



## *The Transformative Power of Flavor*

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## What's on Today's Menu

- **Flavor** as a catalyst for positive dietary change
- **Current science** on culinary **spices and herbs** and their potential to improve health
- Translation of **science to the table** through positive and practical strategies
- Capturing opportunity for **spices and herbs as key** to helping achieve dietary goals and improve overall health

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Consumers think of food as a  
**MEANS OF HEALTH**  
and part of their  
**PERSONAL IDENTITY**

**66%** believe that the  
foods they eat make a  
statement about their  
**personal values**

Source: StrategyOne, We Are What We Eat: Personal Values and Social Responsibility, 2010

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## Positive Nutrition vs. Avoidance

Nearly two-thirds (63%) of  
adults want to  
**know what to eat,**  
instead of what not to eat

Source: - FMI, Shopping for Health 2011

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## The Bonus of Plus Instead of Minus

*It appears **more important to increase** the number of healthy foods regularly consumed **than to reduce** the number of less healthy foods regularly consumed.*

Michels & Wolk, International Journal of Epidemiology, 2002.

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## Nutrition and Dietary Therapies

**Nutrition and diet play a role. . .**

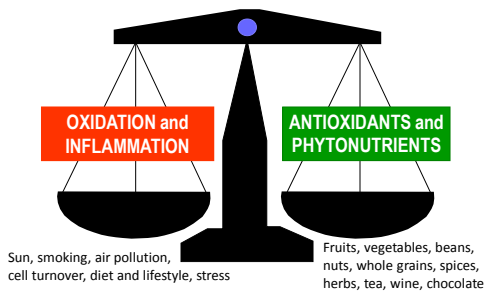
- in 6 of the 10 top leading causes of death
- in 2 of the 3 preventable causes of death
- in a host of chronic and debilitating health conditions and diseases
- to under-nutrition. . . even when overfed
- in promoting healthy weight, wellness, high quality of life, and longevity

**Overall, 2.7 million deaths are attributable to low fruit and vegetable intake.**

Source: WHO and CDC

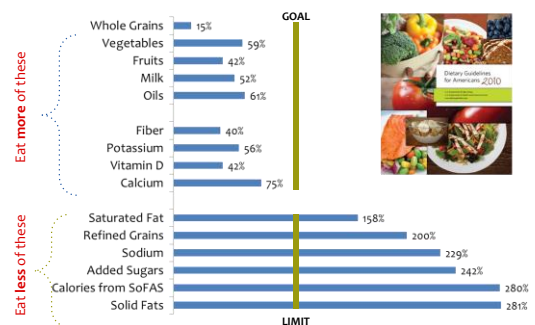
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## Finding Balance



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## Conflict Exists in the American Diet



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## People Are Trying to IMPROVE Their EATING HABITS

Over the past year, which of the following, if any, have you made an effort to do?



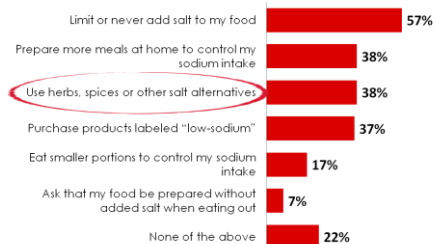
Source: FMI Shopping for Health, 2011; IFC Food and Health Survey 2013

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## Sodium Reduction is Top Consumer Concern

**8 of 10 Americans have taken some action to limit sodium consumption, including using herbs and spices**

Which of the following, if any, do you regularly do regarding your sodium consumption?



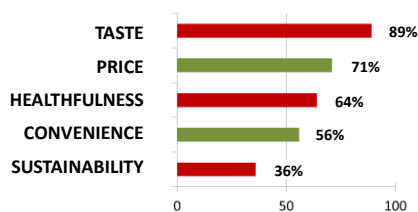
Source: IFC Food and Health Survey, 2012

All (n=1,057)

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## Flavor is NOT an Area of Compromise

Taste remains the #1 driver of food decisions...



Source: IFC Food & Health Survey, 2013

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## Herbs and Spices Have a Long History Linked to Health

**"An herb is the friend of physicians and the praise of cooks."**

~ Charlemagne  
9th Century

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## Renewed Interest in the Potential Health Benefits of Spices and Herbs

**Metabolism**  
Clinical and Experimental

**Ginger consumption enhances the thermic effect of food and promotes feelings of satiety**

Muhammad S. Mansoor<sup>1</sup>, Yu-Ming Ni<sup>2</sup>, Amy L. Roberts<sup>3</sup>, Michael Kellerman<sup>4</sup>,  
Arindam RayChaudhury<sup>5</sup>, Maria Ferris De Gange<sup>1,6,7</sup>

Journal of the  
Academy of Nutrition  
and Dietetics

**Cinnamon shown to reduce blood sugar levels after eating**

Joske Negjercic<sup>1</sup>, NG RE, DDA, PhD, RD, RD

**Physiology  
Behavior**

**Spices may impact energy balance**  
Richard D. Mattes

JOURNAL OF  
AGRICULTURAL AND  
FOOD CHEMISTRY

**Components of black pepper could inhibit adipogenesis**

Uk-Hyun Park<sup>1</sup>, Hong-Suk Jeong<sup>2</sup>, Eun-Young Jo<sup>3</sup>, Tareun Park<sup>4</sup>, Seung-Kwon Yoon<sup>5</sup>, Eun-Joo Kim<sup>6</sup>,  
Ji-Choon Jeong<sup>7,8</sup> and Soo-Jong Um<sup>9,10</sup>



**Influence of Red Pepper Spice and Turmeric on Inflammation and Oxidative Stress Biomarkers**

David C. Nieman, Lynn Cialdella-Kam, Amy M. Knab, R. Andrew Shanely

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## Could Flavor be the Missing Link?



Can **adding more flavor** to USDA's MyPlate can help make it easier – and more enjoyable – to meet the recommendations outlined in the Dietary Guidelines for Americans?

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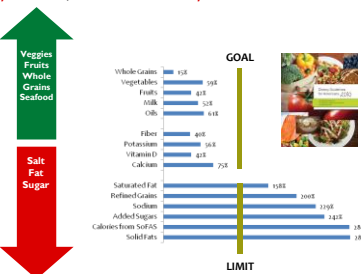
## Phytonutrients in Herbs and Spices



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## Flavor Can Help Close the Gap

Spices and herbs are a powerful solution to help **close the gap** – eat **more of what you need**, eat **less of what you don't need**.



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## Flavor assists the Dietary Guidelines

Supports all 5 major recommendations

	Balancing calories to manage weight	➔ Satiety, energy metabolism and greater appeal of lower-calorie foods
	Foods and food components to reduce	➔ Help reduce salt, added sugars, saturated fat
	Foods and nutrients to increase	➔ Increases palatability of vegetables, whole grains, seafood
	Building healthy eating patterns	➔ Makes it easier to adhere to DASH diet, Mediterranean eating plan and MyPlate
	Helping Americans make healthy choices	➔ Improved flavor and cooking more at home to eat healthier

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## Herb & Spice Research and Health

*From  
Single Spice Benefits  
to Enhancing the  
Total Diet  
and Translating the Science to the Table*



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- Red pepper
- Ginger
- Cinnamon
- Herb/Spice Dips to Increase Veggies in Preschoolers
- Herb/Spice blends to reduce fat and calories in meals and sides
- Herb/Spice education and use to reduce sodium and increase diet compliance



**Transformative Power of Flavor –  
The Science of Herbs and Spices**

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## Red Pepper and Weight Management

- Powerful compounds in red pepper may play a beneficial role in weight management.
- Red pepper enhanced thermogenesis, fat oxidation, and satiety; decreased desire to eat fatty, salty and sweet foods.

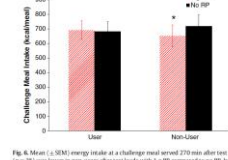
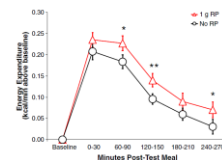


Fig. 6. Mean ( $\pm$  SEM) energy intake at a challenge meal served 270 min after test meals ( $n=25$ ) was lower in non-users after test meals with 1 g RP compared to no RP, but did not vary significantly in users ( $p=0.05$ ; \* $p<0.05$ ).



1 gram red pepper (~ 1/2 tsp; preferred dose)



Source: Ludy and Mattes. Physiology & Behavior. 2011;102:251-258.

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## Red Pepper and Weight Management

### Testing effects on:

- Thermogenesis (metabolism)
- Fat burning
- Satiety / Hunger



### Findings:

- Counteracted usual drop in energy expenditure (metabolism) from caloric restriction common to weight reducing diets.
- Increased fat burning.
- Positive impact on satiety.

~1 gram red pepper ( 1/2 teaspoon) per meal  
2.56 mg capsaicin

Janssens, et al. Appetite. 2014; 77C:46-51, e-pub.  
Janssens, et al. PLoS ONE. 2013;8:e7786.  
Smeets, et al. The Journal of Nutrition. 2013;143:442-447.



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### Science to the Table

## Red Pepper



### Easy Additions:

- 1) Sprinkle 1/4 tsp of ground red pepper (cayenne or paprika) or 1/4 teaspoon crushed red pepper to hummus.
- 2) Sprinkle paprika over deviled eggs, tuna or chicken salad.
- 3) Shake crushed red pepper onto pizza, soups, eggs and poultry/fish.
- 4) Add cayenne Pepper to basic Italian dressing or raspberry vinaigrette.
- 5) Include a pinch of cayenne into chocolate puddings, mousses and baked items.

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## Ginger and Appetite

### Testing the effects of ginger on:

- Metabolism in OW men
- Blood markers

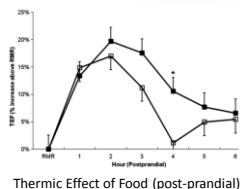
### Findings:

Significant differences ginger vs. control in:

- Thermogenesis
- Hunger, prospective intake

N.S.:

- Blood markers: BG, insulin, lipids, inflammatory markers



Thermic Effect of Food (post-prandial)

2 g ground ginger (~1 teaspoon)



Mansoura, Metabolism, 2012.

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### Science to the Table

## Ginger



### Easy Additions:

- 1) Make a quick Asian-inspired salmon, by stirring 1/2 tsp ground ginger or 1 Tbsp. ginger 'juice' and 2 tsp sesame seeds into 1/2 cup hoisin sauce and brush over salmon fillets during last few minutes of grilling or broiling.
- 2) Sprinkle ground ginger onto cooked carrots or squash.
- 3) Sprinkle 1/2 tsp ground ginger on store bought fruit cups or homemade fruit salad.
- 4) Ginger complements green tea and lemonade.
- 5) Add liquid ginger into salad dressings, marinades, fruit compotes and frozen vanilla yogurt or ice cream.

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## Cinnamon and Blood Sugar / Lipids

### 2013 Meta-analysis



U.K. Study: Type 2 DM patients



#### Beneficial effect in patients with Type 2 Diabetes:

- Fasting plasma glucose
- Total cholesterol
- LDL-C, HDL-C
- Triglycerides

N.S.

- HbA1c

10 randomized controlled trials, intake range 120 mg to 6 g per day (4-18 weeks)

Allen, et al. Ann Fam Med, 2013;452-459.



#### Cinnamon and BG / BP

– Cinnamon supplementation in people with Type 2 DM showed significant decreases in:

- fasting BG
- HbA1c
- BMI
- blood pressure (both SBP and DBP)

– 2g cinnamon (~3/4 tsp)

Akilen, Diabetic Medicine, 2010.

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### Science to the Table

## Cinnamon



### Easy Additions:

- 1) Make cinnamon yogurt by mixing 1 container (6 oz) plain or vanilla Greek yogurt, 1 tsp. maple syrup or honey, ½ tsp ground cinnamon and ¼ tsp ground ginger.
- 2) Sprinkle ½ tsp ground cinnamon over ground coffee before brewing.
- 3) Add ¼ tsp ground cinnamon to oatmeal.
- 4) Toss sliced apples with ½ tsp ground cinnamon.
- 5) Sprinkle to peanut butter + preserves or peanut butter and fruit sandwiches (. . . or almond butter).

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## Herb & Spice Research and Health

*Helping Meet Dietary Recommendations and Enhancing the Total Diet and Translating the Science to the Table*



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## Enhancing the Flavor of Vegetables to Promote Children's Consumption

### Testing:

- Acceptance and likeability of vegetables in preschool children in spice & herb enhanced dips



### Findings:

- Adding flavor to vegetables by offering dips with familiar spices and herbs helped children eat more vegetables, including vegetables previously rejected.
- A low-fat dip with spices and herbs encouraged greater vegetable consumption compared to plain dip.



Source: Birch, JAND, 2013.

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## Science to the Table

## Flavored Dips

## Tips / Strategies:

- 1) Use low fat Greek or regular yogurt as a base for creamy savory and sweet dips using honey and ginger or dill and garlic.
- 2) Add paprika or cayenne to hummus and cumin to black bean dips.
- 3) Make kid-friendly vinaigrettes and healthier ranch dips flavoring them up with herbs and spices.
- 4) Oregano, garlic powder and crushed red pepper can kick-off a pizza-inspired dip.



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## Spices/Herbs and Reduced-Fat Meals

## Testing:

- Whether enhancing the flavor of reduced fat/saturated fat food through the use of spices and herbs can improve overall liking.



Presented at IFT, 2013; Manuscript submitted (in review).

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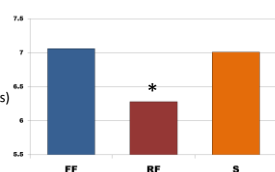
## Spices and Herbs Helped Restore Liking to Full-fat Meal

## Methods &amp; Procedures:

148 subjects tasted 3 versions of a meal of meatloaf, vegetables and creamy pasta

- Full-fat meal (610 calories)
- Reduced-fat meal (395 calories)
- Reduced-fat meal with spices – Onion, Oregano, Paprika, Garlic (395 calories)

## Overall Meal Liking

\* Significant difference to FF,  $p < .0001$ 

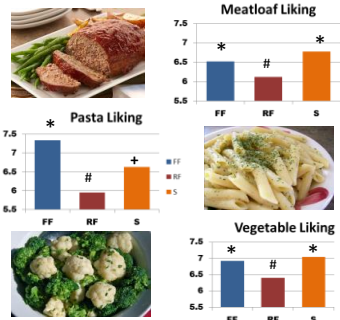
Reduced-fat meals had 35% less calories and 68% less fat

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## Individual Entrée and Side Dish Results



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*Science to the Table*

## Reducing Fat and Calories with Herbs & Spices

### Tips / Strategies:

- 1) Choose extra-lean (95% FF) beef or turkey instead of lean (80% FF) and add 2 tsp herbs/spices per 2 pounds meat in meatloaf, burgers taco meat or meat sauce.
- 2) Try garlic powder, onion powder, and dill and reduce butter (or choose olive oil) on vegetables like broccoli and cauliflower in place of using butter and salt.
- 3) Use tomato based sauce instead of cream sauce on pasta and stir 1 teaspoon dried oregano leaves into 2 cups low sodium jarred (or homemade) tomato sauce.
- 4) In cream sauces, choose low fat milk instead of cream and try garlic, onion powder, Italian seasoning, chervil, chives or other blends in place of salt.

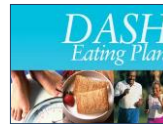


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## Spices/Herbs and Adherence to a Reduced Sodium Diet

### Testing:

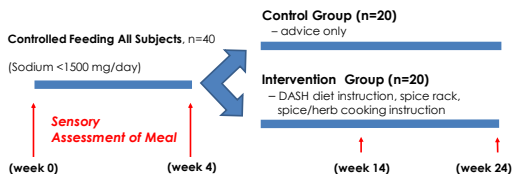
- Whether the current recommended sodium intake can be maintained with a behavioral intervention encouraging the (low sodium) DASH diet enhanced with herbs and spices.



Presented March 2014 at AHA Meeting.

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## Spices/Herbs and Adherence to a Reduced Sodium Diet



Phase 1: "Getting Started" 4 weeks (low-sodium DASH)

Phase 2: "Staying on Track" 20 weeks, randomized into two groups

Presented March 2014 at AHA Meeting.



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## Spices/Herbs and Adherence to a Reduced Sodium Diet

### Findings:

- Intervention group taught to flavor food with spices and herbs showed a **966 mg sodium/day decrease** compared to people who tried to reduce sodium on their own. **1,000 mg ~1/2 tsp**

**Flavor may be the key in adhering to lower sodium diet, like DASH**

Presented March 2014 at AHA Meeting.



### Potential implications:



Bibbins-Domingo et al. NEJM, 2010: 362(7).

- Strokes ↓ **23K**
- Heart attacks ↓ **35K**
- Deaths ↓ **32K** (annually)

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*Science to the Table***Spices/Herbs in a  
Reduced Sodium Diet***Tips / Strategies:*

- 1) Shake garlic powder. Stir into mashed potatoes, add to pasta sauces, or mix into bean dips and marinades for fish or chicken.
- 2) In salad dressings, instead of salt, get the punch of flavor from a little lemon juice or balsamic vinegar. Add some Italian Seasoning blend or a mix of oregano, black pepper, and a hint of cayenne.
- 3) Purchase salt-free jarred tomato sauce and limit the salt you add to 1/4 teaspoon per 2 cups max and add garlic powder, black pepper, oregano and thyme.
- 4) Sauté, grill or roast veggies in a mix of olive oil and salt free seasonings – homemade mixtures or salt-free blend from the market.
- 5) Instead of salt in your morning eggs, use thyme and black pepper.

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**Spices & Herbs***The Transformative  
Power of Flavor*

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**Communicating the Role of Flavor**

Spices and herbs belong on the forefront of the health and wellness conversation

Flavor and health can happily coexist

Flavor is the #1 driver in meal selection – and spices and herbs can help healthy food taste good!

Integrated approach from a simple tip to add an herb or spice to a new recipe, flavor can help transform the plate by the sprinkle, shake or spoonful.

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**Simple—*delicious*—practices.**

- Have a fruit and/or vegetable at every meal.

**Favor flavor—add herbs and spices at each meal.**

- Enjoy nuts—like walnuts, pistachios, almonds and peanuts.
- Have tea-time daily.
- Take time for a dark chocolate treat.
- Enjoy a glass of wine with meals in the company of friends.
- Move daily and Be Healthy.

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