

Flavor Creation Criteria and Quantitative Sensory Data

Flavor Creation requires two requirements:

- Ingredient Selection
- Ingredient use level

There are a number of Criteria used to select Ingredients and Use Levels for Flavor Creation:

- By Existing Formulas
- By Experience
- By Using the Literature
- By Supplier and/or Peer suggestions
- By Odor
- By Tasting

By Existing Formulas:

Many flavorists use this criteria because it appears that the ingredients are useful for the flavor selected, and it also saves time and reduces trial and error. Using this approach may produce similar flavor profiles. One negative is that this approach suppresses creativity, and the use of new and different ingredients. Also all the ingredients in existing formulas may not be necessary or even undesirable in that flavor.

By Experience:

Using this approach saves time and reduces trial and error. It also provides confidence and a good comfort level. As with using existing formulas, this approach may suppresses creativity, and the use of new and different ingredients.

By Using the Literature:

Using the literature provides a good source of ideas and keep up with current technology. Unfortunately many flavorists do not have access to this information. The literature can also be somewhat overwhelming. One cannot possibly manage 200-300 ingredients identified in a product for flavor creation. Many of the ingredients identified in natural products are not approved for flavor use, and it is very time consuming to determine which ingredients are approved.

By Suppliers and/or Peer suggestions:

Suppliers introduce newly approved flavor ingredients, and natural ingredients. This is very helpful as samples are available for evaluation, and some sensory information is usually provided. Peers can also be very helpful to provide information on selection and use of flavor ingredients.

By Odor:

Odor evaluation of ingredients is quick and appears to provide useful sensory information, but has many shortcomings. The flavor of an ingredient is usually similar to it's odor, but the apparent intensity can be very misleading. Based on odor, pyrazines may appear to be very strong but many are relatively weak. On the contrary, some sulfur compounds have strong odors and have even stronger flavor use levels. Odor evaluations cannot provide flavor, use level or intensity profiles, but can be a useful screening tool.

By Tasting:

Tasting flavor ingredients provides an accurate approach for selecting ingredients and use levels for flavor creation. It provides descriptive and quantitative intensity properties of an ingredient at various use levels, and provides an insight into the use of the ingredient. Tasting and documentation sensory properties provides confidence in using the ingredient, reduces trial and error, saves time and produces faster and usually better results.

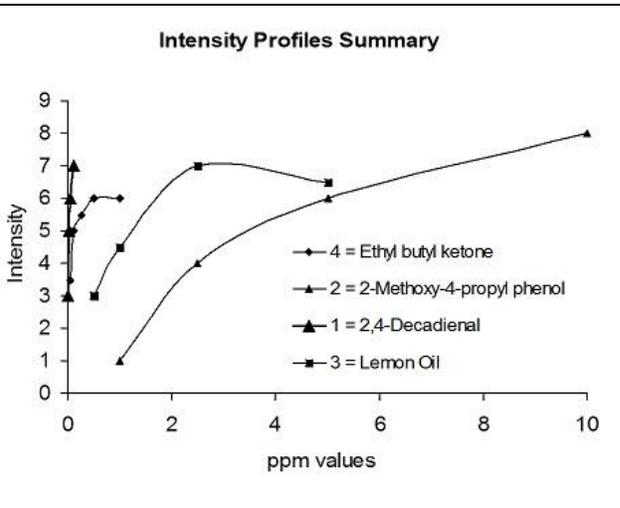
Developing Quantitative Sensory Data (QSD):

Quantitative Sensory Data involves determining the flavor intensity of the ingredient at various (ppm) use levels. An arbitrary scale of 1-10 is used for this purpose.

The ingredient under evaluation is tasted from threshold to high intensity. Initially the ingredient is tasted at ppm levels of the following: 0.1 - 0.05 - 0.1 - 0.25 - 0.5 - 1.0 - 2.5 - 5.0 - 10.0. The range is extended if necessary.

Relative (subjective) intensities of foods may serve as examples for determining flavor ingredient intensities. Milk 3 - 4, butter 3-4, eggs scrambled 4,, white bread 3, apples 4-5, banana 3-4, and boiled chicken 3-4..

Most foods without seasoning or processing are relatively mild. Flavor ingredients obviously are much stronger and need to be used at the correct use level to obtain the desired effect. Over 300 flavor ingredients have been tasted, and qualitative and quantitative intensity data have been documented. From this data it appears that all flavor ingredients fall into 4 intensity profiles.



Plotting ppm use level vs. intensity shows that 2,4-Decadienal covers the useable intensity range within a narrow use range of 0.01 to 0.2 ppm. A number of ingredients like hexanal, 3-methyl-2-butanethiol, leaf alcohol perilla aldehyde and methyl heptine carbonate fall into this category and demonstrate similar profiles.

The importance of this profile indicates that ingredients with steep intensity profiles would affect the flavor profile of a flavor, if that flavor use level were changed from an optimum level. In addition to intensity variation within a narrow ppm range, the flavor profile can also change within the same narrow ppm range.

Using Quantitative Intensity Ratings and Qualitative Sensory Data to Create Flavors:

The following table demonstrates typical sensory and intensity data for 2,4-Decadienal. The intensity data helps in choosing a use level which will produce the desired sensory result in the selected flavor. The next step is to assign 2,4-Decadienal to flavors in which it may be useful.

2,4-Decadienal

Flavor Desc.	Use Level	PPM Level	App	Intensity	Comment
Fatty	0.01	ppm	water	3	Fatty, Chicken Fat, Oily, Nutty, Earthy
Oily	0.025	ppm	water	5	Oily, Fatty, Chicken/Peanut Fat, Roasted
Chicken Fat	0.05	ppm	water	7	Fatty, Oily, Rancid, Chicken Fat
Rancid Fat	0.1	ppm	water	8	Rancid, Oily, Very Fatty, Harsh, Green, Too Strong

