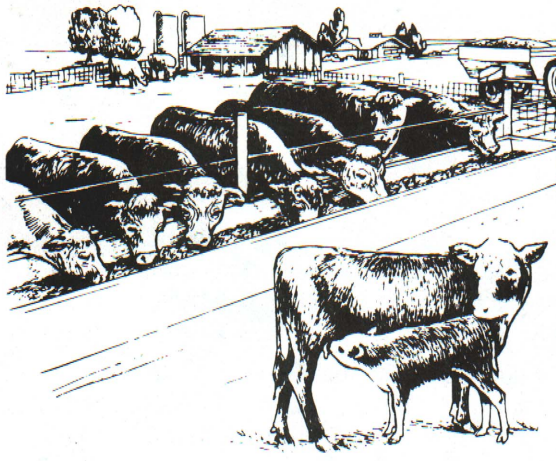
FACT SHEET 1212 — For Beef Manual
Extension Bulletin E-991, September 1976



MICHIGAN BEEF PRODUCTION

Cooperative Extension Service ⇔ Michigan State University

Determining Daily Dry Matter Intakes of Growing and Finishing Cattle

Danny G. Fox, Beef Specialist, Animal Husbandry and J. Roy Black, Extension Economist, Agricultural Economics

Feed intake is one of the key factors influencing feedlot performance. Perhaps no other factor has such an overriding importance in determining rate of gain and, ultimately, the profits derived from the feeding operation. The larger the animal's daily intake, the smaller the percentage of the energy consumed that goes for maintenance and the larger the percentage that is available for growth. This fact sheet summarizes normal daily dry matter intakes for alternative frame sizes of cattle for feeders started as calves and as yearlings. The impact on performance of above and below normal intakes is summarized.

This fact sheet is used in ration formulation and feed use projection. But, one of its most important uses is as a diagnostic tool. Cattle not eating normally are often evidence of a management error, something wrong in the feeding program or in animal health. Tables 1-3 give expected dry matter intakes for steer and heifer calves and for yearling steers. These tables are based upon research conducted at a number of experiment stations with adjustments based upon observations in farm and commercial feedlots.

Feeder cattle gradually eat less dry matter, as a percent of body weight, as they increase in weight. The rate of reduction becomes larger as the animals approach a fatness of high good to low choice. Typically, absolute daily matter intake plateaus, or decreases, once the choice grade is reached.

Yearling cattle typically eat about 10% more than calves when compared at the same weight. In adjusting for age, we have assumed yearling cattle are 30 lbs. heavier at the same *equivalent* body composition as an animal of comparable frame started on feed as a calf. A 60 lb. adjustment is used for two year old steers. These adjustments are based primarily on experience in feedlots since there is little data where cattle of the same breeding and previous nutritional history were compared in experiments.

These tables should provide reasonable benchmarks, but experience may call for adjustments in your situation. Reasons for adjustment include feedlot condition and types of feed used, such as degree of fermentation or date at which hay is cut.

Expected daily gains for four levels of grain feeding using corn-corn silage rations are summarized in Tables 4-7. These projections assume average frame steers in average flesh given a growth stimulant and that the feedlot is stress-free. Adjustment factors for other systems are contained in Fact Sheet 1099, "Performance Adjustment Factors for Sex, Frame Size, Degree of Fleshiness of Purchased Feeders, Use of Growth Stimulants, and Environment." A line is drawn through the expected gains at average intake for a particular weight. Thus, those below the line would be below average and those above the line would be above average in performance.

Adjustment for Feeding Rumensin

Rumensin is a feed additive for beef cattle that improves feed efficiency by increasing the energy available from a given amount of ration. Daily dry matter intake will average approximately 10% lower when Rumensin is fed, with a drop in intake of 10-30% when it is first fed to a drop of only 5-10% when the cattle become adjusted to it. Rate of gain is about the same, with or without Rumensin.

Thus cattle gain the same on about 10% less intake. *The expected gains in Tables 4-7 for the various weights and types of cattle would not be changed by feeding Rumensin, but the intake required to obtain the gains given in these tables would be about 10% less.*

Factors Causing Poor Intake

The daily dry matter intakes presented in Tables 1-3 are only averages. Actual intakes vary considerably as a result of the following factors:

1. **Sickness.** If your intakes are below normal, your cattle may not be healthy. A reduction in daily dry matter intake is typically one of the first signs of illness. When cattle are recovering, however, they will begin to increase intake back to normal rates.

2. **Weather.** Just prior to a change in weather, cattle will increase intake. During the change, intake will decrease and then return to normal after the change. Often, cattle will eat more at night during hot weather and more during the day during cold weather. Anticipating these changes and making appropriate adjustments in feed offered can help avoid a stale feed problem or running out of feed. If underfed and hungry, cattle will often overeat when fed and have digestive upsets. Thus, following feeding they will tend to go off feed.

3. **Stale Feed.** Cattle tend to reduce intake when feed is not fresh. It is better to have clean feedbunks for a short period of time prior to feeding than to place fresh feed on top of stale feed, hoping that the cattle will eventually clean up the left over feed. This is usually the biggest problem during periods of weather change, after a rain, or when cattle go off feed for some reason.

4. **Mud and Lot Conditions.** The greatest problem with mud occurs right behind the bunk apron where the largest amount of travel occurs. Cattle will avoid wading through mud to reach the bunk until extremely hungry. Then, they tend to overeat when they finally go to the feedbunk, causing digestive upsets. Roughness of frozen ground will cause similar problems. Typically, ground will be muddy and rough as a result of rain or snow prior to freezing. Then, it will freeze and stay rough until the ground thaws or until it is gradually worked down by the cattle.

5. **Amount of Concentrate in the Ration.** The rate of grain feeding has an impact on daily dry matter intake, particularly when high rates of grain are fed. As a working rule, dry matter intakes are similar across grain feeding rates until the rate of corn fed/day reaches 60% to 70% of ration dry matter. That is corn at the rate of 1.4% to 1.5% of body weight (dry corn equivalent) in the steer-calf feeding program. Above that level, as the rate of grain feeding is increased, the animal will typically not gain more, but will reduce feed intake. Thus, on a ration containing 10% to 15% corn silage in ration dry matter, daily intake will likely be 90% to 92% of what it is when 30% to 40% of the ration is composed of corn silage. Thus, your gains may be good on the high grain ration, even though they are eating less.

6. **Roughage Quality.** For cattle on haylage rations, the quality of the forage can have substantial impact on intake and economy of gain. For example, at the same rate of grain feeding per day, daily dry matter intake may be as much as 20% to 30% higher for high quality haylage vs. late cut weather damaged haylage. Thus, the problem of lower energy in the poor quality forage is compounded by a reduced intake.

7. **Protein Level of the Ration.** Cattle fed a ration deficient in protein will eat 10% to 20% less dry matter than those fed properly supplemented rations. As a result, gains will be considerably less than potential, and than expected. This is due to the fact that they both eat less and, since the protein level is below requirements, their efficiency of energy utilization is reduced.

Our research suggests cattle on high corn silage rations must have at least 10% protein in ration dry matter and those on high grain rations at least 8.5% to 9% to insure normal intake, even though they are near market condition and their requirements for growth are less than this. Additional protein above these levels is needed to meet the growth requirements of lighter cattle. See Fact Sheet 1097 and 1204 for a discussion of the needs for supplemental protein in corn-corn silage rations.

8. **Feed Quality.** Weather damaged or moldy feed can reduce intake, and feeding a high proportion of these types of feedstuffs will cause intake problems. A small amount of spoilage well mixed in the ration will not likely reduce intake; it is not clear what the maximum proportion of spoiled silage is that can be fed before intake is reduced.

9. **Types of Feed.** Cattle will eat some kinds of feed better than others. For example, a ration of ground hay and shelled corn will likely be consumed more readily than one based on corn silage, especially in new feeder cattle. However, the ration should be based primarily on feeds grown on the farm, and those that are least-cost sources of energy and protein. Palatability, if feedstuffs are properly harvested, stored, and supplemented, is not a major problem with high quality corn-corn silage rations.

10. **Use of Growth Stimulant.** Part of the impact of growth stimulants is to increase intake. Thus, if a growth stimulant is not used or cattle are not reimplanted at the proper intervals (about 100 days), intake may be below normal.

11. **Body Condition.** As cattle approach a fatness of low choice, it will be increasingly difficult to maintain intake. This is a result, in part, of time on feed; other factors related to body condition are important influences also. The net result is, as cattle approach the fatness of choice, the cost/unit of gain increases at faster rates as a result of lower relative intake and more energy required/lb. of gain as a result of the amount of fat relative to protein being deposited.

Table 1. Expected Daily Dry Matter Intake (lbs.) for Steers Started on Feed as Calves and Carried to Slaughter.*

Weight (lbs.)	Frame Size		
	Small (grade @ 840 lbs.)	Average (grade @ 1050 lbs.)	Large (grade @ 1260 lbs.)
400	10.91	10.91	10.91
450	11.91	11.91	11.91
500	12.89	12.89	12.89
550	13.85	13.85	13.85
600	14.78	14.78	14.78
650	15.63	15.70	15.70
700	16.18	16.59	16.95
750	16.67	17.48	17.48
800	16.97	18.34	18.34
850	17.12	18.87	19.20
900	17.12	19.37	20.04
950		19.82	20.87
1000		20.06	21.39
1050		20.24	21.88
1100		20.24	22.33
1150			22.68
1200			22.90
1250			23.07
1300			23.07

*Intakes will average 10% less if Rumensin is fed.

Table 2. Expected Daily Dry Matter Intake (lbs.) for Heifers Started on Feed as Calves and Carried to Slaughter.*

Weight (lbs.)	Frame Size		
	Small (grade @ 690 lbs.)	Average (grade @ 840 lbs.)	Large (grade @ 990 lbs.)
400	10.91	10.91	10.91
450	11.91	11.91	11.91
500	12.89	12.89	12.89
550	13.57	13.85	13.85
600	14.10	14.78	14.78
650	14.40	15.63	15.70
700	14.48	16.18	16.59
750	14.48	16.67	17.48
800		16.97	18.10
850		17.12	18.60
900		17.12	19.07
950			19.33
1000			19.52
1050			19.52

*Intakes will average 10% less if Rumensin is fed.

Table 3. Expected Daily Dry Matter Intake (lbs.) for Steers Started on Feed as Yearlings (Approximately 18 Months of Age) Off Pasture and Carried to Slaughter.*

Weight (lbs.)	Frame Size		
	Small (grade @ 880 lbs.)	Average (grade @ 1080 lbs.)	Large (grade @ 1290 lbs.)
550	13.85		
600	14.78	16.26	
650	15.70	17.27	17.27
700	16.59	18.25	18.25
750	17.48	19.22	19.22
800	18.34	20.18	20.18
850	19.20	20.99	21.11
900	19.62	21.57	22.04
950	19.62	22.12	22.95
1000		22.55	23.78
1050		22.83	24.35
1100		22.95	24.89
1150		22.95	25.39
1200			25.76
1250			26.02
1300			26.13

*Intakes will average 10% less if Rumensin is fed.

Table 4. Expected Daily Gain for an All Corn Silage Ration, Properly Supplemented.*

Lbs. daily dry matter intake	Body weight, lb.					
	450	650	850	1050	1250	
	Expected Daily Gain, Lbs.					
8	0.87	0.17				
9	1.21	0.45				
10	1.55	0.73	0.22			
11	1.87	0.99	0.45			
12	2.18	1.25	0.67	0.28		
13	2.48	1.50	0.89	0.47		
14	2.77	1.75	1.11	0.66	0.33	
15	3.06	1.99	1.32	0.85	0.50	
16	3.34	2.22	1.52	1.03	0.67	
17		2.45	1.72	1.21	0.84	
18		2.68	1.92	1.39	1.00	
19		2.90	2.11	1.57	1.16	
20		3.11	2.30	1.74	1.31	Steer Calf
21		3.32	2.49	1.91	1.47	
22			2.67	2.07	1.62	Yearling Steer
23			2.85	2.23	1.77	
24			3.03	2.39	1.91	
25			3.21	2.55	2.06	
26				2.71	2.20	
27				2.86	2.34	

*Intake needed for the indicated rate of gain will be 10% less if Rumensin is fed.

Table 5. Expected Daily Gain for Shelled Corn (Dry Corn Equivalent) at .6 to .7 lb./cwt. of Body Weight/Day Plus a Full Feed of Corn Silage.*

Lbs. daily dry matter intake	Body weight, lb. 450	650	850	1050	1250	
	Expected Daily Gain, Lbs.					
8	1.01	0.31				
9	1.36	0.59				
10	1.69	0.87	0.36			
11	2.01	1.13	0.59	0.21		
12	2.33	1.39	0.82	0.42		
13	2.63	1.65	1.04	0.61		
14	2.93	1.89	1.25	0.80	0.47	
15	3.22	2.14	1.46	0.99	0.64	
16	3.50	2.37	1.67	1.18	0.81	
17		2.60	1.87	1.36	0.98	
18		2.83	2.07	1.54	1.14	
19		3.05	2.26	1.71	1.30	
20		3.27	2.45	1.88	1.46	Steer
21		3.48	2.64	2.05	1.61	Calf
22				2.22	1.76	Yearling
23				2.38	1.91	Steer
24				2.55	2.06	
25					2.21	
26					2.35	
27					2.50	

*Intake needed for the indicated rate of gain will be 10% less if Rumensin is fed.

Table 6. Expected Daily Gain for Shelled Corn (Dry Corn Equivalent) at 1.4 to 1.5 lb./cwt. of Body Weight/Day.*

Lbs. daily dry matter intake	Body weight, lb. 450	650	850	1050	1250	
	Expected Daily Gain, Lbs.					
8	1.33	0.57				
9	1.70	0.88				
10	2.06	1.17	0.62			
11	2.41	1.46	0.88			
12	2.75	1.74	1.12	0.69		
13	3.08	2.02	1.36	0.90		
14	3.40	2.28	1.59	1.11	0.75	
15	3.71	2.54	1.82	1.31	0.93	
16	4.01	2.80	2.04	1.51	1.12	
17		3.05	2.26	1.71	1.29	
18		3.29	2.47	1.90	1.47	
19		3.53	2.68	2.09	1.64	
20		3.76	2.89	2.27	1.81	Steer
21		3.99	3.09	2.45	1.98	Calf
22			3.29	2.63	2.14	Yearling
23			3.48	2.81	2.31	Steer
24			3.67	2.98	2.47	
25			3.86	3.15	2.62	
26				3.32	2.78	
27				3.49	2.93	

*Intake needed for the indicated rate of gain will be 10% less if Rumensin is fed.

Table 7. Expected Daily Gain for Shelled Corn (Dry Corn Equivalent) at 1.8 to 1.9 lb./cwt. of Body Weight/Day.*

Lbs. daily dry matter intake	Body weight, lb. 650	850	1050	1250	
	Expected Daily Gain, Lbs.				
8	0.80	0.30	–0.05	–0.31	
9	1.13	0.59	0.21	–0.08	
10	1.45	0.86	0.45	0.15	
11	1.77	1.13	0.69	0.37	
12	2.07	1.40	0.93	0.58	
13	2.36	1.65	1.16	0.79	
14	2.64	1.90	1.38	0.99	
15	2.92	2.14	1.60	1.20	
16	3.19	2.38	1.82	1.39	
17	3.46	2.62	2.03	1.58	
18	3.72	2.84	2.23	1.77	Steer
19	3.97	3.07	2.43	1.96	Calf
20		3.29	2.63	2.14	Yearling
21		3.50	2.83	2.32	Steer
22		3.71	3.02	2.49	
23		3.92	3.21	2.67	
24			3.39	2.84	
25			3.57	3.01	

*Intake needed for the indicated rate of gain will be 10% less if Rumensin is fed.

1P-9:76-5M-UP. Price 10 cents. Single Copy Free