



POSTER

MICROBIOLOGICAL SAFETY OF DRY-AGED EYE OF ROUND BEEF TREATED WITH BEEF TALLOW COATING

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Aim. Dry aging is traditionally applied to marbled beef cuts, although its potential benefits have also been demonstrated in leaner muscles. Beef tallow coating is typically applied after approximately 15 days of dry aging to allow the formation of the protective crust required for the process. The aim of this study was to microbiologically and physicochemically characterise dry-aged eye of round beef produced under commercially relevant conditions and to evaluate the behaviour of *Listeria monocytogenes* by means of a challenge test.

Methods. Three batches of eye of round were sliced and divided into control and *L. monocytogenes*-inoculated samples. The latter were inoculated at day 0 with a cocktail of three *L. monocytogenes* strains and, together with the control samples, dry-aged for 45 days in a dedicated dry-aging chamber (Stagionello® Meat Curing Device) under controlled conditions (1 ± 2 °C, $78 \pm 7\%$ relative humidity, and 2.0 m/s airflow speed). Samples were collected at 0, 15, 30, and 45 days, while beef tallow coating was applied to both groups after 15 days of aging. Control samples were analysed for total bacterial count (TBC), lactic acid bacteria (LAB), and Enterobacteriaceae, while *L. monocytogenes* was enumerated in inoculated samples according to the relevant ISO standards (ISO 4833-2:2013, ISO 15214:1998, ISO 21528-2:2017, and ISO 11290-2:2017). pH was measured using a penetration pH meter according to ISO 2917:1999, whereas a_w was determined on crust samples using an

Aqualab 4TE hygrometer according to ISO 18787:2017.

Results. A progressive reduction in microbial populations was observed throughout the dry-aging period. TBC decreased from 5.83 ± 0.34 Log CFU/g at day 0 to 3.62 ± 0.36 Log CFU/g after 45 days. Enterobacteriaceae showed a marked reduction of 1.95 Log units over the 45-day aging period, with the greatest decline occurring during the first 15 days of aging. Similarly, LAB decreased from 4.96 ± 0.34 to 3.09 ± 0.39 Log CFU/g by day 45.

In inoculated samples, *L. monocytogenes* counts declined from 4.32 ± 0.01 Log CFU/g after inoculation to 2.78 ± 0.39 Log CFU/g at the end of the aging period, corresponding to a reduction of approximately 1.5 Log units.

a_w decreased steadily during dry aging, from 0.997 ± 0.001 at day 0 to 0.735 ± 0.014 at day 45, whereas pH remained substantially unchanged, ranging from 5.52 ± 0.06 to 5.56 ± 0.07 . The progressive reduction in a_w was accompanied by a decrease in bacterial populations, indicating an association between reduced water activity and microbial decline during dry aging.

Conclusions. Dry aging under the applied processing conditions resulted in a progressive reduction of microbial populations, including *L. monocytogenes*, in compliance with Commission Delegated Regulation (EU) 2024/1141. Beef tallow coating was successfully applied as part of the commercial dry-aging process without compromising microbiological safety.