

# Pollution tied to animal health

UNIVERSITY PARK - Veterinary scientists at Penn State University have developed a model system to study the effect of air pollutants on an animal's ability to produce antibodies needed to resist bacterial and viral infections.

Dr. Arian Zarkower and associates have already found that substances such

as ozone, sulfur dioxide, silica dust, and carbon dust can decrease the ability of animals to produce antibodies. Harmful bacteria can be neutralized by such antibodies.

Carrying out experiments with mice, the Penn State scientists have observed that even pure carbon - previously thought to be

harmless - is capable of decreasing the animal's ability to produce antibodies.

Silica dust, a known toxic component of a number of rock dusts and coal, had a much greater effect. Silica was found capable of reducing antibody formation by 80 to 90 per cent. Mice in the experiments did not recover fully their ability to produce antibodies when tested 80 days after removal from a two week exposure to silica dust.

The College of Agriculture researchers are asking the question, "What effect do certain pollutants have on the ability of animals to resist infection?" The Penn Staters want to determine what concentrations and

amounts of exposure time may affect the immune system.

The effects of chemicals on livestock could become more serious due to increased numbers and concentrations of livestock on individual farms or feedlots, Dr. Zarkower observed. He described the situation in a recent issue of "Science in Agriculture," the quarterly magazine of the Agricultural Experiment Station at Penn State.

In the early stages, the experiments found changes in the activity of cells which help to develop immune responses. The research has identified some of the cells and functions that may be damaged by the presence of

toxic substances in the air. Such pollutants, Dr. Zarkower said, can damage cells which normally produce antibodies and create immunity to disease.

Research elsewhere has shown that smoke, automobile exhausts, heavy metals, and a number of gases can affect the health and growth of animals. Some pollutants are products of industry. Other pollutants, such as ammonia, can be by-products of the animal's own wastes.

Dr. Zarkower said an increasing amount of attention is being given nationally to creation of "models" to determine the possible consequences of short and long-term inhalation of potentially toxic substances.

Effects of a variety of compounds are being studied as to their ability to damage tissues, induce cancer, destroy vegetation, and produce a variety of other changes affecting health and comfort.



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