# Brucellosis: Answers to Frequently Asked Questions
# Center for Climate and Health

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*This bulletin describes brucellosis, an infectious disease caused by bacteria found in some land and sea mammals, including species that are important food resources. As climate change is providing new opportunities for the spread of infectious disease, ANTHC developed this bulletin to provide prevention guidelines and answer some commonly asked questions. The risk of infection from brucellosis is thought to be low, but it can be a serious illness. This information can help Alaska Natives reduce risk while continuing to enjoy a healthy, subsistence diet.*

**What is Brucellosis?**

Brucellosis (pronounced: brew-cell-o-sis) is a disease caused by a bacteria called *Brucella*, that infects some animals and can also infects people. In Alaska, the most common source of *brucellosis* in people is from exposure to infected caribou and reindeer. *Brucella* can also infect other land mammals including wolves, bears, musk ox, and moose among others. It has also recently been identified in sea mammals including seals and whales.

**Where does it occur?**

Brucellosis is most commonly associated with the four Arctic caribou herds: the Western Arctic, the Teshekpuk, the Central Arctic, and the Porcupine. These herds occupy parts of Norton Sound, the Northwest Arctic Borough, the North Slope Borough, the Interior, and across the border into Canada's Northwest Territory. Brucellosis is also reported in other caribou and reindeer herds in Alaska.

Bearded Seal Courtesy E. Regehr, U.S. Fish and Wildlife.

Caribou (Courtesy APIA Photo Archives).

**How frequently does it occur in animals?**

In surveillance performed since 1971 by the Alaska Department of Fish and Game, more then 1000 North Slope caribou have been sampled, and antibodies against brucella have been found in 5% of the animals tested (Personal communication, Kimberlee Beckmen, ADF&G 2010). Efforts are underway by ADF&G and others to describe this disease in caribou and other wildlife. Tests in marine mammals showed that in parts of Alaska, 46% of harbor seals had been

exposed to brucella. However, to date no Alaskan cases of human brucellosis associated with marine mammals have been identified so the potential risk to hunters and consumers is unknown.

**What are the signs of brucellosis in caribou?**
Brucellosis usually affects caribou reproductive organs and the legs. Infected animals may have swollen joints causing limping or lameness, especially in the front legs. However, this is not the only disease or condition that can cause these symptoms in caribou. In fact, an infected animal may appear healthy. It is for this reason that people handling caribou should be aware of the disease so that they can take precautions.

Photo of swollen caribou fore leg. Courtesy of the Government of Northwest Territories, Canada.

**Would I notice anything different when butchering?**
In caribou, you may find a swollen joint, testicle or womb, but typically you will not find anything unusual. As for marine mammal brucellosis, infected seal usually appear healthy whereas in whales and other cetaceans, lesions in reproductive organs, in the brain, skin and joints have been reported.

**How often does brucellosis occur in people?**
Brucellosis has rarely been diagnosed in people. Since 1973, there have been only 17 reported cases in Alaska (DHSS). The fact that brucellosis is difficult to diagnose may mean the disease is under reported, and rates may actually be higher.

**How does brucellosis affect people?**
In people, the effects of brucellosis can range from having no symptoms at all, to a very serious and sometimes chronic infection of the brain, heart or other internal organs. Untreated it can result in death. When there are symptoms, they can include fever, sweats, headaches, back pains, and physical weakness. Long-lasting, chronic symptoms include fevers that come and go, joint pain, and fatigue. Brucellosis in people can be diagnosed in a laboratory by testing samples of blood or bone marrow.

**What should you do if you think you have been exposed?**
People that experience symptoms and are concerned about infection should tell their health care provider that they may have been exposed to *Brucella*.

**What is the treatment?**
Treatment for a confirmed case of brucellosis involves antibiotics. Depending on the timing of treatment and severity of illness, recovery may take a few weeks to several months. Brucellosis can be cured with treatment.

**How common is it in people?**
It is difficult to say as there are few records in Alaska and it is possible that some cases go without ever being diagnosed. A 1981 State of Alaska Epidemiology Bulletin reported that since 1958, brucellosis averaged about one case per year (ranging between 0 and 5), with 24 cases in all (Ribar, J., 1981).

**How are people exposed to *Brucella*?**
It is usually while butchering, when cuts in a person's hand come in contact with the fluids from the womb, swollen joints and possibly the blood. It can also be contracted if infected fluids are splashed into the eyes, nose or mouth, or through eating uncooked or improperly cooked bone marrow.

**If a caribou looks like it has brucellosis, can I still eat it?**
Remember, it may not be possible to tell if an animal is infected. If it appears infected, you can still eat the healthy looking meat and marrow of the animal as long as it is properly cooked. Freezing, drying, pickling or smoking *will not* kill most bacteria, including *Brucella* either in caribou or in other animals.

**Can the disease be passed from person to person?**
The spread of brucellosis from person to person is extremely rare. However, infected mothers can transmit brucellosis to their infants. This is why cooking meat and marrow is especially important for nursing mothers.

**How can I protect myself while butchering?**
If part of the animal appears diseased, avoid cutting into it. If you have an open cut on your hand, ask someone else to do the butchering and preparation; or wear a pair of rubber gloves. Avoid wiping your eyes or mouth with anything that has come in contact with blood or fluids. Wearing glasses or sunglasses can help to avoid this kind of exposure.

**What about clean up?**
The bacteria can remain viable for months so thorough cleaning of tools after butchering or preparation is strongly recommended. In the field, hand sanitizers are a good alternative if water is not readily available. At home, take care to clean the area where butchering has occurred. Water mixed with bleach, (one part bleach to ten parts water) works well to clean counters and other surfaces.

Wearing gloves helps to prevent exposure to brucella during butchering. Photos M. Brubaker, 2010

**Does this mean I should only eat cooked meat?**
Much of the sea and land mammal that is consumed by Alaska Natives is dried, or eaten raw after freezing. This is an economical and efficient way to prepare meat, and also has cultural and nutritional value. But consumers need to be aware that these practices may carry more risk for brucellosis and other foodborne diseases than cooked meat. Deciding how to eat (cooked, uncooked or otherwise) is a personal decision that should be made based on good information about the specific food resource.

**Are some people more vulnerable to infection?**
Although brucella is difficult to detect in people, the risk for infection is thought to be low. However, special precautions are recommended for people who are more vulnerable to infectious disease, such as infants, pregnant mothers, the elderly, or people that are immune suppressed due to illness or cancer therapy. With these populations, cooking meat and marrow can help to prevent a serious infection.

**What is the connection to climate change?**
Brucellosis is one of the diseases commonly discussed in relation to climate change in the Arctic. Warming temperature is changing the range of many animals and other wildlife, and improving conditions for the spread of some types of disease. Little is known about climate change influence on brucellosis rates in animals or people, but efforts are on-going to improve understanding of the disease and to monitor for new diseases or changes in disease patterns.

**Where can I get more information?**
For more information about brucellosis in wildlife, contact the State of Alaska Department of Fish and Game, or visit their Wildlife Disease Website. For more information about brucellosis in people, you can contact the Alaska Native Tribal Health Consortium, Center for Climate and Health, or the State of Alaska Section of Epidemiology. If you are concerned about your own health or that of your family, contact your health care provider or regional health corporation.

**Conclusion** - Alaska Natives depend upon traditional foods to provide a healthy, affordable, sustainable, and culturally meaningful diet. Wild land and sea mammals are generally more nutritious then the meat that is available at the store. More research is needed into the risks and benefits associated with different methods of preparing wild foods, as well as ways for reducing risk, and broader surveillance for brucellosis is needed. With good information, consumers can make choices based on sound science and their own personal and cultural priorities. Brucellosis is not a new problem in Alaska, nor is it thought to be a common one. But brucellosis can be serious, especially in people who are vulnerable to infections. By taking a few precautions everyone can enjoy the benefits of these important subsistence foods and prevent illness.

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