ENHANCING OR ALTERING FOOD FLAVORS OR TEXTURES TO ENCOURAGE HEALTHIER EATING

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Purpose & Hypothesis

- The purpose of this literature review was to explore how sensory influences on taste and flavor may make healthier foods more appealing and support better eating habits.
- We hypothesized that positive sensory cues would improve how healthy foods and drinks are perceived, which may encourage healthier eating habits.

Background

- **Obesity:** Rising obesity rates highlight the need for strategies that encourage healthier eating.
- **Taste:** Taste plays an important role in food preferences and enjoyment.
- **Smell:** Smell combines with taste to shape flavor perception.
- **Sensory influences:** Environmental cues, such as music and visual context, may change how foods and drinks are perceived.

Methods

- **Sources:** Identified primarily through Husson University library databases, including EBSCO and ProQuest.
- **Search terms:** Sensory influences on food perception, taste and smell, cross-modal perception, and environmental influences on eating behavior.
- **Inclusion criteria:** Studies were included if they examined sensory, environmental, or neurological influences on food perception and eating behavior.
- **Study types:** Peer-reviewed empirical studies published between 2009 and 2025, including fMRI and naturalistic studies.

Key Findings

- fMRI evidence revealed that restricted eaters (dieters) use high cognitive effort (self-control) when viewing food, whereas unrestricted eaters show activation in the brain's reward and taste centers.[1,2,3]

Table 2
Measures of Hunger Before and After Eating A Meal[a]

Question	Restrained	Unrestrained
Time 1		
How hungry do you feel right now?	6.56 (± 1.33)	7.30 (± 0.68)
How strong is your desire to eat right now?	7.00 (± 1.73)	7.50 (± 0.85)
How much food do you think you could eat right now?	6.44 (± 1.33)	7.10 (± 1.19)
How full does your stomach feel right now?	2.56 (± 1.42)	1.90 (± 0.99)
Time 2		
How hungry do you feel right now?	3.44 (± 2.29)	3.70 (± 1.49)
How strong is your desire to eat right now?	3.89 (± 2.62)	4.20 (± 1.62)
How much food do you think you could eat right now?	4.33 (± 2.06)	4.10 (± 1.97)
How full does your stomach feel right now?	5.44 (± 1.88)	5.40 (± 1.43)

[a] Values are the mean (± *SD*) item response for four questions on the verbal hunger questionnaire.

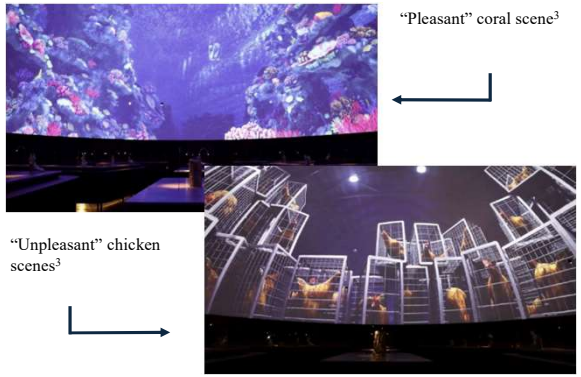
- Listening to pleasant or "sweet" music enhanced the perceived sweetness and pleasantness of a drink, especially when visual input is blocked.[2]

Table 1
Soundtrack Evaluation (Means and Standard deviation) and Mean Difference Results

	Sweet music		Non-Sweet music	
	M	*SD*	*M*	*SD*
Sweetness	7.32	1.5	2.46	1.42
Bitterness	1.64	1.14	5.73	2.22
Sourness	1.62	1.2	4.94	2.38
Valence	7.72	1.3	3.15	1.6
Intensity	4.51	2.36	7.55	1.71

Note. Dif. = Difference between mean values.

- Consuming beverages under pleasant visual environments made them taste better, while unpleasant imagery increased perceived bitterness and sourness.[3]



"Pleasant" coral scene[3]

"Unpleasant" chicken scenes[3]

Conclusions

- Taste perception is influenced by expectations, emotions, moods, and visual surroundings.
- Sensory and environmental cues may shape how healthy foods and drinks are experienced.
- Reducing strict dietary restraints may lessen the cognitive effort involved in food-related decisions.
- These findings suggest that settings such as schools or dining halls may be able to use sensory cues to support healthier eating.

Limitations & Future Research

Limitations

- Most studies focused on short-term effects, so the long-term impact of sensory-based strategies on eating behavior is still unclear.
- Some studies used beverages or highly controlled settings, which may not fully reflect real-world eating experiences with solid foods or broader populations.

Future Research

- Future studies should examine whether these sensory effects influence long-term food preferences and actual healthy eating behavior.
- Research should also test these strategies in more diverse populations and with a wider range of foods and real-world settings.

References

[1]Coletta, M., Platek, S., Mohamed, F. B., van Steenburgh, J. J., Green, D., & Lowe, M. R. (2009). Brain activation in restrained and unrestrained eaters: An fMRI study. *Journal of Abnormal Psychology, 118*(3), 598-609.

[2]Guedes, D., Prada, M., & Garrido, M. V. (2025). Tasting in tune: The influence of music on taste evaluation under visual masking conditions. *Food Quality and Preference, 126*.

[3]Kaya, S. S., Munk, R., Prado, D., & Quoidbach, J. (2025). Emotions shape taste perception in a real restaurant environment. *International Journal of Gastronomy and Food Science, 39*.

[4]Rolls, E. T. (2010, February). The affective and cognitive processing of touch, oral texture, and temperature in the brain. *Neuroscience & Biobehavioral Reviews*, 34(2), 237-245. ScienceDirect. https://doi.org/10.1016/j.neubiorev.2008.03.010

[5]Shaikh, F. H., Shumway, K. R., & Soni, A. (2023). Physiology, Taste. *StatPearl*. National Library of Medicine.