The Strange Case of Beriberi

In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was beriberi. Symptoms of the disease included a fast heart rate, shortness of breath, leg swelling, numbness of the hands and feet, confusion, trouble moving the legs, and pain. Victims often died of heart failure.

1. [SP 3] State a question that scientists might ask regarding beriberi.

Scientists hypothesized the disease might be caused by bacteria. To test their hypothesis, they injected chickens with bacteria from the blood of patients who had beriberi. The injected chickens became sick. They noticed that a group of chickens that were not injected with bacteria also got sick.

2. [SP 3] State the hypothesis scientists tested.

3. [SP 3] Describe how the hypothesis was tested.

4. [SP 3] a) Identify the independent and dependent variables.
b) Identify the control group.
c) State the importance of the control group.
d) State a conclusion scientists might have reached if they had not used a control group.

5. [SP 6] State whether the hypothesis would be supported or rejected. Justify your response.

6. [SP 3] Describe a problem with the design of this experiment.

One of the scientists, Dr. Eijkman, noticed that, before the experiment, all the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished (or white) rice that had the husk, bran, and germ removed. Dr. Eijkman later discovered that polished rice lacked thiamine, an essential vitamin necessary for good health.

7. [SP 3] Propose a new hypothesis.

8. [SP 3] Describe an experiment that could be used to test the new hypothesis. Identify the independent and dependent variables and a control group.