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WHY DOES SECOND-CUTTING RED CLOVER HAY "SLOBBER" ANIMALS

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For years, farmers have noticed the slobbering of animals after feeding second-cutting red clover hay. Severity of this effect, however, has varied from year to year. Questions asked many times are what causes the slobbering and what can be done about it? To get the answers available, let's go back about 37 years into something which appears to be totally unrelated to slobbering and follow research w hich has been done on a fungus, which causes a disease of red clover.

In 1933 workers at the Kentucky Agricultural Experiment Station briefly described a disease called blackpatch of red clover and the fungus which causes it. At that time, very little was known of either the fungus or the disease. Later, research at Wisconsin, Georgia, and West Virginia described and characterized the fungus in some detail and described the disease symptoms more fully. In 1956 Gough and Elliott suggested Rhizoctonia leguminicola as the name for this fungus, but no one had yet associated the fungus with excess salivation or other symptoms reported to be observed in animals eating second-cutting red clover hay. This effect was always ascribed to something in the second-cutting clover.

Work at Missouri in 1959 established that the clover fraction of a mixed clover-grass hay contained a toxic principle which caused slobbering in guinea pigs, was organic in nature, was soluble in water, ethyl alcohol, and chloroform, and lost activity in solution. They suggested that hay may lose its toxicity upon prolonged storage, especially if ground. Several attempts to reduce toxicity by means other than storage were unsuccessful. In their tests with guinea pigs, saponin (which had been suspected as the toxic factor) did not produce slobbering.

Illinois workers reported in 1960 and 1961 that cows consuming forage containing what they called the "slobber factor," began to salivate profusely and stopped eating. Although some have speculated thatthis hay simply irritates the mouth and causes slobbering, the Illinois workers were able to induce slobbering within one hour by drenching animals with hot water extract of the forage.

Smalley et. al. observed that in Wisconsin all hays which produced slobbering had associated with them the fungus R. leguminicola. Typical symptoms were produced in fistulated dairy cattle by introducing the fungus mycelium directly into the rumen. The symptoms could not be produced by fistular addition of the autoclaved cold water extract of red clover which was used as a growth medium for the fungus. They concluded that the toxic principle is associated with the fungus, not the red clover plant.

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Although R. leguminicola may not be the only source of the slobber factor, it is the only source yet identified. So, what can be done to eliminate or decrease the slobber effect? No recommendations can be made which are guaranteed effective, but several possibilities are suggested by the literature upon which speculation would seem justified. Three possibilities are (1) to eliminate or decrease the fungal growth on the hay; (2) to decrease the toxin in the fungus; and (3) to decrease the amount of infected hay in the ration.

To eliminate or decrease fungus growth on hay will probably be difficult since: (1) the fungus has many hosts other than red clover; (2) it probably survives our winters; (3) Kentucky summer weather usually favors growth of the organism; and (4) no red clover plants resistant to the fungus have been found to date. The situation may not be hopeless, however. Although many other legumes have been found susceptible in laboratory inoculations, West Virginia workers have never found the fungus on other legumes unless red clover is nearby. This could mean that other plants are not good hosts.

If under natural conditions, supplementary hosts are limited it may be possible to reduce the extent of fungus growth by sanitation practices and careful seed selection. The disease is unquestionably transmitted on seed. Selection of fungus-free seed over a period of years or development of effective seed treatment procedures could reduce the extent of infection and thus the amount of inoculum available.

The effect of the fungus on animals can possibly be reduced by reducing the amount of toxin in the fungus before infected hay is fed. Since there is some indication that the toxin "decays" with time, storing second-cutting hay in such a way that it can be fed in late winter or early spring might be helpful. Another way of decreasing animal intake of the toxin would be to mix infected hay with clean hay as it is fed to the animals. Growing red clover with a grass should also dilute the toxin in the ration. Byers found that 5-15 pounds of the infected hay caused cows to slobber and stop eating, but this was probably highly infected fresh material. Storing for a time might have made it possible to feed more of the infected hay without adverse effects. Symptoms appear in guinea pigs only after infected hay makes up 40% or more of their diet.

Maybe, someday, someone will find either red clover plants resistant to R. leguminicola or a control for the disease, and the slobber problem will be solved. Until this happens, the best procedures which can be suggested are (1) use clean (fungus-free) seed; (2) store second-cutting hay to be fed last in the winter; and (3) mix infected hay with clean hay either at feeding time or by growing red clover in a mixture with grass.