work in the field.

Program parameters

Many producers were eager to enroll in the demonstration project, and nine located in various parts of the state were selected. They were required to have at least 10% of their adult animals test positive for Johne's using a serum enzymelinked immunosorbent assay (ELISA).

In addition, the herd owners were interviewed and their facilities inspected to ensure that necessary management changes could be made. The herds range in size from 75 to 1,400 cows. Seven are Holstein herds; two are Jersev.

All enrolled herds were then placed on the following management protocol:

- Blood samples are collected on all animals during the last third of lactation.
- Likelihood ratios based on quanti-Lative ELISA results are assigned as negative, suspect, low-positive, positive and strong-positive.
- Strong-positive cows are not allowed to freshen and are culled, either immediately or at the end of their lactations.
- 4 Low-positive and positive in identified with colored zip ties in Low-positive and positive cows are their ear tags. Their colostrum is discarded or fed to bull calves only.
- Suspect, low-positive and positive cows calve in a separate pen from negative animals.

In addition, the following protocol was assigned for calf management in all of the herds:

- Thoroughly clean the teats of colos-I trum donors before harvest.
- Feed 4 quarts of colostrum within four hours of birth (this volume was adjusted for Jersey calves).
- Remove calves from the dam and maternity pen within one hour of birth.
- Start feeding milk replacer or pasteurized milk at 24 hours of age.

If feeding milk replacer, use a formulation that contains at least 20% fat and protein.

Calf housing changes also were made on a case-by-case basis as needed.

Early results

Eggleston says they hope to follow the herds for five to seven years and track their progress. The results to date are quite encouraging.

One of the benchmarks being used

to measure success is the infection rate of heifers (at the end of their first lactations) born after the management changes, compared to heifers born 12 months or less before the changes were implemented. A 400-cow herd in the study had a 6.5% infection rate on heifers born before the start of the program. To date, 85 post-program heifers have been tested without a single positive animal. The same herd's overall positive serum ELISA incidence rate

The National Johne's Working Group

In 1986, Johne's disease was moved from a subcommittee of the Tuberculosis Committee of the United States Animal Health Association (USAHA) to its own standing committee. The committee determined that more in-depth efforts were needed to study the zoonotic potential of *M. paratuberculosis* and its possible relation to human Crohn's disease, and to develop a uniform approach for control, herd certification and eventual eradication of Johne's disease. Thus, the National Johne's Working Group (NJWG) was born in 1994.

More than 40 constituent groups, associations and corporations comprise the NJWG. It is a completely unfunded entity. NJWG co-chair Robert Whitlock, DVM, PhD, University of Pennsylvania College of Veterinary Medicine, says, "The NJWG is truly a grassroots effort. At the 2005 NJWG meeting during the USAHA meeting, more than 160 people participated and were not reimbursed by the NJWG or USAHA. That demonstrates the deep level of commitment they have to conquering this disease."

The NJWG's current priorities fall under six active subcommittees: ■ **Program Standards.** Responsible for developing the standards that

became the framework for the U.S. Voluntary Johne's Disease Herd Status Program for Cattle, a national herdcertification program; a risk assessment model for initial herd investigations; and Minimum Recommendations for Administering and Instituting State Voluntary Johne's Disease Programs for Cattle. Currently, it is evaluating the impact of a model of contract heifer rearing and the transmission of Johne's disease.

- **Education.** Informs producers, veterinarians and agricultural leaders about Johne's disease. Materials are available to help veterinarians, Extension agents and others serve as multipliers of Johne's education. Many are free-of-charge at www.jd-rom.com/ main.asp.
- **Knowledge Gaps.** "Helps define and prioritize the knowledge gaps that are perceived to impede the full development of the national Johne's disease program." These include animal level, bacterial and cellular level, economics, national policy, transmission/effectiveness of control and diagnostic tests.
- Budget and Strategic Planning. NJWG provides input on allocation of federal Johne's disease funds. It has strongly recommended that the largest proportion of funds possible goes to the states for veterinarian education and certification, state producer edu-

has dropped from 13.4% at the beginning of the program to 8.4% today.

In another herd, 10% of their 750 cows tested positive in the beginning, with 5.1% positive heifers born 12 months or less before the changes. Only one heifer out of 96 born after the changes has tested positive at the end of her first lactation, representing an infection rate of less than 1%.

If pointing to one management change that makes the biggest differ-

cation and control programs, and demonstration herd projects.

Laboratory Standards. The necessity to have laboratories approved to conduct both Johne's enzyme-linked immunosorbent assay (ELISA) tests and Johne's fecal cultures was recognized early by the USAHA Johne's committee, and was emphasized to the USDA. The first national Johne's check tests are now an annual effort. A list of certified labs can be found at www. johnesdisease.org/Labs/

■ Demonstration Herds. The number one priority of the NJWG, demonstration herd projects are underway in 15 states, monitored by the USDA/ARS.

certifiedlabs.htm.

Whitlock adds that a group of NJWG volunteers maintains an ongoing effort in the area of Johne's disease in small ruminants and cervids. Judy Stabel, scientist at the National Animal Disease Center in Ames, Iowa, and NJWG member says, "The NJWG has worked very diligently over the past 10 years to put together a comprehensive national effort to combat Johne's disease. Everyone involved in the U.S. cattle industry has benefited, whether directly or indirectly, from the efforts of this group."

ence in conquering Johne's disease, Eggleston says it would have to be maternity pen management. "I constantly marvel at the ingenuity of dairymen in customizing their facilities to implement our recommendations," he says. "The herds that have been able to successfully segregate their maternity areas have made tremendous progress in a relatively short time period."

Breaking the stigma

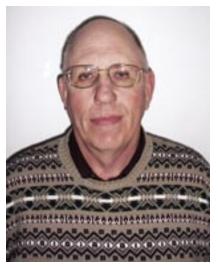
Eggleston says that one of the biggest challenges in tackling Johne's disease is getting practitioners to acknowledge that it is a problem. "In practice, we saw dairymen who switched veterinary practices because they couldn't persuade their veterinarians to help them take on the problem," he notes. "The same scenario repeated itself when we were recruiting herds for this project. Several producers expressed frustration that they could not get their local practitioners to acknowledge that they had Johne's.

"Producers rely on their veterinarians as a reliable source of health information. For a disease like Johne's. we have to be on board and work at it proactively if the problem is ever going to be solved. It's not in our best interest to ignore it, and it is definitely in our best interest to help them fix it."

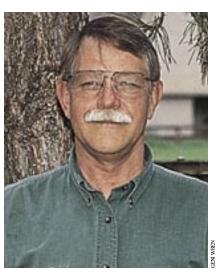
Eggleston believes that recent funding to certify veterinarians and pay them to do risk assessments has both opened the eyes of practitioners and made their clients more aware of Johne's and the impact it can have. In addition, the local veterinarians serving the demonstration project herds have been "totally cooperative," reports Eggleston. "This project has been a growth experience for all of us, and a fortunate side effect is that in a few years, nine Wisconsin dairy herds will have beat Johne's disease."

Accentuate the positive

Don Hansen, DVM, MPVM, has been involved with Johne's disease from the ground up, first as a practitioner in Cal-



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ifornia, then as an Extension veterinarian with Oregon State University and now in his new post as Oregon's state veterinarian.

Hansen has been involved with the NJWG since its inception more than a decade ago. The advice he has to share

The vaccination debate

Vaccinating for Johne's disease is not an exact science. A vaccine containing a mixture of killed mycobacteria and oil has been available in the United States for more than 30 years yet has not been widely embraced for a number of reasons. The vaccine currently may be administered only by a

licensed veterinarian, and its sale must be approved on a documented, herd-by-herd basis by a state veterinarian. Currently, use of the vaccine has been approved by state veterinarians in Iowa, Illinois, Kentucky, Minnesota, Ohio, Oregon, Pennsylvania and Wisconsin. It must be administered to calves less than 35 days of age.

At a symposium during the 2005 United States Animal Health Association's annual meeting, vaccination advocates assert that, particularly in herds with a high level of infection, vaccination used in conjunction with proactive management changes may be the only option to salvage the farm's viability.

They argue that more aggressive use of the vaccine in more herds could lesson the overall environmental load of M. paratuberculosis and slow the disease's transmission within herds and from herd to herd.

The vaccine does not prevent infection, but it can reduce the shedding of the organism later in the animal's life. Many advocates theorize that herds may be able to work themselves into a completely Johne's-free status after several of years of vaccinating.

There are also well-documented drawbacks to the vaccine, including: ■ Vaccinated animals will test positive on blood tests for both Johne's disease and tuberculosis (TB). The true presence of Johne's disease can be confirmed only with a more expensive fecal culture. Confirmation for TB must be performed with a comparative cervical skin test, which may be administered only by a state or federal veterinarian. Given the recent resurgence in bovine TB cases in some parts of the country and the great concern about bringing it under control, this factor alone makes the vaccine a controversial tool.

- The adjuvant in the vaccine is highly irritating and can cause severe tissue reactions when accidental administration to humans occurs. For this reason, many veterinarians simply choose not to handle it.
- Administration of the vaccine also can cause large lumps sometimes as big as a grapefruit or a soccer ball — to develop at the injection site, usually in the brisket region, which may remain throughout the animal's lifetime. Occasionally, they will become draining, abscess-like lesions.

As with any vaccine, there also is the risk that perceived protection via the vaccine will create a false sense of security, lessening the priority placed on day-to-day disease management. The two camps also debate the vaccine's efficacy and whether or not vaccinated animals can actively shed *M. paratuberculosis* in their manure.

The Johne's vaccine is widely used in Australia and Spain (mostly in sheep), and similar vaccines have proven to be effective in sheep and goats throughout Europe. Some advocates insist that widespread vaccination in the U.S. cattle industry is the fastest and most economical means of gaining control of Johne's disease. Still others argue that resorting to vaccination is the equivalent of throwing up our hands and surrendering to the disease. The debate continues.

with practitioners today is hard-won and seasoned with years of Johne's experience.

"It's no doubt that many producers, and sometimes their veterinarians, get hung up on the perceived baggage that the Johne's disease label carries," Hansen acknowledges. "My reply is that, to control Johne's, you are managing against fecal-oral disease transmission. That's a good thing to do whether you have Johne's or not. You'll also be preventing Salmonella, E. coli, rotavirus, coronavirus and Cryptosporidium, plus your dairies will be raising more live calves. What's not to like about that?"

Hansen says the veterinarian is the key influencer on issues like Johne's disease. The more comfortable practitioners are about addressing the disease and the management changes required to control it, the more likely their clients will be to comply. "If the veterinarian supports it, it tends to get done," states Hansen.

This approach also can help facilitate collaboration with others who have a vested interest in Johne's disease. Hansen says that in Oregon the state's largest creamery now requires its herds to have a written Johne's management plan. "In most cases, herd veterinarians have been involved in developing those plans, and they've produced some very logical management protocols as a result," he explains. "It's an effort that has paid off for everyone involved."

Chipping away at the challenge

For herds struggling with Johne's disease. Hansen advocates use of the NJWG's Risk Assessment model. This comprehensive checklist encourages the producer and veterinarian to canvass the operation, identify holes in management and get started on positive changes to bring the disease in check. He recommends tackling the management areas that pose the biggest risk for Johne's transmission first. Often, this is newborn calf management. Then, proceed to the next age

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group until all of the animals in the herd are addressed. Finally, develop a plan for screening outside animals entering the herd.

"I prefer the approach of 'test and manage,' versus 'test and cull," says Hansen. "Ideally, you want every positive animal out of the herd. But that's not economically practical for most dairy operations. A highly infected animal will eventually cull herself. In the meantime, diligence must be exerted to limit her risk as a potential shedder of M. paratuberculosis to young calves. You need to help producers manage that risk."

Even in herds that have eliminated or never had a Johne's problem, Hansen recommends ongoing surveillance. "Johne's is no longer an isolated problem," he says. "It's an industry problem, and every dairy herd in the country needs to worry about it."

In these lower-risk herds, Hansen recommends fecal culturing of environmental samples at least once a year. Some of the best locations to collect such samples are a high-traffic area like the path out of the parlor or the lagoon entrance. If a positive sample is found, the herd should be assumed to be Johne's-positive, and ELISA testing of all individual animals, at the same stage of pregnancy, should be resumed or started to get a handle on Johne's prevalence in the herd.

Because Johne's is a dynamic disease, Hansen stresses continuing education for veterinarians. "Most states have Johne's veterinary certification programs either through their state VMA or department of agriculture," he explains. "The online Johne's certification training offered by the University of Wisconsin is accepted by 37 states. And, every state has a designated Johne's coordinator. Start with that person, who will have all the resources you need to become wellversed in Johne's management."

Looking ahead, Hansen sees Johne's disease as an ongoing - but not impossible — challenge for the U.S. dairy



Joe Itle, VMD, has found that the herd managers who have become accredited and certified in brucellosis and tuberculosis (TB) eradication programs are the ones who are most receptive to Johne's control.

industry. "I've seen 1,500-cow herds work their way from severe disease to Johne's test-free," says Hansen. "In the future, there probably will be a premium associated with that status, in terms of milk sales, animal sales or both. Overcoming Johne's disease is valid work, and it protects against so many other diseases, as well. It's definitely worth the effort."

Fighting a mobile menace

Joe Itle, VMD, is convinced that, above anything else, cattle movement has contributed to the rising incidence of Johne's disease in his area of southcentral Pennsylvania.

"We have high animal density here, and, like almost everywhere else, we've had a good deal of expansion," says Itle, of Dairyside Veterinary Service, Martinsburg, Pa. "As a result, in more than 30 years in practice, I've watched Johne's disease evolve from an isolated problem to a nearly endemic disease in this area. If someone tells me they don't have Johne's, my response is, 'Prove it.' Unless they have tested negative for several years and are on a certification program, they probably have some."

Control or coast?

Itle says the severity of the disease ranges from occasional deaths in older animals who break with diarrhea and clinical Johne's, to 2-year-old heifers that simply lie down and die. Unfortunately, many producers are willing to accept losing a cow to Johne's disease every now and then. "I have some clients who are fully aware that they have Johne's and are willing to live with it," he explains. "Until their problem affects them more profoundly, there's not much I can do for them. I can educate them about the disease, but ultimately, it has to be their decision to make changes in their management."

On the other hand. Itle has several herds that have achieved Level 4 (certified Johne's-free) status in the Voluntary Johne's Disease Herd Status Program for Cattle. He has found that the herd managers who have become accredited and certified in brucellosis and tuberculosis (TB) eradication programs are the ones who are most receptive to Johne's control. Those programs have exposed them to the tandem concepts of testing and controlling disease via management, both of which also are needed for Johne's

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eradication. Another one of Itle's client herds is enrolled in the Pennsylvania Johne's Disease Herd Demonstration Project and is making good progress following the program's management protocol.

"A big part of my job is helping those who want the help and protecting them from those who don't," says Itle. "Unfortunately, choosing to ignore Johne's can hurt more than you — it can hurt your neighbors, as well."

If Itle has a herd with a serious clinical Johne's outbreak, he recommends



Johne's resources

Visit the following websites to learn more about Johne's disease.

■ Designated Johne's Disease Coordinators, by state:

www.johnesdisease.org/State/ StatePrograms.htm

- Johne's Disease Information Center at the University of Wisconsin School of Veterinary Medicine: www.johnes.org
- Johne's information website by the National Institute for Animal Agriculture: www.

johnesdisease.org

- United States Department of Agriculture Johne's information page: www.aphis.usda.gov/vs/ nahps/johnes
- National Johne's Working Group educational materials:

www.jd-rom.com/main.asp

■ National Veterinary Service Laboratory approved laboratories for Johne's serology tests: www.johnesdisease.org/Labs/ certifiedlabs.htm

A big part of my job is helping those (clients) who want the help and protecting them from those who don't.

that cattle traffic stops on and off that dairy until the problem is under control. If replacements are needed in those herds, he encourages sourcing them from Level 4 certified herds.

Eradication reaps rewards

For herds intent on addressing their Johne's problem, Itle has found the use of likelihood ratios assigned to serum ELISA results to be extremely helpful. His basic protocol for large herds is to run a serum ELISA on every cow at dry-off, then confirm the positives with a fecal culture. "Of course we'd like to get rid of every Johne's-positive cow, but that's just not economically practical for most of my clients," Itle relates. "The ratios help us classify the severity of the disease in individual animals and manage them accordingly. If we get one with a very high S/P (sample positive) ratio, she may not even be allowed to freshen, and under no circumstances — including pasteurization — is her colostrum or milk allowed to be fed to calves."

In smaller herds, Itle performs a once-a-year, whole-herd check of second-lactation and older animals. This often is done when he is drawing blood for other disease certification programs.

Itle says many management steps can help prevent Johne's spread, including:

- Remove calves from dams immediately after birth.
- Do not pool colostrum.
- Feed milk replacer instead of waste
- Send calves off-site to be raised by a custom grower from newborns to springer stage. Ideally, the grower would raise calves only for one dairy.

For herds that have achieved Level 4 status or are working toward it, Itle counsels them to be extremely cautious when adding new animals to the herd or sending animals to a new facility, such as a newly rented pasture. "One of the problems in this area is manure — there just aren't enough places to go with it," Itle explains. "So even though it is recommended to only spread manure on ground that will be tilled, it hits a lot of pasture ground, too." If a dairy is renting a new pasture or putting animals into a new barn, Itle suggests collecting environmental samples and running Johne's cultures on them, just as a fecal culture would be performed.

Communication between Johne'sfree herds is a role that Itle facilitates with pleasure. "It is very gratifying to put like-minded people together so they can help each other out," he says. "Growing herds need to find sources of clean replacements and herd bulls and are usually willing to pay a premium price for animals that are less likely to be infected." Itle says the sale of bulls has become an additional profit center for many Level 4 herds.

Down the road, the Pennsylvania practitioner believes that permanent animal identification will aid in Johne's control, because it will at least allow cattle movement to be tracked, and their source verified. Still, he thinks producer motivation will be the number one factor in what happens with Johne's in the next decade and beyond.

"I've seen this disease put some herds out of business, and I've seen its positive control actually improve the business of others," says Itle. "It's an issue of awareness and attitude."