

Introduction

Brucellosis is putting in danger one of the most emblematic animals in the Yellowstone National Park (YNP): bison. Not only is *Brucella abortus* killing bison but also humans under the pretext of trying to keep cattle free of brucellosis, so that it doesn't imply important economic losses to farmers

Brucellosis

Brucellosis is a zoonoses caused by various *Brucella* species. Animals act as its host and different species tend to have different primary hosts. *B. abortus* is found in cattle, elk and bison and its location is reproductive organs. The livestock acquires the infection from the natural reservoirs (bison, elk and deer) and humans are infected by the sick livestock or its products. Some people are more likely to get the disease by occupational exposure. The available current treatment of brucellosis involves a multi-drug approach with doxycycline and either streptomycin or rifampin (1)

Bison in the YNP

Over 50% of bison test positive for brucellosis; they have been exposed to the bacteria. Bison and elk populations in the YNP are the only known source of *B. abortus* in the USA. The transmission to bison is through the contact with an aborted fetus or infected birth tissues (5)

Economic impact

Brucellosis causes infertility; abortions and lowered milk production in cattle and is transmissible to humans. It has caused important economic losses to farmers. The three states surrounding the YNP have achieved brucellosis-free status with no known infection. There is concern over migratory bison transmitting brucellosis to cattle (2,3)

Strategies of prevention

Migrations of bison out of the park led to a series of conflicts with farmers and the state of Montana. The Bison Management Plan (2000) says: (a) separate bison and cattle, (b) use hazing to prevent bison migration, (c) capture bison leaving the park and test them, (d) send test-positive bison to slaughter. The plan has successfully accomplished their objective with no transmission of brucellosis from bison to cattle (3)

Vaccination

The live *B. abortus* strain RB51 (SRB51) is the official brucellosis vaccine for cattle in the USA. This vaccine has been tested on bison but it has the potential to induce abortions in pregnant bison. Model simulations suggest that eradication of brucellosis is unlikely with the currently available vaccine. However, reducing the level of infection may be achievable but would require a long-term investment (3)

Conclusions

Bison and elk populations in the YNP are the only focuses of *B. abortus* in the USA. It should be easier to control the spread of the disease. However, it is difficult to govern wildlife and this could be in detriment of the control of brucellosis. Current plans have proved to be effective because there has been no transmission from bison to cattle. Nevertheless, it is not sure that the lack of transmission is only because of existing plans or due to biological reasons. Some measures, such as bison hunting are controversial and may decrease the bison population. The best way to avoid the spread of brucellosis would be the development of an effective vaccine, as well as conduct research in order to get more insight in the knowledge of the disease

References

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4. Yang X, Skyberg J, Cao L, Clapp B, Thornburg T, Pascual D (2013). Progress in *Brucella* vaccine development. Front. Biol. 2013, 8(1): 60-77
5. <http://www.nps.gov>

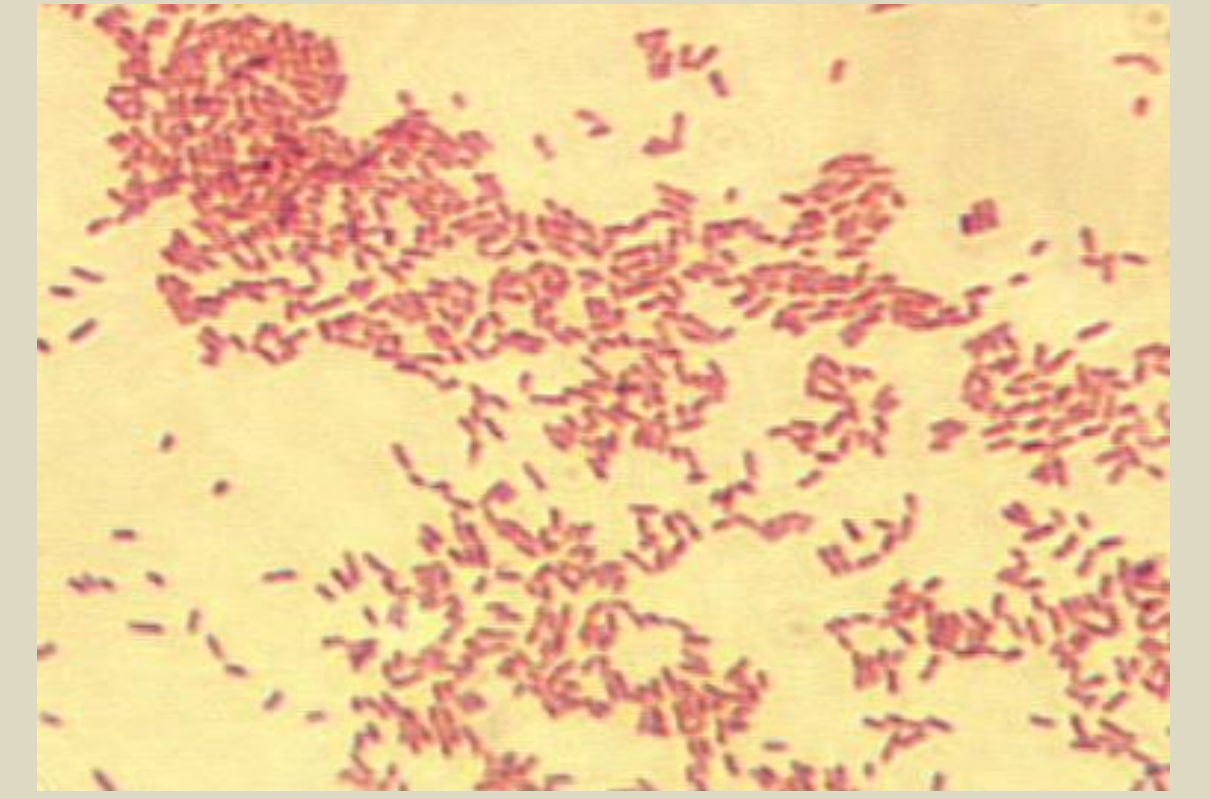


Figure 1. Brucella under the microscope
From <http://microblog.me.uk>



Figure 2. Bison in the YNP
From Elena Portell



Figure 3. The three States surrounding YNP
From www.kirotv.com

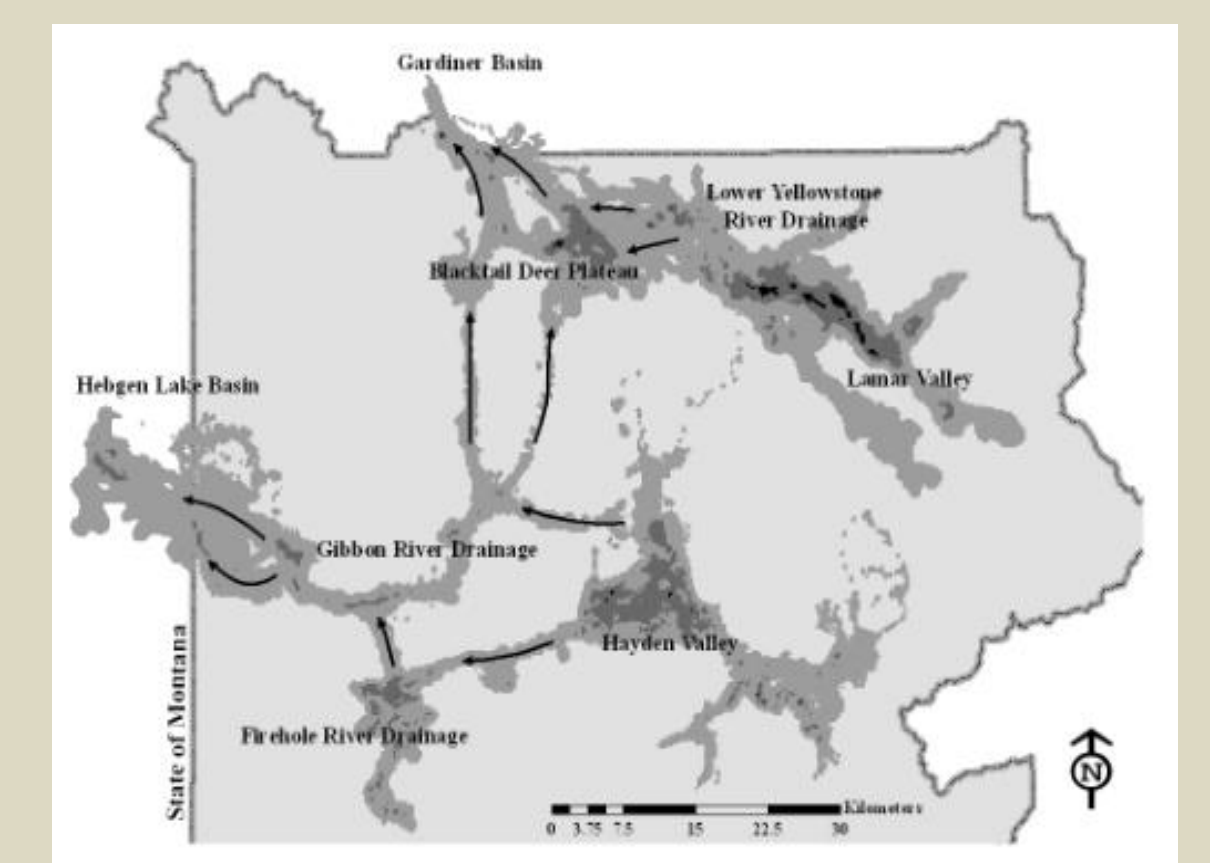


Figure 4. Bison's migration out of YNP
From <http://www.nps.gov>



Figure 5. Bison and its calf
From Elena Portell Buj