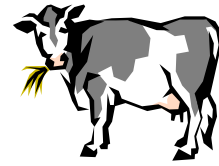


# Smithton Veterinary Service



## February '05 Newsletter

### Milk Quality Tests

Milk quality (and ultimately manufacturability) is defined by many factors including: protein and butterfat percentage, the presence of contaminants and **milk bacterial content**. **Many tests commonly used by farmers and milk manufacturers to gauge milk quality measure the bacterial content of milk.** These may be performed to investigate or monitor a specific problem in milk quality or for routine regulatory testing to maintain minimum standards of produce suitable for human consumption. Milk bacterial count can be influenced by a number of different contaminating sources and conditions that cause overgrowth of acceptable levels of bacteria. These include: milk plant, equipment and udder contamination as a result of poor cleaning and hygiene, mastitis and problems with milk cooling.

#### **Total Plate Count (TPC) and Bactoscan**

The TPC and bactoscan both give an *accurate count of bacteria in vat milk* and are used as regulatory tests by food authorities. Increased TPC/bactoscan counts occur as a result of problems with washing milk plant and equipment; refrigeration of milk; milking wet, dirty teats or rarely, mastitis (especially *Streptococcus* sp. which typically shed very high numbers of bacteria in the milk). The warning level that indicates a break in milk quality is a TPC/bactoscan of greater than or equal to 15000 bacteria/ml.

#### **Thermodurics**

Thermoduric bacteria are those that survive prolonged heat treatment; therefore the thermoduric count quantifies the *number of bacteria per milliliter of milk, from a bulk vat sample, which are capable of surviving laboratory heat treatment*. The importance of this test is that thermoduric bacteria may stay viable post pasteurisation, therefore affecting milk shelf life and quality. Those bacteria that survive heat treatment tend to be of environmental origin. Typical mastitis causing bacteria do not survive pasteurisation thus high thermoduric counts indicate poor cleaning of equipment and sanitation problems allowing incubation of bacteria in the milking system.

#### **Cell Counts**

Cell counts measure the *average number of somatic cells present in a milk sample*. These can include bacteria, epithelial cells, polymorphs, lymphocytes and macrophages. Bulk milk cell counts reflect the raw milk quality, whereas individual cow cell counts directly represent the inflammatory status of the sampled mammary glands.

#### **Bulk milk cultures**

Bulk tank milk cultures give information on the cleanliness of the milk harvesting technique and equipment, and the adequacy of milk cooling. As with other vat sampling techniques errors can occur in sample collection and handling. Vat culture is not a good test for identifying the major mastitis pathogens. Therefore interpretation of BTC with respect to herd mastitis can be confusing and must consider the characteristics of the individual organisms isolated. Accordingly, the presence of obligate intramammary pathogens such as *Strep agalactiae* in bulk tank milk strongly indicate the presence of intramammary infections and should be sufficient evidence to initiate a control program. However, many other pathogens, such as coagulase-positive staphylococci and *Strep. uberis* can originate from sources outside the udder.

#### **Other non-bacterial tests of raw milk quality**

As mentioned earlier, factors other than bacterial content contribute to milk quality, tests, which measure these, include:

- ★ Tests for water content: Presence of excess water can be due to the deliberate addition of water, poor plant drainage, excessive water use during milking, back flushing units with the vacuum on, rinsing the top of the bulk tank or freezing of the milk in the bulk tank
- ★ Sediment test: processors test milk for sediment content from sources including excess udder hair, sand, bedding and poor premilking udder preparation)
- ★ Tests for chemical and drug residues: such as antibiotic residue tests.

### Use of multiple tests to troubleshoot milk quality problems

Different milk quality tests, and the timing of these tests will give an indication as to where the breakdown in milk quality is occurring. For example milk samples taken either at different times during milking or from different locations in the milk plant may differentiate between poor premilking hygiene, equipment cleaning and sanitation, incubation in the milk handling system or mastitis pathogens. Comparison of values from multiple tests such as TPC, thermoturics, coliform and BMCC values can also be used to help diagnose a problem with high raw milk bacterial counts.

Indications for this combined test approach include: BMCC >150-200000 bacteria/mL, TPC >15000 bacterial/mL or >2 clinical cases of mastitis / 100 cows/ month, a suspected case of environmental mastitis, monitoring management changes or for general monitoring purposes (e.g. monthly or at peak lactation).

#### MILK QUALITY TEST RESULTS

POSSIBLE CAUSES	<i>Thermoturics</i>	<i>BMCC</i>	<i>TPC/ Bactoscan</i>	<i>Coliforms</i>
-poor milking hygiene -poor equipment cleaning -poor cow preparation procedures or unclean cow environment *****	Moderately high	Normal	Normal to High	Moderately high
-incubation of bacteria in milking system (e.g. bacterial growth on filters)	High	Normal	High	Very high
-High loads of mastitis pathogens (e.g. strep or staphs)	Normal	Increased	High	Normal
-High incidence of subclinical mastitis	Normal	High	High	Normal

\*\*\*Note: The natural duration of infections caused by coliforms are short, and clinical signs acute, therefore excessive numbers of coliforms without clinical cases suggests poor premilking hygiene or environmental contamination.

#### Seasonal reminders – clients are advised to be aware of the following conditions we often see at this time of year.

Coccidiosis – often presents as scouring calves with blood in the faeces and straining to defaecate  
 Bracken fern poisoning – sick calves often with pneumonia type symptoms, drooling saliva, bleeding  
 Polio – disorientated animals, often blind and may progress to convulsions  
 Pinkeye – obvious eye problems usually in several animals and not always a typical ‘pink eye’  
 Staggers – all classes of stock. Animals show trembling and some may, if put under pressure, fall over or appear to convulse.

These conditions can sometimes appear similar so we would recommend contacting us to discuss your cases before trying to treat them. Initially some animals may need to be looked at or sampled to confirm the diagnosis and allow for appropriate treatment.