

CURRENT PRACTICES AND UTILIZATION OF  
ALFALFA CUBES

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A considerable amount of experimental work has been conducted over the past 20 years or so concerning the use of alfalfa for livestock feeding. This work has included the various forms of alfalfa as hay, cubes, pellets, wafers, etc. This has all been well reviewed before in many places and it won't be my object with this paper to repeat what someone else has already repeated from some experimental work.

I will mention that we, in our practice, are firm believers in the use and benefits of alfalfa in whatever form it appears. Its use is generally governed by the economics of the occasion.

The following are points that would like to make concerning cubes

- The cubing of the hay will not itself improve the nutritive value of the material over the loose form.
- 2 The cubing of hay, however, often will improve the nutritive value of the feed to the livestock because it eliminates the loss of leafy high nutritive material that can occur with loose hay.
- 3 Cube handling can be completely mechanized which can help with a labor problem.
- 4. The sampling and analysis of cubes should be more strenuously observed than with loose hay because of the hiding capabilities of a cube.

It seems to me that one of the most important practices related to the use of cubes concerns their purchase. It is very interesting, however, that this practice is often neglected. The University of California and the California Grain and Feed Association have conducted considerable work to draw up good sampling techniques and analyses to characterize the cubes that are being purchased. At one of the feedyards I work with in the Southwest, we are using a sampling system to purchase 15,000 tons of cubes per year. Under this system, every cutting by each producer is analysed for moisture, crude protein and crude fiber and the producer is paid according to deviations from a standard which we have set up. Premiums and deductions are made for crude protein and crude fiber content when equalized to a standard moisture content. This has worked very well for both the buyer and seller.

Another important aspect of the purchase of cubes is their moisture content. The importance of this arose in Texas last year and is illustrated in the following table.

	<u>Cube Moisture</u>	
	<u>14.0</u>	<u>16.0</u>
	Moisture, %	
Purchased, tons	10.000	10,000
Dry matter purchased, tons	8,600	8,400
Extra moisture, tons		200
Cost of water at \$40 per ton		\$ 8,000

The difference in the moisture content of 10,000 tons of cubes was worth \$0.80 per ton or \$8,000.00 to the feedyard. Besides this economic fact, also was the fact that the 14.0% cubes could be held in a stack without molding whereas the 16.0% cubes would have mold damage in the center of the stacks and also would have a greater problem with heating and fire loss. I understand that one insurance company in the area now refuses to pay claims for fire loss on cubes unless they have been below 14.0% moisture when being stacked.

The use of cubed alfalfa hay is growing with the horse industry. The reasons are a matter of convenience and handling both in bulk amounts and in sack lots. Some problems have been encountered due to excessive wood chewing by horses consuming cubed rations but this can be overcome if small amounts of loose hay or straw are available. The questions of choke and cholic appear not to be causing a problem due to the use of cubed alfalfa hay.

The widest use of alfalfa cubes is with the cattle business. The dairy business is being well covered in another portion of this conference so this paper will only consider the beef animal. As I see it, the following are areas of use of alfalfa cubes with beef cattle:

#### Commercial cattle feedyards

- 2 Range supplementation of both cow herds and grazing stocker cattle
3. Growing programs under confinement in small family-owned yards.

I would first like to deal with the range usages of alfalfa cubes because I think this is probably the area most neglected for use both from the seller side of alfalfa cubes and from the buyer side of the grazing animals. Alfalfa is a good supplemental source for most of the supplemental needs of range cattle. It has a good content of crude protein, calcium, potassium and many trace elements as well as being a source for energy and carotene. The latter, of course, can be readily converted into Vitamin A. The major possible shortage in alfalfa use on the range is its phosphorus content and this can be easily covered with a small amount of phosphorus supplementation in a salt mix as with a 50:50 ratio of salt and sodium tripolyphosphate (STP). The following shows an interesting comparison of various supplemental programs for range cattle.

Feed	\$/Ton	Daily Use, Lbs.	¢/Cow/Day	Lbs. C.P.	Lbs. ENE	Lbs. P.
Cottonseed meal	90.00	2.0	9.0	0.82	1.32	0.022
Alfalfa cubes (17%)	40.00	4.5	9.0	0.77	1.94	0.011
Supplement cubes (20%)	75.00	3.0	11.3	0.60	1.70	0.030

The economics can be changed to fit any particular situation. It is interesting to note, however, that for the same amount of money a range man might spend for cottonseed meal, he could buy alfalfa cubes and he would obtain almost 32% more energy. It is well acknowledged that energy is generally the most limiting item on range so the purchase in this example of alfalfa cubes would be a much better buy. You can also see that the crude protein contents are almost the same and the phosphorus content is short, as has already been mentioned. The supplemental phosphorus required here would not change the course of these economics. The economics for a supplemental range cube are also shown in this example. These can vary widely but I have used a good quality formulation for this example. It can be seen that, in this case, the alfalfa cubes were still the best buy.

There is another consideration for the use of alfalfa cubes on range, however, that should be mentioned along with this economic example. The cubes are easy to handle in bulk but it can be seen that more material would have to be handled than with cottonseed meal. Generally, however, when the handling is set up correctly and given an equitable cost, it also does not change the economics of the preceding example. The added advantage of the carotene in the alfalfa cubes was not considered for this example.

As has been mentioned before, the handling of alfalfa cubes can be easily mechanized. There are many dispensers available to put the cubes out on the range but one of the best I have seen was to remove one or two floor boards from a pick-up truck bed and put in slanted sides and doors on the bottom. In this manner, one to two tons of cubes can be placed on the range in a good location with minimal effort. If you desired 4.5 lbs. of cubes per head per day and were feeding every other day, this would mean that 9.0 lbs. of cubes would be dispensed per animal. At two tons of cubes per load, a man could easily feed 445 animals with one load. The alfalfa in the cube form would be easily accessible to the cattle and, if fed in a good location as a road, the cattle would be able to consume all that was fed.

Alfalfa in the cubed form also is being used in increasing amounts by the small growing feedyards. In many cases, these operations are family-owned and operated and labor may be in short supply. The cubes are being fed whole to cattle weighing over about 400 lbs. with no problems. The waste is minimal along with the labor. The only problem that could be encountered would be that, for the most economical weight gains for calves, some supplemental energy is needed above that of straight alfalfa in many areas. If this is the case, some form of energy, as grain, should be incorporated in small amounts along with the cubes.

The use of alfalfa cubes in the Southwestern states and Texas is increasing by large amounts in the large commercial cattle feedyards of the area. This does not seem to be the case with the feedyards that we work with in California. These latter yards appear to be well entrenched with the use of baled hay and their facilities are tailored for this use. Presently, the handling of baled hay and the economics of the cubes are having some effect on the yards in this state but baled hay still seems to be predominant. In Texas, the new mills in that area have been equipped to handle alfalfa cubes and their production is increasing by large amounts yearly. The use of cubes assists a labor handling problem which is not geared to handle large amounts of baled hay as in California.

The alfalfa cubes in many areas are stacked outside in long piles. These piles will seal themselves with rain and the damage to the cubes will only enter 4 - 6 inches of the pile. This damage is minimal and the cubes are fed to the cattle with no apparent problems. In all cases, the cubes must be broken up before being used in finishing cattle rations in order to eliminate the problem of sorting and mixing in the rations. In these rations, it is best to obtain as much bulk as possible from the roughage sources and, therefore, if we can break up the cubes into flakes about 1/8" X 1 1/4" X 1 1/4", we can still obtain more bulk help from the cubes when compared to pellets. To do the job of breaking up the cubes, there are essentially three pieces of equipment that are available. One is a set of rolls to crush the cubes, another is a shredder and the other would be the existing hay hammer mills in many yards. I prefer the rolls with a setting of about 1 inch apart for the 1 1/4 inch cubes. The reason is for the maintenance of the bulk factor. I am aware of five different ways in which the cubes are being introduced into the feedmills. These are:

1. A dump truck dropping the cubes into a pit covered with a grill. The cubes then flow into the cube breaker.
2. A dump truck dropping the cubes on a covered slab and a front-end loader putting the cubes into an above ground bin. The cube breaker is mounted just below the bin.
3. A dump truck dropping the cubes onto an existing baled hay drag and the cubes carried either into a hammer mill or cube breaker.

- 4 The cubes brought to the mill in a feeding wagon. This is positioned over a cube breaker and feeds the cubes to the breaker.
- 5 Dumping the cubes into a tub grinder mounted at ground level.

With several of these introductions into the mills, small amounts of fat are being added to the cubes prior to entering the cube breaker in order to control the dust of the resulting hay and reduce the shrink and nutrient losses in the air systems that are handling the broken cubes. This works very well for this purpose and can be easily noted at the mill when not in use.

The use of alfalfa cubes in finishing cattle rations probably accounts for their greatest tonnage usage with beef cattle. The amount to use will depend on the nutritionist formulating the rations and the other commodities that are available. It can basically be said that little difference other than bulk would exist in the ration formulation if the hay were in the baled and ground or cubed and broken forms. The amount in the finishing high-energy rations will generally be 5-10% and in the starting rations could be from this level up to 50% or so of the ration. More could be used with favoring economics.