Sensory Insights provide information that allows for tailor-made product development or product optimization to meet the unique preferences of consumers or specific consumer segments. In this respect, Sensory Insights systematically allows developing highly liked products; and what consumers like will be consumed again and again, thus contributing to sustainable sales and product success. After all, we all know that a product has the highest chance for success when the actual product experience (sensory) is fully in line with product expectations raised by marketing (claim, benefits, and emotions).

What makes Sensory Insights so important is the fact that consumers are usually very good in telling us whether they like a product or not, but they are not necessarily good in telling us why. Which sensory attributes of a product are actually important and hence constituting the “drivers of liking” is beyond the capabilities of “ordinary” consumers to express. This is where Sensory Insights enter the stage, allowing us to identify these crucial product features in order to align a products’ DNA optimally with consumers’ needs and expectations.

This type of sensory research, as applied by the Sensory Research Group, looks at both, the specific sensory “fingerprints” of products and the respective acceptance by consumers.

A products sensory “identity” deals with type and intensity of product properties (or attributes) – using a trained sensory panel to establish the specific product profiles. The respective technique, quantitative descriptive analysis (QDA), allows profiling products along certain attributes in a very precise and replicable manner. The QDA technique is rational, cognitive and uses humans as measuring instruments. That’s why only trained individuals, i.e. a sensory expert panel, can be used for such a product profiling exercise. QDA establishes a products’ sensory-DNA.

Product liking, on the other hand, is rather emotional and describes a unique preference or acceptance for a given product by consumers. Such a preference is affective, individual, hedonic, and subjective. Consumers, usually users for that particular category, are used to collect product liking information.
Both, subjective consumer liking and objective product perceptions, are considered as **Sensory Insights**. However, as we deal here with two totally different aspects, they have to be performed separately, using different groups of individuals. Only after the sensory and consumer data are collected, we combine **consumer feedback** with **product understanding** in order to analyze a given set of products, and to advice on optimization needs.

**Sensory Insights truly allow us to create better products.**

**Product Understanding**

A trained sensory panel is used to identify the specific sensory profiles for a range of products, i.e. delivers a precise and objective measurement of attribute intensities. In order to ensure adequate data quality, we need to ensure that:

- Product evaluation is done by a panel of 10 to 12 individuals.
- Panelists have to be specifically recruited and screened for their sensory acuity.
- Sensory panelists must be well trained before they can function as “human measurement instruments”.
- A sensory panel should not be “stretched” over too many different product categories, as performance may suffer, and panel retention may be difficult.
- For each project, the panel develops and precisely defines the “language” (product attributes) used for product description – using external reference materials as ‘anchor points’.
- Once the list of product attributes is finalized and fully understood by panelist, the specific attribute intensities for all test products are collected.
- In order to cover the sensory space of a particular product category, a minimum number of products should be evaluated (ideally 8 or more).
- To avoid order effects, products are served randomly to panelists, and the product evaluation takes place in specifically designed sensory booths.

**SENSORYINSIGHT maintains specifically trained sensory expert panels for product profiling projects.**

Once the sensory data are collected, the sensory profiles for a particular set of products can be displayed, using spider charts. This allows for an easy comparison of all test products across the sensory attributes - a first vital step on the road to an in-depth product understanding.
The visual analysis allows to easily identify product similarities as well as differences.

Product B, in our example, has a relative high intensity on color, milky and fruity taste, while product D is high on aroma, and yoghurt-like, while all products score fairly equal on sourness.

Overall, the analysis already answers some important questions:

- What is the nature and magnitude of product differences – how products are similar or different?
- What is the difference of my product vs. competition?
- Did a change in recipe result in a significantly different product profile?
- Did a change in the manufacturing process result in a significantly different product profile?

Spider charts are a useful tool to get a first quick visual impression of products. However depending on the number of products and attributes, it can easily get difficult to grasp the true nature of product similarities and differences. Hence we need to go a step further in analyzing our sensory data using a principle component approach (PCA). PCA is a visualization of sensory data, and allows us to display the ‘sensory map’ of a given product category.

Sensory Map: Dairy Products.

The PCA-map allows us to see how products are “allocated” in the sensory space. While products D and C show fairly similar positions on the map, product A and product B are clearly different from each other as well as from product D and C. Product A is more on the milky side, and product B is strong in fruity and sourness, while products D and C are higher on color and aroma.
Consumer Feedback

Next to an in-depth product understanding using a trained sensory panel, we are also interested to see how much the test products are liked by consumers. Though asking consumers a few simple questions about product liking seems to be an easy task, some rules must be strictly followed.

- We need to recruit a sample of consumers that specifically meet the requirements of a given project.

- “Convenience sampling” has to be avoided; on the contrary, a sample should be pre-recruited according to the target groups’ specifications (e.g. age, gender, consumption habits and frequency, location, etc.).

- An appropriate sample size has to be ensured, especially if we assume the market consists for several “taste segments”, i.e. consumer groups with unique (and different for others) taste preferences.

- For our sensory insights analysis, the main question is “overall product liking” – usually measured using a 9-point hedonic scale. Other questions such as “attribute liking” or “attribute intensity” can be asked, but care has to be taken not to over-interpret research results (see Sensory Research Group Paper on JAR scales).

- Other questions can be asked as well, and we strongly recommend including product benefit and product emotion statements to further enhance the depth and quality of the analysis (see next Sensory Research Group paper).

- As there are usually several products to be tested by consumers, a sequential-monadic test set up is recommended, with all consumers testing all products. This is a prerequisite for segmentation analysis.

- Open-ended questions, especially regarding product likes and dislikes should be avoided, as not all consumers are able to provide meaningful feedback.

- Usually products are tested “blind”, i.e. without telling respondents which brands they represent. There are however occasions where a “branded” product assessment is recommended.

Product Liking Scores

![Bar chart showing liking scores for four products](chart.png)

The charts shows the liking mean scores for four test products; product D is the most liked product with a mean score of 6.5 while product B is the least liked with a mean score of only 5.6.

Given a liking scale from 1 (extremely dislike) to 9 (extremely like), products should score at least 6.5.
Once sensory data and consumer data are available, the **Sensory Insights can come alive**.

**Sensory Insights – Truly targeted and focused product development/optimization**

It is the crucial and last step in a Sensory Insights project to combine sensory and consumer data. The relationship is established using advanced data analysis techniques, such as PLS Regression or Preference Mapping and Predictive Modeling.

The analysis enables us to do a few critical, winning things:

- In the product-liking-space, to identify the direction of liking.
- Identify the key product attributes, the so called “drivers of liking”.
- Understand why certain products are liked, while others are disliked.
- Identify an ideal product profile to maximize consumer liking.

This is truly 21st century product engineering to create not just better, but winning products.

**The Sensory-Liking Space**

The chart indicates position of products and attributes in relation to product liking.

The analysis clearly reveals the important product attributes, i.e. **drivers of liking**:

- Color
- Aroma
- Yoghurt-like.

In our example, we see that product D is closest to the ideal position; the attribute intensities for product D are already very good.

However, even the current best product can be further optimized, using an advanced “**Reverse Engineering**” technique. This allows us to predict an ideal product profile which would achieve even
higher liking scores. In this respect, companies do not only get information on the current best product profile – which they might intend to match –, but also information to go beyond the current most liked product. This allows them to truly aim for the top.

The entire process is displayed in the following chart.

**The Sensory Consumer Research Cycle**

![Sensory Consumer Research Cycle Diagram]

In sum, embarking on a Sensory Insights journey is an exciting and rewarding thing to do. Requirements along the way are:

- Ideally test products (including prototypes) that span the entire sensory space of your category.
- For product development/optimization project, test 10 products/prototypes or more.
- For all products, identify the sensory-DNA (sensory panel) as well as liking scores (consumers); for consumer research, select products that represent the sensory space.

Using **advanced data analysis techniques**, we can distil the following out of the collected data:

- What are the important product features, the so-called **drivers of liking**?
- What are the **ideal attribute intensities** for these drivers of liking?
- What does an ideal product profile looks like that will maximize liking?

- Are there different consumer segments with different taste expectations?

- If so, what is the ideal product profile for each respective taste segment?

All this enables companies to fully understand their respective product category, including all major competitors’ products, and to create a superior product for more consumer acceptance. All in all, Sensory Insights do significantly contribute to more business success.

Interested to go beyond consumer feedback? Let us know ...

Dr Dieter Walz - dieter@sensoryresearchgroup.com