WOOD
VETERINARY GROUP

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INTERPRETATION OF BULK MILK RESULTS

The value of the results is largely influenced by the quality of the sample, so PLEASE make sure that the milk is kept chilled from the time of sampling until its arrival at the Laboratory. This will be achieved by following the sampling and packaging instructions carefully.
Bacteriology results can only give an indication of areas in which problems might lie: a thorough knowledge of the farm is needed for full interpretation.

TARGET VALUES

Target or "normal" values have been built up over the past few years from the results of processing probably thousands of samples. With increasingly stringent penalties for milk quality, our target levels slowly change, so please make sure you use current values. These are:

TBC/TVC	<5000 cfu/ml
LPC/thermoduric	<175 cfu/ml
Coliforms	<20 cfu/ml
Pseudomonads	<500 cfu/ml
Strep uberis	<100 cfu/ml
Total staphs	<200 cfu/ml
Staph aureus	<50 cfu/ml

TOTAL BACTERIAL COUNT, TBC (= total viable count, TVC).

This represents the total number of viable bacteria growing on milk agar at 37^{o}c. A high TBC could arise from poor plant or tank cleaning; poor environmental hygiene; suboptimal teat cleaning prior to attaching the clusters; mastitis (usually coliforms, Strep uberis or Strep agalactiae, all of which can cause a fluctuating TBC); or poor refrigeration.

LABORATORY PASTEURISED COUNT, LPC (= THERMODURIC COUNT)

High values point to poor plant cleaning, either the milking equipment or the bulk tank. Common faults include water not hot enough, insufficient volume of water, very hard water which reduces the effect of detergents, inadequate turbulence and tank not cleaning properly. In some instances, where coliform, Strep faecalis and Pseudomonas counts are high, suggesting teat and parlour hygiene problems, the thermoduric count may be raised as a result of dust organisms on the teats, even though there may not be a primary plant cleaning problem. Similarly, if the plant is badly soiled with accumulated sour milk, poor plant cleaning can sometimes led to raised coliform and Pseudomonas levels.

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COLIFORM COUNTS

High bulk milk coliform counts usually originate from dirty teats, although any part of the milking equipment can become contaminated with coliforms, for example split rubbers sucking in dirty water, or clusters falling onto a dirty floor during milking. As we are primarily interested in total coliform counts and not just E. coli, we have discontinued the E. coli count (at 44^{o}c) although this can still be carried out if specifically requested. High counts can also arise from clinical or subclinical mastitis milk entering the bulk tank.

PSEUDOMONAS COUNTS

One of the differences between Bactoscan and TBC is that the Bactoscan counts all living bacteria, irrespective of their temperature and growth requirements, whereas TBC counts only those organisms which grow on milk agar at 37^{o}c. In an attempt to identify "dust organisms" and others which grow at lower temperatures, we initially used a "psychrotroph indicator value". This has now been replaced by the PSEUDOMONAS COUNT, which gives a quantitative assessment of non-enteric coliforms, i.e. coliforms from the *environment*. Previous studies had shown that the rise in non lactose fermenting (NLF) coliforms in bulk milk and clinical cases was largely due to Pseudomonas species and this was the reason for selecting a specific Pseudomonas agar. A very high Pseudomonas count could be associated with mastitis.

STREPTOCOCCUS UBERIS COUNTS

Streptococcus uberis is usually categorised as an environmental organism, although it is normally present on many parts of the animal's body (mouth, groin, axilla, vulva) and hence environmental contamination occurs initially from the cow itself. Moderate Streptococcus uberis counts, with increased coliform and Pseudomonas are probably due to teat contamination. Very high counts, with low coliform and Pseudomonas, are most likely to be associated with udder infections (mastitis) and can cause increases in both BactoScan and cell count.

STAPHYLOCOCCUS AUREUS COUNT

Although the shedding of Staph aureus by individual cows is very variable, counts on bulk milk give a good indication of the overall Staph aureus burden in the herd. High values are commonly associated with high cell counts. Even if the cell count is low, a herd with a high Staph aureus count needs to be extremely careful with its milking hygiene (individual towels, gloves, thorough teat disinfection etc.) to minimise the risk of spreading infection.

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TOTAL STAPHYLOCOCCAL COUNT

Total Staphs consist of Staph aureus and a range of different species of coagulase negative staphylococci (CNS), including Staph epidermidis, Staph hominis and Staph haemolyticus. The difference between total staph count less the Staph aureus count gives the CNS count. Once thought to be normal teat end commensals, CNS organisms are becoming an increasingly common cause of mastitis and high cell counts and can be common where Staph aureus has been eliminated. CNS infections can also be present in down-calving heifers.

DIFFERENTIAL SCREEN

In addition to carrying out counts of specific bacteria, a sample of milk is cultured on a range of media just to see which other organisms are present and whether they are present at a high (+++) or low level (+).

STREP AGALACTIAE

Can also cause high cell counts, fluctuating TBCs and increased clinical mastitis. Strep agalactiae is associated with poor milking hygiene -allowing transfer of infection during milking - and poor dry cow therapy.

CORYNEBACTERIUM BOVIS

Associated with suboptimal post- milking teat disinfection.

STREP DYSGALACTIAE (and Staph aureus)

The presence of both organisms could be associated with poor teat skin condition.

YEASTS, MOULDS AND STREP FAECALIS

A wide range of environmental organisms suggests fairly gross contamination of the milk, usually due to dirty teats. Yeasts and moulds can also cause a mastitis which does not respond to conventional antibiotic therapy.

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