

# Transforming Your Taste Buds: How to Make Whole Grains the Food You Crave

Keith E. Williams, Ph.D.  
 Director, Feeding Program  
 Penn State Hershey Medical Center  
 Professor of Pediatrics  
 Penn State College of Medicine

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## Outline of today's talk

- Part 1
  - What governs our food choices?
  - How do we learn food preferences?
- Part 2
  - What does research involving introducing whole grains show?
- Part 3
  - What could you do to help patients, clients, or consumers?



## What factors control your food choices?



- Numerous factors impact the foods we select to eat
- Different factors are dominate our choices at different times and under a range of conditions
- If you are working to change the dietary behavior of patients, students, or consumers, it is helpful for you to consider these factors



## Flavor

- Flavor is related to the sensory perceptions of eating and drinking...this includes taste, appearance, texture, and smell
- A primary consideration for food choice...perhaps the most significant factor for children and single adults
- Taste preferences can and do change over time

Preferences are not fixed!



## Convenience

- Convenience is the time and effort required to acquire, prepare, consume, and clean-up after eating or drinking
- Often a major consideration for parents, especially if both parents are employed



## Cost

- Monetary considerations for foods bought for home or while eating out.
- For families with limited incomes, the goal may be to purchase foods which provide the most calories per dollar rather than the largest health benefit
- Families with limited resources may not have the funds to purchase foods for the purpose of having children repeatedly taste them...conventional wisdom of poor kids not developing picky eating habits probably not true



## Personal Identity

- Religious beliefs may limit the range of possible food choices
- Ethnic identity may influence whether, if, or even when a food should be eaten
- Concerns about the environment may impact food choices



## Emotion

- Foods may be selected because of their past associations, for example, cookies or candy associated with grandparents
- Often when persons are stressed, anxious, or depressed, there may be a higher consumption of "comfort foods"



## Managing relationships

- Food choice may be made based upon the interests of others
- Personal needs may be compromised to build, maintain, or repair relationships
- It is common for one spouse make foods preferred by the other spouse, it is perhaps even more common for parents to make foods that their children will eat



## Health

- Foods are selected for actual or perceived health benefits
- It is common for foods to be classified as good or bad based upon their relation to health or well-being
- As a nutrition specialist, you may stress the health aspect of food choice and even though the selection of healthy foods may be a goal of your client, factors other than health may be stronger influences *at times*.



These factors are fluid, people use different factors depending upon a range of environmental influences

No matter how much you advocate for the health benefits of various foods...the information you provide will not always influence their food choice



## How do we learn to like foods?

- Food preferences are learned; you develop likes and dislikes based upon your experiences with foods across your lifespan
- "I just never liked it" – probably not true
- I will review three mechanisms for learning food preferences.



## Flavor-Nutrient Learning



- The food becomes preferred via repeated pairings as a source of calories
- You eat a food and later have a sense of “fullness”
- This is often the reason foods high caloric density foods become highly preferred...not only to they taste good, they make you *feel* good
- This is not a particularly useful mechanism for expanding diet variety



## Flavor-flavor conditioning



- The preference for a flavor increases when it is repeatedly paired with another flavor that is already liked.
- Coffee is often paired with sugar
- Liking for unsweetened vegetables and teas have become preferred after being presented sweetened on a number of taste occasions



## Mere exposure



- Repeated exposure to a particular food tends to increase preference for that food
- The use of repeated taste exposure to increase liking is one of most replicated findings in the nutritional literature
- Studies involving repeated taste exposure have been conducted with individuals of all ages in a range of settings, especially in schools

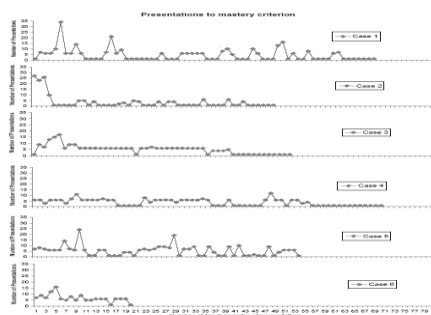


## Something important to know about exposure



- It is developmentally *backwards*, while adults learn many things quicker than children, this is not true about food preferences
- Exposures required until preference
  - Infants 1-5
  - Preschooler 5-10
  - School-aged 10-15
  - Adults 20+
- Most persons think liking should be immediate, not true
- Tasting takes time





## What has already been done to increase selection of whole grains?

While most studies have been designed to increase fruit and vegetable consumption, a few studies have specifically focused on whole grains

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## Increasing whole grain choices with a multi-component school-based intervention



- Children given practical experience in selecting, tasting, and preparing whole grains in classroom instruction
  - Students milled flour, learned to read labels, and taught to plan menus
- Parents involved through newsletter, bakery tours, and Whole Grain Day at a milling museum.
- Cafeteria staff replaced refined grains with whole grains
- Children did eat more whole grains

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## Repeated exposure of whole grains during a weight loss intervention

- Participants were overweight adults enrolled in a RCT
- Randomized into high, medium, and low pulse group
  - High – 1.8 cups for women, 2.7 cups for men/day for 6 weeks
  - Medium – ½ cup per day for 6 weeks for women and men
  - Low – 1 tlb/day for 6 weeks for women and men
- 28 pulses included black beans, chickpeas, peas, pinto beans, etc.
- There was a 3 wk rotating menu with eat food appearing once/wk
- Ratings of taste, texture, and pleasantness increased **but not very much**
- **THERE WAS NO SIGNIFICANT EFFECT FOR DOSE**
  - This is important, repeated exposure does not rely on volume, but the number of exposures

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## The market basket study: another example of repeated exposure



- Participants were adults randomly assigned to two conditions:
  - Whole grains – received a weekly market basket of grains for meals
  - Refined grains – same basket, only refined grains rather than whole
- Whole grain significantly increased in WG group

**“Encouraging consumers to focus on the enjoyment of the taste may be more effective than emphasizing the health benefits of WG consumption.”**



## Fading to increase whole grain intake in a school setting



- The amount of whole grain used in the flour by the school cafeteria was increased from 0 to 67% in 7 increments
- These changes resulted in an increase in whole grain consumption
- A 2<sup>nd</sup> study examined differences in consumption in graham crackers made with 5, 8, 12, & 16g of whole wheat flour per 30g serving
- No differences in preference between the varying levels of whole wheat



## Impact of a 16 wk dietary intervention on subsequent intake of whole grains

- Participants were adults who consumed low amounts of WG
- Randomized into control and two experimental groups
  - Group 1 – asked to consume 3 servings/day of WG
  - Group 2 – asked to consume 3 20g servings/day for 8 wks, the 6 servings/day of WG
- Participants provided with whole grain food packs
- Both experimental groups ate significantly more whole grains at 1 mo, 6 mo, and 12 mo follow-up
- No differences between the two experimental groups



## Effect of repeated exposure on the acceptance of Nordic bars



- 110 Danish children aged 9-11
- Repeatedly exposed to Nordic bars consisting of:
  - pumpernickel, dried sea buckthorn berries, and rye flakes
- Intake and liking increased after exposure
- The goal of the study was to have them develop preferences for healthy whole grain snacks



## What interventions can you use to help people learn to like whole grains?

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### The core of your intervention must be repeated exposure in some form

- Remember, the focus must be repeated tasting over time.
- The size of the taste does not seem to matter and the number of tastes eaten at as single point in time does not matter
  - One rice-size taste is not different than ten large pieces or bites
  - It may even be better because you have reduced the chance of the person having a bad experience with the food, e.g. gagging
- Allow everyone involved understand the need for repeated tasting and that food preferences are learned through tasting
- It must be clear that *liking comes later*

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### The use of modeling



- Modeling involves people learn by observing other persons whom they believe are credible and knowledgeable.
- Modeling has been used to increase diet variety both in clinical research and a number of school-based studies.
- I have used modeling with adolescents and adults.
  - Having adolescents imitating other friends tasting foods their friends or older siblings are tasting
  - Having college students imitate what significant others are tasting
- Focus on tasting, not advocating eating portions of new foods.

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### The role of appetite



- When people taste new foods can also be important.
  - Premeal presentation vs. Offering with meals
- When working with parents, I am often suggesting methods of appetite manipulation
  - Eliminating grazing, reducing portion sizes, lowering caloric density
- When working with adults, at least try to discuss tasting prior to meals

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## Positive reinforcement



- We often use positive reinforcement in various forms to increase tasting
- In reviews of interventions for food refusal and food selectivity, positive reinforcement has been shown to be the most commonly used treatment component
- Large school-based studies have used small incentives to successfully increase intake and liking of novel foods
- Reinforcement works, but its use must be tailored to the individual



## Increasing availability



- The goal of increasing availability of whole grains or other healthy foods is to increase the probability these foods will be consumed
- The market basket intervention just described involved providing participants with the target foods this increasing availability
- Other studies have offered children choices of fruits and vegetables with the goal of increasing availability
- Nudge interventions often rely on increasing availability in some way; perhaps by having more healthy choices or having healthy foods more visible.



## Taste modification



- It is okay to put Irish butter on whole wheat bread.
- High school students prefer vegetables seasoned with herbs and spices, rather than plain veggies.
- Enhancing the palatability increases the probability of consumption



## Closing comments

[Broccolibootcamp.com](http://Broccolibootcamp.com)  
[Feedingprogram@pennstatehealth.psu.edu](mailto:Feedingprogram@pennstatehealth.psu.edu)

