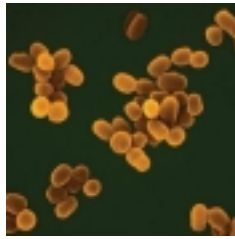


Understanding Brucellosis Seropositive / Seroprevalence



Brucella is the genus of bacteria. There are 9 species of Brucella.

Brucella abortus (*B. abortus*) is a species of Brucella that prefer certain bovines and cervids hosts, such as domestic cattle, bison, buffalo, elk and sometimes deer and moose. Brucella abortus **may** cause an animal to abort their **firstborn**.

Brucellosis is the name of the disease caused by the brucella bacteria.

+ Seropositive \neq Infection

Seropositive - having a positive blood serum reaction for the presence of an antibody – simply shows exposure to disease at some point, it does not equal infection. Seropositive can represent **immunity**.

As a human example, if a blood sample was taken from us to test for tetanus, if we have ever had tetanus or been vaccinated for it, we would show a positive antibody reaction for tetanus – seropositive +. This does not mean we are infected with tetanus or infectious, just that we have antibodies from having been exposed to that bacteria at some point in our life.

If there are no antibodies present in the blood test, the result is seronegative -.

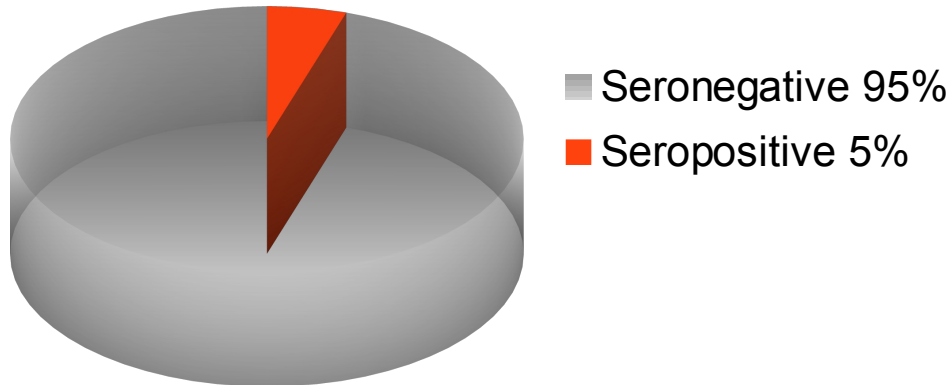
Seroprevalence - is the number of persons / animals in a population that test positive for a specific disease based on serology (blood serum) specimens; often presented as a percent of the total specimens tested or as a proportion of the population. As positively identified by the presence of antibodies for that disease.

“Elk populations in the northern GYA have a low seroprevalence (i.e., exposure; <5%) of *B. abortus*, whereas seroprevalence in Yellowstone bison is high (40-70%).” - Bison Or Elk: Who Should Be The Target Of Brucellosis Control In The Northern Greater Yellowstone Area? 2010
For bison stats, numerous studies estimate seroprevalence at 50%.

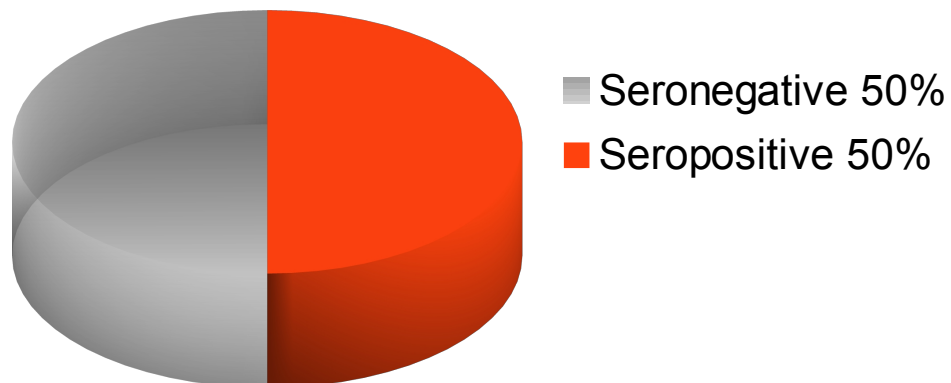
Since wildlife is not managed like livestock where you round them up, pass them through a shoot and test them all, these figures are based on modeling, not actual numbers.

As a visual example, Northern GYA elk and bison seroprevalence would be represented as the following pie charts:

Northern GYA Elk Seroprevalence



Northern GYA Bison Seroprevalence



Test and Slaughter

In order to determine if an animal is currently infected or infectious with brucellosis, you would have to slaughter the animal and see if the harvested material grows a culture of *Brucella abortus*. If the harvested material does grow a culture, it is culture positive; if it does not, it is culture negative. Remember, seropositive does not equal infection/infectious. Nor is the higher prevalence in bison an indicator of infection transmission risk, as the bison *Brucella abortus* biovar is different from that of the elk and cattle biovar 1. *"Our results indicate that elk and cattle isolates are virtually identical genetically, differing by only one to two mutational steps. On the contrary, bison B. abortus differed from cattle and elk by 12-20 mutational steps."* - DNA Genotyping Suggests that Recent Brucellosis Outbreaks in the Greater Yellowstone Area Originated from Elk, 2009. This is why there has never been a documented case of bison to cattle transmission in the wild, even when cattle have been run next to wild bison for over 30 years.