

Feeding Cull Onions to Sheep

Researchers believe feeding onions to sheep can replace whole sorghum as a component of the diet without sacrificing performance or injuring animal health.

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Several years ago, during a visit to the Las Cruces City landfill we saw a small mountain of cull onions with several pickups parked around it. People were climbing over the pile looking for the best onions to load in their pickups to either eat or sell. While watching the people sort through the onions we wondered if we could use onions as a livestock feed.

Sometime later we searched various journals to learn what is currently known about feeding cull onions to livestock. To our surprise, there was very little information. Most all the articles available only described a condition termed "onion poisoning", a condition where sulfur compounds in onions cause red blood cells to lose their ability to carry oxygen and eventually the red blood cells die. Despite these reports in the literature we knew of a few sheep producers who were feeding cull onions.

It became obvious to us that research designed to determine the amount of onions that could safely be fed to sheep might be useful to sheep producers and onion growers alike. Onions are potentially an inexpensive feed. Also, cull onions re-entering the market place negatively affects market demand for onions and onion prices.

With aid from the New Mexico Dry Onion Commission, we completed two studies using sheep. The first study examined what proportion of diet could be onions, without negatively affecting animal health and weight gain. Whole grain sorghum served as a control feed to determine if onions could possibly replace sorghum or other grains in rations for growing animals. Previous chemical

analysis of onions show onions are quite high in readily digestible energy, and low in fiber. These results are similar to results obtained for cereal grains such as grain sorghum.

For this study we used 56 ram lambs of a Polypay x Rambouillet cross with an average initial body weight of 71 pounds. The lambs were sorted into eight pens, with each pen of seven lambs being fed one of four different diets. Of each diet 50 percent of the dry matter consisted of a 19 percent crude protein alfalfa pellet with the remainder of diet being either: 1) 50 percent sorghum, 2) 33 percent sorghum and 17 percent cull onions, 3) 17 percent sorghum and 33 percent onions, or 4) 50 percent onions. Pens received each diet to

provide each animal 3.8 percent of its body weight, as dry matter, for a six-week period.

Once each week before the morning feeding we weighed each animal and obtained a blood sample to determine the proportion of red blood cells in blood. At the beginning of the study and at the end of weeks 1, 3 and 6, blood samples were also used for routine analyses of serum chemistry.

During the first week all pens lost some weight. However, the lambs receiving 33 and 50 percent of their diet as onions lost more weight than animals receiving the other diets. This was probably because lambs fed onions did not readily consume onions initially. During the second week, lambs receiving 50 percent of their diet as onions gained only 0.4 pounds per day, while the remaining lambs gained between 0.6 and 0.8 pounds per day. Daily weight gain during week three was greater for the lambs eating onions than for the pens eating only sorghum grain and alfalfa pellets. The rate of gain for the remainder of the study was similar for all pens (.4 to .6 pounds per day). Over the course of the study average daily gain was not affected by diet.

Sulfur compounds in the onions did cause the death of some red blood cells. However, all values were well within normal limits. By the third week the percentage of red blood cells in the blood dropped marginally in the lambs eating either 33 or 50 percent of their diet as



Polypay-cross ram lambs found onions to their liking.

onions. This drop indicates a loss or death of some red blood cells. The serum chemistry analyses also indicated that some red blood cells were affected. The effect of onions on red blood cells gradually declined through the remainder of the study. This decline probably signifies that the lambs were somehow adapting to the sulfur compounds in onions.

Initially, the lambs did not readily eat the onions, however, after the second week all lambs eagerly ate onions. In fact, several of the lambs appeared to prefer onions to alfalfa. Even lambs eating over 12 pounds of fresh onions per day exhibited a preference for onions. This would be equivalent to a 150-pound man eating 29 pounds of fresh onions each day.

Many sulfur compounds in onions appear to function as antibiotics. We therefore speculated that onions might negatively impact ruminal bacteria, and consequently affect the digestion of many feedstuffs. Bacteria in the rumen are largely responsible for the breakdown of fibrous feeds into compounds that the lamb can use for various bodily functions such as growth. In addition, because onions are 90 percent water, animals con-

suming onions also have a higher water intake. Increased water intake also could affect bacterial populations in the rumen by washing bacteria out of the rumen. This would reduce the number and type of bacteria present in the rumen.

Our second study was established to determine if a diet consisting of onions negatively influences digestion of fibrous feeds, such as hay. For this study we used 15 wethers weighing about 110 pounds.

Onions must be fed as part of a complete ration that contains a good source of protein, or to animals on good pasture.

Each wether was fitted with a canula to maintain easy access into the rumen. The diets were similar to the study described earlier with 50 percent of the dry matter being alfalfa pellets. The dry matter also included either: 1) 50 percent whole sorghum, 2) 25 percent whole sorghum and

25 percent onions, or 3) 50 percent onions. We fed five animals each diet at a level to provide 3.5 percent of their body weight as dry matter.

Flow of fluid through the rumen was not affected greatly by onions, nor was passage of feed particles (alfalfa) from the rumen. Measurements estimating the activity of microbes in the rumen supported these observations. Of these measurements only minor differences occurred. In summary, we found no indication that onions affect ruminal digestion any differently than does sorghum. We did observe that onions reduced the digestion of alfalfa in the rumen, but the reduction was small.

From our studies, we feel that feeding onions to sheep can replace whole sorghum as a component of the diet without sacrificing performance or injuring animal health. However, as with any feed some precautions are advised. First the onions we fed are typical of Southern New Mexico in that they are mild tasting, fresh market onions. Mild onions are low in sulfur compounds, while the more pungent onions are much higher in sulfur content. Therefore, feeding smaller quantities of the more pungent onions, at least initially, is wise.

Second, most livestock deaths due to onion poisoning occur when animals start on onions in poor condition, or when there is little other good feed available. Onions must be fed as part of a complete ration that contains a good source of protein, or to animals on good pasture. Also, the onions we used contained between eight to nine percent crude protein on a dry matter basis, which is not sufficient for a growing animal. Additional protein might also be needed to remove sulfur compounds from the body.

Lastly, sulfur can interfere with copper and molybdenum absorption. Therefore, a mineral supplement with ample amounts of both copper and molybdenum should be available to animals fed onions.

Texas and New Mexico are among the major onion producing states in America. Together in 1990 they produced more than 684 million pounds of onions. Onion packers cull and discard 10 percent or more of the total crop each year. By working with onion packers and exercising a little caution, sheep producers can turn this mountain of cull onions into a very cost effective source of feed.0

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