



Limiting Feed Intake with Salt

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Cattlemen are aware of the impact high cost labor has on profit; thus, management procedures which reduce labor requirements are important. One management tool frequently used is regulating feed intake with salt.

In addition, self-feeding supplements tend to allow timid, slow-eating cows to get their share and it is an easy method of providing Vitamin A, phosphorus, and other feed additives. However, there are disadvantages to feeding salt-concentrate mixes. Salt is not a precise regulator of intake since certain individuals will tolerate more salt than others and abundant water is essential.

Daily salt requirement for mature cattle is less than 1 oz/head/day; however, voluntary intake often exceeds minimum needs. Because there are practical limits to the amount of salt cattle eat, salt can be used to restrict the consumption of highly palatable feeds such as grains and supplements. In such instances, daily voluntary intake of salt will approximate 0.1 pound salt/100 pounds body weight for most classes of cattle. This fact sheet is a guide for formulating salt-limited supplements.

Effects of High Salt Intake

Salt toxicity is seldom seen in cattle because of their high tolerance for salt. The one-time lethal dose for mature cattle is 4 to 5 pounds salt. Salt is rapidly absorbed from the intestinal tract into the bloodstream. It is then excreted by the kidneys through urine. However, the animal is able to eliminate excess salt only when adequate clean water is available.

Salt toxicities are most likely to occur: 1) where cattle have been deprived of salt for extended periods of time and suddenly have readily available salt; 2) if cattle are forced to eat excessive salt with an inadequate water supply; or 3) when cattle are forced to drink water containing a high concentration of salt.

As a rule-of-thumb, cattle on salt mixtures drink 50 or 75 percent more water than normal or approximately 5 gallons of additional water for each pound of salt. If only salty water is available, cattle will often refuse the supplement or may be forced into a toxicity situation. Salt content of water is usually measured by total dissolved solids (TDS) which includes calcium, magnesium, sodium chlorides, sulfates, and bicarbonates. In general, caution is necessary in using salt-limited supplements when water contains above 5,000 ppm TDS. This analysis can usually be obtained through the analytical laboratories of your state university (check with your local county Extension educator).

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Controlled experiments in several states have failed to show any harmful effects upon cattle production from proper use of salt-concentrate mixes. High salt intake with adequate water has had no effect on fertility, calf crop percentage, weaning weight, or bloom on animals.

Adjusting Salt Levels

Several factors influence the concentration of salt required in a mix to achieve a certain feed intake. Where large amounts of salt are naturally present in drinking water or forage, the amount of salt in the mix must be reduced in order to get satisfactory feed intake. On the other hand, it usually is necessary to increase the salt content of the mix over a period of time as cattle become accustomed to the high salt level. Cattle also tend to consume more of a salt-limited supplement when forage is scarce or unpalatable. Extra precautions should be taken under these and other emergency conditions to ensure that water supplies are adequate.

Estimates of salt needed to limit feed intake are shown in Table 1. Actual salt intake occasionally varies from the indicated values. Forage intake, palatability of supplement ingredients, salt content of the water, and animal adaption all influence salt intake.

Feeding Salt-Limited Supplements

When cattle are accustomed to eating supplements but unaccustomed to self-feeding, overeating can be prevented by starting with a high salt level (50:50 or even 60:40 salt to meal)

Table 1. Estimated Salt Intake of Cattle Fed Salt-Limited Supplements.

Body Weight lb	Salt Consumption lb/day		
	Low	Avg	High
300	0.3	0.5	0.6
500	0.5	0.6	0.7
700	0.6	0.7	0.9
900	0.7	0.9	1.1
1100	0.8	1.1	1.3
1300	0.9	1.3	1.5
1500	1.0	1.4	.6

Assumes drinking water is low in TDS.

and then reducing salt level to obtain desired level of intake. If cattle have not eaten concentrates before, a training period of a week or more of daily had feeding of meal without added salt may be necessary, particularly with young cattle.

If grain is included in a self-fed supplement, it should be cracked or coarsely ground and mixed with salt or similar particle size. This prevents separation of the salt from the grain and aids in preventing "overeating" and its accompanying problems. Adequate grass or hay must be available so that the cattle are not forced to eat a salt-limited supplement to survive.

The amount of salt to mix in the concentrate depends upon the intake of concentrate desired. To increase intake of concentrate, decrease the amount of salt in the mixture; to decrease intake, increase the salt. Coarsely ground salt is more effective in limiting meal intake than finely ground salt. Pelleting a salt-concentrate mixture before feeding reduces separation of the salt and concentrate but is normally an unnecessary expense.

Tables 1 and 2 can be used to formulate salt-limited supplements for cattle. For example, assume it is desired to self-feed a protein supplement (soybean meal, cottonseed meal, etc.) at the rate of 2 pounds per head per day to a group of 1100 pound cows. Table 1 indicates that the daily salt consumption

of 1100 pound cattle averages 1.1 pounds when salt is used to limit supplement intake. In the left hand column of Table 2, locate 1.1 lbs. daily salt intake and look across the row labeled non-salt feed for a value nearest 2 pounds. In this example, a self-fed supplement composed of 35 percent salt, 65 percent protein supplement would, on the average, regulate total intake to 2.0 pounds protein supplement and 1.1 pounds salt. Cattle-men may need to adjust these percentages slightly to achieve the desired intake of feed.

Assume that in addition to 2 lbs. protein supplement, it is desired that the cow also consume 3 pounds of grain (corn, milo, etc.) for a total non-salt consumption of 5 pounds; then the self-fed supplement should be only 18 percent salt.

Salt used in self-fed supplements should be coarse, plain white salt. Cost alone prohibits the use of trace-mineralized salt; however, it is conceivable that someone could attempt to use trace-mineralized salt. This should be avoided since forced feeding high levels of trace-mineralized salt could result in toxicity or mineral imbalances due to excessive intake of certain trace elements. If trace-mineralized salt is needed by cattle, the amount of trace-mineralized salt consumed daily should not exceed 0.02 percent of the animal's body weight.

Table 2. Estimated Salt Level to Include in Mixture for Desired Intake of Non-salt Feed.

Salt Intake, lb/day		%Salt in Supplement												
		6	8	10	12	14	16	18	20	15	30	35	40	50
0.3	Total Feed	5.0	3.7	3.0	2.5	2.1	1.0	1.7	1.5	1.2	1.0	0.9	0.7	0.6
	Nonsalt Feed	4.7	3.4	2.7	2.2	1.8	1.6	1.4	1.2	0.9	0.7	0.6	0.4	0.3
0.4	Total Feed	6.7	5.0	4.2	3.3	2.9	2.5	2.2	2.0	1.6	1.3	1.1	1.0	0.8
	Nonsalt Feed	6.3	4.6	3.6	2.9	2.5	2.1	1.9	1.6	1.2	0.9	0.7	0.6	0.4
0.5	Total Feed	8.3	6.2	5.0	4.2	3.6	3.1	2.8	2.5	2.0	1.7	1.4	1.2	1.0
	Nonsalt Feed	7.8	5.7	4.5	3.7	3.1	2.6	2.3	2.0	1.5	1.2	0.9	0.7	0.5
0.6	Total Feed	10.0	7.5	6.0	5.0	4.3	3.8	3.3	3.0	2.4	2.0	1.7	1.4	1.2
	Nonsalt Feed	9.4	6.9	5.4	4.4	3.7	3.2	2.7	2.4	1.8	1.4	1.1	0.9	0.6
0.7	Total Feed	11.7	8.7	7.0	5.8	5.0	4.4	3.9	3.5	2.8	2.3	2.0	1.7	1.4
	Nonsalt Feed	11.0	8.0	6.3	5.1	4.3	3.7	3.2	2.8	2.1	1.6	1.3	1.1	0.7
0.8	Total Feed	13.3	10.0	8.0	6.7	5.7	5.0	4.4	4.0	3.2	2.7	2.3	2.0	1.6
	Nonsalt Feed	12.5	9.2	7.2	5.9	4.9	4.2	3.6	3.2	2.4	1.9	1.5	1.2	0.8
0.9	Total Feed	15.0	11.2	9.0	7.5	6.4	5.6	5.0	4.5	3.6	3.0	2.6	2.2	1.8
	Nonsalt Feed	14.1	10.3	8.1	6.6	5.5	4.7	4.1	3.6	2.7	2.1	1.7	1.3	0.9
1.0	Total Feed	16.7	12.5	10.0	8.3	7.1	6.2	5.5	5.0	4.0	3.3	2.9	2.5	2.0
	Nonsalt Feed	15.7	11.5	9.0	7.3	6.1	5.2	4.5	4.0	3.0	2.3	1.9	1.5	1.0
1.1	Total Feed	18.3	13.7	11.0	9.2	7.9	6.9	6.1	5.5	4.4	3.7	3.1	2.7	2.2
	Nonsalt Feed	17.2	12.6	9.9	8.1	6.8	5.8	5.0	4.4	3.3	2.6	2.9	1.6	1.1
1.2	Total Feed	20.0	15.0	12.0	10.0	8.6	7.1	6.7	6.0	4.8	4.0	3.4	3.0	2.4
	Nonsalt Feed	18.8	13.8	10.8	8.8	7.4	6.3	5.5	4.8	3.6	2.8	2.2	1.8	1.2
1.3	Total Feed	21.7	16.2	13.0	10.8	9.3	8.1	7.2	6.5	4.2	4.3	3.7	3.2	2.6
	Nonsalt Feed	20.4	14.9	11.7	9.5	8.0	6.8	5.9	5.2	3.9	3.0	2.4	1.9	1.3
1.4	Total Feed	23.3	17.5	14.0	11.7	10.0	8.7	7.8	7.0	5.6	4.6	4.0	3.5	2.8
	Nonsalt Feed	21.9	16.1	12.6	10.3	8.6	7.3	6.4	5.6	4.2	3.2	2.6	2.1	1.4
1.5	Total Feed	25.0	18.7	15.0	12.5	10.7	9.4	8.3	7.5	6.0	5.0	4.3	3.7	3.0
	Nonsalt Feed	23.5	17.2	13.5	11.0	9.2	7.9	6.8	6.0	4.5	3.5	2.8	2.2	1.5

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