

# **Modernizing Animal Disease Reporting in the State of Kansas**

by

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**B.S. Animal Science and Industry**, Kansas State University, 2011

FIELD EXPERIENCE REPORT

Submitted in partial fulfillment of the requirements

for the degree

MASTER OF PUBLIC HEALTH

Master of Public Health Program  
Department of Diagnostic Medicine/Pathobiology  
College of Veterinary Medicine

**Kansas State University**

Manhattan, Kansas

2013

Approved by:

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## Abstract

The Kansas Department of Agriculture – Division of Animal Health (KDA-DAH) and the Kansas Department of Health and Environment (KDHE) are two state level health departments located in Topeka. KDA-DAH ensures public health and welfare of Kansas citizens through prevention, control, and eradication of infectious diseases. This is accomplished by regulating animal facilities through inspection and brand recognition. KDHE promotes health, protects the health, and prevents disease/injury among people in the state of Kansas. These goals are completed through surveillance and collaboration with healthcare officials to maintain vaccinations and records. This field experience was completed by collaborations between both agencies with the goal of improvement in reporting of diseases that are mandatory at the state and federal level.

Projects that were completed during the field experience were for the improvement of: general knowledge regarding reportable diseases, improvement in surveillance, and standardization for disease reports. These improvements were implemented by the creation of the Disease Investigative Guideline, Joint Reportable Disease Guide, and a template for reporting diseases, specifically *Brucella canis*. The completed projects will advance through a trial run and will be assessed as necessary.

## Table of Contents

Table of Contents .....	iv
List of Tables .....	v
Acknowledgements.....	vi
Chapter 1 Introduction .....	1
Kansas Department of Agriculture – Division of Animal Health .....	1
Disease Eradication .....	2
Kansas Department of Health and Environment .....	2
Bureau of Epidemiology and Public Health Informatics .....	2
Practicum Synopsis .....	2
Chapter 2- Zoonotic Disease Reporting Template .....	4
Introduction .....	4
Organism.....	5
Diagnosis and Testing .....	6
Treatment/Prevention .....	7
Methods.....	8
Results.....	9
Discussion.....	10
Chapter 3 – Joint Disease Reporting Guide .....	12
Chapter 4 – Final Remarks .....	13
Conclusion.....	13
Recommendations.....	14
Works Cited.....	15
Appendix A – Disease Reporting Form.....	17
Appendix B – Canine Brucellosis Disease Investigative Guideline .....	25

## List of Tables

Table 1: Diagnostic Procedures.....	7
Table 2: Case results for <i>B. canis</i> .....	10

## **Acknowledgements**

First I would like to thank both Dr. Tarrie Crnic and Dr. Ingrid Garrison. These two phenomenal people were instrumental in helping me accomplish my practicum. Without their mentorship, encouragement, and patience this practicum would not have been a success. I would like to thank the staff of both Kansas Department of Agriculture - Division of Animal Health and Kansas Department of Health and Environment Bureau of Epidemiology and Public Health Informatics for their assistance throughout this process.

To Dr. Sanjeev Narayanan, I thank you for your mentorship throughout my collegiate career. Without your assistance I would not be where I am at today. To Dr. Michael Cates and Mrs. Barta Stevenson I thank you for always answering my questions and helping me out in time of need. To Dr. Kimathi Choma, thank you for exposing me to the career of Public Health.

Lastly I would like to thank Dr. Justin Kastner and Dr. Mary McElroy for serving on my committee and assisting where needed.

## Chapter 1 Introduction

Disease reporting is an integral component of public health; by monitoring diseases we are able to assess what strategies to implement to prevent outbreaks in the future. The Kansas Department of Health & Environment (KDHE) has taken drastic steps to improve disease reporting through electronic databases, Disease Investigative Guides, and annually compile data to create health reports for humans in the state of Kansas. These steps assist in forming a modern and realistic view of diseases reported in Kansas. Kansas Department of Agriculture – Division of Animal Health (KDA-DAH) is responsible for disease reporting for animals. Disease reporting for animals is not electronic, and there is not a standard form/template for reporting animal diseases. In order to assist animal disease reporting we modernized the reporting system by creating an electronic database, Disease Investigative Guideline, and Joint Reportable Disease Guide to further improve the efficacy of disease reporting on the animal side of public health.

### **Kansas Department of Agriculture – Division of Animal Health**

The Kansas Department of Agriculture – Division of Animal Health is a division within the state level department of Agriculture that was created in 1969 by consolidating the Livestock Sanitary Commission and the State Brand Commission. The Division of Animal Health was originally a department by itself, but was merged into the KDA as part of an executive reorganization ordered in 2011. It is headed by Animal Health Commissioner Dr. William Brown. KDA-DAH is divided into three sections: disease control, animal facilities inspection, and brands.

### **Disease Eradication**

One of the goals of the KDA-DAH is eradication of infectious and contagious livestock diseases in the state of Kansas. The disease control staff is comprised of department veterinarians, livestock inspectors, and office staff. The department veterinarians are responsible for sanctioning testing programs that identify diseases, as well as assist in surveillance of diseases. Livestock inspectors investigate feedlots, livestock markets, and disposal plants; conduct disease trackbacks; and assist in testing programs. The office staff compiles and maintains vaccination records, test results, and import/export requirements.

### **Kansas Department of Health and Environment**

The Kansas Department of Health and Environment (KDHE) is a state level department that was created to promote health, protect health, and prevent disease/injury among people in the state of Kansas. KDHE is composed of four divisions: Administration Office of the Secretary, Division of Health, Division of Health Care Finance, and Division of Environment. Secretary Dr. Robert Moser heads KDHE.

### **Bureau of Epidemiology and Public Health Informatics**

The Bureau of Epidemiology and Public Health Informatics is responsible for collecting, analyzing, and interpreting data that provide information on different conditions of public health importance and on the health status of the population.

### **Practicum Synopsis**

The practicum consisted of 240 contact hours in Topeka, KS over the months of February – April, 2013. During this time, weekly meetings were held with mentors Dr. Tarrie



Crnic (KDA-DAH) and Dr. Ingrid Garrison (KDHE) to provide guidance as well as input for the completion of the projects. The first project was to create a Disease Investigative Guideline (DIG) for *Brucella canis*. DIGs are used by veterinarians, field staff, and other personnel.

The second project assigned consisted of creating an electronic user friendly database for input of reported cases of *Brucella canis*. This project was created in hopes of establishing a unified and organized way of recalling previous cases of reportable animal diseases. *Brucella canis* was looked at in particular because it is a known zoonotic agent. Therefore, it is of interest to the human and animal side of disease reporting and calls for the collaboration of KDA-DAH and KDHE.

The last project entailed the creation of a document that consists of reportable diseases for both humans and animals. This document contains contact information for KDA-DAH and KDHE, fact sheets for the reportable diseases, and statutes that clearly outlined the jurisdiction of each organization.

## Chapter 2- Zoonotic Disease Reporting Template

### Introduction

*Brucella* is a gram negative non-motile aerobic intracellular coccobacillus when cultured in the planktonic state. There are six classically known zoonotic variants of *Brucella* starting with the most known pathogenic to the least: *B. melitensis* (sheep and goats), *B. abortus* (cattle), *B. suis* (swine), *B. neotomea* (rodents), *B. canis* (dogs), and *B. ovis* (sheep).<sup>1</sup> *B. canis* specifically is the species of *Brucella* that we are interested in for this practicum.

In 1966 Dr. Leland “Skip” Carmichael identified the first naturally acquired human infection of *B. canis*. It was suspected that the patient had acquired the organism from her male German Shepherd, which had positive blood cultures of the organism.<sup>2</sup> Although *B. canis* has the capability of zoonosis, the common person is not at risk for acquiring this agent. *B. canis* is considered to be an occupational hazard. People that are at high risk of contracting *B. canis* are those with occupations of: breeders, veterinarians, and laboratory workers. It is suspected that many cases of *B. canis* are underreported in the United States.

Currently all human cases of *Brucella* are required to be reported to the Centers for Disease Control and Prevention (CDC), but when reports are compiled they are not required to state which species of *Brucella* was being reported. If serological testing was required on the national level, more information could be found on how prevalent *B. canis* is in human infections. According to the CDC, *Brucella* was reported in 28 states.<sup>6</sup> Overall reports for brucellosis are relatively low; this is believed to be because human infection of *B. canis* has many similar clinical signs that are associated with common viruses such as influenza. The clinical signs that *B. canis* presents are mild and people are rarely hospitalized due to

complications; unless the person is pregnant or immune compromised.

In canines, brucellosis is a reproductive disease that remains underreported in many parts of the world. Currently, in the United States, not all states require the reporting of *B. canis* in animals. Of the 50 states, only 28 states have stated that *B. canis* is explicitly reportable.<sup>1</sup> 5 of these 28 states have policies and guidelines that address *B. canis* in dogs.<sup>1</sup> In order to increase surveillance of *B. canis*, every state should have a guideline that addresses how to identify a case of the organism.

Through a collaborative effort of KDA-DAH, and KDHE, guidelines were created to assist in reporting *B. canis*. These guidelines help to ensure the reduction of underreporting of brucellosis in the future.

### **Organism**

Canine brucellosis is a venereal disease spread throughout the world except New Zealand and Australia amongst wild, domesticated, and feral canines.<sup>11</sup> The common method for *B. canis* to colonize the host is through intercourse (can be found in chilled/frozen semen that is used for A.I.), but the disease can also be transmitted through other methods. Some of these manifestations are: ocular fluids, the fetus, placental membrane, milk (vertical transmission), feces, saliva, and urine when in direct contact with the mucosal system or an open wound.<sup>4</sup> Classical symptoms of this bacterium in the female dog are: stillbirths, abortion, and vaginal discharge. In male dogs the symptoms are epididymitis and inflamed prostate; infertility can be found in both genders.<sup>3</sup> When the disease is inadvertently passed to humans the common symptoms are those associated with influenza. There have been no documented cases where the bacterium was transmitted from human – human contact.

## **Diagnosis and Testing**

There currently are no vaccines for *B. canis*; however, there are some being worked on. Most cases of *B. canis* are reported in breeding kennels where, if the disease is not actively checked for it can run rampant throughout the facility. Veterinarians suggest that canines be tested at least twice a year for *B. canis*, and if they are sexually active they should be tested twice every 4-6 weeks.<sup>4</sup> The most common method for testing is the serological rapid slide agglutination test (RSAT), but due to the high sensitivity it is known to produce false positives. Due to the high reporting of false positives other tests must be completed to validate a positive.<sup>8</sup> Some tests that are done in conjunction with RSAT are polymerase chain reaction (PCR) and tissue culture; these tests are done to validate the results for the RSAT. Another reason for the unreliability of RSAT is that the test was originally created to detect the serotype *B. abortus*; therefore, the antigen substrate used is of smooth origin. *B. canis* is physiologically different from *B. abortus* in that its colonies appear rough as opposed to being smooth. A new method of RSAT has been created which helps eliminate false positives by adding 2-mercaptoethanol. It works by increasing the specificity of the test by inactivation of non-specific immunoglobulins, thereby decreasing the frequency of false positives.<sup>9</sup> In order for blood culture to be effective, it must be inoculated in culture immediately; cultures that have seen success are tryptic soy broth, Brain Heart Infusion (BHI), and Columbia broth.<sup>12</sup> Isolation rates for the organism from blood culture are reported to be successful 20-50% of the time.<sup>5</sup> Tissue samples are not ideal, because it can take up to a week for the organism to manifest; also, the tissue that is cultured may not be colonized with the bacteria. There currently are no verified tests to diagnose *B. canis* in humans. Testing for canine brucellosis in Kansas is done at

the Kansas State Veterinary Diagnostic Lab (KSVDL) and the Missouri Diagnostic Lab. Procedures done at the KSVDL and the Missouri Diagnostic Lab are as follows:

**Table 1: Diagnostic Procedures**

	<b>Test</b>	<b>Price per sample</b>
<b>K-State Diagnostic Lab</b>	Card Agglutination*	\$25.00 per sample
	Blood	\$2.50 per sample
<b>Missouri Diagnostic Lab</b>	Tissue Culture	\$8.00 per sample
	Card Agglutination	\$5.00 per sample
	Tube Agglutination Test	1-10 samples \$5.00

\*Due to a manufacturing shortage, all samples are being forwarded to National Veterinary Services Laboratory (NVSL) in Ames, Iowa

### **Treatment/Prevention**

Most reported cases of *B. canis* happen in business settings (kennels and boarding facilities). If the canine is found with the disease, it is recommended that the animal be euthanized so it will not spread the organism to other animals. If the owner wants to treat the dog there are two antibiotics commonly used: tetracycline and dihydrostreptomycin.<sup>11</sup> Even if treatment is done, a relapse can occur and the dog will still shed the organism. It is reported that the bacteria can be shed for up to 5 years.<sup>1</sup> The tests used to diagnose *B. canis* are quite costly for large facilities, (Table 1).

The best solution to this problem is prevention, which includes making sure that facility is verified as “*B. canis* free” before allowing dogs to associate or breed with any of the other dogs. If a case of *B. canis* is found within a facility the best method to treat the premises is with

disinfectants. *B. canis* is capable of surviving on fomites, in dark areas, and in high humidity places for years without a host. It can be deteriorated by sunlight and common household disinfectants. Some of these disinfectants are:

- 1% sodium hypochlorite,
- 70% ethanol,
- Iodine/alcohol solution,
- Glutaraldehyde, and
- formaldehyde<sup>7</sup>.

### **Methods**

*B. canis* can be found worldwide. In the United States it is believed that prevalence of the organism is between 1-8% (depending on source) compared to other countries where the prevalence is 20% and greater.<sup>1</sup> The difference between the prevalence of this disease in other countries and the United States is due to lack of unified guidelines for reporting the bacterium. In a report completed by Dr. Jim Kazmierczak it was found that only 5 states have guidelines to report *B. canis* in canines and of those five states only four have policies on infection in humans.<sup>1</sup> In order for KDA – DAH and KDHE to proceed in recording data on *B. canis*, we looked retrospectively at data from previous cases.

After looking at past cases, we established that for future reference there needs to be a more convenient way of recalling cases in a timely fashion. In order to do this we created an electronic reporting template specific for *B. canis* that was built in the Epi-Trax program. Epi-Trax is a database used by KDHE to keep track of different diseases that occur. It was built as a way to organize data in a user friendly way. Data entered into the program is secured, and only people with special clearance have access to the program. After the electronic template was built for *B. canis*, we proceeded to create Disease Investigative Guideline (DIG). This DIG was

made to serve as a reporting guide to ensure that all reports had uniformity. Therefore, the reports would be easy to compare and enter in the electronic reporting template. People that will use the DIG are field inspectors and veterinarians that have suspicions of *B. canis* in canine facilities, outlined by specific guidelines in the document.

We realize that many veterinarians and field inspectors may not have internet at the facility they are investigating. To combat this dilemma, the DIG and Epi-Trax form for *B. canis* can be converted into a PDF version. The PDF version can be printed off; data from the PDF can be inserted electronically at a later time.

To assist in disease reporting for animals, we also developed a Joint Reportable Disease Guide, where all reportable diseases for humans and animals in Kansas are included. In this Joint Reportable Disease Guide, each disease is designated a fact sheet. These fact sheets include information that is specific for each disease, so that people are able to identify it clearly when reporting the agent. Also, included in the Joint Reportable Disease Guide are the phone numbers of the specific agency that each disease is to be reported to by law (statutes are also included in the guide).

## **Results**

KDA – DAH verifies licenses from breeders and retailers of canines yearly by doing inspections to ensure all the guidelines are being followed. We gathered our data by looking through past reports of facility inspections. There were some issues in finding the cases, since the files are ordered by a person's last and first name instead of by disease. Also, there is no current electronic method of searching a person's file. We found cases through one of the state

veterinarian's recollection; and of the nine cases remembered by the veterinarian, only five of these cases had reports of *B. canis* within the files.

**Table 2: Case results for *B. canis***

Case	Year	Female	Male	Tested	True +	Neutered/Spayed	Euthanized
1	2007	19	5	4	4	5	0
2	2009	60	15	75	3	2	0
3	2008	145	50	16	1	0	1
4	2012	106	42	6	1	1	?
5	2012	40	7	31	13	0	13
Total		370	119	132	22	8	14

### Discussion

Of the five cases recalled that had documentation of *B. canis* (Table 2), 132/487 dogs were tested and 22/132 tested positive for *B. canis*. Since there were no standard guidelines to record information on *B. canis* some of the reports were detailed while others were not as detailed. For example, one file indicated there was no evidence of *B. canis* being reported, but 2 dogs were euthanized. These inconsistencies made it difficult to establish which cases were truly positive or negative. We were told that each year 6-12 cases of canine brucellosis are reported in Kansas, but we were unable to find many of these cases due to disorganization. This is why we constructed a DIG, fact sheet, and electronic template to record cases in the future for surveillance and organizational purposes.

Surveillance plays an important part in assessing methods on how to control rare/underreported diseases. A study conducted in S. Korea actively serotyped *B. canis* and used a multiple-locus Variable Number of Tandem Repeat (VNTR) analysis for *Brucella* fingerprinting. This assay helped to identify *B. canis* serovars that had similar genetic makeup. Their ultimate goal is to use the assay as a method for traceability to help prevent the spread of



disease at its source<sup>10</sup>. Once we implement an efficient surveillance system, the methods used in S. Korea can also be used in Kansas to prevent the spread of *B. canis* throughout kennels and boarding facilities.

## Chapter 3 – Joint Disease Reporting Guide

Throughout the United States federal agencies such as the USDA and CDC have created mandates that certain cases of diseases are to be reported at the federal level. Some of these diseases need to be reported immediately while others need to be reported within the year. Along with the mandatory disease reporting by the federal government each state also requires specific diseases to be reported at the state level.

KDHE makes facts sheets and DIGs accessible to the public on its website for each reportable disease. These fact sheets and DIGs are developed to inform health officials how to go about containing the agent and the contact information of who to report to. KDA-DAH also has a list of reportable diseases; but this can only be found online in the statutes and can be difficult to pinpoint. In order to make this list more accessible we created a document which lists all reportable disease on the human and animal side to make things more accessible to health practitioners.

The reason for the Joint Reportable Disease Guide is to focus on zoonotic organisms, which can potentially affect both animals and humans. Considering KDA-DAH and KDHE operate under different agencies, some zoonotic agents may be reported to one agency and not the other. This can lead to underreporting and decrease the reliability of surveillance. By collaborating and creating this document we hope to decrease underreporting as well as increase collaboration between the two organizations on zoonotic cases. This assists in increasing the state's preparedness when faced with a zoonotic agent by ensuring the appropriate authorities are notified.

## Chapter 4 – Final Remarks

### Conclusion

Throughout this field experience working with two state level government agencies (KDA-DAH and KDHE) has exposed me to how things operate on the human and animal side in regards to health regulation. During the process of obtaining my MPH, in most classes we discussed the importance of One Health. One Health is the concept of incorporating multiple disciplines with the goal of achieving better health for animals, humans, and the environment. By operating in the idea of One Health we encourage such collaborations between different agencies to solve common health disparities.

KDA-DAH and KDHE have both exposed me to how different the culture of the workplace can be, even when working down the street from one another. Before this project I had no idea of the different policies and statutes that each organization had to abide by. Not only are their policies different, but there were other obstacles to face such as; implementing new federal regulations, and having to deal with staff shortages. It was helpful for me to witness how important the government's (federal and state) role is on Public Health. Seeing the regulatory side of Public Health helped me realize that not everything health related is dictated by bench work; and why it is important to be well versed in different areas of health.

Working in this collaborative environment has given me much needed insight on how complicated it can be to achieve the idea of One Health; even more so I was able to witness the accomplishments that can happen once this idea is given motion. I would like to thank everyone at KDA-DAH and KDHE for taking the time to teach and mentor me throughout the project. I have learned many valuable lessons in the Public Health field.

**Recommendations**

We recommend that KDA-DAH create a brief memo to veterinary facilities and veterinarians in the state of Kansas that lists all of the reportable animal diseases. If this memo is carried out a more accurate number of reportable diseases can be assessed. Another recommendation is a yearly audit of cases filed with the KDA-DAH, this audit can be done internally or from a third party. Auditing will assist in ensuring the most proficient procedures are being used in reporting diseases. Our last recommendation is for KDA-DAH to obtain funds so they can delegate specific duties to specific people. Throughout our time with KDA-DAH we found that duties that were meant for three people have been consolidated to one person. We are aware that government cut backs have happened and is one of the reasons for the shortage of available staff. To counter these cutbacks we suggest looking outside of government aid, such as, securing private grants. By doing this and implementing the programs mentioned in this paper we are certain that advancements will occur in disease reporting.

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## Appendix A – Disease Reporting Form

### Disease Reporting

The [Kansas Department of Agriculture – Division of Animal Health](#) (KDA-DAH) and the [Kansas Department of Health and Environment](#) (KDHE) have collaborated to compile a list of reportable diseases that are transmissible to humans from animals. This document provides guidelines on how to identify these agents and the correct authority to notify.

Zoonotic Diseases are agents which are transmissible from animals to humans. Throughout the years, many states have identified the importance of looking at disease through an epidemiological standpoint to assist in implementing prevention strategies. In order for prevention to work, it calls for collaborative efforts of surveillance between government organizations, healthcare providers, veterinarians, and the general public.

Data taken from these outlets will be used to report current trends in health and the steps we can take to improve prevention strategies and disease eradication to aid in increasing the health of our society. Links to the newsletters which report the current trends can be found in this document under “Disease Statistics.”

### Diseases Affecting Domestic Animals

- Animal diseases that are reportable under the authority of [Kansas Statute 47-622](#) (KSA) can be found in [Kansas Administrative Regulation 9-271](#) (KAR). The necessary forms to report the occurrence can be found at (insert web link when standardized form has been created).
- If the animal is found to be a carrier of the infectious agent, the Animal Health Commissioner under the authority of [KSA 47-610](#), can quarantine the animal until infectivity has passed.
- If the diseased animal is found to present danger to people or animals the Animal Health Commissioner can euthanize the animal under the authority of [KSA 47-614](#).
- All reportable animal diseases in Kansas are reported to **KDA-DAH (785) 296-2326**; KDA-DAH sends data to U.S. Department of Agriculture (USDA). KDA-DAH will contact USDA to report unusual outbreaks if technical or laboratory assistance is needed.

### Diseases Affecting Wildlife

- Wild animals are a potential hazard and vector for transporting infectious disease. Although, the [Kansas Department of Wildlife, Parks, and Tourism](#) (KDWPT) does not

actively report disease in time of need, they are to assist KDA-DAH and KDHE in monitoring disease under the authority of [KSA 32-831](#).

### Diseases Affecting Humans

- Human diseases that are reportable under the authority of [KSA 65-118](#) can be found in the [Disease Investigative Guidelines](#). All healthcare providers are expected to report these diseases to [KDHE staff at \(785\) 296-0461](#), or the [Local Health Department](#) (LHD) under the authority of KSA 65-118. The necessary forms to report the occurrence can be found [online](#).
- All reportable human diseases in Kansas are reported to KDHE; KDHE sends data yearly to the Center for Disease Control and Prevention (CDC). KDHE will contact CDC to report unusual outbreaks if technical or laboratory assistance is needed.
- Zoonotic diseases including rabies should be reported to [KDHE Infectious Disease Epidemiology and Response \(IDER\) staff at \(877\) 427-7317](#). More information about reporting to KDHE IDER can be found [online](#).
- Diseases that are reportable within a time frame of four hours or less must be reported to the [Epidemiology Hotline at \(877\) 427-7317](#). Reportable Diseases that require isolates for testing can be mailed to the [Division of Health and Environmental Laboratories \(DHEL\) Forbes Field, Building #740, Topeka, KS 66620-0001 Phone: \(785\) 296-1633](#)

### Case Definition

A case definition is set of uniform criteria used to define a disease for public health surveillance. Case definitions enable public health to classify and count cases consistently across reporting jurisdictions, and should not be used by healthcare providers to determine how to meet an individual patient's health needs (CDC).

### Disease Statistics

Diseases that affect humans are updated in a monthly [newsletter](#) by KDHE. Whereas disease that affects animals are reported annually in a [newsletter](#) by KDA-DAH.

Abbreviations	
CDC	The Centers for Disease Control and Prevention
DHEL	Division of Health and Environmental Laboratories
IDER	Infectious Disease Epidemiology and Response
KAR	Kansas Administrative Regulation



KDA-DAH	Kansas Department of Agriculture – Division of Animal Health
KDHE	Kansas Department of Health and Environment
KDWPT	Kansas Department of Wildlife, Parks, & Tourism
KSA	Kansas Statute
LHD	Local Health Department
N/A	Not Applicable
USDA	United States Department of Agriculture

**Table of Kansas Reportable Animal, Human, and Zoonotic Diseases**

**Purple** = Animal Disease

**Green** = Human Disease

**Red** = Zoonotic Disease

**\*Reported in Humans & Animals, not Zoonotic**

Disease or Condition	Required Reporting		Disease Fact Sheets		Voluntary Reporting & Comments
	Animal Disease or Illnesses	Human Disease or Illnesses	Human	Animal	
Acquired Immune Deficiency Syndrome (AIDS)	N/A	KDHE	Yes	N/A	
African Swine Fever	KDA-DAH	N/A	N/A	Yes	
Amebiasis	N/A	KDHE	Yes	N/A	
Anthrax	KDA-DAH	KDHE	Yes	Yes	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Arboviral Disease, including West Nile virus, Western Equine Encephalitis, and St. Louis Encephalitis	USDA	KDHE	Yes	N/A	
Avian Influenza	KDA-DAH	N/A	N/A	Yes	
Botulism	N/A	KDHE	Yes	N/A	Report to the

					Epidemiology Hotline within four hours for suspected or confirmed cases
Bovine Leukosis	KDA-DAH	N/A	N/A	Yes	
Brucellosis	KDA-DAH	KDHE	Yes	Yes	
Campylobacter Infections	N/A	KDHE	Yes	No	
Chancroid	N/A	KDHE	Yes	N/A	
Chlamydia trachomatis	N/A	KDHE	Yes	N/A	
Cholera	USDA	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Cryptosporidiosis	N/A	KDHE	Yes	N/A	
Cyclospora Infection	N/A	KDHE	Yes	N/A	
Diphtheria	N/A	KDHE	Yes	N/A	
Ehrlichiosis	N/A	KDHE	Yes	N/A	
Equine Infectious Anemia	KDA-DAH	N/A	N/A	Yes	
<i>Escherichia coli</i> enteric infection from <i>E. coli</i> O157:H7 and other Shiga toxin-producing <i>E. coli</i> , also known as STEC	N/A	KDHE	Yes	N/A	Isolates must be sent to DHEL
Foot and Mouth Disease	KDA-DAH	N/A	N/A	Yes	
Fowl Typhoid	KDA-DAH	N/A	N/A	Yes	
Giardiasis	N/A	KDHE	Yes	N/A	
Gonorrhea	N/A	KDHE	Yes	N/A	
Haemophilus Influenzae (Invasive Disease)	N/A	KDHE	Yes	N/A	
Hantavirus Pulmonary Syndrome	N/A	KDHE	Yes	N/A	
Hemolytic Uremic Syndrome, Post	N/A	KDHE	Yes	N/A	

Diarrheal					
Hepatitis B in Pregnancy	N/A	KDHE	Yes	N/A	Report the pregnancy of each woman with hepatitis B
Hepatitis, Viral	N/A	KDHE	Yes	N/A	
Hog Cholera	KDA-DAH	N/A	N/A	Yes	
Influenza, if the disease results in the death of any child under 18 years of age	N/A	KDHE	Yes	N/A	
Johne's Disease	KDA-DAH	N/A	N/A	Yes	
Legionellosis	N/A	KDHE	Yes	N/A	
Leprosy or Hansen's disease	N/A	KDHE	Yes	N/A	
Listeriosis	N/A	KDHE	Yes	N/A	
Lyme disease	N/A	KDHE	Yes	N/A	
Malaria	N/A	KDHE	Yes	N/A	
Measles or rubeola	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Meningitis (bacterial)	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected for confirmed cases
Meningococemia	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases / Isolates must be sent to DHEL
Mumps	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or

					confirmed cases
Pertussis or whooping cough	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Piroplasmosis	KDA-DAH	N/A	N/A	Yes	
Plague or Yersinia pestis	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Poliomyelitis	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Pseudorabies	KDA-DAH	N/A	N/A	Yes	
Psittacosis	KDA-DAH	KDHE	Yes	Yes	
Psoroptic Mange	KDA-DAH	N/A	N/A	Yes	
Pullorum	KDA-DAH	N/A	N/A	Yes	
Q Fever ( <i>Coxiella burnetii</i> )	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Rabies	KDA-DAH	KDHE	Yes	Yes	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Rinderpest	KDA-DAH		N/A	Yes	
Rocky Mountain spotted fever	N/A	KDHE	Yes	N/A	
Rubella, including congenital rubella syndrome	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for

					suspected or confirmed cases
Salmonellosis, including typhoid fever	N/A	KDHE	Yes	N/A	Isolates must be sent to DHEL
Scabies	KDA-DAH	N/A	N/A	Yes	
Scrapie	KDA-DAH	N/A	N/A	Yes	
Severe Acute Respiratory Syndrome (SARS)	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases / Isolates must be sent to DHEL
Shigellosis	N/A	KDHE	Yes	N/A	Isolates must be sent to DHEL
Smallpox	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Streptococcal invasive, drug-resistant disease from group A Streptococcus or Streptococcus pneumoniae	N/A	KDHE	Yes	N/A	Isolates must be sent to DHEL
Syphilis, including congenital Syphilis	N/A	KDHE	Yes	N/A	
Tetanus	N/A	KDHE	Yes	N/A	
Toxic-Shock Syndrome, Streptococcal and Staphylococcal	N/A	KDHE	Yes	N/A	
any Transmissible Spongiform Encephalopathy (TSE) or prion disease	N/A	KDHE	Yes	N/A	Indicate causative agent, if known to Epidemiology Hotline.
*Trichinosis	KDA-DAH	KDHE	Yes	Yes	

Tuberculosis (active and latent)	KDA-DAH	KDHE	Yes	Yes	Report active disease to the Epidemiology Hotline within four hours for suspected or confirmed cases / Isolates must be sent to DHEL
Tularemia	N/A	KDHE	Yes	N/A	
Varicella or Chickenpox	N/A	KDHE	Yes	N/A	
Vesicular Exanthema	KDA-DAH	N/A	N/A	Yes	
Vesicular Stomatitis	KDA-DAH	N/A	N/A	Yes	
Viral hemorrhagic fever	N/A	KDHE	Yes	N/A	Report to the Epidemiology Hotline within four hours for suspected or confirmed cases
Viscerotropic Velogenic/Newcastle Disease	KDA-DAH	N/A	N/A	Yes	
Yellow fever	N/A	KDHE	Yes	N/A	

## **Appendix B – Canine Brucellosis Disease Investigative Guideline**

Canine Brucellosis

Investigation Guideline

Content:

Version Date:

Investigation Protocol:

Investigation Guideline  
03/2013

Supporting Materials found in attachments:

Fact Sheet

Case Report Form

## CASE DEFINITION

### Clinical Description for Surveillance:

- An illness characterized by infertility or sudden abortion in canines. Other signs include one or more of the following: prolonged mucus discharge from the vagina, still births, epididymitis, unwillingness to mate, decreased ejaculate, or recurrent uveitis.

### Laboratory Criteria for Case Classification:

- Definitive:
  - Culture and identification of *B. canis* from clinical specimens
  - Evidence of fourfold or greater rise in *Brucella* antibody titer between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart
- Presumptive:
  - Positive reading using 2-mercaptoethanol Rapid Slide Agglutination Test (ME-RSAT), the Tube Agglutination Test (TAT), or the Indirect Fluorescent Antibody test (IFAT) with a 1:200 titer
  - Detection of *Brucella* DNA in a clinical specimen by polymerase chain reaction (PCR) assay

### Case Classification:

- **Confirmed:** A clinically compatible illness with definitive laboratory evidence of *Brucella* Infection/ isolation of *Brucella* from a clinical specimen by culture
- **Probable:** A clinically compatible case and elevated antibody serology to *B. canis*; or detection of *B. canis* nucleic acids in a clinical specimen by amplification of a specific target by polymerase chain reaction assay
- **Suspect:** A clinically compatible case that is epidemiologically linked to a confirmed case.



## **EPIDEMIOLOGY of Canine Brucellosis in Dogs**

Canine brucellosis is a zoonotic reproductive disease in dogs, and is not commonly reported in the United States. Many states do not list canine brucellosis as a reportable disease. Some believe the low prevalence of canine brucellosis in the U.S. can be attributed to underreporting. In Kansas it is believed that 6-10 cases are reported annually.

### **DISEASE OVERVIEW**

#### **A. Agent:**

*B. canis* is a Gram negative, non-motile, aerobic intracellular coccobacillus. Once in the environment it is susceptible to common household cleaning supplies and direct sunlight.

#### **B. Clinical Description:**

Signs include but are not limited to: epididymitis, testicular atrophy or orchitis, scrotal dermatitis, prostatitis, infertility, loss of libido, diskospondylitis, mucosal vaginal secretions, and sudden abortion or reabsorption.

#### **C. Reservoirs:**

*B. canis* has only been known to be acquired from dogs.

#### **D. Mode of Transmission:**

Transmission occurs through direct contact with infected animals' fluids and/or tissues including: urine, vaginal discharges, aborted fetuses, placentas, and ocular fluids. Airborne transmission may occur through inhalation of aerosols in experimental settings.

#### **E. Incubation Period:**

Variable incubation period, ranging from 5-60 days but may be several months; illness most commonly occurs about 1 month after exposure.

#### **F. Period of Communicability:**

Animals may be infectious for years.

#### **G. Treatment:**

Antibiotic treatment is not recommended as the bacteria can be shed after treatment is complete. Euthanasia is recommended.

#### **H. Vaccine:**

There is no vaccine currently available for dogs.

## INVESTIGATOR RESPONSIBILITIES

- 1) Use current case definition, to confirm diagnosis with the veterinarian.
- 2) Conduct a case investigation to identify potential sources of infection.
- 3) Conduct contact investigation to identify additional cases.
- 4) Identify whether the source of infection is a major animal health concern.
- 5) Initiate control and prevention measures to prevent spread of disease.
- 6) Complete and report all information requested via the state electronic surveillance system.
- 7) As appropriate, use the disease [fact sheet \(link to fact sheet will be added\)](#) to educate individuals or groups.

### Diagnosis:

- Veterinarians who suspect brucellosis should promptly collect blood or bone marrow for culture. Liver, spleen, joint fluid and abscesses can also be cultured. Serum collected for serologic diagnosis, requires an acute specimen collected as soon as possible after onset and a convalescent phase specimen should be collected > 14 days after the acute specimen.
- Alert the laboratory to the possibility of *Brucella* and need for special safety procedures. Level A laboratories should consult with state public health laboratory director (or designate) prior to or concurrent with testing if *Brucella* species is suspected by the physician.
- Serology and Rapid Testing: The standard laboratory test for *Brucella* antibody is the tube agglutination test, but the simpler rapid slide agglutination test is commonly used in commercial laboratories. The rapid slide agglutination test is 97%--100% sensitive and may be as low as 88% specific. If used in a population with a low prevalence of disease, the risk for a false-positive result is high. Therefore, diagnostic laboratory testing should be integrated with epidemiologic investigation when assessing potential covert biological terrorism events to rule out false positive laboratory findings. PCR and ELISA testing may also be available. Biopsy specimens: *Brucella canis* can be identified through direct examination of biopsy specimens using direct fluorescent antibody stains.
- Cultures: *Brucella canis* will grow only in aerobic blood culture bottles after 2-4 days; followed by isolation as typical colonies on BAP and CHOC within 48 hours. Presumptively identified as a small, gram-negative coccobacilli that is oxidase, catalase and urea positive. Confirmatory identification is made by agglutination with specific antiserum in a reference laboratory.

## STANDARD CASE INVESTIGATION AND CONTROL METHODS

### Case Investigation

- 1) Contact the veterinarian who ordered testing of the case and obtain the following information. (This includes medical records.)
  - Using the [case report form \(link to case report form will be added\)](#), identify any signs of brucellosis:
    - Record veterinary visits: location, admission and discharge dates.
    - Record onset date (if a reoccurrence – record the earliest onset date).
    - Record the duration of the current illness in weeks.
    - Determine if the onset was acute or insidious.
    - Record symptoms.
    - Record outcomes: recovered or date of death.
  
- 2) Review the laboratory tests and enter in the following data:
  - Examine and record any treatment that the case received.
  - Collect owner's demographic data and contact information (birth date, county, sex, race/ethnicity, occupation, address, phone number(s))
  - Record how many male and female dogs are in the facility.
  - Record how many dogs were screened.
  - Record how many dogs true positive .
  
- 3) Interview the owner/manager to determine source and risk factors for canine brucellosis (e.g. acquiring new dogs); focus on a 6 month incubation period prior to illness onset.

### Contact Investigation

- 1) Contacts are those dogs with possible exposure to the initial case.
- 2) Examine all dogs with direct contact with potential exposures based on potential modes of transmission with substances containing *Brucella*.
- 3) Identify persons who may have had direct contact with the animal including any kennel workers, veterinarian(s), and/or veterinary staff. Record their name and contact information and report this information to the Infectious Disease Epidemiology Response staff at the Kansas Department of Health and Environment at 1-877-427-7317.

**Case Management** None required.

### Contact Management

Animals

- 1) Animals that have bred with the case should be tested
- 2) Animals that have had direct contact with the case should be tested. This includes any dogs that were housed by the case.

#### Humans

- 1) Canine brucellosis may be transmitted to people. All human contacts will be managed by the Infectious Disease Epidemiology and Response staff and/or local health department.
- 2) Human contacts should be educated on signs and symptoms of the disease and conduct a symptom watch/fever check for at least two months post-exposure (fact sheet will be attached).

#### Environmental Measures

- 1) Personal protective equipment (PPE) needs to be used when handling placenta and fetus from aborted animals. PPE includes:
  - Disposable gloves,
  - Protective Eyewear,
  - Waterproof Shoes,
  - Surgical Mask, and
  - any outer garment that can be disposed or laundered.
- 2) Clean the area with appropriate cleaning tools. If use of any high-powered vacuum or wash be sure to minimize dust so that the organism does not become aerosolized.
- 3) Disinfect contaminated areas with one of the following:
  - 1% sodium hypochlorite,
  - 70% ethanol,
  - Iodine/alcohol solution,
  - Glutaraldehyde, or
  - Formaldehyde.

#### Education

- 1) Educate high-risk workers (i.e., veterinarians, kennel breeder etc.) about the risk of brucellosis and stress methods to reduce occupational exposure such as proper ventilation, appropriate carcass disposal and barrier precautions.

## MANAGING SPECIAL SITUATIONS

### A. Outbreak Investigation:

There are no formal outbreak definitions; however, the investigator may consider the possibility of an outbreak when there is an unusual clustering of cases in time and/or space.

- 1) Notify KDA-DAH (1-785-296-3556) for out breaks in animals.
- 2) Notify KDHE (1-877-427-7317) immediately for outbreaks in humans.

### Safety Considerations:

- Risks to public health, health care and emergency response personnel are not significant.

### Risk Communication Materials:

- Factsheet for canine brucellosis: Located in KDA-DAH and KDHE [Disease Reporting Form \(will input link to Disease Reporting Form when online\)](#)

## DATA MANAGEMENT AND REPORTING

A. Organize and collect data.

B. Report data via the Kansas electronic surveillance system, Epi-Trax.

- All essential data that was collected during the investigation, especially data that helps to confirm or classify a case will be entered into Epi-Trax.