

Lauric Arginate

INTERVENTION SUMMARY	
Status	Available
Location	Ground meats, Smallgoods, RTE products,
Intervention type	Surface or incorporation in some products
Treatment time	Added directly in or on product
Regulations	Approved US and Australia, Europe unknown
Effectiveness	Initial declines in <i>Listeria</i> , aerobic bacteria, lactic acid bacteria although growth will usually occur over time dependent on product and concentration of LAE
Likely cost	Unknown
Value for money	Unknown
Plant or process changes	Minimal
Environmental impact	Unlikely
OH&S	None, breaks down to natural constituent parts
Advantages	Natural product
Disadvantages or limitations	Initial decline only

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Lauric Arginate

Lauramide Arginine Ethyl Ester (LAE) is also commonly called Lauric Arginate is derived from lauric acid and arginine. It is rapidly metabolized in humans to the naturally occurring components (1). LAE was granted GRAS status in the US in 2005 at levels up to 200 ppm.

LAE applied on RTE ham reduced counts of *Listeria* by 1.5 log at day 0, 1 log at day 14 but had no significant difference at day 28 (2). In a separate study of *Listeria* inoculated hams, treated with 8 mL of a 5% LAE solution, a significant difference in counts was still observed after 60 d at 4 °C (3). A number of studies have examined the effect of LAE on the microbial load of frankfurters. Initial lethality was reported when LAE was surface applied to frankfurters with an initial decrease of 1.8 log (4). Similarly initial declines of *Listeria* on frankfurters externally treated with LAE was 2.28 log however *Listeria* counts were not significantly different from controls at day 28 of storage at 4 °C (5). LAE does not provide protection against the outgrowth of *Listeria* during storage of frankfurter style products.

The mode of application may effect the activity of LAE (6). The application as oil-in-water emulsion or as solid lipid particles reduced the antimicrobial effect when applied on the surface of a sausage type product. *E. coli* was not affected by the addition of LAE applied to the surface of a sausage type product while *Listeria* and *Lactobacillus curvatus* had no growth after 24 d at 6 °C at 2.5 mg/g (6). When applied into the product matrix at manufacture these forms of LAE had a greater antimicrobial effect (7).

LAE was effective against *Campylobacter* on chicken breast with significant reductions at 200ppm without altering the pH (8). The growth of psychrotrophs or mesophilic organisms on chicken breast was not different from control samples after 3 days (8). Effects on *Salmonella* on chicken breast was found to be reduced from day 1 to day 7 of storage at 4 °C with a decrease of 0.7 to 1 log cfu/g (9). No effect of LAE on pH or colour or mesophilic organisms was noted (9). When applied to ground chicken no inhibitory effect was noted at either 200 or 400 ppm (10).

Incorporation of LAE, in conjunction with chitosan and organic acids, into a marinade applied to beef steaks demonstrated an initial 3.5 log reduction of a combination of pathogens (*E. coli* O157:H7, non-O157 shiga toxin producing *E. coli*, *Salmonella* and *Listeria*) (11). The effectiveness of the antimicrobial marinade when used at lower concentrations was effected by marinade time, pathogens used and inoculation level (11). LAE when added to ground beef at ≥ 1.5 mg/g initially decreased the level of

aerobic mesophilic bacteria from 0.5 to 1.5 log (12). Increasing the fat level to 50 % delayed the onset of aerobic microbial growth with 0.5 mg/g LAE. Growth of aerobic bacteria was delayed by 4 days at 12 °C with LAE levels of 2 or 2.5 mg/g (5). The growth of lactic acid bacteria was inhibited at 2 and 2.5 mg/g LAE at all fat levels in ground beef (12).

LAE may be useful as a surface disinfectant with activity demonstrated on food processing surfaces at 100ppm of LAE after 5 and 15 min exposure on stainless steel with 1.38 and 2.57 log reductions (13).

Proponent/Supplier Information

A&B Ingredients
“Cytoguard”
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Commonly accepted food ingredient likely to be available from most food ingredient companies

References

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