CLEAN LABEL *SALMONELLA* CONTROL IN RAW MINCED MEAT

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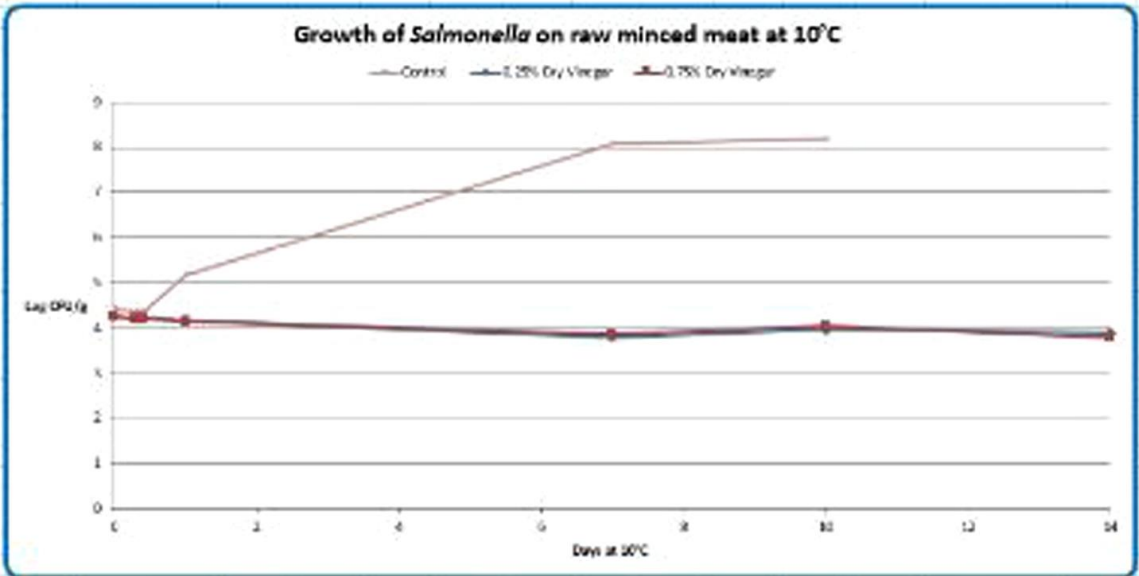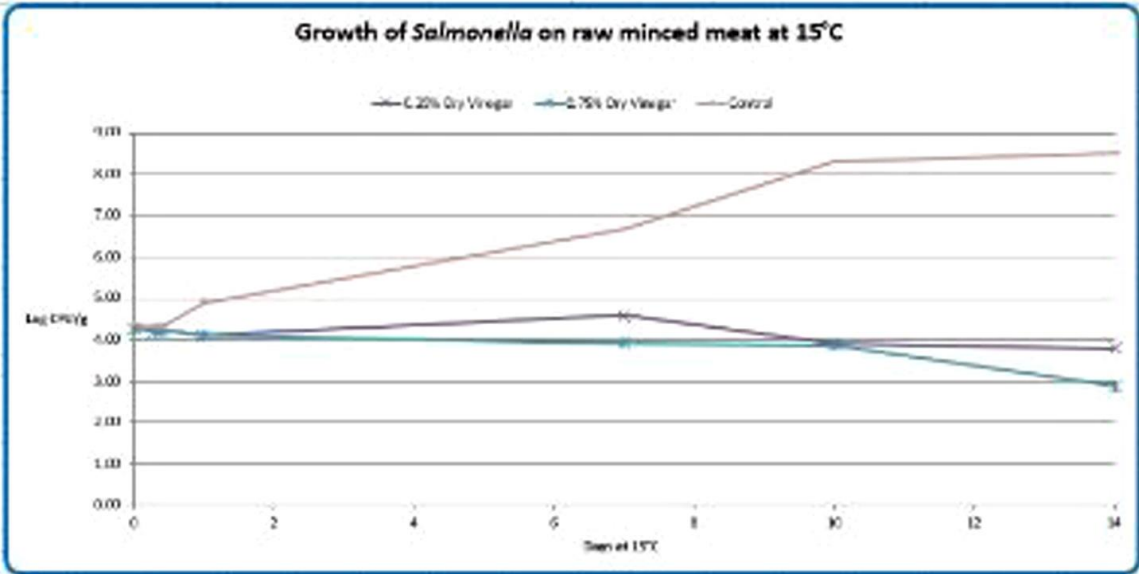*eelco.heintz@niacet.nl

I.   OBJECTIVES

This research demonstrated the possibility to increase safety, by controlling the growth of *Salmonella* of fresh minced beef using preservatives that meet current food trends, like sodium reduction and natural origin.

II.   MATERIALS AND METHODS

Ground beef was mixed with 0.25% and 0.75% (w/w) dry vinegar (Provian Neutralized Dry Vinegar). Thirty-gram portions of ground raw beef (80% lean, 20% fat) were inoculated separately with 5-$\log_{10}$ CFU/g *Salmonella* (including strains *S.* Enteritidis 6424, *S.* Enteritidis E40, *S.* Heidelberg S13, *S.* Typhimurium S9, and *S.* Typhimurium M-09-0001-A1), by applying a 1% inoculum into ground product. Inoculated products were sprayed with a test solution (treatments diluted in sterile deionized water) and mixed for 3 min. The product was divided into polyethylene bags (25 g/bag) and stored at 10°C and 15°C. Triplicate samples were assayed at 0, 1, 7, 10, and 14 d for both temperatures and Salmonella populations enumerated by surface plating on selective agar (Xylose Lysine Deoxycholate agar). The results were statistically analyzed using one-way analysis of variance.

III.   RESULTS

Populations of *Salmonella* increased ~1.5-log in Control samples stored at 15°C for 1 d, and ~1-log after 10 d of storage at 10°C. In contrast, no growth (<0.3 log increase) was detected in any acetate-based treatments stored at 10°C or 15°C for 14 d. The data from this study revealed that vinegar derivatives prevented *Salmonella* growth significantly ($P < 0.05$) at abuse temperatures (15°C and 10°C) during prolonged storage (14 d) compared to the control without antimicrobials.

Growth of *Salmonella* on raw minced meat at 15°C

Growth of *Salmonella* on raw minced meat at 10°C

IV.   CONCLUSION

This research demonstrated the possibility to increase safety of fresh minced beef, by controlling the growth of *Salmonella*, using vinegar-derived preservatives.

Keywords: clean label, food protection, food safety, Provian, *Salmonella* control