5 FACTORS AFFECTING MILK FAT PRODUCTION

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1. MANAGEMENT

- Genetic selection criteria
  - Genetics of the male AND the female
  - kg of fat or differential in milk fat %
  - Check potential of cows and heifers
- Increase number of meals/day - aim to minimize the size of rumen pH decrease
  - Component-fed herds
    - Maximum of 4kg of concentrates per meal
    - Evaluate if weights of feed ingredients is accurate. Check robot/robot calibration
  - TMRfeed 2 times/day vs. 1 time/day
    - Increase feeding frequency from once to twice daily, if possible
    - Research indicates that this can result in +1.42kg of DMI, +2.0kg of milk/cow/day, less sorting (Sova et al., 2013)
- Sorting
  - Discuss Penn State Shaker Box new standards (3 vs. 4 trays) with your Dairy Nutrition Advisor, paying special attention to:
    - Particle length before and after storage in the silo
    - Mixing time
    - Too many long particles allow a great deal of sorting
    - Ingredient mixing order in the TMR
  - Ask your Dairy Nutrition Advisor to evaluate sorting with Penn State Shaker Box looking at differences in feed offered and refused
- Bulk tank
  - Milk which freezes in the tank can result in fat remaining in the bulk tank after pickup
  - Milk is "over agitated" in the pipeline or the tank
  - Ensure your milk tank is cooling properly. It should shut off 15 minutes following milking. If not cooling properly, use a plate cooler.
  - Poor sampling during milk collection

2. ANIMALS

- Breed
  - E.g. Holstein vs. Jersey
- Days in milk (DIM) of the herd
  - As DIM decreases, the milk fat concentration decreases (dilution)
- Season
  - On average, milk fat is 0.2% lower in summer months
- Parity of the herd
  - Fat test decreases about 0.2% per lactation between first and the fifth (more milk and more mastitis risk)

3. ENVIRONMENT

- Feed bunk managment (slug feeding)
  - Insufficient feeding space (minimum 24 inches per cow)
  - Limited access to the feed bunk (minimum 20 hours /day)
  - Varying feeding schedule (ration should be fed 2x and pushed up 3 to 6x/day)
  - Competition at feed bunk (space and quantity, target 3-5% refusal)
- Heat stress (effect on DMI and rumen health)
- Overcrowding
  - Research indicates that increasing animal density from 100% to 142% reduces the fat test from 3.84% to 3.67% (Krawczel, P. and Grant, R., 2009)

4. NUTRITION

- Rumen fibre mat
  - Feed dry hay before concentrates in component-fed herds
- Grain texture
  - Flaked vs. rolled vs. ground
    - Negative effect on milk fat when texture is too fine (especially with high moisture corn)
- Forage texture
  - Silage particles (less than ½ in. of length)
  - Monitor silage particle length at time of feed out as well as out of silo/bunker
- Fibre levels
  - Discuss the minimum insoluble fibre (IF) levels with your Dairy Nutrition Advisor. Recommended minimums are provided below:
    - Haylage 23
    - Haylage (>70%) 24
    - Corn silage and hay silage 25
    - Corn silage (>70%) 26
    - BMR corn silage 27
- Forage dry matter
  - Wet rations can decrease DMI, meaning that more concentrates will be required for the same production
  - Regularly measure the dry matter % of forages
- Use hay or fibrous by-products as part of the ration
  - Mature grass hay or legume
  - Beet pulp
  - Soybean hulls
  - Wheat shorts
  - Whole cotton seed
  - Chopped straw, particle length 5-7.5cm (2-3 in.) mixed in TMR
- Minimize energy deficits
  - About half of the fatty acids in milk come from the diet, but this can decrease during energy deficit, typically seen as a loss of body condition
  - Ensure the formulated diet is offered to the cows and discuss any adjustments with your Dairy Nutrition Advisor
- Discuss the inclusion of additional fat sources to the ration with your Dairy Nutrition Advisor
  - Increases energy intake, making room for more forage
  - Use saturated fats (animal fat) to decrease risk of milk fat depression
  - Rumen protected fats E.g. APF +, Megalac, Energy Booster, where allowed
  - Limit unsaturated fats (vegetable oils, pay attention to forage analysis values, especially grasses)
- RUFAL (Rumen Unsaturated Fatty Acids Level) - a measurement used by Dairy Nutrition Advisors to guide the use of fat sources
  - RUFAL is over 2.5% of total dry matter in the ration may result in decreased milk fat
  - Young forages and pasture contain more polyunsaturated fatty acids (PUFA)
  - Grasses contain more PUFA than legumes
  - Some ingredients have higher PUFA content
    - Corn, soybeans and canola meal, bakery meal, cotton seeds, flaxseed meal, roasted soybeans, and corn distillers grains
  - Analyze the fat content of the by-products used on-farm
  - Factors affecting rumen function (acidosis, non-fermented forages, slug feeding) are likely to exacerbate RUFAL effects
- Discuss carbohydrate surplus in the rumen with your Dairy Nutrition Advisor, who uses this key diet formulation value
  - Factors affecting carbohydrates in the rumen are:
    - % of grain in ration
    - Grain source: dry vs. wet
    - Amount of haylage
    - Storage time of corn silage and high moisture corn
      - The digestibility of carbohydrates increases with time
    - Round bales

4. NUTRITION

- Amino acids - your Dairy Nutrition Advisor uses many nutritional parameters to successfully balance rations for your herd
  - NEWTON® requires the D.M. of forages and the real intakes of cows in order to successfully balance on amino acids, carbohydrates and energy
    - Ensure if the ration being fed is the same as the NEWTON ration before making any changes
- Minerals
  - Magnesium, target 0.36% in rations
  - Chlorine, do not exceed 0.7% in rations
  - Potassium, target minimum 1.3% in rations, and increase by 0.3% more in the summer months
  - Sulphur, target a minimum of 0.2% of DMI
- DCAD in lactating cows
  - Target a DCAD of +30mEq/100g (Shire and Beede, 2013)
  - The higher the DCAD, the higher the effect of palmitic fat
- RM104®
  - Improves rumen health, decreases % of concentrates, increases room to add more fibre to the ration when used as a rumen modifier
- Sodium bicarbonate
  - Buffer effect for decreased rumen pH variation
- Yeasts
  - Buffer effect on ruminal pH
- B vitamin complex
  - Supports liver lipid metabolism, increasing the cow's energy intake and efficiency
- Rumensin
  - Decreases % concentrates if used as a rumen modifer; increases space in the ration for fibre
  - Not a direct cause for the decrease of the fat test result, but if the rumen environment is disturbed, it may increase the problem

5. SELKO® CREMALTO®

- Selko Cremalto, when supplemented in controlled studies by Trouw Nutrition research, has resulted in observations of a significant increase of 109g of fat per day in multiparous cows.

N.B.: Following a period of stress, it takes 7 to 10 days to see a drop in the milk fat test results and it can take between 10 and 14 days before seeing the beneficial effects of a change (A. Lock, S-G Dairy Seminar, 2017).

Rumen health and stability are crucial aspects to examine because they have a major impact on the milk fat test result.

Go back to the basics.

Do not make any assumptions. There are no miracle products or formulations.

It may seem nothing has changed on the farm, but something has definitely changed.

For more information talk to your Dairy Nutrition Advisor or local Shur-Gain® dealer.