

Long before European settlers unwittingly imported brucellosis (or its bacteria, *Brucella abortus*) to the Americas, the disease was a scourge in their countries of origin, where it was known as Malta Fever, Gibraltar Fever, or Mediterranean Fever. Victor Hugo's novel "The Hunchback of Notre Dame" is set in 1482 and concerns Quasimodo, who serves as bell-ringer of Our Lady of Paris. Hugo immortalized a spine-deformed "hunched" individual who is thought to have contracted brucellosis in young adulthood.

Even today, affected humans suffer flu symptoms that never quite go away. If left untreated, the disease leaves the stricken individual with a deformed spine and barely able to function.

On the American continent, brucellosis was nonexistent until settlers' livestock infected the wildlife in the Yellowstone area, when the bacteria was transmitted through contact with domestic cattle. The disease and its origins were identified in 1883 by Sir David Bruce, a bacteriologist and physician who was stationed in Malta during army medical service.

Ranchers in Wyoming, Montana, and Idaho have struggled to keep their herds free of the disease, a well-nigh impossible task since the bacteria are carried by the elk that tend to mingle with ranch cattle. Infection from bison is a lesser problem, since far fewer bison than elk yet inhabit the area—but bison are mercilessly harassed when they leave Yellowstone Park as a consequence of meager grazing. Ranchers can vaccinate their cows with RB51; unfortunately, the vaccine is unevenly successful.

As its name suggests, *B. abortus* causes spontaneous abortions in newly infected animals. In earlier days, when elk roamed over large stretches of land, an aborting cow would go off to an isolated spot, where wolf or coyote soon scavenged the deceased fetus. Today, however, as human encroachment has deprived elk of the range needed for winter grazing, vast herds are fed in managed feedlots. Thus, an infected elk cow will abort within a herd where the bacteria-shedding fetus is sniffed by other elk, who then become infected themselves. When brucellosis manifests in unvaccinated cattle, the abortions can cause tremendous losses to ranchers. Strict shipping restrictions are imposed quarantined animals; further, such cows are not permitted to graze on public lands.

Former state veterinarian Walter Cook, now at UW's College of Agriculture and Natural Resources, recently directed a symposium that brought brucellosis researchers to Laramie from around the country. The June 14-15 Consortium for the Advancement of Brucellosis Science (CABS) featured internationally-known scientists who seek to develop better vaccines, better tests, and a possible vaccine delivery system for brucellosis in elk, cattle, and bison.

"Researchers at UW are testing the use of RB51 in booster combinations," said Mr. Cook. "Instead of giving a single dose to calves only, they have started to test booster doses in adult cows. The scientists are looking at the immune response as well as the safety of doing so." He added that researchers at Texas A&M and LSU have indicated that "some cattle may be genetically resistant to infection from brucellosis. If this is verified, it could provide producers with a great tool to protect their herds."

A "Latent Heifer Syndrome" occurs when a calf is born to an infected cow, itself infected shortly before or after birth. The heifer calf may test negative for brucellosis for a prolonged period of time. "Usually heifers will test positive only as they get close to the time they deliver their own first calf, when they may shed the bacteria." Cook states that, inasmuch as other states are worried about getting latent heifers from WY, MT, and ID, this is becoming an issue. "These animals will have tested negative earlier in their lives, but that test may have been meaningless."

"We need to work with and improve what we have," said Valerie Ragan, who directs the Center for Public and Corporate Veterinary Medicine at the Virginia-Maryland Regional College of

Veterinary Medicine. Whereas in the United States, brucellosis affects livestock and wildlife populations primarily in the Greater Yellowstone area, “brucella affects human health worldwide.” She points out that very few countries are brucellosis-free. “In much of the world, brucellosis is [a problem] because of the effect it has on humans.”

From personal experience Walter Cook knows the effect all too well. During his UW doctoral research, he worked at a research station as part of a team. One day, as the team helped an elk cow deliver an aborted fetus, in spite of protective gear and other precautions, all three members unknowingly came in contact with the bacteria. The head veterinarian, who developed the flu symptoms first, went to see his physician, stating he suspected brucellosis, but the doc dismissed him, saying “No one gets brucellosis any more.” Then Walter developed the indicators. At this point, the two veterinarians decided to take a blood sample from Walter and test it themselves. Sure enough, the infection showed up. They immediately alerted their third team mate. All sought and received the antibiotics required. Still, Walter suffered backaches that only abated with spinal surgery some ten years later.

In future, pursuing a vaccine targeted at livestock rather than wildlife would be a more pertinent focus for CABS, commented Phil Elzer, Assistant Director of the Louisiana Agriculture Experiment Station. “Worldwide, this is a livestock issue,” he said. “If we stop the livestock disease, the human aspect goes away.” Elzer deems wildlife considerations “secondary worldwide.” Still, in parts of the American continent, wildlife and livestock became inextricably linked the day Europeans arrived, bearing their dubious gifts.