

Nutritional Management Of Newly Arrived Stocker Calves

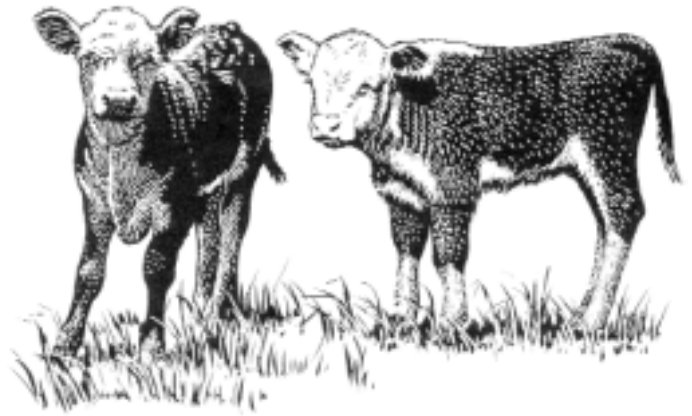
Feeder calves suffer much stress in being moved from one production point through sale barns and order buying facilities to another production point. Stressors include not enough feed and water, weaning, bad weather, and disease. These calves present cattle producers and veterinarians with special nutritional, management, and health problems.

Inadequate nutrition can worsen the effects of stress. Proper nutrition may not prevent stress or infection, but it may be directly beneficial for the animal. It can help prepare the animal for stress, decrease the adverse effects of stress, and help the animal recover from stressful periods.

One of the most obvious changes that occurs during marketing is weight loss (shrink). Even during short-haul (less than 6 hr), approximately 50% of weight loss is gut contents and 50% is tissue loss. In general, a 24-hour transport period affects the calf the same as not having feed and water for 48 to 72 hours. If you feed calves well before a fasting/transport period, there should be enough nutrients in their systems to prevent great losses of the nutrients.

Feeding after the Stress Of Marketing

What the calves are fed in the first four weeks after the stress of marketing greatly affects disease, death loss, performance, and cost of gain. There is probably no single best receiving program for the stressed calf. The best program for each group of calves depends on their background, how much stress they suffered during marketing, available feeds, feed costs, and cattle costs.



Typical Dry Matter Intake (DMI) of Newly Arrived Feeder Calves

Days after Arrival	DMI, % of Body Weight
1 - 7	.5 to 1.5
8 - 14	1.5 to 2.5
15 - 28	2.5 to 3.5

Percentages of Calves Eating during the First 7 Days after Arrival at the Feedyard

Day	Healthy	Diseased
1	38.9	27.0
2	66.2	47.3
3	84.5	66.6
4	88.9	75.8
5	90.2	80.1
6	94.6	81.7
7	94.6	83.4

One major problem in feeding the market stressed calf is the calf does not eat enough. Feed intake varies, but many stressed calves do not consume enough feed until the second and third week after arrival. This makes proper formulation of the diets difficult.

**Nutrient Requirements for a
440 lb. Medium-Framed Steer Calf
Eating 1, 2, or 3% of Body Weight***

Item	Intake, % of Body Weight		
	1	2	3
Average intake, lb	4.4	8.8	13.2
Expected daily gain, lba	-0.29	1.10	2.35
Required concentration:			
Crude protein, %	15.8	13.0	11.8
Calcium, %	0.55	0.50	0.55
Phosphorus, %	0.45	0.28	0.27
Magnesium, %	0.25	0.12	0.10
Potassium, %	1.60	0.80	0.60
Sodium, %	0.20	0.10	0.08
Copper, ppm	20	10	8
Manganese, ppm	100	50	40
Iron, ppm	125	62	50
Zinc, ppm	75	38	30

*Assumes ration has an NEm value of (77mc cal/cwt) and an NEg value of (43 mc cal/cwt). (67.5% TDN)

Energy

Usually energy is the first limiting nutrient in the diet of market stressed calves, mainly as a result of low feed intakes. In general, with more energy in the calf's diet, disease and death rates go up, but performance improves and the cost of gain decreases. You can partly overcome the negative effects of feeding higher-energy diets to stressed calves by providing free-choice, good-quality hay, along with the concentrate diet, for the first 7 days after arrival. You should base the number of days to feed hay on the health of the cattle. If you use alfalfa in the receiving program, it should be of average to good (not excellent) quality. If you feed grass hay, it should be of good to excellent quality.



In operations with limited ability to mix complete diets, you can feed calves good-quality hay along with 2 lb/head daily of a pelleted, 40%

protein supplement. The major limitation of this system is poor early performance.

**Effect of Concentrate Level in Receiving Diet
On Calf Health and Performance**

Item	% Concentrate in Diet		
	25	50	75
Morbidity, %	47	49	57
Mortality, %	4.57	2.35	4.65
Treatment days/calf	2.5	2.7	3.3
Daily gain, lb	1.25	1.40	1.47
Feed/gain	7.58	7.07	6.12
Relative cost/lb gain	1.00	1.02	.98

**Influence of Feeding Free-Choice Alfalfa or
Native Hay with a 75% Concentrate Receiving
Diet on Feeder Calves**

Item	75% Conc. Alone	75% + Alfalfa	75% + Native
Morbidity, %	41	37	30
Mortality, %	0.9	0.0	0.9
Daily gain, lb	1.02	1.12	0.90
Feed/gain	7.99	8.04	9.64
Relative cost/lb gain	1.00	.84	.89

Highly stressed calves do not seem to tolerate supplemental fat in the receiving diet. Adding 4% fat (tallow/vegetable oil blend) to the receiving diet of stressed calves does improve animal performance. However when diseased calves received 4% fat in the diet, death rates increased. This suggests that although you can use fat in the receiving diet, you should not add it to sick pen diets.

**Effect of Added Fat in the Receiving Diet
On Calf Health and Performance**

Item	0% Fat	4% Fat
Morbidity, %	60.2	57.8
Mortality, %	8.4	12.0
Daily gain, lb		
Day 56	2.20	2.42
Feed/gain		
Day 56	6.09	5.61

Stressed calves prefer a dry diet over a diet high in corn silage but seem to adapt to a corn silage-based diet within 7 to 14 days.

Protein

Stressed calves probably do not need much more crude protein than non-stressed calves. But since stressed calves do not eat as much as they need to, you must increase the concentration of protein in their diet. In general, best results have been seen when the receiving diet contained 13.5 to 14.5% crude protein.

Stressed calves have a low tolerance for urea and other non-protein-nitrogen sources. Urea intake should be limited to less than 30 g/head daily during the first 2 weeks.

In general, feeding high "ruminal escape" (bypass) proteins to stressed calves has worked well, but usually not enough to justify the increased cost.

Minerals

As with protein, stressed calves do not seem to need more minerals than non-stressed calves. However, you must increase minerals in the receiving diet to make up for low feed intakes. One exception is potassium. The potassium requirement of stressed calves appears to be approximately 20% greater than non-stressed calves.



It is well documented that infection and stress affect trace mineral metabolism, especially zinc and copper. However, studies evaluating the requirements of several trace minerals for stressed calves have been inconclusive. In addition, studies using organic/chelat-

ed forms of these minerals compared to inorganic forms have yielded variable or inconclusive results. These highly variable results may be due to interactions between trace mineral concentrations and sources.

Many studies have been done to see how adding selenium to calves' diet affects their health, performance, and immunity. As with other trace minerals, the test results have been inconclusive.

Vitamins

Studies on the effects of injecting or feeding vitamins to stressed calves also are not conclusive. Some studies have shown dramatic improvements in health and performance, but others have shown no effect or even negative effects.

Feeding B-vitamins, especially niacin (100 to 200 ppm), tends to decrease sickness and improve performance of stressed calves.

Giving extra Vitamin E seems to stimulate the immune response if you give it before the animal is exposed to disease. Most studies have shown improved performance and health of stressed calves fed supplemental Vitamin E in the receiving diet. However, some studies showed giving extra Vitamin E resulted in either no improvement or negative effects on performance and animal health.

Other Nutritional Factors

Many feed additives and supplements are available for use in stressed feeder calves. Both positive and negative results have been seen for most of these feed additives.

Suggested nutrient concentrations in a receiving diet for stressed feeder calves are presented in the following chart. As a general rule of thumb, receiving diets should be formulated so that the calf receives at least maintenance requirements for protein, vitamins, and minerals when feed consumption is 1.0 to 1.5% of body weight.

**Recommended Nutrient
Content of a Receiving Diet for
Market-Stressed Feeder Calves**

Nutrient	Range
Dry matter, %	82-90
Crude Protein, %	13.0-15.0
NEm, mc/cwt	60-85*
NEg, mc/cwt	36-51*
TDN%	61-72
Concentrate, %	50-70a
Calcium, %	0.5-0.7
Phosphorus, %	0.4-0.5
Potassium, %	1.0-1.3
Sodium, %	0.2-0.3
Magnesium, %	0.2-0.3
Sulfur, %	0.15-0.25
Manganese, ppm	50-100
Copper, ppm	10-20
Iron, ppm	75-125
Zinc, ppm	75-100
Selenium, ppm	0.1-0.2
Cobalt, ppm	0.1-0.2
Vitamin A, IU/lb	1500-2000**
Vitamin E, IU/lb	44-110**
Fat, %	Max 5.0

*For calves weighing 400 lb or less use the greater value; for 500 lb calves use a middle value, and for 600 lb calves and yearlings use the lower value. Feed ration with free-choice hay for the first 7 days.

** If pelleted, double value to compensate for pelleting loss.

Conclusions

Research and experience show there is no one best program for every load of calves. You and your veterinarian must be ready to adjust management to fit each load of calves.



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