

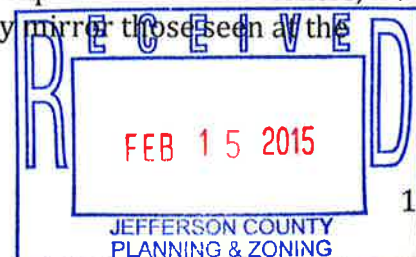
2/15/16

Thank you for the opportunity to address concerns about the proposed 9,000-goat farm and fertilizer plant on Harvey and Mansfield roads in the Town of Aztalan.

If I am correctly interpreting the application materials which Drumlin Dairy, LLC (operator, Mr. Kenn Buelow), the plan is to make 95% of the manure into fertilizer, and land-apply the remaining 5%. More than 12,000 tons of manure is expected *per year*

The following items appear to be missing in the application documents:

1. Construction specifications and schematics for “manure burning operation”/“commercial fertilizer” pelletizing equipment. (Are manure dryer stack heights adequate? Are biofiltration methods sufficient to contain potentially hazardous bacteria and prevent a disease epidemic? Will temperature be sufficient to kill organisms goats can carry, which are infectious to humans: brucellosis, Q Fever, toxoplasmosis, and sore mouth. Information on diseases provided on Page 2.)
2. Map indicating where manure burning/incinerating equipment would be located
3. Explanation of the manure manufacturing/fertilizer production process that would be used, and the type of equipment to process the manure.
4. Up-to-date, science-based evidence on safety of similar-sized goat farms and goat fertilizer production plants (info. in application documents on goat manure is limited—roughly 3 pages--and sources dated 1987)
5. Calculated daily total urine output of the goats. (This is important since ammonia is a chemical associated with odors and has potential health consequences, especially when it becomes airborne.)
6. Statement of the maximum number of goats the proposed set up could safely accommodate.
7. Applicable, site-specific Odor Score calculations. The Odor Score in the application has been calculated without identifying and factoring in what chemicals would be added to the manure during processing. Based on our experience with the chicken manure fertilizer plant, the odors would likely be significantly greater and more noxious than the odor from the goat urine and goat feces alone.
8. The Engineering Report Authorization (P.11) states, “Animal health is a priority. Biosecurity methods ~~will be used to prevent~~ will be employed at the discretion of farm management.” What measures will be taken to prevent the spread of diseases to humans and neighboring animals? Will goats be tested for Johne’s disease? Will wastewater and manure need to be tested before land applying, to prevent disease? What safety measures need to be taken in handling dead carcasses to prevent the spread of disease?
9. Employee Training does not address infectious disease handling rules, what to do in the event of suspected outbreak, etc. OSHA is referred to, but requirements are not addressed. Occupational exposure risks to workers, if a similar manure processing method is used, may mirror those seen at the chicken manure fertilizer plant in Lake Mills.



Brief summary regarding goat-related diseases:

Johne's disease:

- Cattle, sheep, and goats are most commonly affected by this fatal-in-animals disease. (APHIS Veterinary Services Fact Sheet, Nov. 2008)
- It is caused by the bacterium *Mycobacterium avium* subspecies *paratuberculosis* and is often called MAP.
- Purchase of infected animal is the most common way the disease is spread (Sweeney, 1996; Radostitis et al., 2007; Richardson et al., 2009)
- Second most common way it is spread is between farms (Sweeney, 1996).
- The MAP organism is resilient—resistant to heat and cold and can stay alive for more than one year in fresh manure. (Source: https://www.aphis.usda.gov/publications/animal_health/content/ (Go to Johne's Disease FAQ/APHIS Veterinary Services Factsheet Nov. 2008)
- Johne's disease is a herd problem. (More info: <http://adga.org/johnes-disease>, UW-Madison Johne's Info. Center <http://johnes.org>)
- Human research is underway on the MAP bacteria and Crohn's disease.
- Other sources: www.johnesdisease.org/ (Risk Assessment Management Plan—2011 edition, Epidemiology and Prevention)

Q fever:

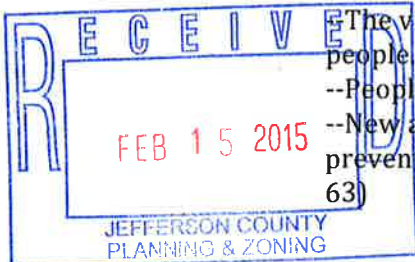
- Goats are one of the primary animals infected, with organism excreted in milk, urine, and feces of infected animals. Infection in people usually springs from inhalation of the organisms from air that contains airborne barnyard dust contaminated by infected animals. (<http://www.cdc.gov/qfever/>)
- Contaminated dust becomes airborne through winds, dry sweeping, straw/hay, manure, high pressure hosing, slaughtering animals and dressing carcasses.
- Q fever is highly infectious. As few as 10 microbes can cause infection (Source: Canadian Centre for Occupational Health and Safety, <http://www.ccohs.ca/oshanswers/diseases/qfever.html>)
- Q fever can be quite serious, with complications such as endocarditis (affecting the heart valves.) (Source: Australia Health and Safety Fact Sheet/Dept. Of Education, Training and Employment Organizational Health, Feb. 2014)

Brucellosis:

- The bacterium, *Brucella*, is highly infective by aerosol and can survive for 6 weeks in dust and 10 weeks in soil or water.
- If untreated, brucellosis can be fatal due to endocarditis.
- To protect workers, gloves, eye protection, and N-95 masks are recommended. (Delaware Health and Social Services, Doc #35-05-20/07/05/5B)

Sore mouth infection (Orf Virus):

- The virus mainly causes infection in sheep and goats, but it can be transmitted to people. (Source: www.cdc.gov/poxvirus/orf-virus/people.html)
- People whose immune systems are compromised can develop serious symptoms.
- New animals should be quarantined before introducing them to the herd, to prevent a potential outbreak (Alabama Cooperative Extension, March 2008; UNP-63)



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Q Fever

Q Fever is a human disease caused by the bacterium *Coxiella burnetii* that is present in a wide range of domestic animals, with sheep, goat, and cattle being of most concern. Workers at dairies, ranches, and other animal facilities are at high risk for contracting Q Fever; though the infection is often treatable, in some cases it persists as a debilitating, costly fatigue syndrome. Employers can reduce the risk by understanding the disease and its transmission and implementing an effective control program.

Coxiella burnetii is common in the global environment and can persist for months or years and can survive heat, dryness, and a wide range of disinfectants. It can travel long distances on the wind, especially in dry or dusty conditions. In animals, the disease is called *coxiellosis*. In humans, the disease is referred to as "Q Fever" because when it was first identified in 1935, its causative agent was unknown, so it was classed as a "Query" fever.

Q Fever (Coxiellosis) in Animals

Among animals, the disease it is most likely to infect goats, sheep, cattle, and to a lesser extent, dogs, cats, horses, and pigs. (Birds and rodents can also be infected, though more rarely.) Most animals that carry *Coxiella burnetii* show no symptoms, but the infection can cause reproductive problems such as spontaneous abortion in late pregnancy, stillbirths, and weak newborns that often die soon after birth.

The bacteria are present in large numbers in infected animals' reproductive tracts and mammary glands, and are shed in amniotic fluid, placental tissue, and milk, as well as in urine, feces, saliva, and other secretions. High numbers of bacteria are shed during the birthing process; during an abnormal birth event such as abortion or stillbirth, the numbers are exceedingly high. Depending on the species, bacteria will continue to be shed in manure, milk, and vaginal discharges for days, weeks, or even months after the birth. Sheep and goats appear to shed higher numbers of bacteria during birth than cattle.

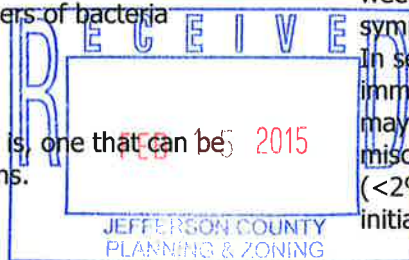
Q Fever in Humans

Q Fever is a *zoonotic disease*, that is, one that can be transmitted from animals to humans.

The *Coxiella burnetii* bacteria is easily transmitted to humans, most often through respiration of infected dusts or aerosols, or through handling of infected animals and their birth or waste products. Infection in humans may also occur after ingestion of contaminated milk or dairy products or by handling infected wool, hides, fur, tools, clothing, or footwear. The transmission of as few as five or ten microbes can initiate infection. Q Fever is not generally transmitted directly between humans.

Antibody studies show that about 3% of the United States population and 10-20% of those in high-risk occupations have been exposed to *Coxiella burnetii*. In the United States, Q Fever is most commonly reported in Western and Midwestern states where ranching, dairy, and cattle operations are common, and locally in other states where sheep and goat farming occur. More than half the human cases of Q Fever in the U.S. occur in California, Colorado, Illinois, Kentucky, Missouri, Tennessee, and Texas.

About 6 in 10 people exposed to *Coxiella burnetii* display an effective immune response and never become ill. About 4 in 10 will develop Acute Q Fever; two to three weeks after exposure, the infected person may experience fever, headache, chills and sweats, photophobia, gastrointestinal distress, fatigue, pain (muscular, chest, or abdominal), and a cough. Treatment is with antibiotics. Most cases resolve in weeks, though some patients develop lasting chronic symptoms known as "post-Q Fever fatigue syndrome." In severe cases, especially in people with compromised immune systems, pneumonia, myocarditis, or hepatitis may develop, and pregnant women may suffer miscarriage or pre-term delivery. In a few cases (<2%), infection may appear months or years after initial exposure, and may last for months.



High-Risk Operations and Occupations

People who have contact with sheep, goats, or cattle, or who work on or near facilities that house these animals, are at risk for exposure to *Coxiella burnetii*. These include employees at, or visitors to:

- Ranches, dairies, or farms with sheep, goats, or cattle, or facilities that handle untreated animal products or wastes
- Veterinary clinics and hospitals, especially those that treat large animals
- Meat processing plants, slaughterhouses, tanneries, stockyards, feedlots, auctions, etc.
- Research facilities where sheep, goats, or cattle are housed

High-risk tasks include any activities in which workers might come into contact with dust, body fluids, animal waste, etc., such as:

- Assisting at birth (risk is highest during lambing and kidding seasons)
- Milking infected animals and handling unpasteurized milk products
- Handling and disposing of birth products and aborted fetuses, manure, bedding, uneaten animal food
- Moving and handling livestock
- Slaughtering and processing infected animals
- Providing medical care for infected animals, especially surgery
- Shearing

Reduce Risk by Providing a Safe Workplace

- Establish a zoonotic disease control program to protect workers and visitors from animal-transmitted diseases, including Q Fever.
- Provide information to employees about Q Fever, how it is transmitted, and how they can protect themselves and others. Inform employees when infection is known or suspected.
- Provide, for affected employees:
 - Appropriate personal protective equipment (PPE), including goggles or safety glasses with protective side panels; waterproof gloves and arm guards/shields; rubber boots; and properly fitted respiratory protection.
 - Appropriate work clothing or uniforms and footwear, including rubber boots that can be cleaned easily, or dedicated footwear that is worn only in designated areas. Disposable shoe covers are an option.

- An appropriate area where employees may remove and disinfect soiled footwear, and where they may remove soiled clothing and shower before donning street attire.
- On-site laundry facility with high-temperature disinfecting capability.
- Train employees in safe and effective:
 - Disposal of contaminated manure, birth products, etc.
 - Cleaning and disinfection of animal areas, tools, equipment, etc.
 - Cleaning and disinfection of clothing, footwear, and PPE.
- Allow employees sufficient time to take care of PPE, clothing, footwear, handwashing, showering, etc., before and after shifts, and before and after breaks.
- Prohibit consumption, purchase, or access to unpasteurized ("raw") milk or dairy products by employees or visitors. High-temperature pasteurization destroys *Coxiella burnetii*.

Ensure that Employees Use Safe Work Practices

Ensure that all affected employees, particularly those who assist at births, clean animal areas, and manage manure, compost, animal remains, or birth products, follow these safe work practices:

- Use appropriate personal protective equipment (PPE) to protect against contaminated splashes, aerosols, and dust.
 - Take special care when assisting at animal births; avoid unprotected contact with all birth tissues and fluids, including aborted fetuses.
 - Work slowly and carefully when handling materials such as bedding, soil, or birth products, in order to avoid generating dust and aerosols. The bacteria become airborne easily.
 - Refrain from eating, drinking, or smoking in animal facilities. Refrain from touching the face, eyes, nose, or mouth.
 - Wash hands with disinfectant soap frequently throughout the day, and especially before eating, drinking, smoking, etc.
 - Protect scratches, sores, and wounds with waterproof bandages.
 - Remove contaminated clothing and footwear immediately after leaving an area where infection may be present.
- Keep contaminated clothing out of the home and wash it separately from the family laundry.



- Seek medical attention should flu-like symptoms develop, and inform the doctor of the work with animals and the possible risk for Q Fever.

Facility Management and Maintenance

- When possible, establish lambing sheds, calving pens, and kidding areas indoors, where they are protected from wind and rain and where they can be more easily cleaned.
- Isolate birthing areas from the rest of the facility, and as much as possible, limit airflow from the birthing area to other areas. Use impervious building materials.
- Remove contaminated bedding, and clean the surfaces, walls, and floors of birthing areas as soon as possible after birth.
- Take care to remove residues of birthing fluids and secretions; even when dry, these retain high numbers of viable bacteria and are highly infective, especially when they turn to dust.
- Use low-pressure hoses for washing down contaminated areas. High-pressure streams of water can aerosolize wet and dry contaminated material, making it more likely to spread.
- Restrict access to birthing areas and contaminated areas to essential staff who are wearing appropriate PPE and who have been trained in safe work practices.
- Keep high-risk individuals (pregnant women, elderly and very young people, and those with compromised immune systems) away from birthing areas.

Waste Management

A clean facility and proper disposal of contaminated materials are essential to controlling the disease.

Birth products and carcasses

- Collect the placenta, fetal membranes, and any other birth tissues before they can be eaten by does, ewes, and cows. Eating the placenta is natural and acceptable in healthy animals; however, because *Coxiella burnetii* can survive the digestive process, the ingestion of an infected placenta contributes to increased infection in the animal's digestive tract and manure.

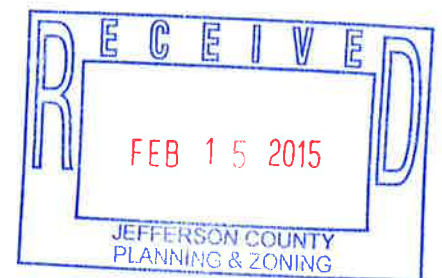


- Dispose of placentas, aborted or dead animals, and other birth products immediately, preferably by deep burial or composting. Other options include rendering or transfer to a landfill. Incineration is not recommended, as this can spread contamination through aerosolization.
- Follow state and local regulations for disposal of contaminated birth products, which may be regulated as medical waste. Choose on-site disposal when possible, to minimize risks incurred through transportation and additional handling.
- Protect the area against scavenging dogs, cats, and vermin.

Manure

- Compost manure for at least 90 days; this is the preferred method for reducing bacteria before subsequent use. Follow state and local regulations for composting.
- If composting is not possible, store the manure in a facility where run-off is contained and cannot contaminate local groundwater.
- If the composted manure is to be spread on arable land, plow it in immediately after spreading. Keep people and livestock away during this process.
- Choose calm weather for moving and spreading manure, and cover manure during transport.
- Do not sell contaminated manure to the public or use it in garden areas, even after composting.

For additional information or assistance, contact your Zenith Safety & Health Consultant.



Zenith provides workplace safety resources at: **TheZenith.com[®]**

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