



FEEDING SYSTEMS

- Total mixed rations (TMR)
- Electronic grain feeders
- Grain fed in the milk parlor
- Individually top dressed
- Intensive pasture

TMR Principles

- All feed ingredients are included
- The ration is uniformly blended
- Predetermined nutrient levels
- Offered free choice



How Much to Feed?



Feeding a TMR Free Choice

- Feed bunk management is critical
 - 2-4% weigh back (orts); as fed
 - 400-800# feed in a 200-cow pen, \$\$\$\$
 - Weigh back is uniform
 - Weigh back is not sorted
 - Feed is available > 20 hours a day
 - Think about time away from the bunk (milking)

Empty Bunk?



TMR GUIDELINES

- Avoid rations over 50% moisture from fermented feeds
- May want to add water to reach 50-55% DM; decreases sorting, increase palatability
- Seasonal feeding for less spoilage and greater intakes
 - Offer larger portions in early evening during summer
- Reformulate if wet ration ingredients change
 - Need to monitor the dry matter content of wet feeds

MEASURING DRY MATTER IN SILAGES AND TMR

- Koster tester
(\$300)
- Microwave oven
(\$25 to \$100)
- Electronic moisture tester
(\$200 to \$300)

Rations Delivered to the Cow



- The ration on paper
- The ration in the bunk
- The ration consumed by the cow
- The ration absorbed in the blood stream

The Ration on Paper

- Inputs are good if they are correct
 - Cows
 - Parity, BW, milk production, composition, #cows in pen
 - Feed ingredients
 - Actual feed analysis
 - Properly sampled
 - Identify lots/stacks for proper mixing
 - Sources constantly changing on large dairies

The Ration on Paper

- Most use equations from NRC with slight changes
 - Dairy Nutrition Software
 - NRC
 - Straight-forward
 - Equations and calculations well described
 - Does not include feed costs
 - Cost is good! (i.e., free)
 - Others
 - Spartan Dairy Ration Program 3.0
 - CPM/CNCPS
 - » Both provide least cost formulation

The Ration in the Bunk

- Mixing proper amounts of ingredients is required
- What error rate is allowable? (<3%)
 - 10 ton mixes with some components representing very minor portions
 - Expectation when using a large payloader



- Determine using feed monitoring systems
(e.g., EZ Feed, Feed Watch, TMR Tracker, Feed Supervisor)

The Ration in the Bunk

- Mixing order and times
 - Function of ingredients and composition
 - Also, feed truck plays a significant role
 - Vertical vs horizontal mixer
- Impact on forage length
- Desire is for a consistent TMR in front of the cows every day!!!



The Ration Consumed

- Is one end of the bunk similar to the other end?
- Is sorting occurring?
 - Check through Penn State separator box and proximate analysis



The Ration Consumed

Variation in ADF

Herd	Calculated	Tested	Orts
	----- % ADF -----		
A	24.2	22.3	29.5
B	19.4	21.2	28.0
C	17.9	19.2	20.1

Tested checks for mixing or feed analysis issues
Orts checks for sorting

NOTE: Lots of fiber left in bunk of Herds A & B (i.e., sorting)

The Ration Consumed

Variation in Crude Protein

Herd	Calculated ----- % CP -----	Tested % CP	Orts
A	18.7	19.7	17.0
B	18.3	21.1	18.8
C	15.4	16.4	15.7

Tested checks for mixing or feed analysis issues
Orts checks for sorting

Testing TMR OR Weigh Backs

USE THE 1-2-3 RULE

- 1: +/- one unit of crude protein
- 2: +/- two units of ADF
- 3: +/- three units of dry matter

TMR: CALCULATED VS TESTED TMR

WEIGH BACK: TESTED TMR VS ORTS

The Ration Absorbed



Depends on what is formulated, delivered and consumed

Impacts are on nutrients consumed and effects on rumen fermentation that the computer does not assume or detect

NEED TO LOOK AT COWS

Dairy Quality Feeds

Feed	CP	ADF	NDF	Starch (NSC)
Hay	>20	27-30	<40	
Haylage	20	25-26	<40	
Corn silage	7-8	<28	<48	28-33 (>30)

Sources

- Some slides adapted from Dairy Nutrition & Management (ANSCI 200/492), University of Illinois at Urbana-Champaign, Dr. Mike Hutjens