

Feeds and Feeding for Junior Beef Cattle Projects

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Most junior beef cattle exhibitors today probably buy feed in a commercially mixed, complete ration. At least partly because of this, many junior feeders may know little of the basics of beef cattle nutrition. The following provides some principles to help choose among various commercial feeds or to formulate custom mixes. Beef cattle feeding involves attention to nutrient requirements. There are four basic classes of nutrients: vitamins, minerals, protein, and energy.

VITAMINS

Most grains are deficient in vitamin A. Green feeds such as alfalfa hay (or growing grass) contain high levels of vitamin A. Other sources include vitamin A feeding concentrates and injections. Other vitamins usually are adequate in most rations. B-complex vitamins sometimes help when starting cattle on feed, especially drawn, stressed calves. Also, some people periodically give vitamin B shots, feeling that appetite is improved. Others feed a complex, and costly, complete vitamin supplement throughout the feeding period. If you think this works, then do it. Peace of mind is worth something.

MINERALS

Grains are high in phosphorous and low in calcium. So, minerals used in grain rations should be high in calcium and low in phosphorous. This is the opposite of a good pasture or range mineral, so be sure to use the right product. You'll have the best results by balancing the complete mixed ration with minerals (including salt), rather than relying on free-choice consumption out of a mineral feeder. Trace mineral supplements can be mixed in the ration to insure they are present in adequate amounts.

PROTEIN

The total diet should average around 11% to 13% crude protein (CP) for most uses. Younger, growing animals need more protein. Some feeders use a ration of around 12% CP throughout the feeding period. Others prefer to feed more protein for starting and less to older, finishing cattle. The accompanying chart shows the CP level of

common feeds. Notice that oilseed meals such as cottonseed and soybean are high in CP. Also, see the section on feeding management.

ENERGY

Energy in cattle diets usually is expressed as Net Energy or Total Digestible Nutrients (TDN). Feed tags of commercial mixes do not list either of these factors, as they are not easily determined. However, crude fiber (CF, which is listed on feed tags) can be used to estimate energy content. Look at the table of feed contents. Notice the relationship between CF and TDN. High energy feeds like corn and milo (sorghum grain) are low in fiber. Low energy feeds such as cottonseed hulls are high in fiber. Low-energy, strictly growing rations usually contain around 60% to 65% TDN, which generally corresponds to a content of 15% to 20% CF. High energy fattening rations have over 70% TDN and less than 8% CF. General purpose or in-between rations have 65% to 70% TDN and 9% to 15% CF. These CF and TDN levels apply to the total ration including extra hay, if any is used.

ROUGHAGE

Roughage is not technically a nutrient but is an important feeding factor. Rations low in roughage are more likely to cause digestive problems. Hays and some products like cottonseed hulls are high in roughage. Some grains with husks, like oats, have a roughage factor. Roughage is closely related to the fiber level, as shown in the table of feeds. However, finely-ground high-fiber materials do not provide as much roughage factor as long-stem hay. Crude fiber is one of the factors listed in the analysis section of a feed tag. In addition, the ingredients section of a tag will list "roughage products," if any are included (possibly even by individual name such as cottonseed hulls), along with the percentage of such products if greater than 5 percent. In some mixes (especially those without oats) these roughage products listed in the ingredients may be the only source of roughage in the feed. However, if grains such as oats are included, the roughage part of the oats (husk) is not required to be listed in the percentage of roughage

products. So, consideration should be given to both the crude fiber content and the percentage of roughage products in evaluating commercial mixed feeds. Even fattening rations generally should contain a minimum of 6% to 8%CF (10 to 15 percent roughage). Starter/grower rations often have 15% to 20%CF (30 to 40 percent roughage).

OTHER FACTORS

Molasses often is included in a feed to reduce dustiness and increase palatability. Special supplements such as milk replacers sometimes are fed. These may help, especially in hair bloom, particularly late in a feeding period when animals may not be full fed. Vitamin supplements already have been discussed. Some feeders like to include alfalfa. Many feeders effectively use a little long-stem grass hay to help avoid digestive problems, especially bloat.

COMPLETE RATIONS

The enclosed table shows three typical types of rations which could be easily self mixed, or locally mixed by a mill. Similar rations are widely available commercially mixed. Two types of rations are listed, those containing oats (A), and those without oats (B). Corn is included as a high energy source. Other grains could be included, such as milo or barley. Oats are a useful, well-balanced feed but often are expensive for their nutritional content. Some show rations contain no oats whatever. Some people question rations without oats, feeling that over-fattening will occur if more corn is fed. However, notice that these higher corn-no oats rations contain more hulls, so the total energy (TDN) of the two types of rations is similar. Total energy consumption is the main factor controlling fattening, not what the source of energy might be. Ration 1 is strictly a starter/grower ration, Ration 3 is a finishing ration, and Ration 2 is in between. Note that the protein decreases slightly while energy varies considerably. This is done by varying the amounts of grains, oilseed meals, and roughage products. Remember, if you buy readymixed feeds, use crude protein and crude fiber on the tag as a guide.

FEEDING MANAGEMENT

How much should a calf be fed? It depends, on the type and amount of gain desired (growth or finishing) and the content of the rations. Growing cattle could be fed daily

around 2 ½ to 3 percent of their body weight of a feed like Ration 1 or less of a medium energy ration, like Ration 2. Finishing cattle could be fed 2 ½ to 3 percent of a feed like Ration 2 or less of a high energy ration, like number 3. If smaller amounts of a higher energy ration are fed then the percentage of protein may need to be raised, especially for growing animals, in order to keep the total amount of protein adequate. This is where personal preference and familiarity with your ration are important. Don't change rations a lot, or at least know what you're changing and why.

HEIFER FEEDING

Heifers require the same nutrients as steers except that growth is desired as opposed to fattening. A feed like Ration 1 could be used for the entire program fed at about 2 percent of body weight. Younger, thinner, or larger-framed heifers would need more of this ration (or possibly a mix like Ration 2) than older, fatter, or smaller-framed heifers.

Some other heifer programs are as follows:

1. 100 percent oats fed like Ration 1 above. Be sure to include salt and a free-choice mineral with around a 2:1 calcium: phosphorous ratio, and inject vitamin A about once a month if this oat program is followed.
2. Graze on wheat or oat pasture, plus salt and 2:1 mineral.
3. Graze on good warm-season pasture or feed high quality grass hay free-choice (such as coastal bermuda, sudan, etc.), while feeding about 1 percent of body weight of a ration with 12% to 14% CP and 70% to 75% TDN, plus salt and mineral.

SUMMARY

As was said at the outset, a large percentage of today's feeders rely on commercially mixed feeds. Many highly desirable products are available. In buying such feeds, insist on freshness and consistency from batch to batch. The premium paid for most show rations certainly warrants such insistence. Remember that crude protein, crude fiber, and roughage content, as shown on the feed tag, (along with physical characteristics) should be used to evaluate commercial mixes. Many steer and heifer feeding programs will work if you know what your feed contains and what your animal needs to do. There are no magic formulas.

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COMMON FEEDS FOR SHOW CATTLE				
	PERCENTAGE in FEED			
NAME	CRUDE PROTEIN	TDN	CRUDE FIBER	ROUGHAGE
Oats	12	68	12	30
Corn	9	80	2	0
Milo	9	75	3	0
Barley	11	75	6	15
Cottonseed meal	41	70	12	0
Soybean meal	44	75	6	0
Cottonseed hulls	4	41	43	100
Grass hays	9*	50	28	100
Dehy. Alfalfa	17	56	25	20
Molasses	3	57	0	0

* May range from less than 5% to more than 15%

SHOW RATION EXAMPLES						
	Ration 1		Ration 2*		Ration 3	
FEED	A	B	A	B	A	B
Oats	33	-	22	-	15	-
Corn	20	38	41	53	61	70
C S hulls	23	33	16	23	6	10
S B or C S meal	12	17	9	12	6	8
Dehy. Alfalfa	5 					
Mineral **	1-2 					
Molasses	5 					
Crude Protein	13		12		11	
TDN	62		67		72	
Crude Fiber ***	17		13		8	
Roughage	33		23		10	

* A similar high oats - low corn ration (with about 65% TDN) could be mixed with 50% oats, 20% corn, 10% CS hulls, and 7% oilseed meal, along with the amounts of alfalfa, mineral, and molasses shown above.

** Salt at 0.3 to 0.5 percent and 1.0 to 1.5 percent (less for oat rations, more without oats) of a mineral mix containing 25-35% calcium and less than 15% phosphorous. An appropriate amount of vitamin A concentrate and trace mineral mix also could be included.

*** In commercial ready-mixed feeds use crude fiber as a guide to energy (TDN) content. Higher fiber equals lower energy.