A Review Of Mad Cow Disease

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Microbiology deals with the study of microorganisms that exist throughout the world. Understanding these organisms helps scientists to understand different diseases that are caused by such organisms that are invisible to the naked eye. Prion is also a micro-organism that causes the “Mad Cow disease”, a neurological disorder that gets progressively worse. The microbe, Prion, is being studied extensively to understand the way it changes from a normal protein cell into a pathogen that is responsible for damaging the central nervous system of cattle. The mad cow disease is called bovine spongiform encephalopathy (BSE), and it can be fatal. It was first discovered in the United Kingdom in 1986. This essay will explore this disease to gain a better understanding of its cause (CDC).

This disease is called BSE due to the spongy appearance of the brain of the cattle observed after their death. This disease changes the behaviour of the cattle, and they lose their motor skills. It lasts from a few weeks to a few months; however, it always ends in a fatality. It is a neurodegenerative disorder that is caused by a mutated protein called a prion; however, this protein carries no genetic material and is a little different in shape as compared to healthy proteins. It can infect other protein cells just by a single contact, thus spreading rapidly in the body. Prion is a very resilient microbe as it can survive a high temperature, which means that it can survive even after cooking the contaminated meat. In humans, prion causes a variation of BSE, which is called Creutzfeldt-Jacob disease (CJD); however, it is not transmitted by cattle (PubMed).

Prion, however; does not just cause BSE and CJD, it also causes variations in other animals which include; “feline spongiform encephalopathy of exotic ungulates, and spongiform encephalopathy of captive primates”. A contaminated protein that may be responsible for the disease in one species may not cause any harm to another species; thus, understanding and isolating the cause has been difficult. The presence of prion in the infected species can only be detected if a test is done on their brain tissue; otherwise, it goes unnoticed. Prions are both infectious and inherited, which makes it a problem as the spread cannot be contained, and knowing the number of infected species can be impossible. The nucleic acid is absent from the cell, making it difficult to contain and disinfect.

In the late 1970s, giving protein supplements to cattle was considered to make them healthier, but these supplements were made from cattle waste, leftover meat scraps and bones. The amount of modification of the raw ingredients in the process left the fat to make tallow intact, and it gave a perfect environment for the prion to thrive. Then, these supplements were fed to the cows, and by 1986, there was an outbreak of BSE. It is hypothesized that prions from “scrapie disease” were present in the contaminated meat, which caused BSE in the cows. Scrapie disease infects the sheep in a similar way that mad cow disease does to cows. These supplements were banned, which resulted in a significant decrease in mad cow disease cases; consequently, bovine offal was banned from being used in human supplements to prevent the BSE from infecting humans. However, as previously

mentioned, BSE cannot infect humans. More than 750,000 cattle were infected and killed by this pathogen. Even after containing the epidemic, the infected cattle's meat can enter the food chain.

Research is being conducted to create a preventative cure for this disorder. However, the problem that the researchers face is that this disorder is not caused by a virus but by an abnormal protein. The structure of this protein makes it difficult to disinfect, and it is not easy to identify living species without conducting a test of the brain tissue to rule out the possibility of this disease. The hereditary aspect of this disorder is the cause behind the prolonging of BSE. Maternal transmission needs to be contained first so that one type of spread can be stopped as these cases keep on multiplying. After the genetic transfer is prevented, all efforts can be focused on dispelling the infectious spread of the disorder. So far, the vaccines and medicines that have been developed have been rendered useless against prison cells. As a precaution, bio-derivatives from bovine origins have been banned in many countries, including the United States. Prevention by banning these products seems to be the only defence that we have against the mad cow disease, but hopefully, more efficient prevention will be developed soon (Acheson and McKnight).

Works Cited

Acheson, David, and Chris MacKnight. "Clinical Implications of Bovine Spongiform Encephalopathy." *Clinical Infectious Diseases*, vol. 32, no. 12, June 2001, pp. 1726–31. *Silverchair*, https://doi.org/10.1086/320760.

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Mad Cow Disease Worksheet

What is the title of your essay?

Mad Cow disease.

What were your sources?

The bibliography has been added to the paper.

Discuss the validity of each one of your sources. Be sure to make comments regarding credibility, bias, timelines and information content.

The first source is taken from CDC, a medical database that contains information about all illnesses,

diseases, disorders and viruses. The second source was taken from PubMed, which is an excerpt from a UK medical journal. The last source is a peer-reviewed article that is an in-depth study of mad cow disease.

How did you search for these sources? What was the process you went through to find these sources?

Google Search, Google Scholarly and PubMed were used to search for reliable sources.

Is the topic of your paper controversial? Is it possible you would find conflicting information on this topic? Which of your sources would be more reliable for information, and how could you tell?

The topic is not controversial as the mad cow disease is still being researched due to the unique behaviour of its pathogen. All the sources are credible, as one was taken from a medical database, and the other two sources are from scholarly sources with peer reviews.