

Sodium Reduction in Meat Products

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Sodium Consumption

- **Institute of Medicine recommended a reduction in sodium intake in 2010.**
- **Large companies promised decreases in sodium content in food products over the next 5 years.**

When Reducing Sodium in Meat Products, Must Consider Alternatives to:

- Sodium Flavor
- Water-Holding Capacity
 - Cooking Yields
 - Product Texture
 - Product Cost
- Food Safety



When Reducing Sodium, Must Also Consider:

□ Consumer acceptance

- Clean labels
- Willingness to try

□ Feasibility of applying technology

□ Allergenic ingredients

□ Cost of implementing



General Considerations

- **To minimize obvious changes in products to the consumer...**
 - **recommend gradual reductions in sodium content over time...**
 - **monitor quality and safety with each incremental reduction.**

Flavor Alternatives

- ❑ Flake salt
- ❑ Reduce sugar content
- ❑ Many flavor enhancing ingredients available
 - acceptability on labels?

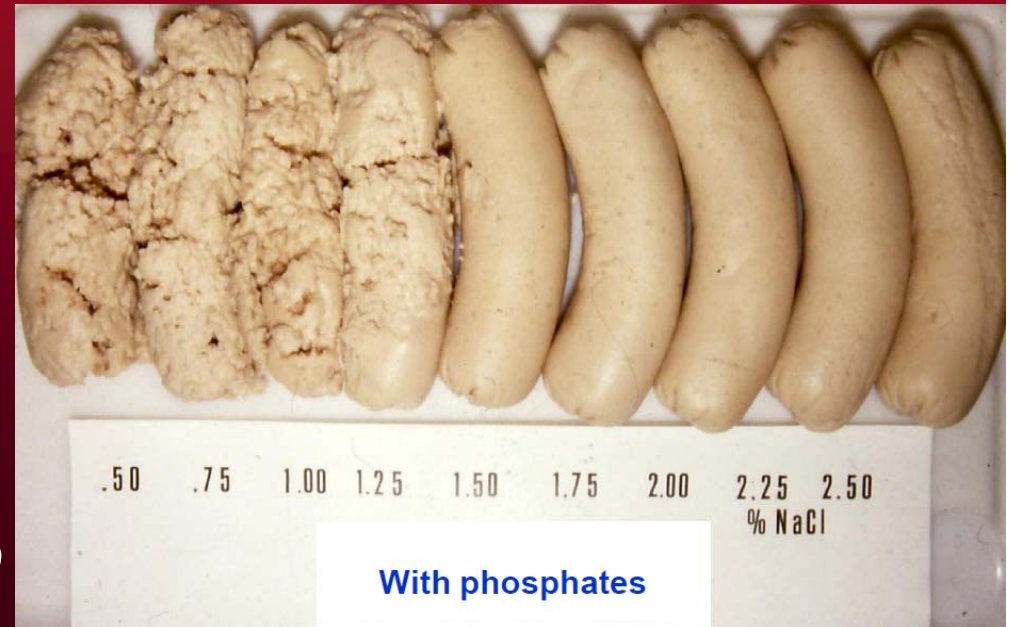


Sodium Flavor:

- **If current sodium flavor is maintained...**
- **...consumers will not adapt to reduced sodium flavors.**
- **Gradual reduction of sodium**
 - **Consumer adaptation to reduced sodium flavors**
 - **Minimize rejection of the new products.**

Water-Holding Capacity Alternatives

- Maximize Functionality of Meat
 - Synergism of salt and alkaline phosphates
 - 2.5 - 1.5% salt
 - Increase pH - 5.8-6.3



E. Puolanne & M. Ruusunen, 2009

Water-Holding Capacity Alternatives

- **Maximize Functionality of Meat**
 - **Pre-Rigor or Preblended Meat**
 - **Vacuum Mixing, Tumbling**
 - **Vacuum Stuffing**
 - **Increase fat content**
 - reduced juiciness



Water-Holding Capacity Alternatives

- **Binders and extenders to hold additional water.**
 - **Collagen**
 - **Carrot or Oat Fiber**
 - **Potato Starch**
 - **Kappa Carrageenan**

Cost Comparison

□ Calculate cost to hold water.

Ingredient	Cost/lb.	Hydration Ratio (Protein:Water)	To hold 100 lbs. water	Cost to hold 100 lbs. water	Comments
Carrageenan	\$5-6.00	1:25	4 lbs.	\$20-24	
Carrot fiber	\$1.70	1:18	5.5 lbs.	\$9.35	1%, clean label, sausage only
Dehydrated Pork Stock	\$3.50	1:20	5 lbs.	\$17.50	0.5-1.0% Inject or add to mixer with lean meat (sausage), clean label
Potato Starch	\$0.80-1.50	1:5	20 lbs.	\$16-30	
Soy isolate	\$2.70	1:5	20 lbs.	\$54	Sensitive to salt

Antimicrobial Alternatives

- Octanoic acid
- Lauric arginate
- Post-Packaging
Pasteurization
- High-Pressure Processing
- Sodium Lactate

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