

Sensory evaluation of flavourings

Sensory evaluation at best is difficult. To compare two food flavourings you need to apply them at their optimum dosage to an unflavoured base. You will also need to compare them using a taste panel.

With flavouring comparison you normally want to see how the flavours compare. Are they identical? Or is one flavour is better than the other.

There is great variation in the ability of people to taste, some have no sense of smell and at the other end of the spectrum there are super tasters.

If you have a taste panel of super tasters then you will get results that show minute differences and if you panel has poor tasters you will get results that do not show serious differences.

The purpose of all taste testing is to ensure that the end user (your target market) “the public” has a product that they like the taste of and has a consistent flavour. The public consists of tasters who have a wide range of tasting abilities. Some will spot minor changes while others will say “what change”.

It is important that your panel should represent the normal variations in tasting ability otherwise you will have no idea of the significance in a change of flavour profile.

The quality control departments of most flavour companies have a problem with all new batches of flavours. In most cases even without a panel they can detect differences between the new batch and the control.

This is because flavours mature and change slightly with age. To help them access the significance they use experienced tasters and as a backup check the GLC analysis. If the GLC traces are identical and the experienced taster regards the differences as normal then the new batch is passed.

End users of flavours need to determine if any change in profile they detect is within the range of normal variation and to that end they need an experienced panel or quality controller that has experience of such variation.

How can I be a super taster? To a limited extent everyone can improve their tasting prowess. The more you taste the better you get. However super tasters will have the natural sensory detectors that detect very low concentrations of specific flavour molecules.

From my experience I have noticed that people who have a high level of garlic in their diet cannot detect low levels of this flavour. When I was a teenager Tonic water tasted so bitter I could not stand the taste, whereas now after several years of gin and tonic drinks I find the bitterness vastly reduced. The same argument applies to chilli and hot curries.

Familiarity to flavourings reduces your sensitivity to them.

These and many other factors muddy the water for sensory testing, however a scientific approach negates some of these problems.

One of the most popular tests is the triangle test, where two samples are identical and one sample the odd one.

The tasters are simply asked to pick the odd sample (from the 3 presented).

There is a 33% chance they will pick the correct odd sample, so data analysis will take into account the fact that each panellist has a 1-in-3 chance of guessing correctly. Enter in the table A the number of panellists and read off the number of correct answers you require to be sure (with at least a level of significance of 5% = 95% probability) that there is a difference between products A and B. Compare the number of correct answers with the tabulated value and draw the conclusion from the test.

To keep this test fair you have to ensure there is no colour or visual difference between the samples and that the evaluation base is identical (sugar, salt, acidity and temperature).

To eliminate a bias due to numeric preferences ensure they are numbered with a 3 or 4 digit numbers picked at random. It is also important to use different order and ensure that half of the panel receives sample A as the odd one and the other half of the panel receives sample B as the odd one. So there are six possible combinations (ABB – BAA – AAB – BBA – ABA and BAB) which are presented at random to the panellists. If possible each order should be used an equal number of times: therefore the total number of panellists should be divisible by six. With non super tasters, the total number of assessors should be at least 24 to 30.

One useful addition to the triangle test is to ask pertinent questions on the test sheet. This may help identify the nature of the differences between samples and help direct flavour companies to changing their flavour to meet the customer's needs.

For example if the flavour was milk chocolate you might ask which sample was most milky or "which sample was best?" You could of course ask an open question "how do you describe the difference?" Obviously you would take more notice of comments if the panellist correctly identified the odd sample.

Finally you must consider how the end user (buyer) evaluates the flavour. Sometimes flavours are evaluated straight from the bottle (by visual evaluation and smelling) and if they pass this test will be tried in a food application.

If your panel contains some super tasters be aware of this, but consider the end customer. Your super taster may be distorting the significance of the results.

The vast number of ordinary consumers may not think the same.

Super tasters are very useful for quick answers and help identify processing faults.

A Triangle Test

Minimum number of correct answers needed to determine there is a difference

Significance level

Number of observations or panelists	95% probability	99% probability
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5	4	5
7	5	6
9	6	7
10	7	8
13	8	9
15	9	10
20	11	13
25	13	15
30	15	17
40	19	21
50	23	26
60	27	30
100	42	45

Website Resources:www.PreparedFoods.com--Type in "sensory" into the LINX search field at the top of the page <http://food.oregonstate.edu/faq/sensory/card.html>--Samples of score card forms used in sensory testing [www.swin.edu.au/bioscieleceng/ SNL/SNL%20HTML%20Files/SNL_EEG%20Sensory.pdf](http://www.swin.edu.au/bioscieleceng/SNL/SNL%20HTML%20Files/SNL_EEG%20Sensory.pdf)--Powerpoint presentation on use of electroencephalography (EEG) in sensory work www.collegian.psu.edu/archive/2004/09/09-28-04tdc/09-28-04dscihealth-04.asp --Penn State's tasting lab www.fst.vt.edu/extension/enology/VC/july-aug97.html--Virginia Polytechnic Institute and State University site with advice on how to conduct sensory evaluations on wine, applicable to all foods and beverages

www.foodperspectives.com/conduct.htm--How tasters should conduct themselves at test sites

QUESTIONNAIRE FOR
TRIANGLE TEST

NAME _____ DATE _____

PRODUCT _____

Two of these three samples are identical, the third is different.

1. Taste the samples in the order indicated and identify the odd sample.

Code	Check odd sample
<u>314</u>	_____
<u>628</u>	_____
<u>542</u>	_____

2. Indicate the degree of difference between the duplicate samples and the odd sample.

Slight _____
Moderate _____
Much _____
Extreme _____

3. Acceptability:

Odd sample more acceptable _____
Duplicates more acceptable _____

4. Comments: