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Popular article

## Reasons For Low Fat and Solid Nonfat Milk in Dairy Cows: Causes and Solutions

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In the previous few decades, dairy activities such as crossbreeding, better health care, and management have propelled India to the forefront of milk production. In India, small and medium animal holdings account for more than 75% of milk output. Because feeding accounts for roughly 70% of total input costs, any increase in dairy cattle nutrition will have a favourable influence on milk yield and quality. To fulfil the standards and compete in the open market, milk quality in terms of optimum fat, solid not fat (SNF), minimum microbial load, devoid of pollutants and endogenous toxins is critical.

### Milk Quality

A genetic factor controls the amount of fat and SNF in milk. Low milk fat can also be caused by a lack of fibre (fodder), feed particle size (too coarse or too fine), more soluble sugar intake, high fat content in the diet, protein and sulphur deficiency in the diet, early lactation, hot and humid climate, faulty milking method, faulty milk testers, and adulteration. Low SNF is usually caused by a lack of fermentable fibre and protein, as well as a lack of rumen bypass protein. The use of sufficient green fodder in combination with a well-balanced concentrate mixture in the form of a total mixed ration will aid in the elimination of both low fat and SNF in dairy cow milk.



## **REASONS AND SOLUTIONS FOR LOW MILK FAT**

### **Genetics**

Low milk fat isn't a concern for every farmer. When compared to jersey and indigenous dairy animals, the holstein frisien (HF) pure and its crosses are genetically predisposed to produce less milk fat. Milk fat is inversely proportional to milk yield, and cows that produce a lot of milk have less milk fat. Milk fat will be low in early lactation, when milk supply is at its peak (less than 3.5 percent).

### **Low fiber/fodder intake**

Reduced acetate and butyrate production in the rumen, and thus low milk fat synthesis, will result from insufficient dry fodder consumption. A minimum of 30% fibre (neutral detergent fibre) in the total dry matter of the diet is necessary. Green fodder (dry matter) intake should be at least 1% of the animal's body weight. Ex. 400 kg body weight, 4 kg dry matter from green fodder, i.e. 25 kg green fodder per animal per day on a fresh basis. Feed the fodder after chaffing it to a length of around 1-2 inches. Due to insufficient rumen fermentation and low rumen microbial protein production, too much fine grinding of feed results in low milk fat and SNF. Supplementing dry feed with legumes and tree leaves will improve milk quality in terms of fat and SNF.

### **More concentrate or high soluble sugar intake**

More lactate and little milk fat will come from a diet high in concentrates or grains (maize) and low in fibre. As a result, fibre and concentrate should be fed in a balanced manner. In most cases, a non-fiber carbohydrate content of 35 to 40% is deemed optimum. Feed chaffed



fodder first, then concentrate for enhanced rumen fibre digestion. Rumen buffers, such as sodium bicarbonate 50 mg per day and magnesium oxide 15 mg per day, are known to increase dry matter digestion and hence rectify the milk fat depression observed on restricted fodder rations. Triglyceride uptake by the mammary gland is increased when magnesium oxide is supplemented.

### **Subclinical rumen acidosis**

It induces rumen acidity when fed additional cereal grains or fermented products. Laminitis in dairy cattle could result from such occurrences over time. Silage alone as a sole source of fodder for a long time will cause subclinical rumen acidosis, laminitis, and poor fat in milk. As a result, silage should be fed in conjunction with a concentrate combination in the form of a total mixed diet, as well as additional forage. Sodium bicarbonate 50-100 gm is indicated during peak lactation, when the diet contains more grains.

### **Excessive fat and oil intake**

The bacteria in the rumen produce more trans fatty acids when the meal contains both high grain and high unsaturated fatty acids. Some trans fats have been shown to inhibit fat formation in the mammary gland. Because some bacteria are sensitive to acidic conditions, low fodder, high concentrate diets lead the rumen fluid to become more acidic, altering the microbial community. The rumen microbiota shift favours the buildup of trans fatty acids, which can reduce milk fat production following absorption into the bloodstream. Too much fat or oil in the diet slows rumen fibre digestion, resulting in little fat in milk. However, this is not a typical occurrence in India.

### **Protein and Sulphur deficiency**

Low protein and sulphur consumption lowers rumen fermentation, lowering milk fat and SNF levels. Protein should be provided in the form of a concentrate mixture or legume fodders. Low milk SNF is mostly caused by a lack of protein intake, as well as insufficient rumen bypass protein intake. To achieve the necessary SNF in milk, the concentrate mixture of high-yielding dairy cows should contain at least 50% rumen bypass protein. Cotton seed meal, legume fodders, and tree leaves will provide high-quality bypass protein.

### **Urea-energy enrichment of dry fodder**

Chaffed dry fodders such as paddy straw/ragi straw, maize/jowar can be sprayed with urea and molasses solution (urea 200gm, molasses/jaggery 400gm, diluted in 2 litre water for 10 kg dry fodder). Adult cattle should be fed a mixture that has been appropriately mixed. The nutritional content of this enriched dry fodder is nearly comparable to that of medium-quality



green fodder, and it aids in rumen digestion. When employing urea as a nitrogen source for adult ruminants, vigilance should be exercised.

### **Total mixed ration (TMR)**

All substances are blended and offered to the animal in TMR. It guarantees that the concentrate intake is evenly distributed throughout the day, rather than being limited to twice daily as in the traditional feeding technique. This improves roughage digestibility, reduces nutrient loss, and increases rumen microbial protein synthesis, all of which improves productivity and profitability. TMR is made up of roughages, concentrates, and other additional nutrients in the appropriate proportions, then mixed into a homogenous mixture in the form of mash or pellets/blocks (complete feed).

### **Season of the year**

Summer months in hot areas usually result in a decrease in milk fat concentration. Although the specific process is unknown, it is hypothesized that decreased milk fat during warmer months is due to changes in dairy cow eating patterns and decreased saliva buffering capacity due to panting. It's also likely that increasing body temperature during heat stress has a direct impact on mammary gland fat formation. As a result, in hot climates, appropriate cooling of cows is essential for milk production. Shades, forced ventilation, and evaporative cooling are all required. This problem can be solved by taking 50gm mineral mixture and 50gm baking soda per day in addition to the concentrate mixture.

### **Managemental factors**

Mixing the concentrate mixture with water is not a good idea. It can be in semi-solid form, if necessary, but not in semi-liquid form. To avoid dustiness, simply sprinkle water over the mixture to concentrate it. Avoid offering drinking water for at least 2 hours after feeding concentrate combination, so that rumen digestion of concentrate is improved. Because the last droplets of milk from the udder contain more fat, thorough milking is recommended. Before analysing for fat and other variables, milk should be kept in a cold area and thoroughly blended and homogenised. Milk adulteration with water should be punished, and incentives for high-quality milk should be offered.

### **Conclusion**

Genetic, dietary, and managemental variables all influence low milk fat and SNF. This condition is more common in high-yielding dairy cows in the early stages of lactation. The answer to solving this problem is to give good quality green fodder with legumes that is balanced with a concentrate combination. Better rumen nutrient fermentation is aided by feeding a whole mixed meal, which improves fat and SNF.

