MICROBIAL CONTROL FOR A READY TO EAT (RTE) CURED COMMINUTED HAM ROLL PRODUCT: EFFECT OF A POST-LETHALITY TREATMENT WITH $Safe_2O^{®}_{Brand}$ RTE 01

Objective:

Determine if a 30 second dip treatment with $Safe_2O^{®}_{brand}$RTE 01 can effectively kill *Listeria monocytogenes* on the surface of a cured comminuted ham roll.

Materials and Methods:

1. Five strains of *Listeria monocytogenes*, were cultured separately in BHI broth overnight at 37°C in a shaking water bath. Prior to use cultures were mixed in equal proportions. The mixture was further diluted 1:1000 with sterile saline to produce a suspension for use. An aliquot was removed and serial diluted prior to plating onto TSA plates to determine the inoculation level.
2. Cured comminuted ham roll was purchased from a local supermarket. Study was initiated by carefully unpacking the roll and removing it from the original packaging. Unpacked roll was immediately transferred to a sterile surface in a Laminar Flow Bio-safety Hood. Nine pieces, approximately 2.0" X 2.0" X 0.25 were excised from the surface of the same piece of cured comminuted ham.
3. All pieces were irradiated with UV light for 30 minutes before inoculation.
4. After irradiation, 20 microliters of *Listeria monocytogenes* suspension, prepared as previously described, was inoculated onto the exterior side of the ham pieces. All inoculated pieces were kept in the hood for an additional 30 minutes to allow bacteria to attach.
5. Inoculated pieces were divided into three 3 groups (T, C_1 & C_2), having three pieces each. Group T pieces were treated by dipping them into 600 ml of $Safe_2O^{®}_{brand}$RTE 01 (1:2 dilution) for 30 seconds. Group C_2 pieces were treated by submersion into 600 ml of sterile dH_2O for 30 seconds. After treatment, excess solution was allowed to drip off for 10 sec and all pieces were then individually sealed in a vacuum pouch.
6. Group C_1 pieces were directly transferred and sealed in vacuum pouches without treatment.
7. All ham pieces were incubated at 4°C for 24 hours before microbial determination. After incubation, 5 ml of peptone water was added to each pouch. *Listeria monocytogenes* organisms were washed from the surface of each ham piece by two minutes of hand massage in the pouch.
8. Colony forming units per piece of ham was determined by serial dilution of an aliquot from each rinsate and plating on Modified Oxford Selective Agar plates.
9. After plating, all plates were kept incubated at 37°C for about 40-48 hours before colonies were counted.

Results:

The objective of this study was to determine if a 30 second dip treatment with $Safe_2O^{®}_{brand}$RTE 01 can effectively kill *Listeria monocytogenes* on the surface of ready to eat (RTE) cured comminuted ham rolls. Pieces of ham excised from the exterior of the ham roll were inoculated and treated as described above. As can be seen from Table 1, treatment with $Safe_2O^{®}_{brand}$RTE 01 for 30 sec resulted in a >3.0 log reduction in the number of *Listeria monocytogenes* organisms associated with the surface of cured comminuted ham rolls.

Table 1: Effect of a post-lethality treatment with $Safe_2O^{®}_{Brand}$RTE 01 on control of *Listeria monocytogenes* on cured comminuted ham rolls*

Group	CFU/piece	Log CFU	Log Reduction
C_1	1.51×10^6	6.18	--
C_2	5.93×10^5	5.77	0.41
T	3.86×10^2	2.59	3.19

*Ham pieces were inoculated at 1.51×10^6 CFU *Listeria monocytogenes*/piece

Conclusions:

Based on the studies presented herein, treatment with $Safe_2O^{®}_{Brand}$RTE 01 is an effective post-lethality intervention. Therefore, utilization of this product would allow the manufacturer of cured comminuted ham rolls to claim Alternative 2 status for products so treated under the new USDA guidelines for the control of Listeria per the final rule effective October 6, 2003 [see Federal Register: June 6, 2003 (Volume 68, Number 109)][Rules and Regulations][Page 34207-34254].