

Frightened as a Rabbit: Anatomy and Physiology of Fear and Stress in the Rabbit

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We know rabbit's reputation with respect to fear. It is not at all surprising considering that the rabbit is positioned just above vegetation on the "food-chain." You cannot watch a nature show, it seems, without having the opportunity to see a helpless little bunny satisfy the nutritional needs of a much larger predator that is a click or two up "the ladder."

It may be of some interest to you to know what is happening to your long-eared friend during periods of fear and stress and how that affects the way he reacts.

The perception of a dangerous or frightening situation causes the release of chemicals called neurotransmitters from the pituitary gland at the base of the brain. These neurotransmitters affect many tissues in the rabbit's body, but most notably the adrenal glands that release epinephrin (adrenaline) and, with protracted periods of stress, glucocorticosteroids.

Epinephrine causes the rabbit's heart rate and blood pressure to increase. Blood flow is directed to vital muscles and organs and away from those that are nonessential in this dangerous situation. The rabbit's respiratory rate increases, his eyes dilate, and his blood sugar (the fuel for the bodies tissues) soars. Other neurotransmitter and hormonal effects of fear not as easily understood are that they cause an ileus of the gastrointestinal (GI) tract-that is, they cause the GI tract to stop moving.

The effects of these hormones for the short term are obvious. The rabbit is placed in a heightened level of awareness and in a physical state where he can better sense the danger, and can run faster to get away from that danger. He can bolt from the danger in an instant.

However, when these physiological conditions exist for a long period, they affect the rabbit negatively. Restriction of blood supply to "nonessential tissues" leads to their dysfunction. Ileus results in changes in GI tract bacterial balance and potentially can lead to gut stasis, diarrhea, enteritis or even enterotoxemia. Exhaustion of liver energy stores leads to a starvation of body tissues that may be lethal.

A not uncommon example of this is a syndrome named "Shock Disease," originally described in snowshoe hares in the 1930s. Researchers saw the disease when they trapped the snowshoe hares for study. We have seen this "disease" in obese pet rabbits or pet rabbits who have been on a rich (pellet) diet and have undergone a stressful event.

In our practice we have seen shock disease in two rabbits dipped in lyme-sulfur dip, several rabbits infested with fly larvae (maggots), in a rabbit locked on a balcony for the night, and other similarly stressful situations. These rabbits, because of fatty changes in their liver caused by their poor diet, became hypoglycemic (developed low blood sugar levels) once they had exhausted their glycogen stores following stress and adrenaline stimulation.

We can't always protect our rabbit pets from stress, but we can work to protect them from some physiological effects. A diet high in fiber (that means mostly good quality grass hay) helps to protect the GI tract from enteritis, and helps prevent gastric stasis and the development of fatty liver.

Familiar smells reduce stress as does a favorite companion. If your rabbit experiences a stressful situation, you should return him to a "normal" environment as soon as possible and ensure that it eats and drinks. Should he become depressed, quiet or weak, you must undertake medical intervention immediately. When choosing a veterinarian look for one who has a "rabbit only" ward and takes special precautions to protect the rabbit from the sounds and odors of hospitalized dogs and cats.