B.C. DAIRY TALK

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Added Water: The Hidden Costs

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The presence of added water in milk is often simply due to accident, erroneous practices and/or faulty equipment. Regardless, of how it got there, it is a cost to you and the industry:

1. Added water dilutes the nutritional value of milk.
2. Added water contaminates the milk with potentially hazardous bacteria and/or chemicals.
3. Added water can affect payment under a multiple component pricing scheme.
4. Added water is a direct violation of the *Milk Industry Standards Regulation.*

Method of Assessing "Added Water"

Milk is composed of about 88% water. The temperature at which milk freezes is consistent and will only vary within certain limits. Added water is tested using a Cryoscope test that measures the freezing point of milk in a temperature scale called Hortvet. Milk freezes at -0.545°H and anything above this level is considered abnormal. The exact freezing point can be translated into percent added water:

Hortvet Freezing Points as they relate to Added Water		
Freezing Point (H)	**Added Water (%)**	**Comments**
-0.545°	None	Average normal freezing point of milk.
-0.545° to -0.535°	None to 1.8	Normal range for milk.
-0.534°	1.9 and above	Leviable range.

All producers milk is periodically examined for possible added water content. If a sample shows the freezing point to be below -0.535°H, re-sampling at the farm is done on the next pickup. If water is routinely gaining entrance, or the freezing point is lower than average, the subsequent sample will also show added water. Because there are a few "natural" causes that can contribute to positive water responses the producer is given two options:

1. Accept the penalty resulting from the violation.
2. Have an authentic sample taken directly from the cows.

If option number two is chosen, the local Dairy Technologist or Specialist will visit the farm within two weeks of the second sample and collect an authentic sample. This sample would be taken directly from a representative number of cows in the herd. This sample will determine if the added water is originating from the cows or from some outside source. The penalty will be calculated from the results of the second test less the results of the authentic sample. If option one is selected, the results of the second test less 1.8% (upper limit of normal milk) will determine the penalty.

To explain how this will work, examine the following three milk test results:

	Percentage of Added Water		
Sample Type	Farm A	Farm B	Farm C
Initial Test	2.0	2.2	2.0
Confirmation Test	2.4	2.4	0
Authentic (cow sample)	2.4	0	Not required
Penalty*	0 (2.4 – 2.4)	0.6 (2.4 – 1.8)	Warning letter

** Penalty is for the gross value of the milk shipped during the month of the infraction.*

If the cause has originated from the cows (Farm A) due to certain environmental or management factors, the authentic sample will confirm this. If, however, the cause is equipment, cleaning or otherwise (Farm B), then the authentic sample will determine the presence of added water and establish the penalty. In either case it is wise to go over the following possible causative factors with all members of your staff, family or equipment representative before requesting the third sample.

Preventing "Added Water"

Some Possible Causes:

Management

Affecting Cow and Authentic Sample:

1. Time of year (temperature).
2. Feed type - sudden changes in moisture level (e.g., quick introduction of pasture, green chop or wet commodity feeds).
3. Imbalanced ration.
4. Inadequate supply of clean, readily available drinking water.

Affecting Initial Test Only:

1. Water used to chase milk from the pipeline after milking.
2. Water sprayed over the bulk tank when milk was in the tank.

Improper sampling technique. If you sample milk from the bulk tank, agitate the milk for five minutes before sampling and be certain to use a dry sample container and dipper when sampling.

Equipment

1. Poor drainage:
   a) Pipeline not sloped properly, water sits in the line.
   b) Bulk tank not draining thoroughly after sanitizing (poor slope, not enough time to drain).
2. Vacuum not shut off when claws are being rinsed between cows.
3. Back flush system is not functioning properly.
4. Bulk tank refrigeration is at or below 0° C.
   a) Ice forming on the sides (water from the air).
   b) Ice crystals in the tank (can affect sample results).
5. Rinse or wash water accidentally being discharged into the bulk tank. Install a microswitch on the discharge portion of the pipeline to prevent this from occurring.
6. Water from manual flushing of claws during milking entering the tank. Allow water to drain from unit before milking next cow.

Protect your product and your market. Maintain quality production and be certain that water and solutions do not get into the milk. For assistance on this or any other quality problem, contact your local BCMAFF Dairy Programs representative, equipment dealer or processor field person for assistance.

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