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TECHNIQUES FOR SUPPLEMENTING DIET, ATTRACTING AND BAITING BIGHORN SHEEP^a

Previous attempts to improve the welfare of bighorn sheep by providing mineralized salt have indicated that such dietary supplementation has a place as a management technique. Since salt may also be used as an attractant without regard to its value as a dietary supplement, and since other substances may be used as attractants or baits in trapping bighorn sheep, a specific study to investigate acceptance, usage and efficient placement of salt, minerals and feed for bighorns was undertaken by the Research Section of the Colorado Division of Wildlife. This paper presents guidelines for using supplements and attractants, developed over two years of field testing.

SALT AND MINERALIZED SALT

Hopefully, studies of nutritional deficiencies and needs on bighorn sheep range will eventually provide information on precisely what elements need to be supplemented, and in what proportions and amounts. At the present time it appears that mineralized salt blocks standardized by the livestock industry for general range use offer the best available source of supplementary minerals. Accordingly, mineral blocks from two separate manufacturers, Carey and Moorman, were tested for acceptance and usage by sheep, and the most efficient placement and ability to withstand weathering.

The major differences between the two blocks are: the Carey Range-Min block contains from 50.0 to 53.0 percent salt (NaCl), while the Moorman Special Range Mineral block contains only from 17.5 to 21.0 percent salt. But the Moorman block contains from 15.0 to 18.0 percent calcium, while the Carey block contains only from 7.5 to 9.0 percent calcium. Levels of other minerals, particularly in trace elements, are approximately equal in the two blocks.

Past experience has indicated that the higher the salt (NaCl) content of a block, the more attractive and palatable it is to bighorns, to the



Fig. 1. Bighorn ewe and lambs using Carey Range-Min block, south side of Pikes Peak, summer 1972. (Photo by William H. Rutherford)

point that if bighorns are offered a pure white salt block (100 percent NaCl) they will use it to the complete exclusion of mineralized blocks when a choice is given. It appears that if mineral blocks are to be of value in bighorn dietary supplements, the formula must be a compromise between salt content and mineral content. In this study, when sheep were offered a choice between blocks containing approximately 20 percent and 50 percent salt, the block having the higher salt content was invariably selected. The Carey Range-Min block appears to offer the best compromise between acceptability and mineral content. Bighorns will use this block if it is the only one provided.

Blocks placed on open rocky ridge-tops, and on open flat areas close to rocky escape cover, received more use than blocks placed in depressions, brushy areas or open flat areas away from escape cover. This corroborates what is known to be generally true regarding bighorn habitat preferences (Rutherford 1972). In selecting loca-

^a Contribution from Federal Aid Project W-41-R

tions for placing mineral blocks, it is more logical to choose those sites to which sheep will naturally move, rather than attempt to use the blocks as attractants to less desirable locations, assuming that the primary purpose is to provide supplements. If, in certain instances, it is desirable to use blocks for their attractant value (e.g., baiting sheep to a trap or keeping them away from heavily-traveled highways), it is better to use the plain white block than a mineral block.

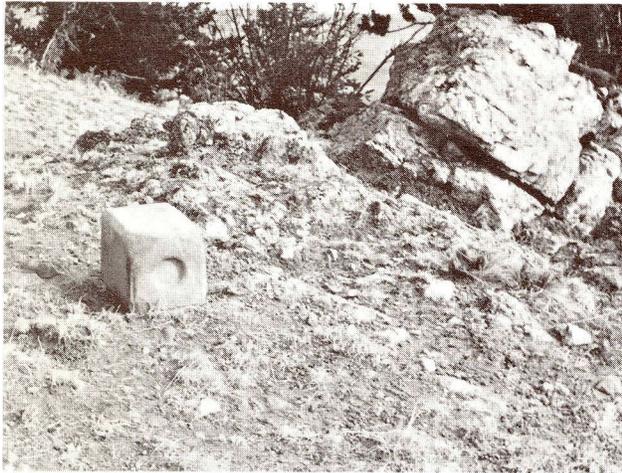


Fig. 2. Carey Range-Min block two weeks after being placed, Tarryall Range, winter 1971-72, showing bighorn sheep usage. (Photo by William H. Rutherford)

All blocks tested withstood weathering remarkably well when placed on ridge-tops or other well-drained sites. Those placed where moisture could collect showed deterioration over a period of several months, but nevertheless held up so well that weathering can be discounted as a potential problem.

FEED FOR BAITING AND ATTRACTING

Prior to 1971, nearly all work with bighorn sheep which involved baiting them to a trap or controlling their movements and distribution made use of salt and alfalfa hay, either separately or in combination. All of the trapping on Tarryall Creek between 1944 and 1952, accounting for 218 animals, was through the use of these two common attractants. An additional 12 sheep were trapped in 1969 and 1970 on Pikes Peak with the same bait.

In 1971, personnel of the Colorado Bighorn Sheep Investigation Project, W-41-R, began experimenting with baits and attractants as a preliminary to a sheep trapping and marking study conducted on the Cache la Poudre River west of Fort Collins. Salt and alfalfa hay were naturally the first baits tried. Bighorns would come to these baits, but not with any degree of consist-



Fig. 3. Bighorn sheep caught with drop-net trap, south side of Pikes Peak, winter 1972-73. Note alfalfa hay and apple-pulp bait under net right of ram and outside of net to the right. (Photo by Robert L. Schmidt)

ency; furthermore, time periods they would spend on the bait were often very short. The first few trial attempts were unsuccessful because sheep were not staying long enough for the operators to get set up and ready. The need for a bait with greater attractiveness was keenly felt.

Bighorn sheep in Glenwood Canyon, east of Glenwood Springs, have for a number of years concentrated in an apple orchard at the mouth of Grizzly Creek, where they consumed windfall apples almost as rapidly as the apples fell to the ground. This habit was common knowledge to personnel involved in the study and, accordingly, several bushels of apples were procured and placed on the Poudre Canyon bait stations. The response by the sheep was somewhat short of expectations. They would eat the apples, but would not come to the site or stay on the bait to any greater degree than when salt and alfalfa were used.

The next approach in the search for a dependable bighorn sheep bait fortunately coincided with the autumn apple harvest and processing of apple cider. A quantity of the pulp or "mash" left from cider-making was obtained, allowed to ferment, and then placed on bait stations. The response to this bait by the sheep far exceeded expectations. Only a few days were required to make the introduction; following this, sheep would seek out the bait stations, consume all of the apple pulp and remain at the station attempting to find more. One successful trapping operation, using this bait, was conducted in Poudre Canyon during the winter of 1971-72. Other trapping attempts that year failed because of complications in the operation of the trap, but these attempts further proved the value of apple pulp as a bait.

During the winter of 1972-73, after most of the difficulties with the trap had been overcome, a bighorn sheep trapping operation was conducted

on Pikes Peak. As expected, only a few days were required for the sheep to become "hooked" on the apple-pulp bait. Catches were made at five separate trap sites during the winter, totaling 75 sheep.

During the periods of active trapping attempts, apple pulp was placed at the trap site just before dark. Observation the following morning began shortly after daylight, before the sheep left the bed ground. Often, the observed behavior of sheep upon arising from the bed ground was to line up in single file and head for the trap site at a run. Upon arrival, they would immediately begin eating the apple pulp and, oblivious to anything around them, stay on the site until the last scrap was consumed. The net could be dropped at any time, with trapping success being dependent upon the desires of the operator and proper functioning of the equipment.

In practice, white block salt and alfalfa hay must still be used in combination with the apple pulp, particularly when establishing a new trap site. Generally, a bait station should be started with only salt and hay. Once sheep begin using these baits, the apple pulp should be added, since it does not appear to serve as an initial attractant by itself. Later, after sheep have begun eating the pulp, the salt and hay provide extra incentive for sheep to remain at the bait station

or trap site. At no time, either in prebaiting or in actual trapping, should apple pulp be used alone.

With the value of fermented apple pulp as a bighorn sheep bait now firmly established, the possibilities of its use in therapeutic treatment become apparent. There is every reason to believe that it will provide an excellent vehicle for administering drug dosages to wild, free-ranging bighorns in quantities sufficient for successful treatment. The search for drugs that will, upon ingestion by bighorns, kill larvae and adults of the hair lungworm continues. If such drugs are found, a way to administer them is now at hand.

LITERATURE CITED

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