Case 2.7 “In the News”

In the late 1980s there was an epidemic among livestock in Great Britain. Approximately 180,000 cattle were found to have “mad cow disease”, so named because the condition attacks the central nervous system, which leads to bizarre behavioral symptoms followed by death. The disease seems to be caused by an “unconventional transmissible agent,” meaning it is unlike most microorganisms. No genetic material from this organism has ever been detected in infected tissues, although foreign protein fibers accumulate in large concentration in the brain. Infected cows were still turning up in the late 1990s.

There was great alarm in the late 1990s when dozens of humans started to turn up with symptoms similar to those seen in the cows in the late 1980s. More than 50 people have been diagnosed with the human variant of mad cow disease. This is consistent with the approximately 10-year incubation period of this unconventional transmissible agent. In 1996 scientists confirmed that the same agent was present in affected human and cow brains.

1. What is the name for a transmissible agent that contains only protein and has no genetic material?

2. What is the formal name for mad cow disease? Explain the name.

3. The human form of the disease is called something else. What is it?

4. Scientists suspect that the humans infected during this outbreak acquired the disease from eating meat from diseased animals. Even when meat is well cooked, it transmits the infection. What does this say about the infectious agent?

5. These cases in Britain were not the first cases of the disease; it occurs at a low constant rate in other countries, including the US. Although some of these sporadic cases can be traced to transplant operations of infected tissues, such as corneas or brain tissues, most are idiopathic. What does idiopathic mean?

6. Livestock control measures have been in place in Britain for several years now. Can we expect more human cases with links to the British cattle epidemic, or is it behind us? Defend your answer.