



## Feeding Total Mixed Rations

Feeding a Total Mixed Ration (TMR) has become a common practice on today's dairy farms. Many producers feed the same TMR to all lactating cows. This does simplify the feeding chore and may reduce mixing errors. But, it is not the most economical feeding program. Especially in times of low milk prices and/or high feed costs, feeding two to four different rations can improve the bottom line. Dr. Norman St-Pierre at Ohio State presented data from 2002 when milk prices were \$12 per cwt. and feed costs were fairly low (about 6 cents per lb of dry matter).

| No. of Rations | Avg. Milk        |               |
|----------------|------------------|---------------|
|                | Production (lbs) | I.O.F.C. (\$) |
| 1              | 77.4             | 6.12          |
| 2              | 77.8             | 6.24          |
| 3              | 78.3             | 6.33          |

The number of rations that could be formulated depends upon grouping capabilities, herd production level, and TMR mixing capacity. There are many ways to group milking cows (Williams & Oltenacu JDS 75:155, 1992). The following represents one method that probably offers the most economy.

|              | High/<br>Not | High/<br>Pregnant | Near<br>Dry | Hos-<br>pital   |
|--------------|--------------|-------------------|-------------|-----------------|
| State: Fresh | Pregnant     | Pregnant          | Dry         | pital           |
| DIM:         | <35          | 35~175            | 150-325     | 1 week variable |

General management and feeding recommendations for each group are:

- **Fresh cows** – includes all cows up to 5 weeks after calving. A separate group: allows more closely monitoring of health problems, provides more cow comfort and bunk space and allows

for the possibility of milking more frequently. The primary challenge for a feeding program is the gap between intake and requirements. Rumen function is not quite in full gear and the risk of acidosis is high.

The ration – It is not practical to close the energy gap. Feeding supplemental fat to raise energy density sometimes increases milk production, sometimes lowers intake, and seldom closes the gap (Harvatine & Allen JDS 89:1081, 2006). Because of the acidosis risk, the energy density should be moderate (0.74-0.76 Mcals/lb) and fiber levels should be more than adequate.

Microbial output from the rumen is lower, and protein reserves are limited. This is the group needing the highest protein density (18-20%) and rumen undegradable protein. Also, because of the lower intake, mineral and vitamin levels should be high per lb of dry matter.

**Expected Feed Efficiency (lbs milk/lbs DM):** 1.7-2.0. More than 2 and the cow is probably losing too much body condition.

- **High/Not Pregnant** – peak milk and peak appetite occurs during this time. Cows need the highest energy density (0.77-0.80 Mcals/lb) in this ration. Rumen microbial protein output should be high, and protein density around 17% should be adequate (Olmos et al JDS 89:1704, 2006) unless fresh cows are included in this group. Some producers will have a separate group for first lactation heifers, but the ration formulation can be the same although fed at a lower amount.

Fill from fiber can be a limiting intake factor, and the best quality forages should be fed here.

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**Cumulative 3.5% FCM Yield (lbs) By Stage Of Lactation**

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| DIM     | BMR <sup>3</sup> Forage | Control | Difference |
|---------|-------------------------|---------|------------|
| 0-50    | 3,949                   | 3,892   | +57        |
| 50-150  | 7,570                   | 7,100   | +470       |
| 150-300 | 8,718                   | 8,427   | +291       |

Longuski et al 2000

**Benefits of various feed additives are most likely to accrue here.**

**Expected Feed Efficiency: 1.5-1.8**

- **High & Pregnant** – These cows should be rebuilding body reserves and do not require as high a nutrient density. However, if energy density drops by more than 0.03 Mcals/lb from the high/not pregnant group, milk production is likely to greatly drop when cows are moved. Significant feed cost savings are primarily obtained by reducing protein (15-16% of DM) and reducing various feed additives.  
**Expected Feed Efficiency: 1.3-1.6.**
- **Near Dry** – many of today’s cows are still producing well (>30 lbs) when it is time for them to go dry. These cows are at high risk of

developing mastitis. Feeding a low energy (<0.70 Mcal/lb) ration will cause a sharp drop in production. The objective is not feed cost savings but to properly dry-off the cow. This ration should not be fed longer than a week, thus the feasibility of this grouping depends upon cow numbers. Placing cows that are simply gaining too much body condition onto this ration will not help control condition because the cow will drop in milk.

- **Hospital Pen** – these cows will vary in reproductive stage and level of milk production, making exact ration formulation difficult. It is probably best to feed a ration similar to the high-pregnant TMR. Addition of **Vigortone Lacto Edge**<sup>®</sup> can help cows rebuild appetite.

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**Effects Of Top Dressing Lacto Edge On TMR Fed To Hospital Cows On Milk 30 Days After Leaving Hospital Pen**

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| Control |            | Lacto Edge |        |            |            |
|---------|------------|------------|--------|------------|------------|
| # Cows  | Status     | Milk (lbs) | # Cows | Status     | Milk (lbs) |
| 38      | Just Fresh | 78.1       | 89     | Just Fresh | 91.7       |
| 52      | Sick       | 69.4       | 36     | Sick       | 80.8       |

Key Words: TMR, Grouping, Feed Efficiency