

KEEPING MILK FRESHER, LONGER

When milk spoils before its use-by date, even when it has been carefully stored and handled, it is usually due to the presence of a group of cold-loving microbes called psychrotrophs, says Food Science Australia (FSA) dairy researcher Dr Heather Craven. "In health terms these bacteria are pretty harmless, but they do pose a problem if they get into the milk because then whole batches can go off and dairy companies receive complaints from consumers," she explains. "Even if you keep the milk chilled, they can multiply from a few per milliliter to over a million in the space of just six days. Even one microbe in a carton of milk can cause a spoilage problem." Scientists at FSA, Australia's largest food research organization, have found a way to help industry manufacture pasteurized milk with improved storage life. The research is a joint venture between CSIRO and the Australian Food Industry Science Centre (AFISC) and was supported by the Dairy R&D Corporation and the Victorian Department of Natural Resources and Environment.

Until scientists at FSA developed Psychro-Fast, a test specifically designed to detect dairy spoilage organisms, there was no easy, rapid and reliable way for a dairy plant to know if a batch of milk was contaminated by spoilage bacteria. Dr Craven says the test can be used to monitor the whole dairy production line from pasteurize to carton, in order to pinpoint the source of any spoilage problem. Both milk plants and consumers can then be confident the milk will exceed its declared shelf-life, so long as it is kept at 4 degrees C or less. At present, most processors expect fresh milk to keep for about two weeks at 4 degrees C. But if the product can be guaranteed free of the spoilage bugs, milk can potentially last for up to three weeks.

The Psychro-Fast test has been designed so any dairy plant with a basic lab can perform the test. Milk is mixed with a selective agent to screen out unimportant microbes and an indicator, then incubated at 30 degrees. If psychrotrophs are present, their numbers will rapidly climb to millions per milliliter - and the indicator turns the milk sample pink. The test can be easily adjusted to count numbers of spoilage organisms and can be used to improve the quality and shelf-life of other dairy products such as butter, cream and cottage cheese. The test has proven so effective that about half of Australia's dairy factories have already adopted it, and there is growing interest from round the world.

Victorian Quality Manager for Dairy Farmers, Mr Trevor McManus, says the Psychro-Fast test offers greatly enhanced sensitivity in detecting spoilage organisms. It has enabled producers to tune up hygiene at each point in the production line, and has become a key performance indicator for production teams. "It's the next step in quality assurance. It offers a way of providing consumers with milk which has a greater shelf-life and absence of the stale smell and taste they associate with stored milk. "It's all about the quality image of our product - and you can't put a dollar value on that," Mr. McManus says.