

## **Hair Loss in West Virginia White-tailed Deer**

### **SCWDS Briefs, April 2004, Vol. 20 No. 1**

Since 1998, personnel with the West Virginia Wildlife Resources Division have received sporadic reports from the public regarding white-tailed deer with extensive hair loss (Figure 1). Case histories indicated that variable amounts of supplemental deer feeding with shelled corn occurred at most of the locations where affected deer had been reported. In April 2003, six affected deer, 9 months to 5 years of age, from four counties were examined in an attempt to ascertain the cause of this condition. Necropsies, microscopic examinations, and detailed dermatologic evaluations were performed on the deer. All deer were in fair body condition, with adequate stores of adipose tissue. Gross abnormalities consisted of areas of bilateral, patchy hair loss on the trunk, with sparing of the head, limbs, and tail. The hair in affected areas was easily detached and appeared broken off in many areas, leaving hairs that were lighter and shorter than normal. There was excessive dryness, scaling, and hyperpigmentation of the underlying skin in affected areas, some of which contained areas of hair regrowth. Variable amounts of hair and supplemental corn were found in the rumen contents but significant pathologic changes other than hair loss were not apparent in any of the deer.

Inflammation secondary to bacterial, fungal, parasitic, or viral infection can cause hair loss, but microscopic examination revealed no inflammatory processes and no bacterial, parasitic, or fungal organisms were apparent. In fact, the gross and microscopic findings indicated that the dermatologic lesions in affected deer were non-inflammatory and were characterized by excessive numbers of involuting and resting hair follicles, while developing follicles were under represented. Differential diagnoses for non-inflammatory alopecia include nutritional deficiency or stress, endocrine disruption via ingestion of toxins, excessive grooming/self trauma, hypothyroidism, hyperadrenocorticism, mycotoxin ingestion, and genetic defects.

The case histories did not suggest a genetic cause, and excessive itching or scratching was not reported. Nutritional stress, such as protein starvation, may cause alopecia in domestic ruminants; however, protein starvation has not been described as a primary cause of alopecia in deer, and these animals did not have gross or serologic evidence of such malnutrition. Consistent mineral imbalances involving copper, molybdenum, and selenium were not detected through mineral analyses of liver and kidney, although three deer had low copper levels. Vitamin E values were within normal ranges for all deer.

Based on histological and gross features, relatively normal nutritional values, and the absence of infectious agents, hair loss in these white-tailed deer could be related to an endocrine disorder. Endocrine disorders include anomalies associated with one or more of the endocrine organs (pituitary, thyroid, parathyroid, endocrine pancreas, adrenal glands, and reproductive organs) or their products. The affected deer had evidence of hair cycle growth arrest, a condition that sometimes is associated with endocrine-related alopecia. However, identifying sources of endocrine-related disruption in wildlife populations can be very difficult.

Nearly all of the animals in this small study came from sites where supplemental feed, primarily corn, was available to wild deer. Corn can support fungi, such as *Fusarium moniliforme*, that are known to produce estrogenic mycotoxins. However, establishment of a relationship to feeding corn was not possible, particularly because a significant amount of time had elapsed between the onset of the alopecia problem in the deer and our examination of the animals. The underlying cause of the non-inflammatory alopecia in these deer remains unknown. (Prepared by Karen Wolf, Nicole Gottdenker, and Randy Davidson)

**Figure 1. Hair Loss in White-tailed Deer in Grant County, WV**

