Survey of Veterinarians and Producers on Johne's Disease in Iowa Cattle

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ABSTRACT

Iowa's Johne's disease (paratuberculosis) control program was assessed for the first time through a survey of all state cattle veterinarians and cattle producers who were reported to the Iowa state veterinarian as having at least one positive diagnostic test result for Johne's disease within the previous 5 years. Questionnaires assessed (1) the need for continuing education about Johne's disease; (2) the use and interpretation of diagnostic tests; (3) disease control programs; and (4) potential support for a federal disease control program. Surveys were completed and returned by 277 of 450 (62%) veterinarians and 296 of 542 (55%) producers. A large majority of veterinarians (82%) felt they needed more information about Johne's disease. Twenty-seven percent of veterinarians reported requests from producers that they avoid definitively diagnosing Johne's disease, and 16% had recommended that producers avoid obtaining a definitive diagnosis. The questionnaire also gathered data on vaccine use and effectiveness, and the advisability of designating Johne's disease as qualifying for quarantine. There was greater support for a federal Johne's disease control program among veterinarians (59%) than among producers (19%). A voluntary federal disease control program was supported by 6% of veterinarians and 39% of producers. Seven percent of veterinarians and 6% of producers preferred a mandatory disease control program, while 15% of veterinarians and 16% of producers favored a voluntary period longer than 4 years. Four percent of veterinarians and 12% of producers did not want any program.

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INTRODUCTION

Paratuberculosis (Johne's disease), a chronic progressive wasting disease of ruminants caused by *Mycobacterium avium subspecies paratuberculosis* (MAP), occurs throughout the world. In the United States, an estimated 21.6% of dairy herds[1] and 7.9% of beef herds[2] have cattle infected with MAP. The disease costs the U.S. dairy industry an estimated $200–$250 million annually.[1] Control and prevention of Johne's disease can be difficult. Subclinically infected cattle are often infectious long before clinical signs appear, and currently available diagnostic tests lack the sensitivity needed to detect these subclinically infected animals.

The state of Iowa has a long history of implementing a Johne's disease control program, which prior to 2003 was primarily based on vaccination and herd visits by state and federal veterinarians. The vaccination program in the state of Iowa allows producers to have veterinarians vaccinate their herd if they have at least one confirmed case of Johne's disease and they agree to test their herd with caudal fold tuberculin prior to vaccination. The program allows only calves between the ages of 1 and 35 days of age to be vaccinated. No management changes are required; however, producers are visited by a state veterinarian to encourage good management practices. No restrictions of sale and/or shipment of vaccinated animals are imposed by the state. The survey we present is the first evaluation of the Iowa program to be conducted.

This project benchmarks the educational needs and control strategies of Iowa veterinarians and producers. Veterinarians were surveyed to determine: (1) their continuing Johne's disease education needs; (2) their use and interpretation of Johne's disease diagnostic tests; (3) control program/vaccine use recommendations; and (4) potential support for a federal disease control program. Iowa cattle producers were surveyed to determine: (1) their knowledge of Johne's disease; (2) control strategies implemented; and (3) potential support for a federal Johne's disease control program.

MATERIALS AND METHODS

The target population for the veterinarian survey included actively practicing veterinarians in Iowa who serve dairy and/or beef cattle producers (Figure 1, pg. 244). These veterinarians were not readily identified by any known mailing lists. Consequently, all 12 State District Veterinarians and Federal Veterinary Medical Officers (VMOs) in Iowa volunteered to hand-deliver surveys to veterinarians who serve dairy and/or beef cattle producers in their respective districts. A total of 450 surveys were delivered, and returned in business reply envelopes or picked up by the VMO within 1 to 2 weeks.

The target population for the producer survey included dairy and/or beef cattle producers in Iowa whose herds had been diagnosed with Johne's disease between 1994 and 1999 (Figure 2, pg. 248). Although Johne's disease was not reportable for regulatory activity in Iowa during that period, veterinary diagnostic laboratories informed the state veterinarian's office of positive diagnoses. A positive diagnosis included one or more of the following tests: serology, fecal polymerase chain reaction (PCR), culture, or histopathology. The initial list of 612 producers with reported Johne's disease in their herds was obtained from the State Veterinarian's office. After removing duplicates and verifying addresses, 542 producers were identified. The producer's survey was mailed on January 15, 1999. A reminder was mailed 10 days later. A duplicate survey was sent to non-respondents on February 18, 1999.

Survey Development and Design

The questionnaire was developed by 3 faculty members at Iowa State University and a state district veterinarian. Both surveys included questions related to gathering data for a profile of the veterinarian or producer, their knowledge of Johne's disease, disease management recommendations, and regulatory issues. The veterinarian survey also included questions about continuing educational needs. Questions were close-ended

and included questions in the following formats: yes/no, ranking, "choose all that apply," and multiple choice. A draft was submitted to the Survey Laboratory at Iowa State University for review. Revised drafts were tested on 5 veterinarians and 3 producers knowledgeable about Johne's disease.

Statistical analysis was performed using Statistical Analysis Software (SAS) version 8.00 (SAS Institute) and Microsoft Excel (Microsoft Corp.). Categorical data were analyzed using percentages and Chi-square statistics using 2 x 2 contingency tables. Each question that had answers rated on a scale was averaged over all respondents and compared using paired *t*-tests. The alpha critical value (α) used for these tests was calculated by dividing .05 by the total number of possible pairwise comparisons.[3]

Table 1. Iowa veterinarians' need for more information about Johne's disease and attendance at continuing education (CE) programs on Johne's disease in the last 2 years

	Need more information	Attended Johne's CE in the last 2 years
	Number (%)	Number (%)
Total (n = 277)[c]	228 (82%)	140 (51%)
Had diagnosed Johne's disease (n = 208)	180 (87%)[a]	120 (58%)[b]
Had not diagnosed Johne's disease (n = 64)	43 (67%)[a]	20 (31%)[b]

[a,b] $P \leq .0005$.

[c] Five veterinarians did not specify if they had ever diagnosed Johne's disease.

RESULTS

Veterinarian Survey

Completed surveys were returned by 277 of 450 (62%) Iowa veterinarians. Seventy-five percent of the veterinarians surveyed had diagnosed Johne's disease during their career; 57% had diagnosed Johne's disease in dairy cattle and 54% in beef cattle. Of the 75% that had diagnosed Johne's disease, 28% had clients that used the currently available Johne's disease vaccine (Mycopar, Fort Dodge Animal Health). A great majority of veterinarians (82%) desired more continuing education (CE) in Johne's disease; approximately half have attended CE programs on Johne's disease in the last 2 years (Table 1).

Responding to a question in a "choose-all-answers-that-apply" format, veterinarians preferred written materials (65%) and meetings (64%) to other educational venues for Johne's disease CE. The Iowa Cable Network, a real-time, interactive fiber optic statewide communication service, was preferred by 29%, while workshops were preferred by 20%. Only 2% said they preferred no Johne's disease CE.

Diagnostic test utilization and interpretation

Veterinarians were asked on a scale of 1 (least likely) through 5 (most likely) which tests they used to diagnose Johne's disease. The most commonly used tests were enzyme-linked immunosorbent assay (ELISA) (average response, 3.3) and clinical observation (3.3), followed by fecal culture (2.5), PCR (1.7), and acid-fast staining (1.5). There was no difference in preference for specific tests if veterinarians were attempting to diagnose an individual or a group of animals.

Veterinarians were asked to estimate the positive predictive value of a Johne's serum ELISA that had a sensitivity of 50% and a specificity of 98% in a herd with a prevalence of 10% (Table 2). The correct calculation for estimating positive predictive value is:

$$\frac{\text{number of animals testing positive that are actually positive}}{\text{all animals that test positive}}$$

In this case, if the herd had 1000 animals and a 10% prevalence of Johne's disease, 100 animals would be positive. At 50% sensitivity, the test would identify 50 of those 100 animals. There would be 900 truly negative animals in the population, but the test–having 98% speci-

Table 2. Iowa veterinarians' estimate of the positive predictive value of a Johne's disease enzyme-linked immunosorbent assay (ELISA) diagnostic test given a population with a 10% prevalence of Johne's disease, an ELISA with 50% sensitivity, and a 98% specificity

Veterinarians' experience	Under-estimated value No.(%)	Correct value No. (%)	Over-estimated value No. (%)	No response No. (%)
Total (n = 277)[b]	73 (27%)	32 (12%)	117 (42%)[a]	55 (19%)
Had diagnosed Johne's disease (n = 208)	57 (28%)	21 (10%)	94 (45%)[a]	36 (17%)
Had not diagnosed Johne's disease (n = 64)	15 (23%)	11 (17%)	22 (34%)[a]	16 (25%)

[a]Data do not conform to a random distribution ($P \leq .0005$).
[b]Five veterinarians did not specify if they had ever diagnosed Johne's disease.

Table 3. Iowa veterinarians' ratings of Johne's disease management practices and disease transmission routes on a scale from 1 (least important) through 5 (most important)*

Veterinarian's ranking of management practices to control Johne's disease	
Culling clinical animals	4.7
Culling test positive animals	4.4[a]
Reducing fecal contamination of water feed and environment	4.4[a]
Colostrum and raw milk management	4.4[a]
Calf removal at birth	4.3[a]
Purchasing animals from herds with a Johne's known status	4.3[a]
Designated clean calving pens	4.2[a]
Pre-purchase testing	3.8
Acquiring negative semen	3.0[b]
Pre-purchasing only adult replacement animals	2.8[b]
Veterinarian's ranking of transmission routes for Johne's disease	
Fecal /oral	4.3
Milk	4.1
Vertical (in utero or mother to calf)	3.5
Adult to adult	3.0
Semen	2.6

*Answers averaged and reported from most important (5) to least important (1) according to responses.
[a, b]Using pairwise comparisons, all numbers are significantly different from each other ($\alpha \leq .05$) unless they have the same superscript.

ficity–would falsely identify 18 of those 900 as positive. The correct answer would be:

$$\frac{50}{(50+18)} \times 100\% = 73.5\%$$

Therefore, using this test in a herd with 10% prevalence, there would be 73.5% certainty that a positive animal was truly positive.

Forty-three percent of veterinarians indicated that they felt there was a breed pre-disposition to exhibiting clinical Johne's disease; however, when asked to name these breeds or breed, only 4 veterinarians actually did so.

Disease management recommendations

According to survey results, 66% of Iowa veterinarians who have diagnosed Johne's disease routinely discussed the economic impact of Johne's disease with their clients. Only 2% of veterinarians felt milk productivity was not reduced in cows testing positive for Johne's disease, 37% felt that milk production would be reduced by 225 kg per lactation or less, and 38% felt that milk production would be reduced by 630 kg or more. (Twenty-two percent of veterinarians did not answer the question.)

Forty-eight percent of veterinarians believed Johne's disease could be controlled through management practices alone. Table 3 shows veterinarians' ratings of disease management recommendations that were most important in the control of Johne's disease and disease transmission routes on a scale of 1 (least important) through 5 (most important).

Johne's disease vaccination

Of the 28% of Iowa veterinarians who had used the Johne's disease vaccine, 81% indicated that is effective. Seventy-one percent of veterinarians who had used the vaccine for Johne's disease and 9% of veterinarians who had not used it were comfortable recommending the vaccine.

Veterinarians were asked to rate the benefits and the limiting factors obtained through a vaccine program. These results are calculated as discussed earlier and are reported in Table 4.

Table 4. Ratings by Iowa veterinarians of the potential benefits and limiting factors of the Johne's disease vaccine on a scale from 1 (least important) through 5 (most important)

Potential benefits of vaccination	Veterinarians who vaccinate*	Veterinarians who do not vaccinate*
Reduced clinical signs	4.4[1]	3.8[b,1]
Decreased transmission	3.8[a]	3.8[b,c]
Increased production	3.5[a]	3.5[c]
Increased value	2.9	2.6
Reduced management changes	1.7	1.9
Limiting factors of vaccination		
Confounds serology	4.2	4.4
Restricts market options	3.2[a]	3.5[d]
Restricts movement of animals	3.1[ab]	3.4[d]
Human health risks	2.8[abc]	3.2[d]
Decreased value	2.6[bc]	2.8[d]
Not effective	2.4[c1]	3.4[de1]
Cost of vaccination	2.4[c1]	2.8[ef1]
Vaccine may cause disease	1.6[1]	2.6[f1]

* Answers were averaged and reported from most important (5) to least (1).
[a–f]Column numbers with the same letters are not significantly different ($\alpha = .005$).
[1]Row numbers between veterinarians who vaccinate and veterinarians who do not vaccinate that are significantly different ($\alpha = .05$).

Regulatory issues

Forty-seven percent of veterinarians indicated they would sign health certificates for animals coming from herds known to be infected. Of these, 84% would write a statement on a health paper about the status of Johne's disease in the herd. Eighteen percent of the veterinarians responding to the survey are aware of the Iowa uniform commercial warranty code, which implies a warranty that the seller is not aware of a disease state that may prevent an animal from being used for the intended sale purpose.

More than one quarter of veterinarians (27%) report being asked by cattle producers to avoid obtaining a definitive diagnosis of Johne's disease. Sixteen percent of veterinarians have recommended that producers avoid getting a diagnosis confirmed by laboratory tests.

Sixty-eight percent of veterinarians believed that Johne's disease should be a reportable disease, and 48% thought Johne's disease should qualify for quarantine.

Table 5 compares veterinarians' and producers' responses when asked their preferences about the structure of a federal Johne's disease program. Veterinarians preferred a voluntary period followed by a mandatory program, while a wholly voluntary program was preferred by producers.

Producers' Survey

Completed surveys were returned by 296 of 542 (55%) dairy and beef producers who had a positive test result submitted to the state within the previous 5 years. Eighty percent of producers knew their herd was diagnosed with Johne's disease and 19% did not. At the time the survey was completed, 82% still owned the cattle herd that was diagnosed with Johne's disease. Sixty-eight percent of producers owned dairy cattle, 9% owned commercial beef cattle, 3% owned beef breeding-stock, and 10% owned both dairy and beef cattle. Nine percent of producers no longer owned cattle at the time of the survey; these producers were asked to send in the survey and not complete any other questions.

Table 5. Format of proposed federal Johne's disease control program that Iowa veterinarians and producers would be willing to support

	4-year voluntary, then mandatory	Totally voluntary	Totally mandatory	Longer voluntary, then mandatory	No program	No response
Veterinarians (n = 277)	164 (59%)[a]	16 (6%)[b]	20 (7%)	40 (14%)	10 (4%)[c]	27 (10%)
Producers (n = 269)	55 (21%)[a]	105 (39%)[b]	15 (6%)	42 (16%)	34 (13%)[c]	18 (7%)

[a,c]($P < .0005$)
[b]($P = .0028$)

Table 6. Iowa cattle producers' ratings of (a) their most important sources of information for Johne's disease and (b) the most important economic factors affected by Johne's disease on a scale from 1 (least important) through 5 (most important).

Most important sources of information	
Publications	3.2[a]
Local veterinarians	3.0[a]
Other producers	1.9
Extension	1.7[b]
University	1.7[b]
Most important economic impact	
Reduced salvage value	3.2
Premature slaughter/mortality	2.7[a]
Lost production	2.7[a]
Increased cost of management changes and/or vaccination	2.7[a]
Slows genetic improvement	2.4[b]
Lost markets	2.3[b]

[a,b]Column numbers with the same letters are not significantly different ($\alpha = .0033$).

Thirty-nine percent of producers owned their herd longer than 20 years, 31% for 10 to 20 years, 17% for 5 to 10 years, and 12% for 1 to 5 years. Most producers (96%) had no plans to sell their herd in the near future. Thirty-one percent (31%) of responding producers had not had a suspect Johne's disease animal within the last year. Twenty-two percent (22%) had had 1 suspect animal, 31% had had 2 to 4 suspect animals, and 13% had had 5 or more suspect animals in the last year.

Producers were asked to indicate using a scale of 1 (least important) through 5 (most important) how they received information about Johne's disease and the economic impact of Johne's disease. Results are displayed in Table 6.

Management/control measures

If no attempts are made to control Johne's disease in a herd, 61% of producers felt that the disease would gradually worsen, 11% thought the disease would stay the same, 4% felt the disease would eventually be seen less, 12% did not know, and 12% did not answer the question.

Responding to a "choose-all-that-apply" question about actions taken when a suspected case of Johne's disease arises, 77% of producers had sold cattle suspected of having Johne's disease to slaughter. Twenty-four percent had sold them at an auction market, 6% had retained them in the herd, 5% had destroyed the animals, 2% had changed the animals' diet, and 1% had treated them with antibiotics.

Half (50%) of the producers had sold feeder steers or heifers in the last 12 months; 42% had sold baby calves, 14% had sold replacement heifers, 13% had sold breeding bulls, 12% had sold bred cows, 6% had sold colostrum, and 3% had sold semen in the last 12 months. The only significant difference between producers who vaccinate and those who do not vaccinate when responding to the above question regarding the sale of replacement heifers is that 4% of producers who vaccinate sold replacement heifers versus 18% of producers who do not use the vaccine ($P = .007$).

Sixty-nine percent of producers purchased breeding cattle, and 26% maintained a closed herd.

A great majority (94%) of dairy producers reported separating calves from adults until the calves are at least 6 months of age. Eighty percent of all producers kept sick cows isolated from calves. Fifty-seven percent of dairy producers used free stall barns, where cows are housed inside and allowed

to move freely around their pen. Thirty-seven percent of all producers used the same equipment to handle manure and feed. Thirty-three percent of all producers kept cows in areas with access to surface water such as ponds. Twenty-five percent of all producers provided colostrum or raw milk to calves only if it is from cows that have tested negative for Johne's disease. Twenty-three percent of all producers required negative results on Johne's disease tests on all cattle added to the herd. There was no significant difference in any of these management practices between producers who vaccinate and producers who do not vaccinate herds.

Eight percent of producers stated that they would discourage other producers from confirming an animal suspected of having Johne's disease. Fifteen percent of producers reported that veterinarians suggested they avoid obtaining a laboratory confirmation of Johne's disease.

Johne's disease vaccination

A little more than a quarter (27%) of producers participated in Iowa's Johne's disease vaccination program. Of these, 75% indicated that the program was helpful in controlling Johne's disease; 8% did not know as they had just entered the program.

Concerning producers who use the vaccine, 63% use the vaccine only in heifer calves 1 to 35 days of age, 15% vaccinate all calves 1 to 35 days of age, 6% vaccinate only replacement heifers 1 to 35 days of age, 8% responded "none of the above," and 8% did not answer the question.

Seventy-two percent of producers responding to the survey did not participate in Iowa's Johne's disease vaccination program. When asked why they did vaccinate in a "choose all that apply" question, 58% said their veterinarian had not recommended the vaccine and 57% were not aware of the program. Thirty-six percent were in the process of a test and removal program, and 23% felt the vaccine was not effective. Eighteen percent of the producers did not vaccinate because they felt the vaccine was too expensive; 8% said a vaccination program was too much work; and 4% did not want to do the whole-herd tuberculosis test required for the vaccination program.

Regulatory issues

A majority of producers (86%) thought that the cattle industry should address Johne's disease. Fifty-one percent (51%) of producers surveyed knew laboratories reported positive Johne's diagnoses to the Iowa state veterinarian's office. Thirty-two percent of producers had received notification from the state veterinarian's office regarding the Johne's status of their herd. Forty three percent of beef producers but only 19% of dairy producers thought Johne's disease should qualify for quarantine ($P = .0027$).

DISCUSSION

The response rates of veterinarians (62%) and producers (55%) to the survey were consistent with mailed surveys as reported in the medical literature.[4]

A surprisingly high number of producers, nearly 20%, were unaware their herd had been diagnosed with Johne's disease. Possible explanations for this failure include: submitting veterinarians had not provided producers with diagnostic laboratory results, producers had forgotten the results, producers had failed to understand what disease had been diagnosed, or the State Veterinarian's Office had failed to notify the producers of the positive diagnosis. Some veterinarians may have interpreted a positive test result such as the Johne's disease ELISA as a false-positive, and did not report it to the producer.

An overwhelming majority of veterinarians (82%) feel they need more information about Johne's disease, even though 52% attended Johne's disease CE programs in the 2 years prior to the survey. It is difficult to determine if veterinarians feel CE has been adequate or if there is a more general lack of information about Johne's disease. It would be interesting to examine this issue further to

find out if veterinarians feel that previous CE programs were insufficient because there was not enough time or adequate depth of information received, or if there is simply a general lack of scientific solutions to Johne's disease and more CE would still leave veterinarians wanting more.

Nearly half (43%) of veterinarians responding to the survey indicated there is a breed predisposition to exhibiting clinical Johne's disease. Veterinarians may have interpreted this as a prevalence question, as current literature does not support a genetic breed predisposition for susceptibility to Johne's disease,[5] although there are several reports in the literature of a higher prevalence in the Channel Islands breeds (Jerseys and Guernseys).[6]

The Johne's disease ELISA test is commonly used as a diagnostic test; therefore, it is important to document and understand how veterinarians interpret ELISA results. Sensitivity, specificity, and prevalence have a major impact on diagnostic test interpretation. These three parameters can be used to calculate positive predictive value. In the survey, only 12% of veterinarians correctly determined the positive predictive value of an ELISA test given specific parameters. Most veterinarians responding to the question overestimated the positive predictive value of the test, indicating that veterinarians may not be adequately concerned about false-positive results. Although there is little literature about veterinary practitioners on this topic, Steurer et al showed that physicians tend to overestimate positive ELISA test results as well. [7]

Producers indicated that the greatest economic impact of Johne's disease was "reduced salvage value," closely followed by "premature slaughter or mortality" and "lost production." This is not consistent with reports in the literature, as lost milk production accounts for of the majority of dollars lost due to Johne's disease.[8,9]

Producers perceive "loss of markets" as having the lowest economic impact. This is most likely because most producers do not change how they market cattle once their herd has been diagnosed with Johne's disease.[1] Producers who vaccinate, however, were less likely to sell replacement heifers than producers who do not vaccinate. Producers were not specifically asked if they had changed marketing practices or had lost markets once their herd was diagnosed with Johne's disease.

When veterinarians were asked about the possible benefits of Johne's disease vaccination, there was little difference between those who vaccinate and those who do not vaccinate, with the exception that veterinarians who vaccinate indicated that "reduced clinical signs" offer a bigger benefit than did veterinarians who do not vaccinate.

Veterinarians who vaccinate for Johne's disease view the disadvantages of vaccination differently from those who do not use the vaccine. Although both groups felt that interfering with serologic tests was the largest limitation, veterinarians who do not vaccinate were more likely to see "the vaccine is not effective," "the vaccine causes disease," and "cost of vaccination" as significantly larger limitations.

A concern occasionally cited about using the Johne's disease vaccine is that it may give producers a "false sense of security."[10] In this survey, management practices were not different between producers who used the vaccine and those who did not.

Approximately half of the producers were not aware that Iowa has a Johne's disease vaccination program. This is most likely due to local veterinarians not recommending the vaccine for Johne's disease. Iowa State District Veterinarians are encouraged to contact producers in their districts about Iowa's Johne's disease control program when a producer is first diagnosed with Johne's disease; however, only 32% of producers recall being contacted by the State Veterinarian's Office.

The questionnaire asked several questions about veterinarians and producers avoiding obtaining a definitive diagnosis of Johne's disease. The extent to which produc-

ers avoid a Johne's disease diagnosis has never been documented. Even though at the time of the survey, Johne's disease was not reportable for regulatory action in Iowa, veterinary diagnostic laboratories notify state regulatory authorities of a positive diagnosis. Producers may be concerned they will be subject to regulatory action if a Johne's disease control program is ever instituted.

There was a lack of consensus among veterinarians about whether or not they should sign health certificates on animals from known infected herds. Approximately half said they would and half said they would not sign health certificates. This most likely reflects the lack of clear guidelines for veterinarians on this issue.

A large majority of producers (86%) want the cattle industry to address the Johne's disease problem in the United States. However, they are far more cautious than veterinarians about wanting a federally mandated Johne's disease control program.

CONCLUSIONS

Veterinarians in our survey want more information about Johne's disease. CE formats they prefer include written materials and meetings. Like their physician counterparts, veterinarians have a tendency to over-interpret positive diagnostic test results without considering the impact on test specificity and disease prevalence.

An overwhelming majority of veterinarians and producers who vaccinate indicated that the vaccine was effective. Clinical trials and quality observational studies should be conducted to validate their observations.

Johne's disease did not significantly affect options for cattle produces in our survey. Within the 12 months prior to the survey, 10% of owners of infected herds have sold replacement heifers, breeding bulls, and/or bred cows to other producers.

Veterinarians need clear guidelines for writing health papers or certificates of inspection when it is necessary to identify the herd or test status for Johne's disease.

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Form: 8-1/5

First Name:

Last Name: Veterinarian

Address: 2270 College of Veterinary Medicine

Organization Name: Animal Health Information Network

Survey of Iowa Veterinarians about Johne's Disease in Cattle

Veterinarian Region (circle region number)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

1. Do you feel the need for more information about Johne's in cattle?

☐ Yes ☐ No

2. Have you attended any educational presentations on Johne's during the past two years?

☐ Yes ☐ No

3. What type of educational offering for Johne's would you like to see? Check all that apply.

☐ Meetings ☐ Workshops
☐ Iowa Cable Network ☐ Written material
☐ None

4. Have you ever diagnosed Johne's in a dairy herd?

☐ Yes ☐ No

5. Have you ever diagnosed Johne's in a beef herd?

☐ Yes ☐ No

6. When attempting to diagnose Johne's in an INDIVIDUAL animal, which test(s) do you commonly use? (Score on a scale of 1 to 5, with 1 being the least commonly used and 5 the most commonly used.)

6. a) ELISA

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. b) PCR (DNA probe)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. c) Fecal culture

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. d) Acid fast stain

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. e) PPD (skin test)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. f) Clinical observation

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. g) Other (Specify) _____

7. When attempting to diagnose Johne's in a GROUP of animals, which test(s) do you commonly use? (Score on a scale of 1 to 5, with 1 being the least commonly used and 5 the most commonly used.)

7. a) ELISA

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. b) PCR (DNA probe)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. c) Fecal culture

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. d) Acid fast stain

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. e) PPD (skin test)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. f) Clinical observation

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. g) Other (Specify) _____

Figure 1. Survey of Iowa veterinarians about Johne's disease in cattle.

Form: 8-2/5

8. Assume that the sensitivity and specificity of the Johne's ELISA test are 50% and 98% respectively. If you test a herd of 100 cows with an estimated 10% prevalence and have 1 ELISA test positive animal, what percent of the time would you estimate that the test has correctly identified the animal?

☐ 27% ☐ 17% ☐ 33% ☐ 71% ☐ 92%

9. The PPD skin test for Johne's has not been commonly used because of its questionable sensitivity and specificity. If these areas are improved, do you feel the PPD skin test could be effectively utilized in your practice?

☐ Yes ☐ No

10. Do you feel there are certain breeds of cattle that are predisposed to exhibiting clinical signs of Johne's?

☐ Yes ☐ No

10. a) Which breed(s)? _____

11. When do you request laboratory testing for Johne's? Using a scale of 1 to 5, with 1 being the least common reason and 5 the most common reason.

11. a) When clinical signs suggest
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. b) When purchasing animals
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. c) When selling animals
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. d) At owner's request
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. e) When problem becomes severe
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. f) Other (Specify) _____

12. Have you ever had an owner request that you avoid making a definitive laboratory diagnosis for Johne's?

☐ Yes ☐ No

13. Have you ever avoided acquiring a definitive laboratory diagnosis for Johne's to minimize client complications?

☐ Yes ☐ No

14. How often do you see the following clinical signs associated with Johne's? (Score on a scale of 1 to 5, with 1 never, 2 rarely, 3 commonly, 4 frequently, 5 almost always.)

14. a) Diarrhea
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. b) Pneumonia
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. c) Bloody diarrhea
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. d) Chronic wasting
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. e) Loss of appetite
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. f) Fever
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. g) Other (Specify) _____

Figure 1, continued.

Form: 8-3/5

15. In general, do you advise that the milk productivity of a cow that tests positive for Johne's will.....

- ☐ 1. not be affected significantly.
- ☐ 2. be slightly decreased.
- ☐ 3. be reduced by less than 500 lbs. per lactation.
- ☐ 4 be reduced by 1400 lbs. per lactatioin.

16. Do you routinely discuss the economic impact of Johne's with your clients who have Johne's infected herds?

☐ Yes ☐ No

17. Indicate how significantly the following items are affected by Johne's, when 1 means least significantly affected and 5 means most significantly afffected.

17. a) Reduced milk production
☐ 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5.

17. b) Increased cull rate
☐ 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5.

17. c) Lost genetics
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

17. d) Reduced marketing opportunities
☐ 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5.

17. e) Reduced feed efficiency
☐ 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5.

17. f) Reduced reproduction
☐ 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5.

17. g) Other (Specify) _____

18. How important is each of the following management practices in controlling Johne's. Use a scale of 1 to 5, with 1 the least important and 5 most important.

18. a) Colostral and raw milk management
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. b) Calf removal at birth
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. c) Culling test positive animals
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. d) Culling clinical animals
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. e) Pre-purchase testing
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. f) Acquiring negative semen
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. g) Reducing fecal contamination of water, feed and environment
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. h) Maintaining designated, clean calving pens
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. i) Purchasing only adult replacement animals
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. j) Purchasing animals from herds with a Johne's known status.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

19. Do you feel Johne's can be controlled within a herd through management practices alone?

☐ Yes ☐ No

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Figure 1, continued.

Form: 8-4/5

20. How important is it to discuss each of the following types of TRANSMISSION with your client? Use a scale of 1 to 5, with 1 being the least important and 5 the most important.

20. a) Horizontal (adult to adult)	20. b) Vertical (in-utero or mother to calf)
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
20.c) Colostral/raw milk	**20.d) Fecal/oral**
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
20. e) Semen	
☐1 ☐2 ☐3 ☐4 ☐5	

20. f) Other (Specify) _____

21. Have you participated in a Johne's vaccination program?	21. a) If yes, do you think it was benefical?
☐ Yes ☐ No	☐ Yes ☐ No
22. Do you feel comfortable in recommending a Johne's vaccination program?	
☐ Yes ☐ No	

23. In your professional opinion rate the possible benefits obtained through a Johne's vaccination program? Use a scale of 1 to 5, with 1 being the least beneficial and 5 most beneficial.

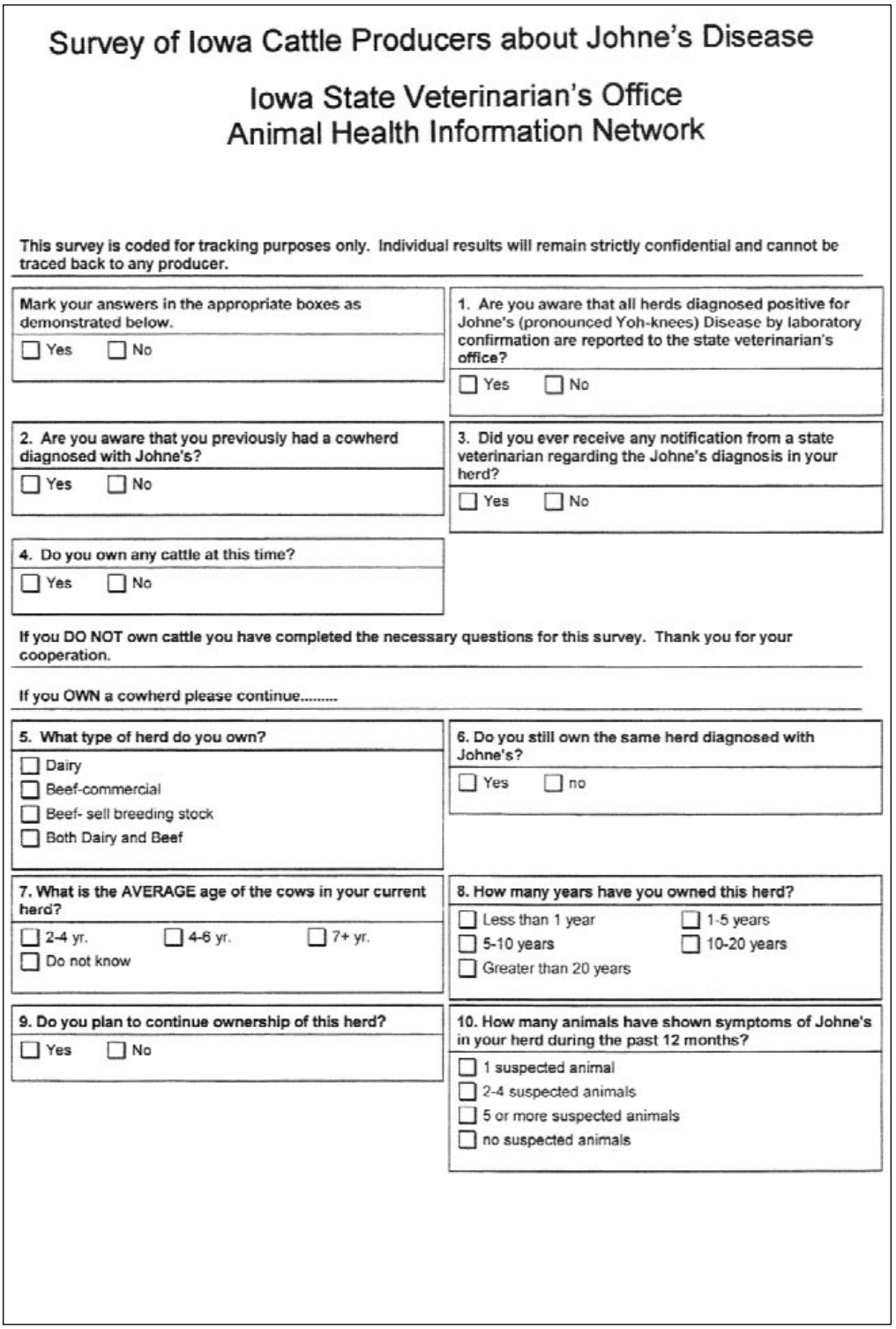
23. a) Reduce clinical signs	23. b) Increase production
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
23. c) Decreased transmission of disease with the herd	**23. d) Reduce need for management changes**
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
23. e) Increase animal's value	
☐1 ☐2 ☐3 ☐4 ☐5	

23. f) Other (Specify) _____

24. Rate the possible limiting factors of a Johne's vaccination program, with 1 being the least limiting and 5 the most limiting.

24. a) Serologically distinguishing between infected and vaccinated animals	24. b) Vaccine is not effective
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
24. c) Vaccine may cause disease	**24. d) Human health risks from the vaccine**
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5
24. e) Decreases the value of vaccinated animals	**24. f) Restricts the movement of cattle**
☐1 ☐2 ☐3 ☐4 ☐5	☐1 ☐2 ☐3 ☐4 ☐5

Figure 1, continued.



Survey of Iowa Cattle Producers about Johne's Disease

Iowa State Veterinarian's Office
Animal Health Information Network

This survey is coded for tracking purposes only. Individual results will remain strictly confidential and cannot be traced back to any producer.

Mark your answers in the appropriate boxes as demonstrated below.

☐ Yes ☐ No

1. Are you aware that all herds diagnosed positive for Johne's (pronounced Yoh-knees) Disease by laboratory confirmation are reported to the state veterinarian's office?

☐ Yes ☐ No

2. Are you aware that you previously had a cowherd diagnosed with Johne's?

☐ Yes ☐ No

3. Did you ever receive any notification from a state veterinarian regarding the Johne's diagnosis in your herd?

☐ Yes ☐ No

4. Do you own any cattle at this time?

☐ Yes ☐ No

If you DO NOT own cattle you have completed the necessary questions for this survey. Thank you for your cooperation.

If you OWN a cowherd please continue.....

5. What type of herd do you own?

☐ Dairy
☐ Beef-commercial
☐ Beef- sell breeding stock
☐ Both Dairy and Beef

6. Do you still own the same herd diagnosed with Johne's?

☐ Yes ☐ no

7. What is the AVERAGE age of the cows in your current herd?

☐ 2-4 yr. ☐ 4-6 yr. ☐ 7+ yr.
☐ Do not know

8. How many years have you owned this herd?

☐ Less than 1 year ☐ 1-5 years
☐ 5-10 years ☐ 10-20 years
☐ Greater than 20 years

9. Do you plan to continue ownership of this herd?

☐ Yes ☐ No

10. How many animals have shown symptoms of Johne's in your herd during the past 12 months?

☐ 1 suspected animal
☐ 2-4 suspected animals
☐ 5 or more suspected animals
☐ no suspected animals

Figure 2. Survey of Iowa cattle producers about Johne's disease.

Form: 8-2/4

11. When you suspect an animal of having Johne's do you? (Choose all those that apply)

- ☐ Sell to slaughter
- ☐ Treat with antibiotics
- ☐ Destroy
- ☐ Change diet
- ☐ Sell to sale barn
- ☐ Retain in the herd

12. How frequently do you get information on Johne's Disease from the following sources? (Score these on a scale of 1 to 5: 1 never, 2 rarely, 3 sometimes, 4 often, 5 always)

12a. State Veterinarian	12b. A practicing veterinarian
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
12c. Extension	**12d. Publications/Magazines**
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
12e. University	**12f. Other producers**
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12 g. Other (Specify) _____

13. If you do not attempt to control Johne's disease in your herd, with time, do you believe the disease would: (choose one response)

- ☐ Eventually be seen less?
- ☐ Stay about the same?
- ☐ Gradually worsen?
- ☐ Don't know.

14. Are you aware that there is a state Johne's vaccination program available for infected herds?

☐ Yes ☐ No

15. Have you ever used Johne's vaccination in your herd?

- ☐ Yes, please go to question 15 a.
- ☐ No, please go to question 17.

15 a. If yes, do you think vaccination has been helpful in controlling Johne's disease in your herd?

☐ Yes ☐ No

16. If you are CURRENTLY participating in the Iowa Johne's vaccination program, how is the vaccine being used? (Choose one response)

- ☐ Vaccinating ALL calves between 1-35 days of age
- ☐ Vaccinating ONLY heifer calves between 1-35 days of age.
- ☐ Vaccinating ONLY REPLACEMENT heifer calves between 1-35 days of age.
- ☐ None of the above

17. If you are NOT participating in the Iowa Johne's vaccination program, mark all reasons that reflect your reasons for not vaccinating.

- ☐ Not aware of the program
- ☐ Not recommended by veterinarian
- ☐ Too expensive
- ☐ Too much work
- ☐ Vaccine is not effective
- ☐ Are testing and removing positive animals
- ☐ Do not want to test herd for tuberculosis
- ☐ None of the above

18. Do you buy bulls, cows, springing heifers, or calves?

☐ Yes ☐ No

page break

Figure 2, continued.

Form: 8-3/4

19. How frequently do you usually get replacement animals from the following sources? (Score these on a scale of 1 to 5: 1 never, 2 rarely, 3 sometimes, 4 often, 5 always.)

19 a. Single source farm tested negative forJohne's Disease	19 b. Single source farm sales of unknown Johne's status
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
19 c. Cattle dealers	**19 d. Sale barns**
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

19 e. Other (Specify) _____

20. During the past 12 months, have you sold any of the following? (Choose ALL that apply)

- ☐ feeder steers or heifers
- ☐ baby calves
- ☐ breeding bulls
- ☐ semen
- ☐ colostrum
- ☐ replacement heifers
- ☐ bred cows

21. Do you separate calves from adults until the calves are at least 6 months of age?

☐ Yes ☐ No

22. Do you use the same equipment to handle manure and feed?

☐ Yes ☐ No

23. Do you use free stall barns?

☐ Yes ☐ No

24. Do your cows have access to surface water, such as ponds?

☐ Yes ☐ No

25. Are sick cows isolated in a pen where calves do not have access?

☐ Yes ☐ No

26. If you provide colostrum or raw milk for your calves, is it from cows that have tested negative for Johne's Disease?

☐ Yes ☐ No ☐ Do not know

27. If you ARE testing for Johne's in your herd are you....(Choose ALL that apply)

- ☐ testing all adult animals annually
- ☐ testing only suspect animals
- ☐ removing all positive animals
- ☐ removing offspring of positive cows
- ☐ testing a certain percent of the adults

28. Do you require a negative Johne's test on all cattle added to your cowherd?

☐ Yes ☐ No

29. To control Johne's, would it be possible for you to split and manage your cowherd in a young (<7 years old) and an old (>7 years old) herd?

☐ Yes ☐ No

30. Mark the level at which you feel Johne's impacts the economics of your herd. (Score on a scale of 1 to 5, with 1 being very little impact and 5 extremely high impact)

30 a. Lost markets (sale of replacement animals)	30 b. Lost production (milk production, reproduction efficiency, calf weight)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
30 c. Cow/bull death loss or premature slaughter	**30 d. Slows genetic improvement**
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Figure 2, continued.

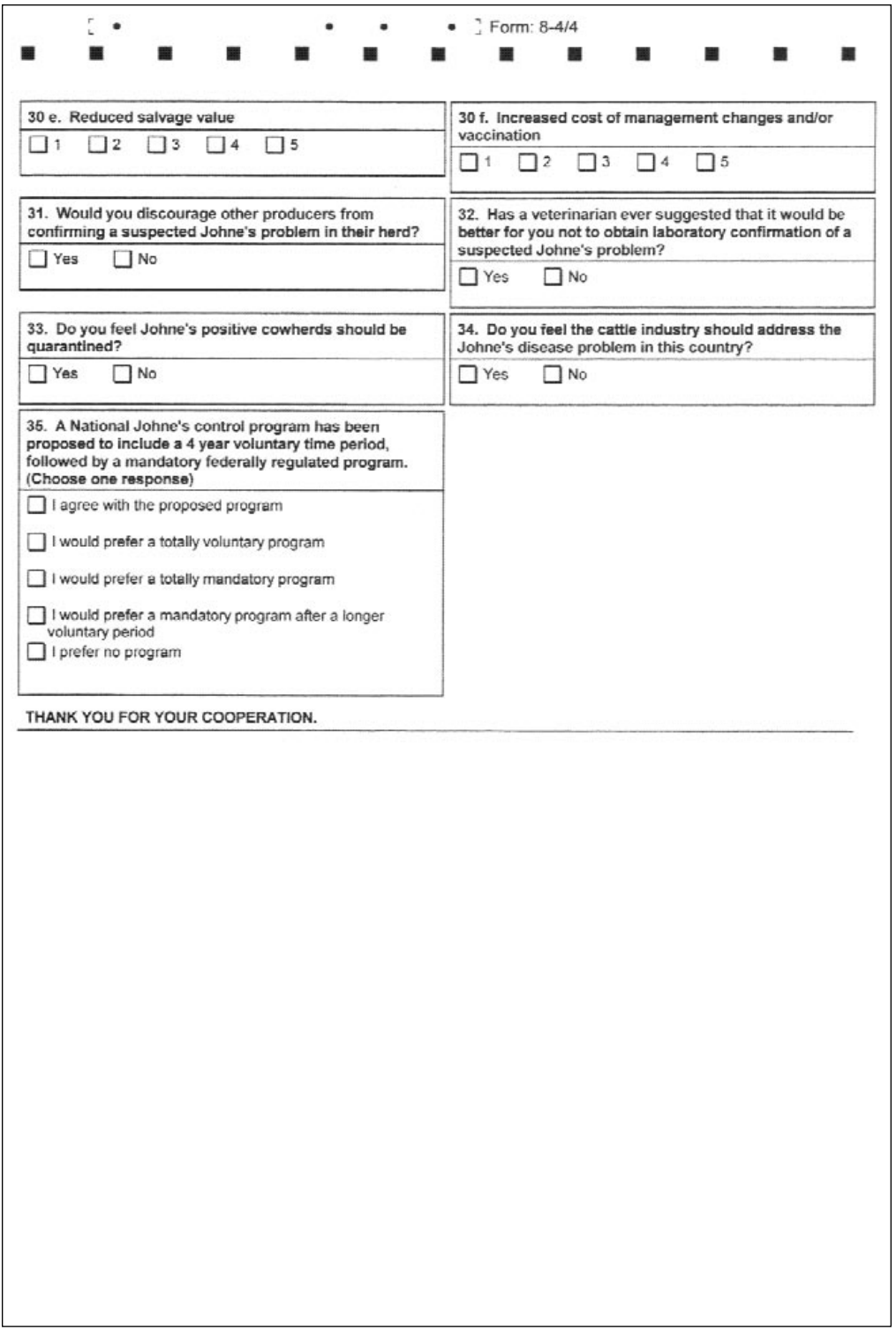


Figure 2, continued.