



Introduction

- Approximately 57% of fresh pork in the United States is enhanced
- Trends indicate that consumers are more willing to purchase perceived clean-label products (1)
- Alkaline electrically reduced water shows promise as a replacement for traditional salt and phosphate enhancement solutions due to:
 - Elevated pH, ionic strength (2)
 - Labeled as water

Objectives

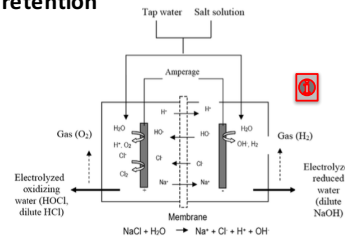
- Determine if pork loins enhanced with one of two alkaline electrically reduced water solutions were comparable to traditionally enhanced pork for:
1. Water holding capacity
 2. Palatability characteristics

Acknowledgements

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Methods

- 64 IMPS 413 whole boneless pork loins were enhanced to 110% of raw weight with one of four enhancement solutions
 - Alkaline electrically reduced water (EOH)
 - EOH plus 2.5% potassium lactate (EOK)
 - Water with 0.35% STP, 0.14% NaCl, and 2.5% K-lactate (IS)
 - No Enhancement (CON)
- 2 chops were cut for Warner-Bratzler shear force
- 7 chops were cut for moisture retention
 - Individual basis
 - Free Drip
 - Expressible Juice
 - Bound Water
 - 100% basis
 - Free Drip
 - Expressible Juice
 - Bound Water
- 2 chops were cut for trained sensory analysis
- Data were analyzed using Proc Mixed of SAS as a completely randomized split plot design
 - Loin within treatment by rep was considered the random term
 - Means were separated using the PDIF option at $\alpha < 0.05$



References

1. Huang, Y.-R., Hung, Y.-C., Hsu, S.-Y., Huang, Y.-W., & Hwang, D.-F. (2008). Application of electrolyzed water in the food industry. *Food control*, 19(4), 329-345.
2. Zurawicki, L. (2015). Pleasures of the palate from the consumer marketing perspective. *Food Research International*, 76, Part 2, 200-206.

Results

Table 1: Whole loin enhancement

Traits	CON	EOH	EOK	IS	SEM	P - value
Gm Wt.	3.40	3.23	3.27	3.17	0.08	0.20
Enh. Wt.	3.40 ^b	3.78 ^a	3.74 ^a	3.57 ^{ab}	0.10	0.04
Rest Wt.	3.40	3.59	3.58	3.47	0.09	0.43
PU Initial, %	-	16.74 ^a	13.96 ^b	12.59 ^b	0.71	<0.01
PU Final, %	-	10.90 ^b	9.26 ^b	9.47 ^b	0.42	<0.01
pH Grn	5.80	5.75	5.66	5.85	0.07	0.29
pH Enh	5.80	5.71	5.75	5.86	0.05	0.30

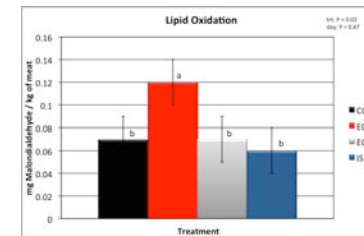
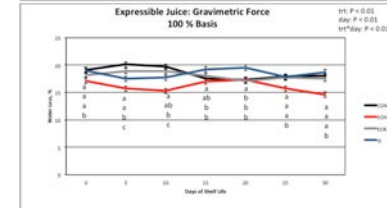
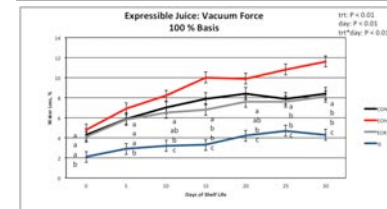
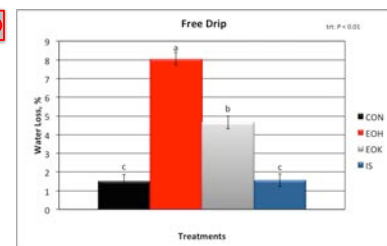


Table 2: Cooking and sensory

Trait	CON	EOH	EOK	IS	SEM	P - value
Cooking						
Thaw Loss, %	7.06 ^a	9.45 ^a	7.64 ^a	1.26 ^b	1.56	<0.01
Cook Loss, %	10.86 ^{ab}	14.33 ^a	11.39 ^b	9.62 ^b	0.61	<0.01
Total Loss, %	17.20 ^b	22.43 ^a	18.15 ^b	10.76 ^c	1.48	<0.01
WBSF	2.09 ^a	2.18 ^a	1.59 ^b	1.46 ^b	0.12	<0.01
Sensory						
Tenderness	4.95 ^a	4.61 ^a	5.71 ^b	6.75 ^b	0.23	<0.01
Pork Flavor	4.88 ^{ab}	4.59 ^a	5.11 ^b	5.73 ^b	0.14	<0.01
Juiciness	4.29 ^b	4.01 ^b	4.44 ^b	5.45 ^b	0.18	<0.01
Off Flavor	1.12 ^a	1.09 ^a	1.16 ^{ab}	1.33 ^b	0.06	0.03



Conclusions

Due to the excessive loss of water during the free drip and Expressible Juice stages of water analysis, as well as the corresponding decrease in sensory juiciness we do not suggest alkaline electrically oxidized water as a replacement for traditional salt phosphate enhancement solutions at this time.



Results: Explained

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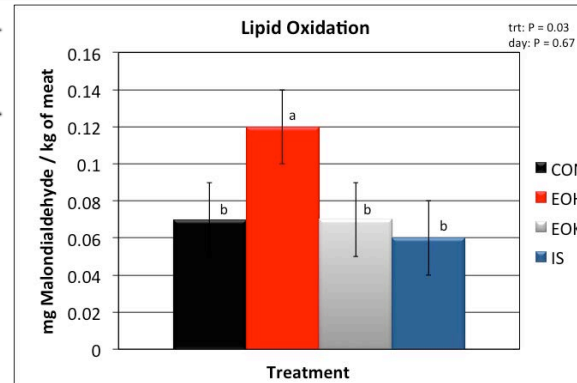
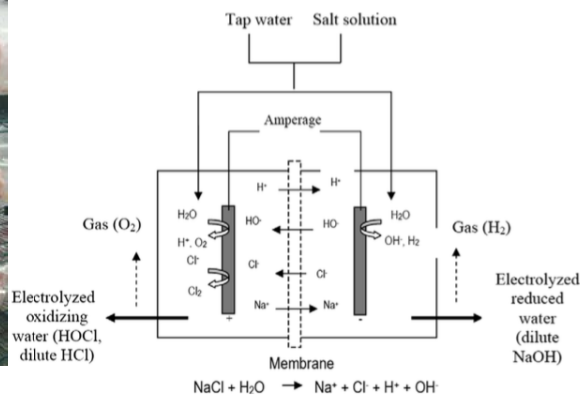


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