



**TEMPERATURE ADAPTATIONS IN DOMESTIC FOWL**

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The internal or deep body temperature of birds is generally higher than that of mammals. Deep body temperatures of common domesticated birds (pigeons, ducks, geese, turkeys, and chickens) range from 105 degrees to 108 degrees F, as compared to 97 to 102 degrees F for common domesticated mammals. The upper lethal temperature is about 116 degrees F and the lower lethal temperature ranges from 59 to 73 degrees F, depending on the age. This range of temperatures means that if the deep body temperature falls below or rises above these temperatures, the bird will probably die.

There are several inherent factors that influence deep body temperature. Newly hatched chicks have body temperatures about four and one-half degrees F below those of adults; adult levels are not reached until about six days after hatch. In addition, the chick's temperature control system is immature, so we must provide heat during the brooding period.

The increase in body temperature during the first week after hatch is related to an increase in feather cover (insulation) and increased metabolism associated with feed intake and growth.

Body temperatures vary with the size, breed, and sex of the bird. In general, lighter breeds have higher body temperatures. For example, Leghorns generally have higher rectal temperatures than

broiler breeders or crosses of the same age. Also, in general, males have higher temperatures than females in cool environments, but this difference is not apparent in warmer environments.

There are also several environmental factors that cause changes in body temperature. Increased physical activity, food intake, and increases in environmental temperature all tend to increase body temperature. These effects are modified by diurnal (day-night) rhythms. In most domestic birds, which are active in daylight, highest body temperatures occur during the day. Experiments have shown that drugs that modify thyroid activity tend to dampen the day-night variations in body temperature, showing that the thyroid, which controls basal metabolism, is important in temperature regulation.

Recent research indicates that triiodothyronine (T3) is the active hormone. Reversing the period of daylight also reverses the diurnal temperature cycle, even though the environmental temperature cycle remains the same.

To understand how birds adapt to their temperature environment, it is important to know some of the basics of how birds control their body temperatures. In my next article, I'll discuss how some of the anatomical systems of the bird interact to modify or control body temperature when the environment changes.

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