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College of Agriculture
and Life Sciences

Animal Science

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Feeding the Cow/calf Herd

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Summary

1. *Requirements*
2. *Supply*
3. *Examples*

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Nutrition 101

Nutrients:

1. Water
2. Energy
3. Protein
4. Minerals
5. Vitamins
6. Non-nutritive factors

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Energy

Terms:

- TDN (total digestible nutrients)
- ME (Metabolizable energy)
- NE (Net energy for gain and maintenance)

Energy (cont)

Feeds:

- Grains: corn, oats
- Forages: hay, pasture
- Fermented feeds: corn silage, hay crop silage

Protein

Terms:

- Crude protein (CP)
- Soluble protein
- Escape or bypass protein

Protein (cont)

Feeds:

- Grains: wheat, rye
- Legumes: soybeans
- Forages: hay, pasture
- Fermented feeds: hay crop silage
- Byproducts: soybean meal, wheat midds

Information needed to determine requirements

1. Cow weight
2. Month since calving
3. Weaning weight
4. Peak milk
5. Stage of production (late gestation, early lactation)
6. Pounds & % TDN required
7. Pounds & % CP required

Requirements

From handout, Feeding Beef Cows and Their Nursing Calves

Table 1. Weight of male calves expected at different milk production levels

Peak Milk, lb	Month since birth		
	5	6	7
Frame size 4 (1100 lb)			
12	374	431	492
18	404	464	527
24	433	495	562
Frame size 6 (1250 lb cow)			
12	396	457	523
18	429	493	558
24	457	523	592
Frame size 7 (1320 lb cow)			
12	407	469	537
18	442	508	573
24	469	537	607
Frame size 8 (1400 lb cow)			
12	418	482	552
18	454	522	588
24	480	550	621

Requirements

****ASSUMPTION: Cow is eating a minimum of 2.2% of her weight in DM****

Table 2. Daily TDN and crude protein (CP) requirements of beef cows

Peak Milk, lb	Stage of production			
	Dry		Early lactation	
	TDN	CP	TDN	CP
-----lb (%)-----				
Frame size 4 (1100 lb cow)				
12	11.2 (53)	1.6 (8)	12.1 (56)	2.0 (9.4)
18	11.2 (53)	1.6 (8)	13.3 (60)	2.2 (10.9)
24	11.2 (53)	1.6 (8)	14.5 (65)	2.5 (12.3)
Frame size 6 (1250 lb cow)				
12	12.4 (53)	1.8 (8)	13.7 (55)	2.2 (9.2)
18	12.4 (53)	1.8 (8)	14.6 (59)	2.5 (10.2)
24	12.4 (53)	1.8 (8)	15.5 (63)	2.8 (11.3)
Frame size 7 (1320 lb cow)				
12	12.5 (53)	1.9 (8)	13.4 (55)	2.2 (9.1)
18	12.5 (53)	1.9 (8)	14.6 (59)	2.5 (10.1)
24	12.5 (53)	1.9 (8)	15.9 (63)	2.8 (11.2)
Frame size 8 (1400 lb cow)				
12	13.1 (53)	1.9 (8)	14.0 (55)	2.3 (9.0)
18	13.1 (53)	1.9 (8)	15.2 (58)	2.6 (10.0)
24	13.1 (53)	1.9 (8)	16.5 (62)	2.9 (11.0)

Information needed to determine requirements

Example

1. Cow weight – 1320 lb
2. Month since calving - 7
3. Weaning weight – 550 lb
4. Peak milk - 18
5. Stage of production (late gestation, **early lactation**)
6. Pounds & % TDN required – **12.4, 53%**
7. Pounds & % CP required – **1.9, 8%**

Describe Forage

% Dry Matter	93.9
% Adj Crude Protein	6.9
% TDN	62

Dairy One
 FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 726 WAREHOUS ROAD
 ITRACA, NEW YORK 14850
 607-257-1272 (Fax 607-257-1350)

Sample # 1502 (2469961)
 (01/08/19)(01/08/19) | Component | As Fed | DM

Analysis Results

MOISTURE | 6.1 | 93.9 | 6.9 |
 CRUDE PROTEIN | 6.4 | 6.4 | 6.4 |
 CELLULOSE | 48.2 | 48.2 | 48.2 |
 ADJUSTED CRUDE PROTEIN | 6.5 | 6.5 | 6.5 |
 DEPENDABLE FERTILIZER | 1 | 1 | 1 |
 NDF | 21.3 | 21.3 | 21.3 |
 ADF | 16.9 | 16.9 | 16.9 |
 LIGNIN | 37.6 | 37.6 | 37.6 |
 NDF | 23.0 | 23.0 | 23.0 |
 STARCH | 0.1 | 0.1 | 0.1 |
 NRC (Water Sol. Carbs) | 15.4 | 15.4 | 15.4 |
 NRC (Starch + Sugar) | 6.2 | 6.2 | 6.2 |
 TDN | 62 | 62 | 62 |
 NRC Moist/Lb | 58 | 58 | 58 |
 NRC Moist/Lb | 54 | 54 | 54 |
 RELATIVE FEED VALUE | 188 | 188 | 188 |
 TO TAKE ORC CUPFORMER SHOWS AND | Calcium | 1.21 | 1.21 |
 BE ORDERED TO WIN A \$100 VISA | Phosphorus | 1.18 | 1.18 |
 SHIP CASES! | Magnesium | 1.13 | 1.13 |

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Determining Daily Intake Requirements

Dry Matter Intake
 DMI = 2.2% BW
 DMI = 2.2% x 1320 lb
 DMI = 29 lb/d

MMG hay

TDN, lb = DMI x TDN%
 TDN, lb = 29 x 62%
 TDN, lb = 18
 Reqt, lb = 12.4

Energy needs are met

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Determining Daily Intake Requirements

DMI = 2.2% BW
 DMI = 2.2% x 1320 lb
 DMI = 29 lb/d

MMG hay

CP, lb = DMI x CP%
 CP, lb = 29 x 6.9%
 CP, lb = 2.0
 Reqt, lb = 1.9

However NDF > 50% restricts DMI
 NDF of this hay = 61.3%
 Predicted DMI = 24 lb
 CP, lb = 24 x 6.9% = 1.7

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Describe Forage

% Dry Matter	58.8
% Adj Crude Protein	15.7
% TDN	55

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Sample # 1502 (2469961)
 (01/08/19)(01/08/19) | Component | As Fed | DM

Analysis Results

MOISTURE | 41.2 | 58.8 | 15.7 |
 CRUDE PROTEIN | 17.2 | 17.2 | 17.2 |
 AVAILABLE PROTEIN | 14.7 | 14.7 | 14.7 |
 ADF | 1.5 | 1.5 | 1.5 |
 ADJUSTED CRUDE PROTEIN | 15.7 | 15.7 | 15.7 |
 DEPENDABLE FERTILIZER | 1 | 1 | 1 |
 NDF | 21.3 | 21.3 | 21.3 |
 ADF | 16.9 | 16.9 | 16.9 |
 LIGNIN | 37.6 | 37.6 | 37.6 |
 NDF | 23.0 | 23.0 | 23.0 |
 STARCH | 0.1 | 0.1 | 0.1 |
 NRC (Water Sol. Carbs) | 5.7 | 5.7 | 5.7 |
 NRC (Starch + Sugar) | 1.2 | 1.2 | 1.2 |
 TDN | 55 | 55 | 55 |
 NRC Moist/Lb | 58 | 58 | 58 |
 NRC Moist/Lb | 54 | 54 | 54 |
 RELATIVE FEED VALUE | 188 | 188 | 188 |
 TO TAKE ORC CUPFORMER SHOWS AND | Calcium | 1.21 | 1.21 |
 BE ORDERED TO WIN A \$100 VISA | Phosphorus | 1.18 | 1.18 |
 SHIP CASES! | Magnesium | 1.13 | 1.13 |

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Determining Daily Intake Requirements

DMI = 2.2% BW
 DMI = 2.2% x 1320 lb
 DMI = 29 lb/d

Clover baleage

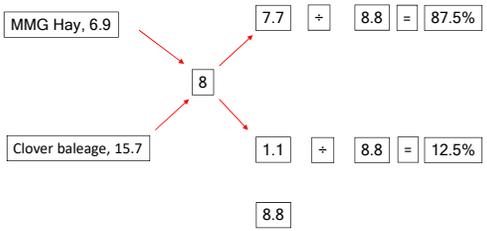


TDN, lb = DMI x TDN%
 TDN, lb = 29 x 55%
 TDN, lb = 16
 Reqt, lb = 12.4

CP, lb = DMI x CP%
 CP, lb = 29 x 15.7%
 CP, lb = 4.6
 Reqt, lb = 1.9

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Pearson square to balance ration



MMG Hay, 6.9

7.7 ÷ 8.8 = 87.5%

8

Clover baleage, 15.7

1.1 ÷ 8.8 = 12.5%

8.8

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Determining Daily Intake Requirements

MMG Hay 87.5% x 29 = 25 lb DM

25 lb DM ÷ 94% = 27 lb AF

Clover baleage 12.5% x 29 = 4 lb DM

4 lb DM ÷ 59% = 8 lb AF

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Why use MMG hay?

If hay cost is \$70/t, baleage must be \$45/t

Baleage ration. 29 lb DMI = 49 lb AF @ \$45/t = \$1.10/hd/day

MMG + Hay. 27 lb hay @ \$70/t = \$.94/hd/day
 8 lb baleage @ \$45/t = \$.18/hd/day
 Total = \$1.12/hd/day

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Summary

1. *Overfeeding is expensive*
2. *Underfeeding is expensive*
3. *Determine requirements*
4. *Forage test*
5. *Balance for optimal performance*

