



## Using Low-Moisture Blocks to Improve Livestock Distribution and Reduce Winter Feed Costs

*Beth Burritt*, Department of Wildland Resources, USU Extension

*Derek Bailey*, Department of Animal and Range Sciences, New Mexico State University

Do your cattle refuse to graze in the uplands yet over-graze the bottoms? Do you want them to change their ways? Molasses based low-moisture blocks (LMB) can help. Rangeland pastures can be under-grazed and over-grazed at the same time. Forage quality and quantity, interactions with other herd members, location of water, lack of information about other locations, or perhaps just plain laziness influence where cattle graze. Using supplements like LMB can change livestock distribution resulting in rangelands that are more uniformly grazed. Low-moisture blocks can also cut costs by replacing expensive hay with poor-quality mature forage. Placement and type of supplement, time of year, proper training, and herding all influence the effectiveness of supplements.

### What Is Low-Moisture Block?

LMB are molasses-based supplements that provide energy, protein and/or minerals. LMB contain 2 to 4% moisture and are self-fed. Nutrient compositions of LMB vary. All contain fat and trace minerals. Some provide protein at levels from 20 to 40%. Others provide additional macro-minerals, like calcium and phosphorus, and/or trace minerals.

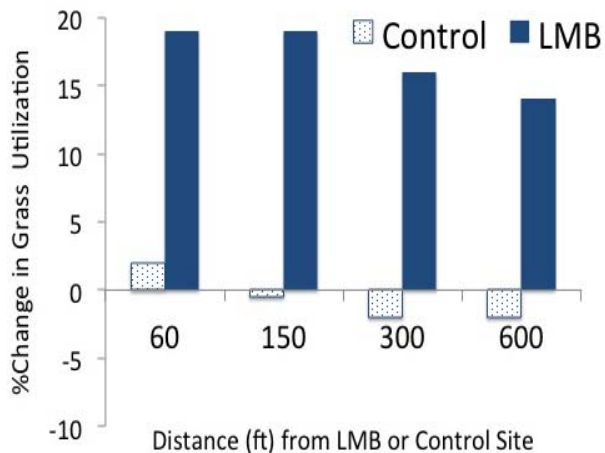
### Why and When Should I Supplement?

Supplements provide nutrients to livestock when forage is too low in required nutrients. In fall and

winter, the amount of mature forage on rangelands may be adequate to meet dry matter requirements, but its nutrient content is often too low to meet an animal's nutritional requirements. For example, the protein content of mature grass is normally 4-6%, yet the protein requirement for a mature, dry, pregnant cow is 6-7%. Molasses supplements containing additional protein and minerals provides adequate nutrition for rumen function. They can also improve intake of low quality forage by as much as 30% and its digestibility by 20% (Greenwood et al., 2000; Titgemeyer et al., 2004).

### Why and When Should I Supplement with LMB?

LMB can change livestock distribution in late summer, fall and winter including where livestock graze and loaf (Figure 1). For example, on a ranch in Montana, riders typically gathered 20% of the cattle from the eastern half of a 5,000-acre pasture in the fall. When LMB were located on the eastern half of the pasture, riders gathered 55% of the cattle from the eastern half in the fall. Cattle often spend as much as five hours per day within 100 yards of LMB. They also eat more forage, as much as 40%, at distances as far as third of a mile from LMB sites. LMB supplementation can increase forage utilization up to 300 acres around the block. In studies on rangelands in Montana, the average was about 212 acres.



**Figure 1. Change in grass utilization near LMB and control sites located on Montana rangelands.**

LMB can increase and focus grazing in moderate terrain and attract cattle to steep and difficult terrain that is typically not grazed. Forage utilization can be improved as much as 25% on moderate and 10% on steep slopes when cattle are supplied with LMB near these areas (Bailey and Welling, 1999). Remember if livestock producers want to supplement daily and aren't worried about cattle distribution, less expensive supplements other than LMB are available.

### How Can an Expensive Supplement Save Me Money?

LMB extends the grazing season. It replaces expensive hay with inexpensive mature forage. Feeding LMB costs \$6.83 plus the cost of standing mature forage per AUM versus \$30 to \$50 per AUM for hay. LMB prevents overgrazing riparian areas so cows can stay longer in a pasture. Riparian areas had longer stubble height in allotments where cows were fed LMB in the uplands than allotments where cows were not fed LMB because they remained in the riparian areas.

LMB can improve body condition scores (BCS). LMB can be helpful for producers who are unwilling or unable to supplement their animals on a regular basis. Especially, if producers are grazing their cows on low-quality forages and need to supplement them to maintain body condition. Cows with lower BCS have lower conception and calving rates.

### Other Advantages of Using LMB.

1. Feeding LMB is not labor intensive.
2. It doesn't require expensive infrastructure.
5. If animals are herded, LMB helps place and hold cattle.
6. It's environmentally friendly and weather resistant.
7. It may improve detection of new weeds by getting producers out in areas they wouldn't usually see.
8. Elk don't eat it. At Utah State University, researchers have tried to train elk to eat LMB with no success.

### How and Where to Supplement

LMB are available in 125 to 250 lb barrels and can be moved to rugged rangeland with a four-wheel drive truck or an ATV and small trailer. The 250 lb LMB barrels can be tipped on edge and easily rolled on and off trailers or truck beds using ramps. As a rule of thumb, when the primary source of feed is standing dead grass, a 250 lb barrel lasts 25 cows about 2 weeks.

According to a Montana study, intake of LMB was about 0.7 lbs/head/day in fall and winter. Most of the cattle within the herd ate LMB. Using GPS tracking collars researchers found that 48 out of 50 collared cows visited LMB (Bailey and Welling, 1999).

Placing LMB near each other increases social interactions among animals increasing the chances that supplement sites will also be used as a loafing area. The recommended density according to one study is eight barrels in an area 200 yd. by 200 yd. Salt should be placed in the same area because LMB do not contain salt. It is also recommended to place new supplement barrels at least 300 yards from old sites to improve livestock distribution and forage utilization. If supplements are placed repeatedly in the same area, nearby areas will be over-grazed (Bailey and Welling, 2001).

LMB are most effective at luring livestock to under-grazed areas in fall and winter. They may also improve distribution in the summer depending on growing conditions. However, protein and energy supplements tend to be less effective as attractants

in spring and early summer when forage is actively growing and adequate in nutrients.

LMB may also help keep cattle away from recently burned areas of a pasture. Cattle often prefer forage regrowth on recently burned sites and can inhibit establishment and growth of preferred plants. In a study conducted in Montana, forage utilization in burned areas of the pasture and near LMB was both 23% by the end of the grazing period. Furthermore, utilization of unburned areas was 8% higher near LMB than on comparable sites without LMB. Overall, LMB encouraged more uniform use of forage across the pasture (Thrift et al., 2009).

### Training the Herd

Even though LMB are extremely nutritious, animals must be familiar with LMB before they can be used as attractants. Offering animals a supplement in drylot or small pens is the most effective method to get animals to sample new supplements. Supplements are high in digestible nutrients making learning from nutrient feedback rapid. On large pastures, placing supplements near water will result in most animals becoming familiar with them within two to four weeks, though this method is not as effective as introducing supplements in a small area where animals are fed hay.

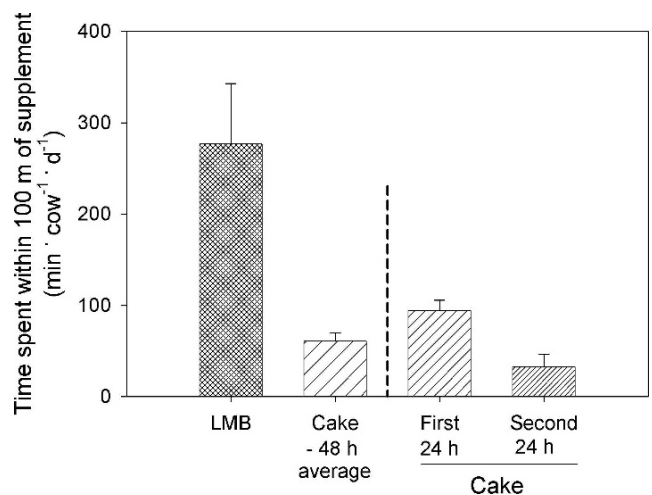
Showing animals where a supplement is located is a good practice especially if it is moved a long distance from its former location. Cows can be herded, “called” or “honked” to a new supplement site. Not all cows need to be shown the new location. Generally, the entire herd will find the location if 30 to 50% of the herd is shown the supplement site once.

Animals may or may not find supplement locations without help. In studies in Montana, cattle found LMB locations in 600-acre pastures within 2 days but only half of the time. Placing LMB on ridgelines may enable cows to see other cows eating the supplement. In areas with trees, animals should be shown the location of the supplement. One study on a 700-acre pasture with gentle terrain and interspersed with pinion and juniper trees, cows did not find a LMB for 6 weeks even though it was placed next to a cow trail because LMB was located in the trees.

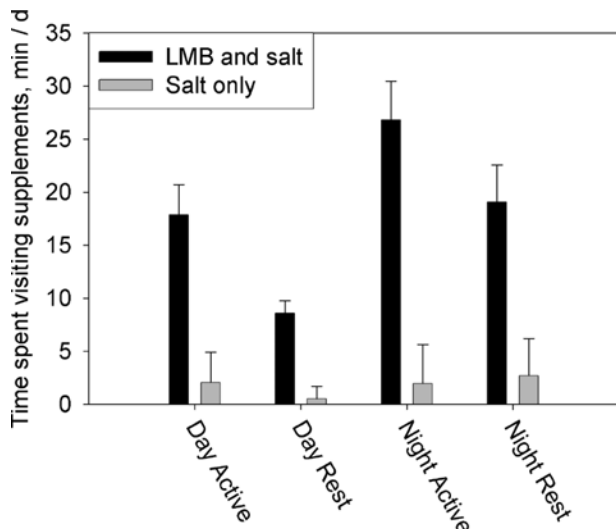
If new supplement barrels are placed only a short distance, 200 to 400 yards, from their previous locations, animals will readily find them. A numbers of studies showed cows consistently found new barrels of supplement within one or two days when they were placed 200 to 400 yards from the last supplementation site. Using this method, animals need only be herded to the first supplement location. The idea is to place supplements along areas such as ridges that typically receive little grazing (Bailey and Welling, 2001).

### Supplements Aren't Created Equal

Supplements that provide needed nutrients and must be eaten slowly like LMB or pressed molasses blocks will likely be more effective at improving livestock distribution and forage utilization than supplements that are eaten quickly like range cake or cubes. Cake or cubes are largely ineffective at changing foraging locations because cattle return to favored locations as soon as the supplements are eaten (Figure 2). In addition, producers are not likely to travel to remote locations several times a week to feed cake or cubes. LMB is often less expensive to feed than cake because it requires less labor and fuel costs (Bailey and Jensen, 2008). LMB was also more effective at luring cattle to areas of low-forage use than either salt or other mineral mixes (Figure 3) (Bailey and Welling, 2007).



**Figure 2.** Time spent by cows within 300 ft of low-moisture block (LMB) and range cake feeding sites. Range cake was fed three times per week. LMB was continuously available in higher and steeper terrain than cake locations. Time spent within 300 ft of range cake feeding sites is presented for the first and second 24 hours after feeding cake.



**Figure 3.** Time spent by cattle that were active or resting near low-moisture blocks (LMB) or salt blocks. A visit was defined as cattle located within 30 ft of supplement (LMB or salt). Resting animals were likely standing or lying. Location and activity were determined using GPS collared cattle.

## Supplements and Herding

Using low-stress livestock handling techniques to move livestock away from sensitive areas such as streams and wet meadows is effective whether or not LMB are available on upland sites. In one study, forage remaining on or near stream banks was 2 to 4 inches taller in pastures where cattle were regularly herded whether or not LMB was placed on upland sites compared with cattle that were not herded and did not receive LMB. Placement of LMB blocks appeared to help hold cattle in upland areas where they were herded. In two of three pastures, cattle spent 1.5 to 2 times more time in upland target areas when supplement was available (Bailey et al., 2008).

The combination of low-stress herding and strategic LMB placement may be sufficiently effective to attract big game to specific locations and to reduce fine fuels for management of catastrophic wildfires. Research in New Mexico found that cattle grazing could be focused in 50 acre areas located 1.5 to 2 miles from water for up to 7 hours per day using low-stress herding and LMB placement (Pollak, 2007). These target areas were more attractive to pronghorn than corresponding ungrazed controls. Ongoing research in Arizona found that cattle could be focused in target areas in rugged terrain located 1.5 to 2 miles from water for over 8 hours per day (Bruegger et al., 2012a). Cattle reduced forage

levels in the target areas from 1500 lbs / acre to 550 lbs / acre (Bruegger et al., 2012b). Such a reduction in fine fuels would reduce flame lengths and rate of fire spread.

## An Economic Example of Using LMB

Here's one economic model that compares LMB to hay for a herd of 300 cows. A complete description of the ranch operation used in the model and its results are published in Tanaka et al., 2007. The major benefit of improving livestock distribution with LMB was to replace feeding expensive hay with inexpensive standing mature forage. Overall, the model projected that the net economic benefit for feeding LMB in fall to improve animal distribution was \$4,407/year. The increase in revenue was due to increased hay sales, less hay purchased and/or an increase in herd size (eight cows). Another benefit of LMB in addition to extending the grazing season might be increasing calf crop. The ranch used in the economic model had an average calf crop of 84%. If calf crop were increased to 90% by improving cow body condition, 82% of the time it was profitable to feed LMB. Profitability depended on cattle prices. The average increase in revenue due to an increase in calf crop was \$15,780/year.

## Conclusions

Strategic placement of low-moisture blocks can be an effective tool to manipulate cattle grazing patterns. This supplement is highly palatable and can be used to lure cattle to graze areas that typically receive little use and contain poor quality forage.

For more information about LMB, watch the video about the benefits of LMB at <http://vimeo.com/15461789>.

To decide if LMB makes economic sense for your operation download the excel spreadsheet at: <https://extension.usu.edu/BEHAVE/htm/learning-tools/economics-of-behavior>. Scroll to the bottom of the page and click on: **Comparing the Cost of Molasses Blocks vs. Feeding Hay**. There is also additional information about LMB at this site or you can contact Beth Burritt—[beth.burritt@usu.edu](mailto:beth.burritt@usu.edu) or 435-797-3576.

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