Let's have modern, accurate milk fat test

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For this first column I'd like to focus on a problem that's been costing dairy farmers money for a long time - milk fat tests. Or, more precisely, the correct fat test for a milk shipment from the farm to the processing plant.

Let's assume you have a herd of 100 Holstein cows that produce an average 40 pounds of milk per cow, filling your 4,000 pound milk tank daily. You'll get 13 cents per pound for that milk if the fat content is 3.5 percent. This gives you a daily gross income of $520, from which, of course, you must pay all your feed, labor, utilities, veterinarian, taxes and other expenses.

If the milk in this 4,000 pound tank tested 4.0 percent instead, you'd receive $552 - or $32 a day more - for its contents, because of the $0.0016 fat differential for each one-tenth percent milk fat per pound above the 3.5 percent standard. Assuming your production costs remained the same, this daily increase of $32 would translate into a handsome $11,680 by the end of the year.

Looked at this way, the fat test level of the milk in your farm tank becomes an economic problem of considerable importance not only for you, the producer, but also for the processing plant which buys milk from you and other farmers.

Accurate test

Considering the money involved, it's easy to understand why the issue of accurate fat tests has been a bone of contention and suspicion between the farmer and the processing plant for a long time.

The controversy is based, of course, on the fact that fat and milk don't normally mix, but continually separate. The fat, in the form of cream, rises above the milk because it's not soluble in that aqueous medium and has a lighter specific gravity. This means it must be mixed back into the rest of milk manually or by machine for

even distribution and for accurate sampling. It takes time to do this – at least 5 minutes in a full 4,000 pound tank.

Milk is hauled from the farm in tank trucks which pump the farm tank empty. Before he loads up, the driver must get an accurate volume measurement on that milk and take a sample which will be analyzed later to determine its fat content. How does he collect that sample? **Manually**, as he and other drivers have done for the last 30 years.

Procedure

First, he reads the dipstick in the quiet tank to record the exact number of pounds of milk there.

Next, he turns on the agitator to mix the milk and fat. He must then wait at least 5 minutes to allow for complete mixing.

After that he lowers a dipper into the full tnak and collects his sample for later laboratory analysis.

Finally, he's ready to pump the tank empty and proceed to the next farm.

It's obvious that this manual system for recording, sampling and testing is full of potential human errors, errors which can translate into substantial amounts of money lost by either the farmer-producer or the milk processor. Given the technical and electronic capabilities of this space age, it's also clear that such manual procedures are obsolete and need to be replaced.

So what can be done to solve this problem?

Get modern

Three industrial milk metering and flow-thru sampling devices are already available and in use in other parts of the world. An orifice-type collecting device called "Patch" is made and used in Denmark. A cylindrical sampler with a diaphragm, "Diessel", is made and used in Germany.

A third type called "Isolok", made in the U.S., uses the syringe principle to draw out 3 milliliter samples from every 50 quarts of milk flowing through the pump hose from the farm tank to the truck. This device is officially approved in the Quebec province of Canada. In fact, Quebec Department of Agriculture regulations require automatic sampling devices on farm bulk milk pickup trucks.

This device is also widely used now in milk processing plants. Since its development in 1969, over 600 Isoloks have been installed in these plants and over 400 are in use on milk tank trucks. The sampler has been extensively tested and is consistently accurate within plus or minus 0.01% of the true fat test value. It is easily cleaned with normal automatic CIP procedures and has successfully met federal and local sanitary standards.

With systems like this, it's no longer necessary to wait for farm milk tanks to be agitated for proper mixing before sampling. Automatic flow-thru samplers not

(Turn to Page E11)