



Natural Curing and *Listeria monocytogenes* Control in an RTE Pork Ham Using a Blend of Vinegar and Celery Powder

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Objectives

All food manufacturing segments are feeling the consumers' increasing demand for purity in food. Verdad Avanta C100 is a unique blend of specialty vinegar and celery powder (C100) and has excellent protection against *Listeria monocytogenes*, and provides a desirable cured meat color and flavor. Naturally cured meat products derive lower levels of nitrite from celery in comparison to conventionally cured products, thereby providing a more limited protection against *L. monocytogenes*.

The objective of this study was to evaluate the antimicrobial efficacy of C100 on inhibition of *L. monocytogenes* growth potential in a pork ham for 110 d of storage at 4°C, as well to assess the impact on cook yield, curing and sensory attributes.

Materials and Methods

The following treatments, along with proximate data, were used for inoculation of vacuum packed pork ham (80.0% pork meat, 17.3% water, 2.0% sea salt and 0.7% cane sugar) with a 5-strain *L. monocytogenes* cocktail (serotypes 1/2a, 1/2a, 1/2b, 1/2c, and 4b).

The treatments were sampled and enumerated for *L. monocytogenes* (in duplicate) at 12 regular intervals up to 110 d of incubation using selective Palcam media. In parallel new products were produced for cook yield and sensory. Cook yields ($n = 2$) of the different treatments were calculated by the weight after cooking divided by the initial weight of the pork ham expressed as a percentage. Sensory evaluations of the different formulations were done by a trained panel on basic taste attributes. Proximate analyses were performed for all the treatments.

Results

The data from the C100 and vinegar treatments showed significant ($p < 0.05$) control in outgrowth of *L. monocytogenes* compared to the control and the natural cure treatments. The 2 log outgrowth for *L. monocytogenes* was reached in 15 d for control treatment and in 18 d for natural cure treatment, respectively. For the other 2 treatments, an inhibition (< 1 log outgrowth) of *L. monocytogenes* was observed during 110 d of incubation.

Using C100 over the vinegar treatment resulted in an improved cooked yield. An increase of ~3% cook yield was observed in C100 treatment compared to the vinegar treatment. There were no differences between treatments on the basic taste attributes. Except in the control (no cure), in all batches a desired cured meat color was developed, no differences were observed within the treatments.

Conclusion

Results from this study demonstrate the antimicrobial efficacy of this blend of vinegar and celery powder in RTE meat to control *L. monocytogenes*, give a desired cured meat color as well an improved cooked yield. C100 therefore provides the meat industry with an effective natural antimicrobial solution for shelf life extension and food safety.

Treatment details	aw	pH	Moisture	Cook yield
Control (no cure)	0.980	6.16	74%	86.6%
Natural cure (75ppm NaNO ₂)	0.975	6.17	74%	88.0%
0,70% Vinegar (Verdad Powder N6)	0.973	6.11	75%	87.9%
1.13% C100	0.972	6.22	75%	90.9%