

Nontoxic Ferns

feeding tests with cattle find gold fern, bird's foot fern nontoxic

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No evidence of toxicity was found in gold fern and bird's foot fern, two plants suspected to cause jimmies—or jitters—in cattle moved to and from mountain ranges.

The condition is also reported in animals grazing in the mountains and sometimes on foothill range.

It is possible, however, that the two ferns are toxic only in certain years as was observed in feeding tests with bracken fern.

Descriptions of symptoms of the disease vary, but the most consistent characteristics are staggering gait, muscular tremors, and collapse after exertion. Muscular inco-ordination in rear quarters, labored respiration, apparent visual impairment, and frequent urination are also described.

Recovery in most cases follows if the animals are left undisturbed and not forced to travel or to become excited. Death sometimes occurs from prostration with animals headed down hill. Bloat is the immediate cause of death.

Plant toxicity is usually suspected. Among the plants indicted are certain lupins, parsley, laurel, skunk cabbage, buckeye, oak leaves, moss, and ferns. Of the latter, gold fern and bird's foot fern are suspected particularly in some of the lower foothill elevations. Bird's foot has been reported to be poisonous to sheep.

Because solution of the cause or multiplicity of causes for jimmies appears to rest upon trial and error methods and by process of elimination, feeding tests were run with cattle on the San Joaquin Experimental Range.

Both gold fern and bird's foot fern produce new frond growth in the spring. Before spore maturation, the fronds dry out and remain dormant through the dry summer and fall. They revive with the onset of autumn rains, and the spores mature. Then, having completed the cycle, they die. Since toxicity in both developmental stages has been suspected, both the desiccated and the revived forms were tested.

Eight animals were used. In a prelimi-

nary test, cows were given single doses of each species in amounts varying from .15 to .2 pound of dried material. Subsequently, two heifers weighing about 600 pounds were fed .2 pound daily for 14 consecutive days. Four calves averaging 354 pounds were fed .4 to 1.1 pounds of green fronds daily for feeding periods varying from 23 to 29 days. Except in one cow which developed a belligerent attitude uncharacteristic of her, no abnormalities were observed, even after the animals were driven as far as two miles.

The amounts fed may appear too small to give conclusive evidence of nontoxicity. Considering the availability of the plants and grazing habits of cattle, however, the amounts fed were thought to be greatly in excess of those likely to be taken in normal grazing.

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EGGS

Continued from page 3

means that of the total variability in blood-spot incidence between individuals about half is due to differences in their inheritance, the other half to environmental factors. The tendency toward blood-spotting is thus highly heritable.

To keep blood-spotting at a minimum in production-bred flocks, selection pressure against this defect must be maintained in breeding practice. In spite of its high heritability combined individual and family selection must be called upon in the choice of breeding stock. The lower the level of such a character as blood-spotting is in a flock the more difficult it is to obtain genetic gains in the desirable direction. Simple elimination of eggs carrying blood-spots from the incubators is not likely to produce great improvement when the incidence is not very high.

Similarly, if an otherwise good strain has a high level of blood-spotting, it is not likely that a simple outcross to another line will lower the incidence sufficiently to give a commercially tolerable level of inedible eggs. Under these conditions rigid selection in the original strain or continued selection of the outcross progeny would probably be required.

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1. Gold fern (*Gymnogramme triangularis*). 2. Bird's foot fern (*Pellaea ornithopus*). In each case the desiccated form is to the left and the revived form to the right.

Photograph by Nathan Cohen

