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BIGHEAD IN SHEEP, A RESULT OF PLANT POISONING 11

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A form or, more correctly, a result of plant poisoning which stock owners rarely have recognized as such is known throughout the Intermountain region of the United States as "bighead." In some portions of this region the condition is known as "swellhead." The terms are descriptive of one of the common effects and can be applied equally well to the results associated with various causes. As used in the Intermountain States the term bighead is applied to a specific type of illness and one very generally recognized by the sheepmen throughout the Intermountain country. Its general distribution is shown in figure 1.

Where and When Bighead Occurs

Throughout this region there are numerous well-defined and restricted areas which those using the ranges recognize as places where, during certain periods, serious losses from bighead are liable to occur. This period is during the spring months, more particularly when during April and May the sheep are being driven from the winter ranges to the lambing grounds and summer ranges, or, in some portions of the region, after the sheep have reached the lambing grounds. Although the great majority of the outbreaks and the most serious losses have occurred in definite areas while the sheep were being trailed, they have not been entirely confined to such areas or periods. Some cases have occurred while the sheep were still on the winter ranges and a few have been reported as occurring after the sheep have reached the summer ranges. It is apparent, therefore, that although conditions are most favorable in certain areas and at certain very restricted periods for the development of bighead cases, they may develop in other places and at other times. Many of the most dangerous areas are known and some can be avoided but the plants responsible for the poisoning are so generally distributed that in order to reduce the danger of losses from this source a knowledge of the underlying causes is most important.

Plants that Cause Bighead

Throughout the region shown in figure 1 two closely related plants have been found associated with bighead. One or the other of these plants is abundant on the different areas where bighead cases have occurred and typical cases of the illness have been produced by feeding those plants to sheep. The two plants are shown in figures 2 and 3. The one sometimes called little-leaf horsebrush is known to botanists as Tetradymia glabrata. The sheepmen who use the ranges where it grows call it various names, among the most common of which are coal-oil brush, lizard shade, rat brush, and dog brush. Most of these terms have reference to a peculiar odor which the plant

has. It starts growth very early in the spring before most of the other desert plants, except the bud sage, become green. About the time the sheep are being driven in from the winter range its leaves, new twigs, and flower buds are making their most rapid growth. This is its most poisonous stage. About June 1 it begins to mature and soon after that it loses its leaves.

Little-leaf horsebrush, a shrub from 1 to 4 feet high, is most abundant on bench lands, well-drained slopes and low elevations on the winter and early spring ranges, and is commonly, but not always, associated with soils which have originated in part from lava. It extends from central Utah to eastern California and southwestern Oregon, and on some of the worst bighead areas forms a very large proportion of the browse plants. It is much more poisonous than the other species.

The other plant, called spineless horsebrush or Tetradymia canescens, usually is a more compact and lower shrub than the former species. It does not start growth so early in the spring, nor mature so soon in the summer. This plant is most abundant in the southern part of Idaho but extends as far south as central New Mexico, west almost to the Pacific and north to central Washington. It, like the little-leaf form, is making its most rapid growth at about the time bighead cases produced by it occurs. On many of the worst bighead areas of Idaho it constitutes 50 percent, and in some places more than 75 percent of the vegetation.

Symptoms of the Disease

The more prominent symptoms of poisoning produced by these plants have varied considerably at different times and in different regions. In some instances when many sheep have been poisoned by the little-leaf species in the late winter and early spring and before the plants had made any appreciable growth, very few of the animals have shown any noticeable swelling of the head. Such sheep have been depressed and weak and many of them have died within a few hours. In other instances and under different conditions the swelling which gives the disease its name has been the most apparent effect and has occurred in practically all of the affected sheep. In many outbreaks as they have occurred along the trails through little-leaf horsebrush areas, the first effects have been an acute illness often accompanied by the death of some of the animals. A few hours later, especially when the sheep were exposed to sunlight, evidences of sensitiveness and irritation about the head occurred and this was soon followed by a swelling of the ears, eyelids, nose, and other tissues of the head and neck. The affected and dead skin and accompanying serum soon dried down and eventually, if the sheep lived long enough, the dead or necrotic material peeled off. Due to the hardened skin of the eyelids which covers over the eye, such sheep are unable to see and may lose their eyesight entirely. When the affected sheep were shorn so the skin of the body was exposed to light, the actions of the animals, in many cases, indicated an irritation along the back and sides. There are reasons to think that the swelling is most common and pronounced among poisoned sheep that have been on green feed. Apparently, to a considerable extent, the presence or absence of green feed offers at least a partial explanation for the wide variations in the swellings about the heads in different outbreaks of poisoning.

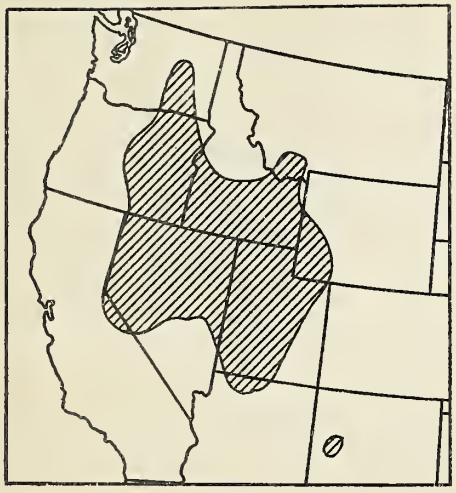

Figure 1.-- Part of the United States within which bighead has caused serious losses of sheep.

Figure 2.-- (Above) Branches of little-leaf horsebrush showing leaves, flowers, and the new growth. At this stage of growth the plant is still poisonous. In Utah it is most commonly called coal-oil brush, lizzard shade, rat brush, and dog brush.

Figure 3.-- (Left) Branches of spineless horsebrush showing leaves and flowers. This plant has no recognized common name among sheepmen. It has frequently been mistaken for a form of sagebrush.

A common and usually very serious injury due to the poisoning and associated with cases of bighead, occurs in the liver but the connection between the liver injury and the swelling of the head has not been determined. Animals that have died during an outbreak and those in which the disease has been produced experimentally have shown the same liver condition. During the acute stage this condition has varied from severe congestion to very marked degeneration of the liver cells. Apparently, too, there is very marked increase in the production of bile, for in the cases examined the gall bladders nearly always have been distended. In many cases of prolonged illness the livers have been reduced in size. It is probable that the liver condition is an important contributing cause of death, especially in the prolonged cases.

Why Sheep Eat the Poisonous Plants

Neither of the two species can be considered as palatable for sheep and yet occasionally they are eaten in considerable quantities. Of the two the little-leaf form is less readily eaten than the spineless form. Usually when they can get other feed sheep refuse these plants. An exception sometimes occurs when sheep are confined too long at a time on one type of feed, even when that feed is green tender grass. When being trailed, and during stormy periods, the sheep frequently eat either species of Tetradymia in considerable quantities and it is during or following such periods that many of the most serious outbreaks of poisoning occur. In places where the little-leaf horsebrush is abundant, as it is on some of the worst bighead areas in Utah, a definite relationship appears to exist between the drinking of water and the subsequent feeding on this brush. This is especially true after the sheep have been over trails where, because of conditions, they have become very hungry and thirsty. It is commonly known by sheepmen that after being watered, hungry sheep will often eat plants that under more nearly normal conditions they will not touch. Since many of the most serious losses from bighead have occurred following these periods, it would appear to be good practice, whenever possible before driving such sheep from watering places into areas where the poisonous plants grow, to feed them some accessory and bulky feed, preferably hay. While more concentrated feeds if given along the trails would benefit the sheep, there is no definite evidence that their use would prevent the animals' eating the poisonous plants when conditions such as those just described exist.

Special Precautions Required

During the spring months after the buds begin to swell, special care should be taken when sheep are allowed to graze in areas where either the little-leaf or the spineless horsebrush is abundant and under certain conditions patches of these plants should be avoided. The more important of these conditions are: During stormy periods whether the precipitation is rain or snow, when other available feed is limited in quantity or variety, and when hungry sheep are being trailed, especially shortly after such sheep have been watered. After sheep have been poisoned whether the swelling of the head occurs or not there is little one can do besides furnish such feed and water as the animals will take and, if possible, keep them in a cool and more particularly a shady place. As the swelling is due partly to the action of direct sunlight on the poisoned animals, it is very important that

cases of this type be kept in the shade as much as possible. If during the first few days after the poisonous plants are eaten this can be done much of the swelling and the subsequent damage can be prevented. So far as known, remedies aside from shade, water, and wholesome food are of little value. Far more important is the proper caution in handling the sheep so they will not be compelled to eat the poisonous plants.

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