

Econoliser

The Econoliser – Industry Trial and techno-economic tool

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Project description

The Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption (AS4696) specifies that facilities for cleaning and sanitizing implements be provided with an adequate supply of hot potable water at no less than 82°C or that implements receive an equivalent method of sanitizing.

One such alternative is the two-knife Econoliser (Airtech Distribution Ltd, Belfast, UK), which uses a high-pressure spray of only 140 mL of water greater than 82°C to sanitize the knife blade. The Econoliser units include a heating element which heats water of any temperature rapidly to the required >82°C. Given the potential water savings and associated energy and emissions savings, AMPC was interested in trialling the two-knife Econoliser units to determine whether they would achieve an equivalent microbiological outcome to traditional continuous flow sterilisers under Australian conditions and the implications for water, energy and emissions savings.

Project content

The validation of the microbiological performance of the electric two-knife Econoliser, connected to the hot-water supply, was undertaken at two stations each at two beef and one sheep establishment. The stations on the processing chain consisted of the flanking stand and the boning room MHA stand at Plant A (Beef), the first leg and bunging at Plant B (Beef), and the Y-cut and the retain rail at Plant C (Sheep). At each station, knives were swabbed after having been inserted into the steriliser (n=25) or the Econoliser (n=25) and the Aerobic Plate Count (APC) and *E. coli* detection and count on the cleaned knife blade were determined on a per cm² basis.

To facilitate adoption of this technology, an Excel-based Adoption Guidance Tool was developed. The tool requires a series of inputs from the user, related to the number of sterilisers, water flow, operating hours, water and energy costs, etc. to calculate the comparative annual water consumption and cost, energy consumption and cost to heat water, and associated CO₂-equivalent emissions between traditional sterilisers and the Econoliser. This tool was subsequently used to evaluate several adoption scenarios, including: cold versus hot water supply to the Econoliser; small versus large number of animals processed; and replacing a single low-use steriliser with an Econoliser. Plants wishing to adopt the Econoliser are encouraged to use the tool to evaluate the potential cost savings that are achievable, given their unique inputs.

Project outcome

The Econoliser resulted in an equivalent microbiological outcome to the continuous flow steriliser provided the supplied water pressure was at least 35 PSI, as required by the manufacturer. Further in-plant trials also indicated that warm water (approx. 40°C) needed to be supplied to the Econoliser to ensure adequate heating at the plant's chain speed.

Since the Econoliser uses only 140 mL of water per activation, substantial savings can be made in relation to water use, as well as associated energy needed to heat the water. For example, replacing a single low-frequency use steriliser with an Econoliser, e.g. at carton meat assessment, could achieve water savings of about 540 kL, energy savings of around 259 GJ, and emissions reductions of 13 t CO₂-equivalent per year. For this example, the associated total cost saving is approximately \$16,000 per year.

Benefit for industry

Adoption of the two-knife Econoliser has benefits of reducing meat establishment's water use, energy use, and associated CO₂-equivalent emissions. This in turn will contribute to the Australian red meat industry reaching its 2030 carbon neutral emissions target.

Useful resources

The industry webinar is available via AMPC's YouTube channel: <https://www.youtube.com/watch?v=EIO-WqtJYU0>.