

Some processors are monitoring levels to improve product quality and shelf life

Spotlight on tackling thermoduric bacteria

Why are thermoduric bacteria an issue and what can producers do to prevent and tackle thermoduric problems if, or when, they arise? We spoke to a vet to find out more.

text **Ben Bartlett**



Testing for thermoduric bacteria

If you're interested in establishing thermoduric levels on your farm, testing can be done using the routine bulk milk sample collected by NML.

Cost is £9 per sample and full guidance notes on interpreting the results are provided.

➔ Further information on tackling thermodurics can be found on www.nationalmilklabs.co.uk



Bacteria levels in milk have been monitored through the use of Bactoscan for many years. Aggregate data shows that the industry has been successful in bringing bacteria levels down to well below the European average. But there's a new challenge on the horizon for producers as some milk processors are now monitoring levels of thermophilic bacteria in milk, as well as assessing overall Bactoscan levels. So says vet Andrew Henderson, from the Evidence Group.

He explains that thermophilics are a specific type of bacteria, capable of surviving pasteurisation. And some of these bacteria will not only survive pasteurisation temperatures but will also continue to grow at temperatures lower than 7°C – typical refrigeration conditions. This is worrying because it means that these bacteria may be able to grow in milk on the supermarket shelf. This begs the question regarding what the consequences are for milk containing thermophilic bacteria. “High thermophilic levels can manifest in finished product in many ways – such as reduced cheese yields, ‘off’ flavours and an issue known as ‘late blowing’ in certain types of cheese due to gas production. They have been reported to affect cream causing sweet curdling, ‘bitty’ cream and ‘off’ flavours. Similar problems are also seen in liquid milk,” says Mr Henderson.

Possible sources

Thermophilics can also be an issue in infant milk formula (IMF) – so much so that the European Union has set upper thresholds for Bacillus (one of the most predominant thermophilics) in IMF. Bacillus is commonly found in IMF, but generally at very low levels. However, if stored inappropriately levels can rapidly increase, raising the

Andrew Henderson: “Seek help if thermophilic bacteria problems persist”



test	result	target (cfu/ml)
total viable colony count (cfu/ml)	14,000	< 5,000
coliforms (cfu/ml)	43	< 20
thermodurics (cfu/ml)	2,700	< 150
psychrotrophs (cfu/ml)	2,700	< 500
Bactoscan (x 1,000)	30	< 30

Table 1: Results of a quantitative bulk tank analysis of a milk sample from a herd with a normal Bactoscan level

possibility of causing food poisoning.” Against this background it is clearly important that thermophilic levels are as low as possible when milk leaves the farm. Achieving this requires a good understanding of the possible sources of thermophilic bacteria.

“Thermophilic bacteria can be found in many areas of the farm,” explains Mr Henderson. “But chronic problems tend to be caused by inadequate levels of hygiene within the plant. Failure to clean the milking parlour properly allows residues to build up within the plant, providing the perfect environment for thermophilic bacteria to thrive. As these residues build up they also provide the bacteria with increased protection from temperature and cleaning agents.”

He says that there are three main areas to focus on to control the level of thermophilic bacteria in milk: maintaining high levels of cow cleanliness, following a routine for pre-milking teat preparation, and regular maintenance and effective cleaning of the milking parlour.

Monitoring thermophilics

Unfortunately while Bactoscan is a good overall measure of the hygienic quality of milk, the Bactoscan test measures the number of both live and dead bacteria in milk and does not specify how many of the live bacteria have thermophilic properties. As a result, a specific culture based test is needed. This can be done on the bulk milk sample and takes 48 hours to complete.

Data from NML shows that from a random sample of 870 British farms tested in May 2017, 20% had a thermophilic count above 500cfu per ml, which poses a risk of causing spoilage problems in finished dairy products. Of these it should be noted that 15% had Bactoscan averages of below 30,000 (see Figure 1). This confirms that while Bactoscan is a good general indicator of hygienic quality, it cannot be relied upon to identify all farms with thermophilic issues.

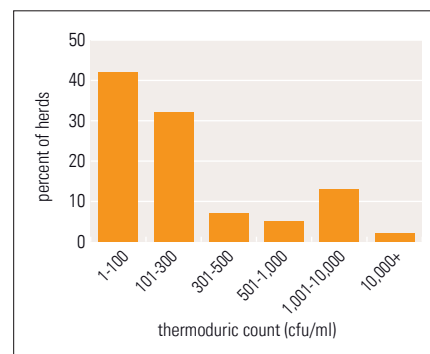


Figure 1: Thermophilic test results from a random selection of 880 bulk milk samples in May 2017

Further work on farms affected by thermophilics shows that there are often other bacteria lurking in the milk. Identification of these bacteria can assist in determining the cause of the problem. Table 1 shows a unit that has high thermophilics but also has a low Bactoscan. This indicates good hygiene practices, but the presence of coliforms can suggest some faecal matter in the milk. This is not enough to trigger high Bactoscans, but the thermophilic results are a problem. In this instance giving the parlour a ‘deep clean’ brought the thermophilics back under control while tighter pre-dip procedures achieved a reduction in coliform counts.

Series of investigations

“We come across a range of causes of thermophilics on farm. But the source of the problem can, typically, be identified quickly by carrying out a series of investigations in the parlour,” says Mr Henderson. “Often assumptions regarding the effectiveness of boilers and water pumps are found to be false, while awareness of the risk posed by biofilms in pipework also helps.” He advocates seeking help if thermophilic problems persist. “There are plenty of organisations that are able to assist in identifying the cause of thermophilic problems. And while there may be a cost associated with this, the peace of mind associated with tackling the problem is well worth the investment.” |