



Application note



Dairy

Extended shelf life in dairy



Extended shelf life (ESL) dairy products help enable dairy producers achieve wider distribution of products within their own country, as well as into major global markets. With extended life span in product freshness and quality, ESL is becoming a popular option for dairy manufacturers and retailers.

The challenge:

For dairy manufacturers, developing brand equity with basic milk is difficult. Consumers will pay only so much more for private label prices. As a result, in order to grow their top line, manufacturers often look at expanding their geographic distribution. However, the perishability of dairy products is a barrier that must be overcome.

Processes such as high temperature short time (HTST) and ultra-high temperature (UHT) help produce extended shelf life dairy products. Combined with specialized packaging, these processes can help extend the distribution range for dairy manufacturers. In order to inform retail customers and consumers of the extended shelf life, dairy manufacturers need coding equipment that can keep up with fast line speeds and provide crisp codes in tough environments. Continuous inkjet (CIJ) printers from Videojet are well-suited for dairy production facilities, as they deliver code flexibility, can print at high speeds and are designed to perform in challenging conditions.

Videojet advantage:

Videojet is a leader in CIJ printing, offering printers that routinely achieve 99.9% availability. In addition, Videojet offers over 640 inks and fluids, some of which are specially formulated for operating challenging conditions typically found in dairy production facilities. The Videojet patented CleanFlow™ printhead technology provides a positive flow of filtered air to help reduce buildup on the printhead, decreasing maintenance needed to keep the printers running. In addition, uptime is increased with Dynamic Calibration™ technology that automatically adjusts ink viscosity, helping ensure crisp, clear codes.

Coding technology and the affect on extended dairy shelf life



Dairy markets are categorized into two major types: products distributed in a cold chain and those products that are distributed at ambient temperature. In almost all countries, there are regulations which dictate that milk must go through some kind of thermal process in order to help ensure harmful pathogens are eliminated.

Shelf life of dairy products is highly dependent on the microbial count within the product (see Fig. 1). Shelf life is also a gating factor for how far away from the plant dairy manufacturers can send – and therefore sell – their products. The CEO of a large dairy manufacturer in Northern California noted that if he could add just 4 days more of shelf life, his company would be able to service the considerably large markets in Southern California.

Processes like HTST and UHT destroy more of the microbial count while still maintaining almost all of the nutritional benefits of the product. Extending the shelf life of dairy products has many advantages beyond expanding the sales area. Evergreen packaging company, in a technical guide from 2014, noted the following additional benefits¹:

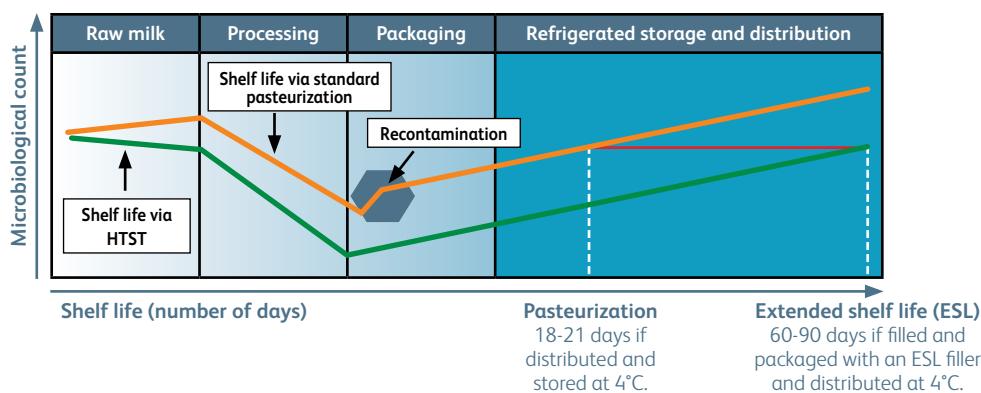
- Increased plant efficiency through longer production runs
- Reduced distribution costs with fewer, larger, deliveries to distant markets
- Reduced product returns from expired, short-term pull dates
- Increased retail facings due to longer pull dates which boost consumer purchases
- Increased sales - consumers equate longer pull dates with freshness
- Enhanced brand building

The key to extended shelf life is hygiene, and levels of hygiene need to be raised across the entire dairy plant. There is no one single piece of equipment or technology that enables extended shelf life; it is about a system that works optimally together. Downtime for any reason decreases the hygiene levels and efficiency is when maintenance is needed to get the line back up,

The coding machine, which will print the extended 'best-by' date on the product, is an important part of the system that is needed to help achieve extended shelf life. Dairy manufacturers should partner with a marking and coding company that has experience servicing the dairy industry and can help them achieve extended shelf-life goals.

¹ Shelf life of refrigerated products, Evergreen Packaging, 10/3/14.

Fig. 1





Videojet continuous inkjet (CIJ)

Videojet 1000 Line CIJ printers are easy to operate, are more reliable, cause fewer mistakes, and offer extended uptime, even in challenging environments like those found in the dairy industry. Videojet CIJ printers deliver greater flexibility to meet your organization's many needs with high-quality print and Ultra High Speed (UHS) models that can accommodate today's production line speeds.

These printing solutions offer consistent operation with Dynamic Calibration™ technology that automatically adjusts to changes in temperature and adjusts ink viscosity for consistent print quality. This feature helps to deliver high-quality, clear codes, lowering the occurrence of scrap and rework, saving money. These printers are also designed to perform in wet, damp environments such as dairy plants.

Videojet IP 65 rated machines allow for easier washdowns, and no external air is needed to achieve the IP 65 rating. Our CleanFlow™ printhead technology provides positive airflow to the printhead, leading to cleaner heads. By reducing ink build up that can cause traditional inkjet printers to shut down, this unique printhead requires less cleaning and enables longer runs without intervention. This also allows for more creative mounting of the printhead. For example, the printhead can be positioned facing upward and printing on the bottom of the package. Simpler operation is also provided from the Videojet Smart Cartridge™ fluid system that virtually eliminates the mistakes, rework and financial loss associated with other fillable ink systems.

UHS * Font/Lines	Max. line speed for samples as shown (m/minute)	
	1620/1650 UHS	50 Micron (μ) Nozzle Print Sample
4x5 Single	508	ABCDEFGHI 12345 4X6
5x5 Single	423	ABCDEFGHI 12345 5X6
4x7 Single	339	ABCDEFGHI 12345 4X7
5x7 Single	282	ABCDEFGHI 12345 5X7
7x9 Single	254	ABCDEFGHI 12345 7X
10x16 Single	121	ABCDEFGHI 1234
4x5 Twin	254	ABCDEFGHIJKLMNO 1234567890 4X6TL
5x5 Twin	212	ABCDEFGHIJKLMNO 1234567890 5X6 TL
4x7 Twin	191	ABCDEFGHIJKLMNO 1234567890 4X7 TL
5x7 Twin	158	ABCDEFGHIJKLMNO 1234567890 5X7 TL
7x9 Twin	91	ABCDEFGHIJKLMNO 1234567890 7X9TL
4x5 Three	179	ABCDEFGHIJKLM 1234567890 4X6 TRI LINE
5x5 Three	149	ABCDEFGHIJKLM 1234567890 5X6 TRI LINE
4x7 Three	132	ABCDEFGHIJKLM 1234567890 4X7 TRI LINE
5x7 Three	110	ABCDEFGHIJKLM 1234567890 5X7 TRI LINE

**Additional font options available*

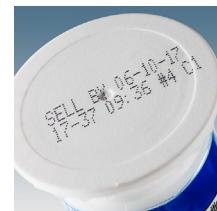
Videojet Ultra High Speed (UHS) printers

The Videojet 1650 Ultra High Speed (UHS) printer is the ultimate in speed with dual and tri-line codes up to 40% faster than the previous industry benchmark, the Videojet Excel UHS, all without compromising print quality. The 1650UHS allows you to print more content in the same space, shrink an existing code to preserve precious packaging real estate or make it bigger or bolder to be easily readable.

The 1650UHS generates up to 100,000 individual drops of ink per second. Generating the drops is the easy part . . . rendering them into a high quality code is what sets the 1650UHS apart. With Precision Ink Drop™ technology, Videojet takes a system-based approach to print quality, combining unique ink chemistry, advanced high frequency printhead design, and sophisticated software algorithms that modify the flight path of individual ink drops for optimal code quality.

Fluids

With the wide variety of container materials used in the dairy market, it's important to select the correct fluid for each application. Depending on the dairy production environment, fluid selection may change to better compensate for temperature and humidity. The 1000 Line printers offer a wide choice of inks and fluids. General purpose fluids adhere well to a variety of substrates, including glass and plastic containers and metal cans. For high humidity environments and products with light surface condensation, specially designed fluids are available that deliver adhesion properties that excel in these environments.



The bottom line

Global trends in dairy have created a competitive market environment, so consolidation and taking advantage of economies of scales are needed for many dairy manufacturers to survive. Extended shelf life is an important tool to help enable dairy products to travel greater distances required by wider distribution areas while maintaining product freshness.

However, establishing an extended shelf life program requires a series of processes with which Videojet can assist. With highly reliable coding equipment that performs strongly in the environments found in the dairy industry, manufacturers can break out of the mold of a mostly commoditized industry and leverage higher profitability.

**Let Videojet help
you select the right
solution to meet your
production objectives and
performance needs.**

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