

Innovate for faster results, lower costs, and improved risk mitigation

Aseptic packaging is very well accepted in food and beverage applications. While aseptic filling systems utilise ultra-high temperature (UHT) processing and maintain commercial sterility of long-life shelf stable products, contamination can still occur during manufacturing and production. To ensure product integrity, food manufacturers must test each product for sterility before release for sale.

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The same is true of extended-shelf life (ESL) processing; while treated to reduce microbial count below normal pasteurisation and packaged under extreme hygienic conditions, it poses similar issues with contamination risk. Both processes also require proper hygiene design and close monitoring using typical clean-in-place (CIP) processes for maintaining equipment and lines.

Traditional methods for sterility testing involve direct and indirect test methods measuring the growth of micro-organisms in products. While this process is relatively reliable, it is a manual process which is error prone and takes days to weeks for results, using valuable resources and incubator space.

Evaluating the presence of colonies on plates still takes the same amount of time. Visual inspection of plates poses other issues as well; it requires carefully looking at many plates with no growth to ensure no small colonies are present. In addition, colony growth on a plate does not confirm which organism is present – further testing is required to identify and confirm the species. This can lead to a number of errors and can take additional days to complete.

Other tests, such as pH measurements, also require follow-up tests to confirm microbial contamination (typically plate culture). Traditional pH testing,

which has been used for most ultra-high temperature (UHT) aseptic and extended shelf life (ESL) packaged products, can add uncertainty and cost because it is simply not a dependable method to ensure products are free from microbial contamination.

Independent studies have proven pH testing to be less accurate than rapid methods since not all organisms cause a pH shift as they grow. Therefore, potential contaminants may not be detected using the pH method. In addition, organisms that grow slowly may be missed entirely. These flaws make pH testing a risky method for ensuring finished product quality.

Streamline laboratory testing

To reduce time to result and streamline laboratory testing, a rapid method is needed – this is where Hygiena's Innovate System comes in. Results can be obtained in less than 30 minutes with the ability to run 96 samples (no secondary incubation needed as for other growth-based methods, including plate counts, and other commercial methods). In addition, the product matrix is diverse – from UHT milks and creams to sauces, soups and broths, juices and beverages.

Hygiena technology utilises the efficient light-producing enzyme system of ATP-bioluminescence for the rapid detection of micro-organisms.



All actively respiring organisms contain adenosine triphosphate (ATP), which is used as the universal currency of free energy in biological systems – energy obtained from oxidation of foodstuffs.

Over the past few years, ATP bioluminescence technology has become the industry standard for the rapid microbial screening of UHT aseptic and ESL dairy and beverage products.

The Innovate system has been implemented at top dairy and beverage companies around the world and the company's rapid detection technology is increasingly being used to test a wide variety of dairy, foods and beverage products including syrups, soups and broths, brewed tea, sports and nutritional drinks, pudding, infant formula, condiments and sauces, nut milks and fruit and vegetable juices.

Many food and beverage products contain high levels of non-microbial ATP that needs to be removed before microbial ATP can be detected. The Innovate

System utilises the Hygiena RapiScreen Dairy reagents which contain a proprietary ATP-depleting reagent (ATX). ATX is capable of isolating and depleting free and somatic ATP commonly found in these sample types. A 10-minute treatment

reduces sample background readings (expressed in Relative Light Units, or RLUs) to low levels on all sample types.

Outperforms other systems

The Innovate system outperforms other ATP-based systems due to several innovative features including on-board reagent cooling to ensure the stability of the enzymes, an easy-to-maintain instrument platform, intuitive software, and a unique injector system for delivering precise quantities of reagents at appropriate intervals.

Hygiena's Innovate System provides a simple, cost-effective, rapid solution to monitoring for contamination during UHT and ESL processing. The flexible protocol is backed by Hygiena's global technical support, applications development and validation teams, and distributor network, ensuring prompt reliable response to maintain critical operations.

With a solid understanding of the key considerations in selecting a rapid method, dairy, food and beverage manufacturers can capitalise on the full benefits of rapid microbial screening with the Innovate System: faster, more reliable microbial results; improved manufacturing efficiencies; reduced inventory requirements; increased customer responsiveness; and faster time-to-market.

The benefits add up to ongoing quality assurance with significant, bottom-line savings for today's progressive companies. ■