BUSTING THE MYTHS ABOUT FOOD PASTEURISATION

by HRS Heat Exchangers, Hertfordshire, UK

Across the world there has been growing concern over the safety of raw flour. Currently there is a massive recall for thousands of pounds of flour and flour products in the USA. This is due to a strain of *E.coli* named *E.coli* 0121 contaminating commercial flour products.
According to Leslie Smoot, Ph.D., senior advisor in the FDA's office of Food Safety, the grain used to produce flour is "typically not treated to kill bacteria", which means, that any bacteria the grain used for flour has come in contact with in the field or during harvest, may find its way into the flour that is on our store shelves.
HRS Heat Exchangers based in the UK, examine in depth food pasteurisation and try to dispel any myths the industry may have about the process, which could prove key in the future of flour milling, where pasteurisation to sterilise bad bacteria is being considered a very real option.

Pasteurisation has been established as a key method of destroying pathogenic bacteria in the food and drink industry since its invention in the middle of the 19th century, although the origins of heating wine for preservation go back to China in the 1100s.

However, as food and drink processing becomes more complex and food chains longer, the importance of pasteurisation has increased.

At the same time, the technology has also improved, with developments in the equipment used for High Temperature, Short Time (HTST) and Low Temperature, Long Time (LTLT) methods. While simple plate heat exchangers may still be suitable for the pasteurisation of simple fluids such as milk and fruit juices, more textured and viscous products, such as cooking sauces, creams and curds, will require different solutions in order to maintain their quality and texture.

Here we dispel eight popular myths about food pasteurisation:-

Myth 1: Pasteurisation is expensive

While the exact costs will vary with each installation, there is no doubt that there is a capital cost to pasteurisation.

However, compared with the potential losses due to food spoilage, or worse a food safety incident, these costs are insignificant. In the US, the costs of recalling food products have been shown to average US$10 million*, before accounting for brand damage. Last year alone, 24 recalls due to *E. coli*, Listeria monocytogenes and Salmonella resulted in the destruction of almost 700,000 pounds of food products.

Against these potential costs, the capital cost of a corrugated tube heat exchanger-based pasteurisation system is a sound investment. Alongside the capital costs, the running costs of a pasteurisation unit need to be considered. Heat exchangers and pasteurisation units made by HRS Heat Exchangers are designed to reduce fouling and maintenance, while their wide range of heat recovery options mean that energy costs are kept to a minimum (see below).

Myth 2: Pasteurisation is too complex

Pasteurisation itself is a relatively simple process. It requires that a material is held for a certain time at a certain temperature in order to kill micro-organisms. There is no doubt that pasteurisation adds an additional step in the overall manufacturing process, but if well designed it should not slow down throughput or place additional management burdens on the plant.

The use of continuous pasteurisation systems mean that the process is simple and the potential for product damage or change in quality is minimised.

Myth 3: Pasteurisation is only suitable for simple fluid materials

Pasteurisation can be used on a wide variety of liquid and semi-liquid materials. While simple Newtonian fluids will be the easiest to work with and can often be effectively pasteurised with a simple plate heat exchanger, there are solutions for almost any material.

HRS' innovations, such as the use of corrugated tube and scraped surface heat exchangers, means that the company can deal with anything from viscous fluids requiring gentle handling or with low rates of heat transfer, to complex mixtures, such as curd cheese, which could otherwise foul the heat exchanger, reducing thermal efficiency and requiring regular cleaning and maintenance.

Myth 4: Pasteurisation requires a lot of energy

The amount of energy used in food pasteurisation is highly

variable depending on the process used, the nature of the material being treated, and the heat exchanger used. The bulk of any energy requirement is used to raise the temperature of the foodstuff. Traditional pasteurisation units simply dump this heat afterwards, meaning they are incredibly wasteful and inefficient.

Where possible, HRS heat exchangers recapture that heat and use it again, making them up to 70 percent more efficient than some traditional systems.

Myth 5: Pasteurisation equipment is high-maintenance

The use of corrugated tubes, together with integrated cleaning-in-process (CIP), minimises the amount of fouling and therefore the amount of cleaning necessary to maintain the efficiency of HRS pasteurisation systems. The careful design of static tubes also helps to keep down production (and therefore purchase) costs.

Myth 6: You cannot pasteurise viscous fluids

Subjecting viscous and non-Newtonian fluids, such as cooking sauces, to shear stress during the manufacturing process can damage the quality and texture of the material, which may preclude the use of certain designs of heat exchanger for pasteurisation.

However, by choosing a system such as the HRS Unicus scraped surface heat exchanger, which prevents fouling while maintaining relatively low pressure, such unwanted effects can be overcome.

Myth 7: Pasteurisation is the same as sterilisation

Unlike sterilisation, pasteurisation does not completely eliminate micro-organisms which may be present in the foodstuff. Pasteurisation reduces the microbial load by a significant factor (for example by 5-logs) which in normal circumstances reduces contaminating pathogens to a level at which they do not pose a hazard.

Pasteurisation need not be overly onerous or detrimental to the quality of the product. Certainly, with the correct choice of equipment, pasteurisation does not need to have a negative effect on plant throughput or efficiency and a well-designed system incorporating heat regeneration and corrugated tubes should enhance the overall facility, helping to add flexibility to your business.

About HRS Heat Exchangers

Headquartered in the UK, HRS Heat Exchangers Ltd operates at the forefront of thermal technology, offering innovative and effective heat transfer solutions worldwide, across a diverse range of industries. With over 35 years' experience, we specialise in the design and manufacture of an extensive range of tubular, corrugated and scraped surface heat exchangers. All our products are designed in accordance with the ASME standard. HRS has a network of offices throughout: Spain, USA, Malaysia, Australia and India; with manufacturing plants in the UK, India and Spain.

www.hrs-heatexchangers.com