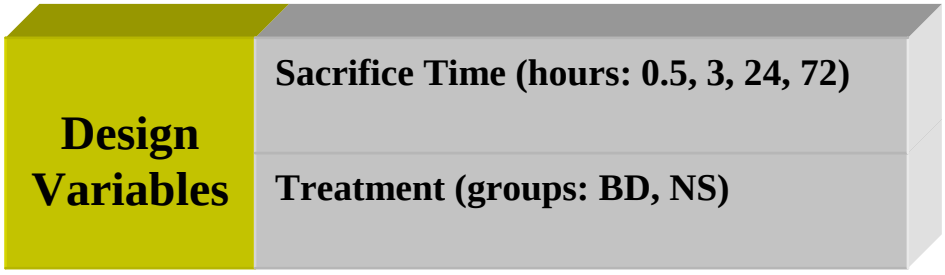
BLOOD-BRAIN BARRIER EXPERIMENT

2. Study Design

The blood-brain barrier experiment is not a randomized experiment because no random mechanism was used to assign the rats to the two treatments. Randomization ensures that the rats with different and possibly relevant characteristics are mixed up between the two groups. As the randomization was not used, it is possible that rats with different physical characteristics and different response to the antibody were placed disproportionately in one of the treatment groups. In this case the estimated relationships may be related to confounding variables over which the experimenter had no control.

Thus no cause-and-effect relationships can be drawn from the experiment. Causal implications can only be justified on the assumption that the assignment method of the rats to the two treatments had the same effect on the response as if a random assignment would have been made.

How should the randomization be carried out in the experiment? Notice that the sacrifice time factor occurs at four levels, and treatment factor occurs at two levels.



Thus, there are eight possible combinations of sacrifice time and treatment. Thus rats should have been randomly assigned to one of the eight groups. This is a completely randomized design.

If the effectiveness of the method is suspected to be related to the sex of the rat, the above procedure should be performed separately for male and female rats.