

Innovate (RapiScreen)

dramatically more reliable detecting microbes in samples than Promilite

Ultra-high temperature (UHT) pasteurization of milk can achieve a microbe-free shelf life for up to nine months. But contamination can occur during filling operations, an ineffective cleaning and sanitation program, and because of some spore-forming bacteria that sometimes survive UHT.

To prevent this contamination, testing UHT-processed product is necessary. Traditional methods like plate culture are accurate but very time-consuming, meaning that products must be put on hold for days pending testing results, leading to excessive inventory costs. Rapid methods like Hygiena's **Innovate System** can reduce this hold time, but need to

generate results equivalent to plate culture methods. **Innovate** relies on adenosine triphosphate (ATP) bioluminescence technology, the industry standard for the rapid microbial screening of dairy, food and beverage products. ATP measurements are reported as Relative Light Units (RLUs).

According to a 2018 study by researchers at the University of Chemistry and Technology Prague, the **Innovate System** (then called RapiScreen, before Hygiena acquired the technology) was the only method tested that reliably detected microbial contamination in all samples. Comparing the **Innovate** to Promicol® B.V.'s Promilite III, the researchers found dramatically higher rates of false-negative results from the Promilite in tests on non-spore-forming microbes. These results (where Promilite consistently did not detect any non-spore bacteria) were likely due to more stable Hygiena reagents. Spore-forming bacterial results did not show significant differences in either rapid method. **Table 1** shows the difference between **Innovate** and Promilite III performance.

Table 1 RLUs of Innovate/RapiScreen and Promilite III detecting spiked non-spore-forming bacteria

| 24 Hours | | 48 Hours | |
|----------|-----------|----------|-----------|
| Innovate | Promilite | Innovate | Promilite |
| 30,465 | 30 | 9,619 | 32 |
| 25,590 | 53 | 8,836 | 21 |
| 25,009 | 53 | 9,714 | 20 |
| 37,397 | 52 | 14,126 | 31 |
| 34,939 | 75 | 16,433 | 30 |
| 37,639 | 71 | 12,962 | 30 |
| 47,223 | 67 | 12,344 | 50 |
| 49,463 | 73 | 21,308 | 27 |

| Bacteria Tested | |
|-------------------------------------|--------------------------|
| Non-spore forming | Spore-forming |
| <i>Stenotrophomonas maltophilia</i> | <i>Bacillus mycoides</i> |
| <i>Shewanella putrefaciens</i> | |
| <i>Citrobacter braakii</i> | |
| <i>Serratia</i> species | |

The study was published in the *Czech Journal of Food Science*. It is the only known comparison study of RapiScreen (**Innovate**) to date. The researchers noted the difference in effectively detecting spore forming bacteria:

“Even though the Promilite and the RapiScreen are based on the sample principle (ATP detection), big differences in accuracy of results were found between them.”

“Only the (Innovate) RapiScreen system reliably detected microbial contamination in all samples, no matter how high the concentration was.”

The study, the researchers wrote,

“indicates that the Innovate RapiScreen system probably had much more stable reaction reagents compared to reagents used by Promilite.”

