A Suspected Case of Stock Poisoning by Wild Onion (Allium Canadense.)[1]

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On June 23, 1917, a case of live-stock poisoning had been reported by Mr. William Feldt, living about five and one-half miles southeast of Lafayette. Dr. G. M. Funkhouser, of Lafayette, who investigated the case, reported, in substance, the following facts:

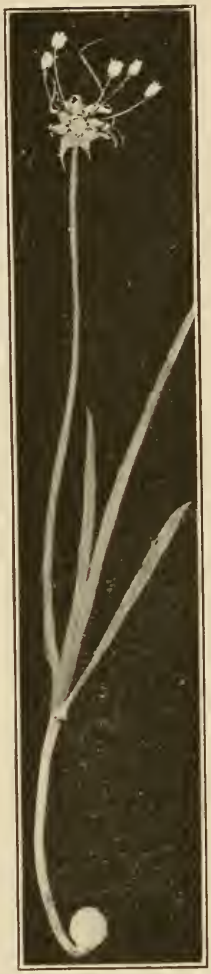
Five cows and one heifer were taken from a timothy pasture, which was rather dry and short at that time, and turned into a woods pasture on Sunday morning. In the evening of the same day, only four cows and the heifer returned from the pasture to the farm barnyard. The fifth cow was found in the pasture lying down and unable to get up. When the cows were milked it was noticed, with one exception, that the milk emitted a very strong and offensive odor and had considerably decreased in quantity. The breath of the cows was also strongly tainted with this odor and, in fact, it seemed that their whole bodies exhaled it.

On the following morning the doctor found the cow left in the pasture in a complete paralytic condition, her temperature, however, being quite normal; she died two days later. One of the cows in the barnyard was, by this time, in a similar condition and died the same day. One of the remaining three cows stood with her head erect, the hair bristling, and refused to move. Another had a tendency to draw her head to one side and when compelled to move went around in a circle and fell down. The third had a staring attitude and also a tendency to move in a circle. The temperature of all three animals was normal. All died on the following day. The heifer also had a staring attitude and in addition showed signs of cerebral disturbance, acting rather wildly.

The post-mortem examination showed that the inside membrane of the paunch was strongly affected, appearing as though scalded and

[1] Contribution from the Department of Botany of the Purdue University Agricultural Experiment Station.

sloughing off very readily. The feces of the affected animals were comparatively thin and very dark. The intestinal tract was inflamed and



Wild Onion (Allium canadense).

showed effects similar to those produced by gastro-enteritis. The contents of the paunch also emitted a very strong odor identical with that noted in the milk.

In treating the animals cathartics and stimulants were administered, but, as already stated, all cows died and only the heifer survived after a long struggle. It may be of interest to note that this heifer refused feed for several days after becoming poisoned; however, when a bunch of wild onions was offered to her, she displayed a greedy appetite for it and would have devoured it had she been permitted to do so.

The strong odor detected in the milk, breath and the paunch of the poisoned animals closely resembled that of wild onion and provided a clue for the probable cause of poisoning. In making a close search of the pasture in question a good-sized patch of wild onion (Allium canadense) was found. No other poisonous plants were noticed. The onion patch showed much evidence of recent grazing and it appeared quite certain that the cows had partaken of the onions. The plants in question were nearly mature, each having a cluster of a dozen or more aerial bulblets. The leaves were nearly all dried and the stems were rather tough. It was quite apparent, therefore, that the aerial bulblets formed the main portion of the cows' feast.

All evidence seemed to point to the onions as the cause of the poisoning. This particular species and its close relative, wild garlic (Allium vineale), are well known to taint dairy products and the flesh of animals feeding on them in the pastures of southern Indiana. In addition to the tainting effect, they may also produce colic and diarrhoea, especially in horses. No effects of more serious consequence, however, were ever recorded. All kinds of live-stock are fond of wild onions and garlic and will usually take them in preference to any forage plants. However, the plants are generally eaten, whenever found in the pastures, in their tender leaf stage early in the spring. The young plants are very mild in flavor as compared with the mature plants, especially the aerial bulblets. The oil which gives the plants their characteristic odor and which may seriously affect the grazing animals, is, undoubtedly, developed in greater proportion in the bulblets than in the foliage of the young plants. This may account for the fact that young plants cause no serious poisoning while plants with fully developed aerial bulblets are liable to prove of serious consequence when eaten in excessive quantities, especially if the stock is not accustomed to them. Two other heads of stock had been in the pasture in question throughout the spring months and no doubt pastured on the onions. Owing to the

reasons stated above, however, they did not seem to be troubled in any way. The poisoned animals were turned in from a pasture in which good feed was very scant and coming upon the onion patch, they undoubtedly gorged themselves with the succulent onion bulblets.

Literature on poisonous plants records no case of live-stock poisoning due to wild onion. The Lily family, to which wild onion belongs, contains several poisonous plants, the most dangerous of which are, perhaps, Death Camas and Colchicum, the latter species containing an alkaloid known as colchicin ($C_{22}H_{25}NO_6$). It is said[2] that "the animals which eat the plant (Colchicum) suffer with acute gastro-enteritis, coma, staggering, weak pulse and increased urination." Inasmuch as the cows in question showed some of these symptoms, particularly the first three, it appears probable that the onion bulblets contained some poisonous principles similar to those of Colchicum. Allium unifolium,[3] a close relative of Allium canadense, is said to be poisonous in California.

Pammel[4] mentions a report published by Dr. W. W. Goldsmith in the Journal of Comparative Pathology and Therapeutics, and later abstracted in the American Veterinary Review (36:63), by Prof. A. Liautard, upon cattle poisoning, caused by the garden onion. The following facts are submitted:

"Loads of onions partly started to shoot and partly decayed, were unloaded in a meadow where nine head of cattle were grazing. After a week the cattle seemed sick and one died, displaying the following symptoms: Intense onion odor; tucking up of flanks; constipation in some; purging freely in others; one vomited abundantly; another very ill, grunted, was much constipated, staggered in walking, was very tender in loins, temperature 103°, urine dark and smelling of onions. Treatment: Feeding with soft food and hay. Large doses of linseed oil. One animal that was very ill got also extract of belladonna and carbonate of soda. All but one of the animals recovered. At the autopsy of the dead one, the rumen was found inflated and also the bowels. Liver enlarged and of light color. Kidneys dark green and with offensive odor. Rumen contained large quantity of onions and grass. The whole carcass and organs smell of onions."

[2] Pammel: Manual of Poisonous Plants, Part II, Page 375.
[3] Pammel: Manual of Poisonous Plants, Part I, Page 104.
[4] Pammel: Manual of Poisonous Plants, Part II, Pages 383-384.

The oil which gives all species of the onion family their characteristic odor, consists of oxide and sulfides of allyl. According to the National Dispensatory, rectified oil contains mainly a sulfide compound $(C_3H_5)_2S$. This compound is said to possess a stimulating effect upon the organs of the digestive system. If taken in excessive quantities it produces nausea, vomiting, colic and diarrhoea. When in contact with the skin it reddens it and may even vesicate it. In mucous membranes this effect would no doubt be even more pronounced.

In summarizing the evidence pointing to wild onion as the probable cause of poisoning the cows in question, the following facts stand out prominently:

1. Apparently healthy cows were taken from a pasture where feed was scant and turned into a woods pasture where they found and grazed heavily on a patch of succulent wild onions.

2. Symptoms of poisoning appeared within twelve hours after pasture was changed.

3. The attending veterinary found no other cause, aside from forage poisoning, which might have been responsible for the condition of the affected cows.

4. The characteristic odor of wild onion was strongly pronounced in the milk and the whole system of the poisoned animals.

5. No other plant was found in the pasture, aside from wild onion, to which the poisoning could be attributed.

6. The poisoned cows refused to eat any ordinary feed, but when one of them was offered a bunch of wild onions she manifested a greedy appetite for them.

7. The oil which gives the species of Allium their characteristic odor is known to have an irritating effect on skin and membraneous tissues, and causes digestive disturbances if taken in excess. The bulblets of wild onion undoubtedly contain this oil in comparatively large quantities.

8. A number of plants closely allied to wild onion are definitely known to be poisonous, and some of the symptoms of poisoning produced by them, such as gastro-enteritis, coma, and paralysis, are quite similar to those shown by the cows in question.