Dairy farmers are fortunate. Milk is used to produce many different products. This allows consumers to choose among a variety of healthful foods containing milk components. Consumption patterns of dairy products have been shifting because of changes in consumer tastes. Unfortunately, this variety of products makes milk pricing a very complex problem.

One pricing problem is to determine how to pay dairymen for milk with different solids content. Traditionally this differentiation has been based on the fat content of milk. Fat percent is measured easily. Fat can be removed from milk to allow it to be used in other products like ice cream or butter.

The value placed on fat has been a function of the wholesale price of butter. However, fat also is of concern in milk products. Non-fat solids also are of value in various milk products. But how do we put a value on these other components?

In a strict economic sense, the value of the solids components of milk should be based on their real value in the products in which they are used and sold. If this criteria were followed, the value of each component would depend on:

1. how each component affected the yield of each product
2. amount of each product used
3. product’s market value
4. processing costs involved in manufacturing products

The lactose percent of milk usually is larger (average about 5 percent) than either fat (average about 3.8 percent) or protein (average about 3.3 percent) and it contributes directly to the yield of nonfat dry milk (NFDM) and to the palatability or taste of bottled milk. But there is less variation in lactose percent than in fat or protein.

Lactose also is a major problem in whey disposal, being the largest solids component of whey. It is a lactose sugar that usually is not considered in most component pricing systems. In this particular article, we will deal with determining the value of fat and protein content of producer milk.

The value of protein in bottled milk is difficult to determine even though protein contributes to milk flavor. This is because the bottled milk market does not have an accepted price differentiation for milk with higher protein content except in the case of milk fortified with added milk solids. This usually is only a small proportion of the bottled milk sold (about 10 percent nationally).

Frozen desserts, such as ice cream and ice milk, are manufactured using concentrated milk products such as cream, butter and NFDM. Therefore, it is difficult to relate values to the milk solids used for frozen products separate from their values in butter and NFDM.

For simplicity's sake, we will limit the scope of the products considered in this study to general classes of dairy products: "hard" cheeses, cottage cheese, butter, and NFDM.

First, let's discuss manufacturing costs, separating them into two groups:

1. Those costs which are constant for a given volume of milk regardless of solids content (fixed costs of processing may include transportation, separation, plant cleanup and some processing costs. For example, the cost of transporting 100 pounds of milk is the same regardless of whether it yields 10 or 12 pounds of cheese. Per pound of product produced, these costs will drop as the yield of the product from a given volume of milk increases.

2. Those costs which change with the solids content  

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