

Improving Butterfat: Using Components To Drive Profitability



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With the economic challenges facing the dairy industry today, farmers are looking for any and every way to increase profit and maintain sustainability. We are currently in a market where the volume of milk is exceeding the demand. In this situation, striving

to produce more milk can be expensive and often have a minimal return. An alternative to increased volume is increasing the nutrient quality of the milk through higher butterfat content. This can make a large impact on a farm's bottom line. In July of 2019, the average national price paid for butterfat was \$2.69 per pound.¹ A cow producing 75 pounds of milk could increase income by \$0.30 per day if butterfat content was raised from 3.6 to 3.9%. Along with the economic impact, higher components are also a sign of good rumen health indicating efficient digestion. Increasing butterfat is not always easy, but there are strategies that can help improve milk components to drive a farm's profitability.

Rumen pH

Acidosis, caused by low rumen pH, is one of the first things to look at when attempting to increase fat tests on a dairy. Sub-acute rumen acidosis (SARA) occurs when the rumen pH drops to levels between 5.2 and 6.0 for prolonged periods of time.² A healthy rumen should maintain a pH of between 6.0 and 6.4. This lowering of the rumen pH can occur for multiple reasons with two of the most common being diet formulation and timing of feeding.

Two major factors to look at in the ration that influence rumen pH are carbohydrate level and source. Starch and sugar levels should also be evaluated. Diets containing a combined level of starch and sugar greater than 30% can begin to cause a drop in rumen pH because of the increased amount of propionic acid produced when starches and sugars are introduced to the rumen. Sugar is soluble in the rumen and is readily available to the rumen microbes. Good rumen microbe health is needed for microbes to grow and properly ferment



fiber. However, this rapid breakdown of sugar in the rumen can cause low rumen pH if the sugar levels are too high. Typically, in high producing dairy cow diets, sugar levels of 5-7% are desired. When looking at starch in the diet, levels of 22-26% are targeted. It is not only the total level, but the source of starch that is very important. Corn silage and high moisture corn are ensiled. This ensiling process increases the fermentability of the feed in the rumen because the fermentation has already started in feed storage. While this can create more complete utilization in the rumen, it increases the risk of lowering the rumen pH because of how rapidly the feeds ferment. When evaluating carbohydrate levels, the fiber level of the diet also needs to be considered. Acid detergent fiber (ADF) and neutral detergent fiber (NDF) levels in the diet should be assessed. ADF level should be no less than 19% of the total diet on a dry matter basis. NDF level should be no less than 27% of the total diet on a dry matter basis. Sugar feeds the rumen microbes, whose job is to break down fiber, which promotes rumination and cud chewing. When cows chew their cud, they naturally produce sodium bicarbonate in their saliva. Sodium bicarbonate is a buffer that helps neutralize

rumen pH, decreasing the risk of SARA and improving butterfat tests.

Once the nutrient composition of the diet has been examined, the timing of feeding and feeding behavior should be reviewed. Any time large amounts of grain are fed or consumed; the rumen pH drops. When cows eat many, smaller meals a day the risk of SARA is reduced; hence the benefit of a total mixed ration (TMR). With a TMR, cows essentially get the same composition of nutrients with every bite that is taken. This keeps consistency and balance in the rumen compared to component feeding. If cows sort the TMR and pick through to find the grain and concentrate particles, the feeding situation has now essentially turned back into slug feeding. Eliminating sorting and striving for consistency is critical. Multiple feed, or feed push up events along with the avoidance of sorting, help keep intake consistent. Any time new feed is delivered, or feed is pushed up, it stimulates cows to get up and eat. If cows are only being fed one or two times a day, and no feed is pushed up in between those times, they will consume the majority of their feed only during those times. This again essentially creates a slug feeding approach. To prevent this, provide adequate bunk space (30" per head for fresh cows and 24" per head for lactating cows) to eliminate competition and provide a minimum of 6 feed events a day (meaning the combination of feedings and push ups is 6 or greater).

Fatty Acids

While the relationship of rumen pH and butterfat has been understood for quite some time, more recent research has taken place giving a better understanding of dietary fat level and type. Unsaturated fatty acids, like vegetable fats, can cause milk fat depression. When unsaturated fatty acids enter the rumen, they must undergo a process called bio dehydrogenation. This is the process in which the rumen turns the unsaturated fatty acids into saturated fatty acids that then leave the rumen and are used by the cow. During this bio dehydrogenation process, trans fatty intermediaries are formed that can lead to major drops in butterfat percentage.³ Rumen Unsaturated Fatty Acid Load

(RUFAL) is a measurement that is used to monitor the amount of unsaturated fatty acids in the diet. Diets containing more than 3% RUFAL pose a higher risk to causing milk fat depression. Ingredients in a diet that can lead to this issue include:

1. Distillers Grains
2. Raw Soybeans
3. Full Fat Roasted Beans
4. Cottonseed
5. Vegetable Oils
6. Extruded Soybean Meal

Feed Additives

Rumensin[®] is a common ingredient used in the dairy industry to increase feed efficiency and milk production. Unfortunately, butterfat level often drops as Rumensin[®] is added to the ration. Rumensin[®] is a feed grade antibiotic that functions by killing fiber digesting bacteria so the starch digesting bacteria can flourish. Crystal Creek[®] does not promote this type of logic of feeding a dairy cow. Ideally, dairy cattle should live long, productive, healthy lives while consuming diets high in fiber. The approach of feeding Rumensin[®] is counterproductive to the goals of maximizing milk components and overall farm sustainability.

Increasing butterfat and other components can be a great way to help improve a herd's overall profitability. With the right approach, positive impacts can be made to the butterfat concentration on a dairy. Rumen pH, fat levels and type, and ingredients in the ration can all add up to make large impacts. Crystal Creek[®] strives to maximize profits on dairies by maximizing components. Call 1-888-376-6777 to talk with a Crystal Creek[®] nutritionist today about increasing the butterfat on your dairy.

Sources:

- ¹ USDA, USDA September 2019 Advanced Price Announcement., Retrieved from: <https://www.ams.usda.gov/mnreports/dymclassprices.pdf>
- ² Abdela, Nejash, et al. "Sub-acute Ruminant Acidosis (SARA) and its Consequence in Dairy Cattle: A Review of Past and Recent Research at Global Prospective." Retrieved from: <https://www.sciencedirect.com/science/article/pii/S2078152016300773>
- ³ Zaugg, Ueli, et al. "A New Approach to Solving Butterfat Depression." Retrieved from: <https://www.dairyherd.com/article/new-approach-solving-butterfat-depression>