

Current Report

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*Limit Feeding Light-Weight Cattle
High Nutrient Density Diets*

Programmed Feeding for Calves (PROGFEED)

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For a cattleman, who has light weight cattle and who does not have adequate forage to maintain growth for some limited period of time, but has sound economic reason to retain the cattle for pasture or feeding at a later date, limit feeding may be the answer. Light weight cattle usually are grown on forages or on bulky high roughage growing diets. Another method to grow cattle at moderate rates of gain is to limit feed at a higher concentrate ration. In times of drought or with high roughage prices, limit feeding concentrates may be more economical. With limited intake of high energy diets, it may be cheaper for cattlemen to buy complete high energy feeds from feed manufacturers and achieve lower costs of gain than buying hay or forage which is expensive and difficult to transport and handle. However, more management is required to handle limit fed high concentrate diets than to feed roughages.

When limit feeding, one must calculate the amount of feed to achieve competitive but restricted gains on growing cattle. PROGFEED is a Lotus template designed to calculate the daily amount of feed for a pen of cattle. This amount varies with cattle weight, the energy values of the ration, and the desired rate of gain.

Feeding Management

Limit feeding of cattle requires special skills and facilities. Minimum requirements are:

- 1) Adequate bunk space so that most cattle can eat at one time.
- 2) Pens small enough that cattle come up to the bunk when fed.
- 3) Scales or other methods of weighing out the daily feed.
- 4) Skill on the part of the manager.
- 5) Roughage feeds to work the cattle up to a high concentrate diet.
- 6) Sufficient business management skill to assess the economic limitations and opportunities in limit feeding of cattle.

- 7) A sound plan for the use or sale of the cattle following limit growing.

First a ration must be formulated or purchased. It is simplest to calculate the ration's net energy values (NEm and NEg) on a dry matter basis. Appendix 1 gives the energy values on a number of common feeds which may be used. Rations used for limited intake growing programs require special formulation. The levels of protein, vitamins, and minerals must be increased over the levels used in ad libitum fed diets. Consult a trained nutritionist or the **1984 NRC Nutrient Requirements of Beef Cattle** for this information. After energy levels are determined, this program (PROGFEED) can be used to estimate the feed intake required to reach a target gain. The user then should compare the amounts of protein and mineral provided against the NRC tables (amount per day for a given weight and gain) and make any necessary additional adjustments.

A sample output from PROGRAMMED FEEDING FOR CALVES is on page 3. Most of the inputs are obvious. In the programs distributed on disk from OSU, all cells are protected except the ones requiring user input. This is done to prevent accidental erasure of critical formulas used in the calculations. This program will calculate the amount of feed needed by a single animal or a pen of cattle. The cattle will be fed the same amount of feed each day for a two week period. Then, based on the amount of gain presumably achieved, feed will be slightly increased the next two weeks because one is feeding a heavier animal.

All of the inputs are required except for pen number. Feed cost per cwt, the ration dry matter percentage, and the net energy values (NEm and NEg) need to be calculated from the ration or obtained from your feed supplier. The initial shrunk weight is either the off truck weight or the gross weight multiplied by 0.96 for full cattle. Programmed feeding will only work with cattle uniform in weight, size, age, and background. Sorting cattle into similar groups may be necessary before starting.

The user inputs are illustrated in the example below:

INPUTS:	
FEED COST PER CWT AS IS--->>	\$7.73
RATION DRY MATTER % --->>	90.00
NEM OF FEED, MCAL/CWT--->>	91.49
NEG OF FEED, MCAL/CWT--->>	58.00
INITIAL SHRUNK WEIGHT, LBS--->>	375.00
EXPECTED DAILY WEIGHT GAIN, LBS--->>	2.25
STEERS (1) OR HEIFERS (2)--->>	2
NUMBER OF HEAD PER PEN--->>	100
PEN NUMBER--->>	1

The user of this program should use judgment when inserting **expected daily weight gain**. Experience has shown that the net energy system, which is used in this program, is quite accurate. Target gains set between 1 pound per day and 2.5 pounds per day should be permissible. If gains are set low, the cattle

will not receive much feed. If the gains are to be set to lower levels (less than 1.75 pounds per day), the roughage level must be increased over the example ration shown in Appendix 2.

Two net energy equations (**STEERS (1) OR HEIFERS (2)**--->>) are included in this program. They are based on the 1976 NRC equations for steers (1) or heifers (2). These equations have worked well with light weight cattle.

The number of head per pen determines the amount of dry matter or AS FED feed to be delivered to the pen each day. If the feeder wishes to feed twice daily, he should enter half the number of cattle that are in the pen, and feed the amount of feed per pen twice daily.

Feed cost of gain is computed for each 2 week period. Feed cost is only a part of total cost of gain. The user can use the companion template FLCALC to evaluate total cost of gain. To do this, the average feed intake for the period must be calculated.

Apparent gains of cattle over short periods of time often are distorted by changes in "fill". Limit fed animals often have less fill than ad libitum fed animals.

PROGRAMMED FEEDING FOR CALVES

INPUTS:
 FEED COST PER CWT AS IS---->> \$7.73
 RATION DRY MATTER % ---->> 90.00
 NEM OF FEED, MCAL/CWT---->> 91.49
 NEG OF FEED, MCAL/CWT---->> 58.00
 INITIAL SHRUNK WEIGHT, LBS---->> 375.00
 EXPECTED DAILY WEIGHT GAIN, LBS---->> 2.25
 STEERS (1) OR HEIFERS (2)---->> 2
 NUMBER OF HEAD PER PEN---->> 100

PEN NUMBER---->> 1

WEEK	AVERAGE WEIGHT	PER ANIMAL /DAY		PER PEN / DAY		FEED/ONLY COST GAIN
		POUNDS DM	POUNDS AF	POUNDS DM	POUNDS AF	
1-2	390.8	9.19	10.21	919.10	1021.22	\$0.35
3-4	422.3	9.74	10.82	974.13	1082.36	\$0.37
5-6	453.8	10.28	11.42	1028.14	1142.37	\$0.39
7-8	485.3	10.81	12.01	1081.22	1201.35	\$0.41
9-10	516.8	11.33	12.59	1133.44	1259.38	\$0.43
11-12	548.3	11.85	13.17	1184.87	1316.53	\$0.45
13-14	579.8	12.36	13.73	1235.57	1372.86	\$0.47
15-16	611.3	12.86	14.28	1285.59	1428.43	\$0.49
17-18	642.8	13.35	14.83	1334.97	1483.29	\$0.51
19-20	674.3	13.84	15.37	1385.74	1537.49	\$0.53
21-22	705.8	14.32	15.91	1431.95	1591.05	\$0.55
23-24	737.3	14.80	16.44	1479.62	1644.02	\$0.56
25-26	768.8	15.27	16.96	1526.78	1696.43	\$0.58
27-28	800.3	15.73	17.48	1573.47	1748.30	\$0.60
29-30	831.8	16.20	18.00	1619.69	1799.66	\$0.62

DEVELOPED BY DONALD GILL & BRITT HICKS, 1988
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FILE NAME IS PROGFEED

APPENDIX 1

Net energy values of selected feeds expressed as megacalories per 100 pounds of dry matter. These values are for typical high quality feed ingredients found in feedlot diets.

Feed	Megacalories/Cwt DM	
	NEm	NEg
Alfalfa, dehy. 17%	66	31
Alfalfa hay, excellent	66	34
Alfalfa hay, good	57	27
Barley, 48-52#/bu.	97	64
Barley, 44-46#/bu.	80	53
Barley, 38-42#/bu.	73	46
Cane molasses	79	50
Corn, dent no. 2	103	67
Corn silage, typical feedlot	73	43
Corn silage, high grain	73	46
Corn stover	56	27
Cottonseed meal	77	50
Cottonseed hulls	47	10
Cottonseeds, whole	91	54
Fat, blend	208	127
Hominy feed	100	65
Milo, minimum process	80	53
Milo, semi process	90	60
Milo, extensive process	97	64
Sorghum silage	67	30
Soybean oil meal	87	59
Wheat	100	65
Wheat middlings	73	45
Wheat Straw	16	7

Appendix 2

The following is an example ration for a 450 pound steer to gain about 2.25 pounds per day. This is a very high concentrate ration which cattle will have to be worked up to with caution. For gains below 2 pounds per day, additional roughage may need to be added to increase feed intake.

FEED	COMPOSITION		NUTRIENTS	RATION COMPOSITION	
	DM %	AS FED %		DM %	AS FED %
ALFALFA PELLETS	8.00	7.88	NEm	91.19	81.77
CALCIUM CARB	0.94	0.87	NEg	58.00	52.01
BOVATEC 68	0.02	0.02	CRUDE PROT	15.67	14.05
CANE MOLASSES	3.50	4.18	ETHER EXT	3.61	3.23
ROLLED CORN	66.16	65.91	CRUDE FIBER	8.01	7.18
COTTON MEAL SOL	13.67	13.47	K	0.90	0.81
SALT	0.30	0.28	CA	0.56	0.50
SOYBEAN MEAL 48	2.38	2.38	PHOS	0.42	0.37
VITAMIN A-30	0.02	0.02	TDN	79.20	71.02
COTTONSEED HULLS	5.00	4.98	DRY MATTER	100.00	89.67
TOTAL	100.00		COST/CWT	8.62	7.73



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