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Analysis of the seasonal food habits of pine voles (Microtus pinetorum) by Cengel et al. (1978) revealed that apple tree root consumption occurs only during winter months. Increased root consumption in the winter has been postulated to be due to a decrease in the quantity and quality of other foods in orchards. However, the normal translocation of carbohydrates into the root systems of trees during the dormant season may improve the quality of apple tree roots as a food source for voles. One objective of the pine vole nutrition studies at Virginia Polytechnic Institute and State University is to examine the seasonal variation in the quality of the pine vole's diet and the seasonal quality of apple tree roots as a food source for pine voles.

Apple tree roots were collected from ten different trees in each of two orchards on a bimonthly basis from May to January. The moisture content of these roots was determined and was found to be relatively constant throughout the sampling period. The phloem and bark layers of the roots were then fed to pine voles in a dried and ground state in a mixture with Purina rabbit chow to determine their digestibility by the difference method. The roots were about 50% digestible throughout the sampling period. The variability in the root digestion results indicated that this method was not accurate enough to distinguish small changes in digestibilities between months. However, a nutritive analysis of the root diets by the Goering and Van Soest (1970) procedure for analyzing the nutritive quality of feeds and forages showed that there was an increase in cell solubles (the highly digestible portion of the roots) between May and January and a corresponding decrease in the acid detergent fiber levels. Compared to other forages utilized by pine voles that have been examined in the VPI&SU lab, roots were as digestible as orchard grass when fed in similar trials, but much less than clover and dandelion. Future root analyses will include bimonthly determinations of total sugars, total nonstructural carbohydrates, ether extract, and crude protein levels.

A series of digestion trials using 24 diets made up of various combinations of four commercial feeds (Wayne lab block, Purina rabbit chow, and two varities of Purina horse chows) and five orchard plants that are commonly fed upon by pine voles (orchard grass, clover, dandelion, apple tree root bark, and apple) have been completed. Stomach contents of the voles used in these trials have also been analyzed by the Goering and Van Soest (1970) procedure. These data

will be used to develop a regression equation that will predict the digestibility of the pine vole's diet in the field from a Van Soest analysis of its stomach contents. In addition, data from this same experiment will be used to evaluate the lignin tracer method of determining the diet digestibility of field caught voles.

Stomach contents of pine voles snap-trapped in many different orchards over the last year will be used to determine the seasonal variation in the digestibility of the pine vole's diet using the predictive equation developed in the lab. These data, coupled with information on the seasonal changes in the nutritive quality of apple tree roots, may aid in explaining why voles turn to roots for a food source during the winter months.

Literature Cited

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