

20 TREND INSIGHT 15 REPORT

11 FACTORS INFLUENCING TASTE PERCEPTION

There are many factors that can alter taste perceptions, ranging from an individual's age to the temperature of the food. These variables are extremely important for food & beverage industry professionals to keep in mind when evaluating and developing new products. Considering these factors will help ensure accurate sensory and benchtop tasting results and the development of products consumers desire. How people perceive taste makes all the difference!

In this article, FONA's Director of Sensory Services, Lori Walker, explains several of these influences and the effects they have on taste.



TASTE FACTORS



Wonder why your food tastes different sometimes? How you perceive taste today could be different tomorrow!

Keep these 11 factors in mind to help ensure accurate sensory and benchtop tasting results.

**Contributor
Lori Walker,
Director of
Sensory**



Lori has more than 25 years of experience in sensory science. She leads FONA's sensory efforts, ensuring customers receive the relevant, detailed testing results needed to make informed decisions throughout the product development process.

Email: lwalker@fona.com

1 Age

Taste discrimination tends to decrease with increasing age. Around age 45, taste buds begin to degenerate. Taste loss becomes apparent in your late 50s, with sour less affected than the other tastes. In the elderly, taste thresholds for sweet, salt and bitter are 2.5 times higher than in the young. For example, at age 20 or 30, you use one teaspoon of sugar in your coffee, and at age 75 you may need three teaspoons of sugar to get the same perceived sweetness.

2 Meals

Sensitivity is reduced for between one and four hours after a meal, depending on what the meal included. A spicy/hot meal such as enchiladas will have a greater effect than a bland meal such as oatmeal and milk.

3 Hunger

Hunger affects how food tastes by making hungry people more sensitive to sweetness and saltiness. This makes hunger the downfall of many dieters, as they reach for sweet or salty foods, which may not be the healthiest choices. Bitterness perception, however, is not affected by hunger.

4 Smoking

When smoking a cigarette or cigar, the smoker places the taste buds in contact with chemical compounds that greatly decrease the taste buds' ability to register salty, sweet, sour and bitter tastes.

TASTE FACTORS (continued)



5 Obesity

Children and adolescents who are obese have less sensitive taste buds. That means for obese children, sweet foods taste less intensely sweet, bitter foods are milder and salt is not as readily perceived.

6 Pregnancy

During pregnancy, nearly two-thirds of women experience changes in taste. Pregnant women have been found to have a reduced sensitivity to salty tastes, which may be the body's way of ensuring increased salt intake during pregnancy.

7 Colds/Flu/Allergies

When suffering from a cold, individuals frequently complain that they have lost their sense of taste. In reality, they have lost their sense of smell. Obstruction of air passages reduces olfactory perception, a key component of how we taste.

8 Disease

People with cancer and anorexia have reduced taste sensitivity as the result of their compromised physical condition. Cancer patients have reported that taste changes return to normal after treatment is completed.

9 Temperature

Influence of temperature on taste is not uniform. Taste buds can be put out of action by both high and low temperatures. Increasing temperature appears to increase the response to sweetness and decrease it to saltiness and bitterness. Decreasing temperature appears to increase the response to bitterness and decrease the response to sourness.

10 Adaptation

Adapting to the taste reduces sensory acuity, thus preventing you from detecting differences between stimuli. The order in which you taste samples during a sensory test is important. Tasting a strong sample, then a weak one results in adaptation. The opposite order, first weak then strong, should not affect taste sensitivity. With short waits between samples (three minutes or so), most effects of adaptation should dissipate. There are almost no issues when two stimuli have different taste qualities.

11 Taste Medium

Solid vs. Liquid

The taste buds can only detect flavors that are dissolved in a liquid. You cannot taste a dry substance with a dry tongue. Water is the best medium for sensitivity tests. Taste thresholds are lower in water than in tomato juice.

Viscosity

Increased viscosity reduces tastes sensitivity. Meaning, it's easiest to detect tastes in liquid state, harder in foams and more difficult in gels.

EXPERTISE YOU CAN TRUST

Let FONA's flavor and product development experts help you find the solution that works best for your particular product while working through the unique set of characteristics and challenges presented. We understand how to integrate the complexities of flavor with your brand development, technical requirements and regulatory needs to deliver a complete taste solution. From concept to manufacturing, we're here every step of the way.

CONTACT OUR SALES SERVICE DEPARTMENT

at 630.578.8600 to request a flavor sample or visit www.fona.com.

SOURCES:

Sensory Evaluation Techniques – Morten C. Meilgaard, Gail Vance Civile and B. Thomas Carr, Fourth Edition; 2007
UC Davis Extension – Foundations of Sensory Science – Teaching Manual – 2011

Age

Aging Changes in the Senses – National Library of Medicine; American Accreditation Healthcare Commission (2013).
Takahashi, Paul (2012). Age Related Changes to Taste and Smell a Common Occurrence, Mayo Clinic
Pierce, Joseph B., Bartoshuk, Linda & Cain, William (1984). Chemical Senses and Aging: Taste versus Smell, John B. Pierce Foundation Library and Yale University
Cowart, Beverly J. (1993). Relationship Between Taste and Smell Across the Adult Life Span, Monell Chemical Senses Center and Department of Otolaryngology
Stevens, Joseph C. & Cains, William S. (1993). Changes in Taste and Flavor in Aging, John B. Pierce Foundation Library and Yale University

Meals

Bailey, R.A. (2005). On Optimal Cross-Over Designs When Carry-Over Effects are Proportional to Direct Effects, School of Mathematical Science, Queen Mary, University of London

Hunger

How Hunger Affects Taste – A Moment of Science – (2006)

Smoking

Hendrick, Bill (2009). Cigarette Smoking Dulls Taste – Smoking May Affect the Shape of Taste Buds and Impair Sense of Taste, Journal BMC Ear, Nose and Throat Disorders

Obesity

Differences in Taste Sensitivity Between Obese and Non-Obese Children and Adolescents , Archives of Disease in Childhood 2012;97:1048-1052
Development of Eating Behaviors Among Children and Adolescents; Pediatrics Vol 101 No. Supplement 2; March 1, 1998
Study: Obese Kids Have Less Sensitive Taste Buds – Archives of Disease in Childhood - Alexandra Sifferlin – Sept 2012

Pregnancy

Brown, J.E. & Toma, R.B. (1986). Taste Changes During Pregnancy, Am J Clinical Nutrition, Vol 48 No. 8 414-418

Colds/Flu/Allergies

Taste and Smell – Society of Neuroscience – (2012)
Leopold, D.A., Holbrook, E.H. (2010) Physiology of Olfaction. Otolaryngology: Head & Neck Surgery. 5th ed. Philadelphia, Pa: Mosby Elsevier; chap 41
Baloh, R.W., Jen J., Smell and Taste. Cecil Medicine. 24th ed. Philadelphia, Pa: Saunders Elsevier; chap 435.

Disease

Biology of Taste Buds and the Clinical Problem of Taste Loss; Anat. Rec (New Anat) 253:70 – 78. 1998
Schiffman, Susan S. & Zervakis, Jennifer (2002). Taste and Smell Perception in the Elderly: Effect of Medications and Disease, Advances in Food and Nutrition Research Vol.44

Temperature

Talavera, K., Ninomiya, Y., Winkel, C., Voets, T., & Nilius, B. (2006). Influence of Temperature on Taste Perception Cellular and Molecular Life Sciences

Adaptation

O'Mahony, Michael (1986). Sensory Adaptation, Journal of Sensory Studies – Vol 1 Issue 3 – 4 pages 237-258, Dec 1986

Taste Medium

Christensen, Carol M. (1980). Effects of Taste Quality and Intensity on Oral Perception of Viscosity; Perception & Psychophysics, 28 (4) 315-320; (Mondell Chemical Senses Center, Philadelphia, Pennsylvania 19104)