CONNECTING PUBLIC HEALTH AND FOODSERVICE OPERATORS:

CULINARY TECHNIQUES AND REDUCING SODIUM, WHAT DO YOU TASTE?
WHY SALT?

- Functional benefits
- Covers poor technique
- Covers poor ingredients
- Enhances good flavors
- Instantly good!
- Cultural staple
• Top ingredients take time and skill
• Cooking methods add to deliciousness
• Consideration must be given to balance of flavor
• Textures maintained
• Colors enhanced
• Create recognition through flavor profiling
GLOBAL FLAVOR PROFILES

Flavor quiz, below are flavor profiles, please pick the associated country for each profile;

1. Soy, sesame, ginger, garlic
2. Chile powder, cumin, garlic, lime
3. Paprika, lemon, saffron
4. Basil, garlic, black pepper, tomato
5. White wine, cream, meat essence, truffle

a. Italy  b. Spain  c. Mexico  d. France  e. China
A SENSORIAL FIESTA

• Taste and flavor are a culmination of your senses

• Attracting and keeping diners is based on the ability to titillate the senses

• Taste is a function, flavor a sensation
THE 5? TASTES

- Salt
- Sweet
- Sour
- Bitter
- Umami
- Fat, alkaline, umami
KEY STRATEGIES SO FAR

1. Measure salt, follow recipes
2. Season foods with spices & herbs
3. Apply “menu forensics” as a tool
4. Contribute to sound business decisions
5. Track primary purchases, create benchmarks
6. Design menus and recipes to benchmarks
7. Increase salability through variety
KEY STRATEGY #8
PLAY TO THE SENSES
WHEN WE ENTICE, WE WIN

• Use the group, all the attributes play well together

• Successful offerings must connect with more than just a good concept

• Urge operators to create for sales

• Couple textures, colors and flavors to entice
FLAVOR IS A COMBINATION OF:

“A food’s flavor includes its texture, smell, temperature, color and painfulness (as in spices), among many other features”

• Taste
• Smell
• Sight
• Sound
• Touch (chemesthesis)
Steaming foods imply hot foods

Juicy looking hints at succulence

Bright colors indicate freshness
PERCEPTION OF SODIUM

- Depends on concentration of sodium in food, or, “top salting” as opposed to integrated
- Can change from putting food in mouth, through chewing and swallowing
- Is in entire oral cavity (no “tongue map”)
- Depends on food matrix (eg: liquid vs. bread)
- Depends on interactions between taste compounds
THE MAILLARD EFFECT

- Browning of proteins to cause intense flavor
- Intense heat does it better
- Removes fat and adds umami
- Citrus and brown
TASTE INTERACTIONS

- Salt and bitter - mutually suppressing
- Salt and umami - mutually enhancing
- Sour - additive with salt
- Salt - enhances sweetness
- Carmelization and citrus - richness, mimics salt
- Fat and acid - suppresses salt, adds flavor complexity
ADDING FRESH HERBS
Liking of canned soups with varying levels of herbs was evaluated before and after consumers added salt to their liking.

When herb flavor increased, the amount of salt added decreased.

Liking decreased for the highest level of herb tested in the study.

HERBS AND SODIUM REDUCTION

• Inclusion of herbs and spices enhanced the perception of the salty taste of a low salt soup to the same level as the standard soup.

• Repeated exposure to the herb-and spice-modified soup led to a significant increase in liking.

Figure 3 Overall liking development across the repeated exposure days (error bars represent SEM). ★ = low salt soup; ▲ = oregano modification soup; ♦ = standard soup.

HERBS AND SPICES

• Teaching people to use herbs and spices in cooking, over a 20 week behavioral intervention;
  • led to an average intake of 966 mg/day of sodium less than the group that didn’t receive the intervention
  • and they enjoyed their food more!

LEMON AND SODIUM REDUCTION

- In taste tests, most subjects preferred the reduced salt recipes with lemon juice and zest to the original recipes.

<table>
<thead>
<tr>
<th>RECIPE</th>
<th>ADDITION</th>
<th>SODIUM REDUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEGETABLES</td>
<td>LEMON JUICE + ZEST</td>
<td>UP TO 75%</td>
</tr>
<tr>
<td>PORK, TUNA, HALIBUT</td>
<td>LEMON JUICE + ZEST</td>
<td>UP TO 50%</td>
</tr>
<tr>
<td>DRY RUB (FOR CHICKEN AND BEEF)</td>
<td>LEMON ZEST</td>
<td>UP TO 30%</td>
</tr>
</tbody>
</table>

GLOBAL FLAVOR PROFILES

The answers...

• Soy, sesame, ginger, garlic
• Chile powder, cumin, garlic, lime
• Paprika, lemon, saffron
• Basil, garlic, black pepper, tomato
• White wine, cream, meat essence, truffle
KEY STRATEGY #9
CHOOSE DELICIOUS FOODS TO EXCITE & ENHANCE

• Use fresh herbs, aromatics and umami

• Use acids with flavor, lemon, lime, orange, vinegars

• Speak to the flavor

• Maillard affect, toasting and browning, carmelization

• Fermentation adds flavor and interest
UMAMI

- First described by a Japanese scientist in 1908
- Literally “the presence of glutamic acid” translated to mean “deliciousness or wonderful taste”
- Considered to be a 5th taste as well as having the property to enhance the flavor of savory foods
- Little effect on sweet foods
- Very helpful in lowering sodium

Professor Kikunae Ikeda
UMAMI RICH FOODS

- Seafood
  - Clams, lobsters, scallops
  - Fish sauce
  - Anchovies
  - Kombu seaweed
- Vegetables
  - Fresh tomatoes
  - Cooked potatoes
  - Shiitake mushrooms
- Aged, fermented, and cured foods
  - Dry-aged steaks
  - Balsamic vinegar
  - Soy sauce
  - Green tea
  - Grapefruit
  - Aged cheese
UMAMI AND SODIUM REDUCTION

- In taste tests, when salt was substituted with soy sauce, products were acceptable with significant sodium reduction.

<table>
<thead>
<tr>
<th>RECIPE</th>
<th>SALT REDUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALAD DRESSING</td>
<td>50%</td>
</tr>
<tr>
<td>STIR-FRIED PORK</td>
<td>17%</td>
</tr>
<tr>
<td>SOUPS</td>
<td>29%</td>
</tr>
</tbody>
</table>

GLUTAMATE / UMAMI

• Glutamate enhances salt taste by about 30%
  • (J Food Sci, 1984;49:82-85)

• Although many fermented foods are high in sodium (soy sauce, fish sauce, miso, cheese, salumi, etc.) they may be helpful in reducing sodium in the US diet.
FERMENTED FOODS AND SODIUM REDUCTION?

• Fermentation increases, aromatic compounds, umami taste

• Is available in many RTU forms, miso, fish sauce, soy and pickles of all types
**FERMENTED FOODS FOR SODIUM REDUCTION?**

<table>
<thead>
<tr>
<th>SODIUM CONTENT OF NATIONAL BRANDS OF CHEESE PIZZA</th>
<th>SODIUM (MG PER 100 GM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RANGE OF SODIUM CONTENT IN EIGHT NATIONAL BRANDS (2014)</td>
<td>376 -692</td>
</tr>
<tr>
<td>AVERAGE OF EIGHT NATIONAL BRANDS</td>
<td>575</td>
</tr>
<tr>
<td>NATIONAL SALT REDUCTION INITIATIVE 2014 TARGET FOR SODIUM IN CHEESE PIZZA</td>
<td>390</td>
</tr>
<tr>
<td>ITEM</td>
<td>SODIUM (MG PER 100 G)</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>CONTROL TOMATO SAUCE</td>
<td>320</td>
</tr>
<tr>
<td>TOMATO SAUCE + FISH SAUCE</td>
<td>265</td>
</tr>
<tr>
<td>TOMATO SAUCE + BLACK GARLIC</td>
<td>240</td>
</tr>
<tr>
<td>TOMATO SAUCE + KOJI EXTRACT</td>
<td>240</td>
</tr>
<tr>
<td>CONTROL DOUGH</td>
<td>400</td>
</tr>
<tr>
<td>DOUGH + MISO</td>
<td>300</td>
</tr>
<tr>
<td>DOUGH + YEAST EXTRACT</td>
<td>250</td>
</tr>
<tr>
<td>DOUGH + DRIED SOY SAUCE</td>
<td>280</td>
</tr>
</tbody>
</table>
FLAVOR IS COMPLEX
SIMPLE CONTRIBUTORS

- Freshness
- Good cooking techniques
- Fermented ingredients
- Herbs and spices
- Aromatics, onions, garlic, citrus, ginger
- Carmelization
- Sensorial attributes, seeing is believing
Thanks for joining us!