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**AT THE FEED BUNK WITH JANET:  
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Feeding and Managing for  
Components

## Feeding and Managing for Components

In my practice I am regularly being asked to lower fat % (BF%), increase BF% or increase protein % (MP%) in a herds' milk; the decision is usually based upon the "Milk Cheque" and/or cow health.

**Diets that cause low BF% tests may also cause acidosis, laminitis, displaced abomasums and feed intake problems.**

However, MP% content is being emphasized as BF% price differentials decline due to the public's demand for low-fat dairy foods.



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# Feeding Strategies to Maximize Milk Solids

## Factors that affect milk composition include:

- ✓ **Genetics** 55% of the variation in milk solid composition is due to genetics. 45% is due to environmental factors such as feeding management.
- ✓ **Stage of lactation**
- ✓ **Level of milk production**
- ✓ **Age of cow**
- ✓ **Environment**
- ✓ **Disease** (for example mastitis)
- ✓ **Nutrition**
- ✓ **Feed additives/medications** (e.g. sodium bicarb and Rumensin).



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## Feeding Strategies to Maximize Milk Solids

The following are critical to maximizing solids in milk:

- Proper ration formulation.
- **Maximum dry matter intake intake.**
- Monitoring diet composition (routine forage and feed analysis).
- **Harvesting &/or buying high quality forage.**
- Properly feeding protein, energy, fibre, mineral and vitamins.



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## Maximize Dry Matter Intake

The importance of maximizing feed intake is related to minimizing negative energy balance during early lactation.

As cows move into positive energy balance, body weight is regained, cows produce milk of normal fat and protein composition.

Increased dry matter intake (DMI) can improve MP% by 0.2 to 0.3 units. This increased MP% may be due to overall increase in balanced energy intake as total feed intake increase.



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## Maximize Dry Matter Intake

If your cows are consuming less than 3.5% to 4.0% of their body weight, consider the following factors that will impact upon the DMI of your herd:

- ✓ **Feed bunk management (bunks must be clean, adequate in size 0.8 metre/cow, shaded etc.).**
- ✓ **High quality feed should be in front of cows 24 hours a day.**
- ✓ **Rations should contain approximately 50% moisture.**



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# Maximize Dry Matter Intake



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## Maximize Dry Matter Intake

- ✓ Social interactions (boss cow problems when heifers and mature cows are mixed together in one group).
- ✓ Sudden ration changes without rumen adaptation will cause extreme drops in DMI
- ✓ Proper housing including flooring and ventilation. Cows will drop drastically in DMI and production when temperatures exceed 21' C.



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## Concentrate Feeding

Properly feeding concentrates primarily involves maintaining adequate, but not excess, fibres both as NDF, ADF and effective fibre, as well as monitoring forage to concentrate ratios.

In addition, non-fibrous carbohydrates (NFC or NSC) must be maintained between 35 to 40% for milking animals and dietary starch range between 25 and 30% of DM.



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## Concentrate Feeding

Over feeding NFC (i.e.>40%) often leads to increases in MP% of 0.2 to 0.3% with an associated depression in BF %.

However, this can be extremely dangerous in terms of the metabolic health of the cow and is often highly associated with acidosis, laminitis, displaced abomasums etc.

*Personally, I will not go above 38% NFC.*



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## Concentrate Feeding

### Guidelines for managing concentrates include:

- ✓ Limit grain to a maximum of 2 kg per feeding to avoid “slug feeding”
- ✓ Manure with high levels of undigested grain indicates that grain is being over fed or soluble protein levels and NFC levels are out of balance resulting in poor rumen fermentation.
- ✓ Grain processing can also influence milk composition; rolled or ground barley or flaked corn causes a rapid and severe decrease in BF%; flaked corn may increase milk protein %.
- ✓ Oats may decrease MP% by 0.2% compared with barley.



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## Fibre Levels

The cow's fibre requirements consist of 2 types of fibre:

1. Chemical fibre (ADF & NDF)
2. Fibre from particle size.

Both the level of the chemical fibre and particle size contribute to the effectiveness of a fibre source for stimulating rumination, salivation and maintaining normal milk fat and protein levels.



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## Fibre Levels

At the barn level:

- ✓ **Minimum ADF levels are between 18-21%.**
- ✓ **NDF levels should not fall below 28%.**
- ✓ **To assure adequate particle length, forage should not be chopped to less than 1 cm theoretical cut length. Chopping finer would dramatically decrease BF% and increase MP % by 0.2 to 0.3%. *The cow and her rumen are not healthy.***
- ✓ **Rations too *high* in fibre (i.e. too low in energy) limit milk protein production because energy is limited.**
- ✓ **Forage length that is TOO long (all pieces >5 cm) encourage sorting and transient acidosis.**



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## Fibre Levels

So what's the big deal with sorting?

- **Less rumination and cud chewing.**
- Digestive upsets and fluctuation in intake.
- **A drop in milk production and reproduction.**
- Low or erratic BF%.
- **Laminitis, sole ulcers, white line disease**
- Higher incidences of displaced abomasums.
- **Depressed immune system, body abscesses.**



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## Fibre Levels

How can we prevent “sorting”?

- ✓ **Ensure total ration moisture is between 46 to 55%.  
If too dry, add water or products such as wet brewers grains.**
- ✓ **Limit dry hay (or straw in the case of heifers and FAD cows) to 1 to 2 kg/hd/day.**
- ✓ **Limit maximum fibre length to 5 cm or less.**
- ✓ **Processed corn silage helps; the presence of husks and cobs in the TMR promotes sorting.**
- ✓ **Feed more frequently or push-up frequently.**



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## Fibre Digestibility's

Most labs now offer *fibre digestibility analysis* (ask for the 48 hour in vitro test).

Knowing the digestibility of the fibre in your forages will help to:

- ✓ Determine which forages fit in best to which production group.
- ✓ Fibre digestibility's are useful in determining whether substituting expensive, high fibre by-products for concentrate or increasing forage in the diet would help increase BF% w/o reducing milk volume e.g. beet pulp, soy hulls, straw, fuzzy cottonseed.



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# Fibre Digestibility's



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## Fibre Digestibility's



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## Protein Levels

Meeting the cow's requirement for both CP and by-pass protein is essential to maintaining normal MP %.

High production dairy cows require a CP level of at least 18%, almost half of which should exist in the by-pass component.

- ✓ **Dietary CP levels affects milk yield but not MP %, unless the ration is deficient in CP.**
- ✓ **Excessive degradable protein (i.e. urea) can reduce MP %.**



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## Feeding Fat

It is essential to follow certain precautions when feeding fat to avoid a drop in MP% level. Fats should be added to the ration slowly, take 2 to 4 weeks to reach the maximum fat level in the diet.

- ✓ **3% of ration DM should come from fats found in forages, grains etc.**
- ✓ **2 to 4% should come from natural fat sources such as tallow and vegetable oils**
- ✓ **2 % should come from protected fats such as Megalac or Boosterfat.**

✓ **The Total fat content of the ration DM should not exceed 7%.**



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## Feed Additives/Medications

Certain feed additive will alter the volatile fatty acid (VFA) fermentation patterns in the rumen thereby changing the milk fat and milk protein levels in the milk.

**The 2 most common products used in Canada are:**

1. **Buffers, specifically sodium bicarb. Buffers shift the VFA levels over to favouring acetic acid, thereby promoting the manufacturing of milk fat.**

**I use 150-220 g/h/d of sodium bicarbonate with 50-100 g/h/d of Mgox (which is actually an alkalizer). Adjust salt in the TMR accordingly.**



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## Feed Additives/Medications

### 2. The ionophore Rumensin (monensin) by Eli Lilly.

Rumensin, on the other hand, favours propionic acid production and can narrow the fat/protein ratio in milk.

There is some concern that Rumensin at elevated doses may depress BF%; in fact Elanco/Provel now has a claim to that effect.

The benefits in terms of reduction in ketosis, increased BCS and feed efficiency far out way any risk of BF% depression.



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## Feed Additives/Medications

I am a long time fan of *Rumensin*, both as the CRC bolus (legal in Canada only, not the US) and in lactating premixes.

I recommend putting in a *CRC bolus 3 weeks prepartum*, NO *Rumensin* in the dry cow premix and *200 mg/h/d of monensin in the lactating premix*.



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## Feed Additives/Medications

Yeast culture and yeast stimulate fibre-digesting bacteria, stabilize rumen environment and utilize lactic acid.

I do not use it across all herds but put it in herds under stress and to combat heat stress.



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# Management Factors and their Effects on Components

Management Factors	Milk Fat %	Milk Protein%
MAXIMUM INTAKE	INCREASE	INCREASE 0.2 TO 0.3 UNITS
INCREASED FEEDING FREQUENCY OF GRAIN	INCREASED 0.2 TO 0.3 UNITS	MAY INCREASE SLIGHTLY
UNDERFEEDING ENERGY	LITTLE EFFECT	DECREASE 0.1 TO 0.4 UNITS
HIGH NSC (>40%)	DECREASE BY > 1.0%	INCREASE 0.1 TO 0.2 UNITS
NORMAL NSC (35 TO 40%)	INCREASE	MAINTAIN NORMAL LEVEL



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# Management Factors and their Effects on Components

Management Factors	Milk Fat %	Milk Protein%
EXCESSIVELY HIGH FIBRE	MARGINAL INCREASE	DECREASE 0.1 TO 0.4 UNITS
LOW FIBRE (<26% NDF)	DECREASE BY 1% OR MORE	INCREASE 0.2 TO 0.3 UNITS
SMALL PARTICLE LENGTH	DECREASE BY 1% OR MORE	INCREASE 0.2 TO 0.3 UNITS
HIGH CP	NO EFFECT	INCREASE IF PREVIOUS DIET WAS DEFICIENT
LOW CP	NO EFFECT	DECREASE IF DIET IS DEFICIENT



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# Management Factors and their Effects on Components

Management Factors	Milk Fat %	Milk Protein%
BY PASS PROTEIN ADEQUATE	NO EFFECT	INCREASE IF PREVIOUS DIET WAS DEFICIENT
ADDED FAT >7% OR FAT INTRODUCED TOO QUICKLY	VARIABLE	DECREASE BY A LOT!



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