DLG Expert report 5/2016

Sensory analysis: Overview of methods and application areas

Part 4: Classic descriptive tests & new rapid methods

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Besides discrimination tests, the analytical tests also include descriptive sensory analyses. Descriptive tests are intended to register and measure human perceptions and sensations during the consumption of foods. Classically, this is initially carried out qualitatively with the aid of sensory descriptions (sensory vocabulary) and subsequently – depending on the method – quantitatively with intensity ratings for each described attribute. These attribute descriptions can be used to create individual product profiles that help to characterise and distinguish between products. They are usually used to compare similar products, i.e. products from one category. In combination with popularity tests, this can be used to determine which product characteristics lead to the rejection or acceptance of the product among consumers.

For a long time, conventional descriptive analysis methods formed the link between market research, marketing and product development; however, they are also used in quality assurance, i.e. during product profile checks in quality standards and for monitoring storage stability and best-before dates. In order to make the results as objective as possible, only trained sensory assessors are used for these methods, resulting in relatively high time and cost expenditure.

More recently, numerous rapid sensory profiling methods or short-term methods have emerged; in these, consumers directly describe the products that are presented and undertake hedonic ratings in the same test. These frequency-based methods include the CATA method (check all that apply) and numerous similarity measurement methods. While these methods reduce the time and financial outlay required for a descriptive sensory panel, their results are often less precise.

The following Expert report is intended to provide an overview of longstanding and new descriptive methods. Reference is made to the respective specialist literature for further information.

Classic descriptive tests

According to the definition by Stone/Sidel (2004), profile analyses represent a quantitative description of sensory product characteristics that is based on the sensory physiological perception of qualified persons. One of the prerequisites for participation is that the sensory assessors are also product users. The selected sensory assessors are trained following a sensory screening or a suitability test. The training process usually consists of switching between group discussions and individual tests. The participants develop or are familiarised with terms used to describe attributes and how to apply them. Once the assessors are able to characterise the products in terms of their appearance, odour, taste and texture, intensities are allocated to these verbal descriptions so that the qualitative description is supplemented with a quantitative indication. Reference samples are often used with the intention of enabling the assessors' perceptions to be standardised. Complete quantitative calibration in this process is not realistic; instead, the objective is to reduce the variance between the tester's ratings. The entire training usually takes between 80 and 150 hours, and also includes checking the sensory panel's reliability.

The essential methods of descriptive sensory analysis are described in the following. These include the very time-consuming, classic, intensity-based methods such as the consensus profile, conventional profiling (descriptive profile test) or also the Quantitative Descriptive Analysis (QDA®) and the SpectrumTM method. Descriptive tests in which the testers use their individual vocabulary, Fig. 1: Example of a test form for the 'simple

Simple descriptive test

Product: **tomato juice** Date: _____

Sensory assessor: _____

Please describe the attributes of the individual test samples.

Test sample no.	Aspect	Attributes	Remarks
322	appearance	fresh shade of red homogeneous unnatural, artificial dull	

Fig. 1: Example of a test form for the 'simple descriptive test'

descriptive test' such as free choice profiling (free choice sensory profile) and flash profiling, are also counted among the profiling methods and are aimed at achieving increased efficiency with comparable result quality. Widespread descriptive methods also include the 'simple descriptive test' and the 'descriptive test with integrated rating'.

Simple descriptive test (DIN 10964-2014)

The **objective** of the 'simple descriptive test' method described in the context of DIN 10964 is to describe all or just individual product aspects (such as appearance, odour, taste, texture/consistency) by means of attributes.

Application areas: The method can be used to characterise product standards and to check the influence of changed raw materials, recipe changes and production-related changes on sensory product characteristics. It is also used during the sensory assessor and panel training.

Execution: Both trained and untrained sensory assessors can be used for this method. What is important is that the sensory assessors are able to describe their sensory perceptions accurately and understandably. Comprehensive sensory assessor familiarisation is therefore crucial. However, there should be at least three sensory assessors, and the test can be carried out as both an individual and a group test. The terms used to describe the product can be freely selected by the sensory assessors or selected from specified lists. The 'Sensory Analysis Vocabulary' book (DLG-Verlag GmbH, 2015) contains lists of descriptors for a high number of food groups and may prove helpful in selecting descriptors that have to be unencumbered by hedonic evaluations. Fig.1 shows an example of a test form for the 'simple descriptive test'.

a) Descriptive terms

Assessment product: _____ Date: _____

Assessor: _____

Describe the presented test sample in terms of its appearance.

Aspect	Attributes
appearance	

b) Reduction of terms

Assessment product: _____ Date: _____

The individual report terms are collected and subsequently revised and condensed.

Aspect	Collection of attributes	Final status of attributes
appearance		

c) Test report from individual tests with intensity indication

Assessment product: _____ Date: _____

Assessor: _____

Describe the intensities of the attributes of the presented test sample.

Intensity scale:
0 Not recognisable
1 Very faintly recognisable (recognition threshold)
2 Faintly recognisable
3 Noticeably recognisable
4 Clearly recognisable
5 Very clearly recognisable

Aspect	Attributes	Intensity (scale value)
Appearance	transfer from the list of reduced terms (final status of attributes)	

Fig. 2: Examples of test forms for the profiling test

Conventional profiling (DIN 10967-1-1999)

Objective: Conventional profiling is used to qualitatively describe and quantify products in terms of their characteristics.

Linear scale

attribute: pale

not recognisable — clearly

Fig. 3: Intensity scale in the form of a linear scale

This method is **used** in product development and optimisation, when comparing several products or also for monitoring the product qualities defined in the context product standards.

Execution: In order to create a conventional profile, it is first necessary to collect descriptive terms. The lists of terms subsequently have to be structured, in which case similar terms are combined and hedonic attributes are eliminated. In the second step, the intensity of the attributes is rated within the framework of the individual assessment. The sensory assessors must therefore have extensive sensory knowledge and be able to describe the registered product characteristics accurately. They must additionally be able to recognise the defined attributes and express their intensity. The minimum number of sensory assessors is usually six persons in order to obtain a result that can be interpreted. The sensory assessor training and preparation are very time-consuming. The final result is determined by totalling the individual results and subsequently forming the arithmetic mean. Statistical evaluation of the test is usually carried out by means of a variance analysis and a main component analysis.

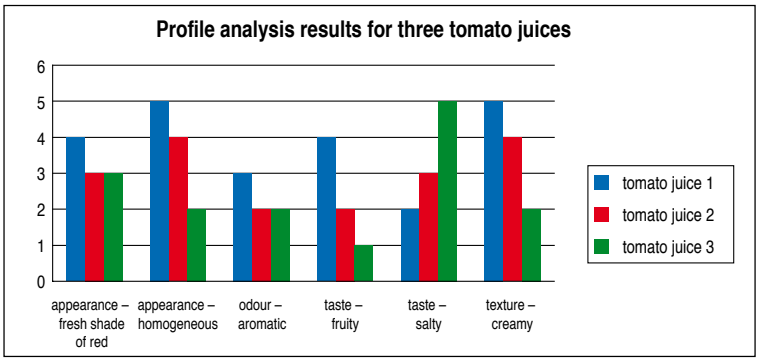
d) Visualisation of profile analysis results

Example: tomato juice

d1) Tabular form

Attributes/intensities	tomato juice 1	tomato juice 2	tomato juice 3
appearance – fresh shade of red	4	3	3
appearance – homogeneous	5	4	2
odour – aromatic	3	2	2
taste – fruity	4	2	1
taste – salty	2	3	5
texture – creamy	5	4	2

d2) Bart chart



d3) Spider web chart

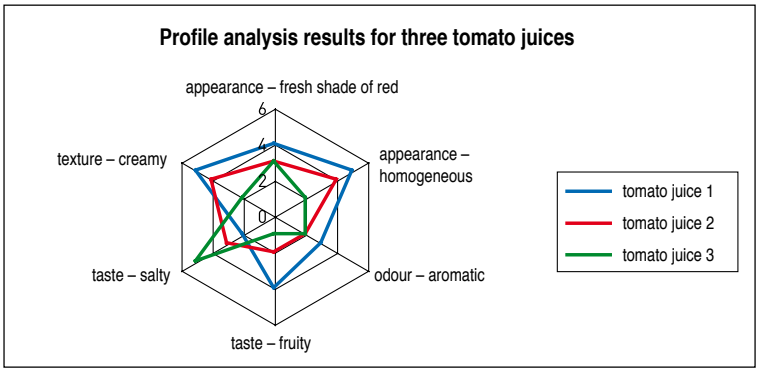


Fig. 4: Visualisation of profile analysis results

The results can be visualised in tabular or graphical form. Examples of test forms and result visualisations are shown in Figs. 2, 3 and 4. The conventional profiling methods also include the QDA® and SpectrumTM methods, which originate from America. Both are proprietary processes that may only be used in cooperation with the respective institutes. The main difference between the two methods is the training procedure, which is relatively short in the case of QDA® and relatively long in the case of Spectrum™. Refer to the respective specialist literature for details concerning this.

Consensus profile (DIN 10967-2-2000)

Objective: The consensus profile method originates from the Flavor Profile® method. It, too, is used to describe and quantify sensory product characteristics.

Its **application areas** include the characterisation of product standards, the comparison of several product standards, product development and optimisation as well as the registration of technologically-related product quality fluctuations and sensory assessor training (sensory panel training).

Execution: In terms of the selection and condensation of attributes, the methodological procedure for the consensus profile is identical to that of conventional profiling. All sensory assessors also rate the same product-relevant attributes in this method as well. The two profile methods differ due to the fact that, with the consensus profile, the sensory assessors discuss their results in the group once the individual intensity descriptions have been recorded in the individual test, and then develop a joint, overall result in consensus. Final evaluation is therefore carried out through a group discussion rather than by means of statistical methods and calculations from the respective individual assessments. The result is then visualised as in conventional profiling. According to DIN, it should usually be possible to merge the assessments of at least six sensory assessors. Other sources and practical experience have shown that it is sensible to use sensory panels with an odd number of seven to 13 sensory assessors and to limit the number of products to be tested to around twelve samples.

The criticism levelled against this method refers particularly to the sensory assessors themselves, as they may possibly mutually influence one another due to the group discussion in the round table, with the result that they adopt their neighbour's assessments rather than forming their own. Conducting the test in individual booths, at individual test tables or at a test table with partition walls may remedy this and can help to first record individual assessments before the group discussion begins.

Free choice profiling (DIN 10967-3-2001)

Objective: Like the other profiling methods, the 'free choice sensory profile' or 'free choice profiling' is used to describe and quantify sensory product characteristics. In this process, an attempt is made to reduce the extensive training effort and the high time and cost expenditure of the conventional assessment methods somewhat.

Application areas: 'Free choice profiling' can be used to describe individual product attributes or to register the complete array of product characteristics.

Execution: While conventional profiling assessments necessitate intensive sensory panel training and a high level of standardisation, which above all involves developing and learning a common vocabulary for describing the product, the 'free choice profiling' method forgoes these. The reason given by proponents of this method is that intensive sensory assessor training prevents sufficient consideration from being given to consumer perceptions.

The following procedure is characteristic of a free choice profiling method:

a) No lengthy sensory assessor training is required, as sensory assessors with no or little training, usually consumers with good perceptive capabilities, are used. The members of the sensory panel must have sensory skills and be able to verbalise sensations. Standardising the terms is not necessary in this method. This means that the joint selection and condensation of the descriptive terms are forgone, because each sensory assessor uses his/her own descriptions of the attributes for product characterisation.
b) The quantitative description of the attributes can be carried out on an individual intensity scale, or the scale is specified by the assessment director.
c) Evaluation is carried out with the aid of a special multivariate statistical method called the generalised Procrustes analysis (GPA), which enables the derivation of a consensus configuration from two or more data sets. However, this data evaluation method is more complex compared to the standard statistical methods that are used to evaluate conventional profiling assessments.

The less training the sensory assessors have undergone, the more sensory assessors are required to obtain statistically validated results. The number of sensory assessors is usually eight to 30, but more participants can also be involved.

Flash Profiling

The flash profiling method also mainly uses untrained consumers, thus enabling time and costs for intensive training phases to be saved. In methodological terms, this is a combination of 'free choice profiling' and a modified assessment system, the product ranking method.

The **objective** is to offer food producers a quick method for obtaining decision-relevant sensory information. The products are analysed in direct comparison. Instead of intensity ratings on a scale, rankings according to the intensity of each attribute are established.

Application areas: Flash profiling is especially suitable for comparing products quickly on the basis of their significant sensory characteristics or differences.

Execution: As in the free choice profiling method, the sensory assessors are also at liberty to choose the number, the meaning and the sequence of their descriptive terms in flash profiling. By waiving uniform terminology, extensive training processes are forgone. In contrast to free choice profiling, all sensory assessors are not provided with all of the samples to be tested consecutively, but at the same time, resulting in a different assessment system, since the products can be compared with one another directly during tasting (see Fig. 5). In the first session, the testers generate their individual attribute lists. In the second session, they then test all of the products in parallel, characteristic by characteristic, and rank each attribute in order of its intensity. This results in descriptor-centric profiling in inter-product comparison. Finally, all of the products in the product set to be tested have been described as regards their intensity in terms of their sensory characteristics and in relation to one another. Again, the results are evaluated and interpreted by means of the generalised Procrustes analysis (GPA), which is also used in free choice profiling.

Classic profiling	System in flash profiling		
Sample 1 - sweet - aromatic - bitter	Sample 1	Sample 2	Sample 3
	- sweet		

Fig. 5: Overview of the various profiling systems

By using consumer panels, 'free choice profiling' and 'flash profiling' enable the quick, consumer-oriented description of products in terms of their essential sensory characteristics and differences. The findings obtained from this can lead to the initial pre-selection of products; in some cases, a deeper dive is also possible using classic profiling methods, or the findings can also be linked to the results of affective consumer tests. While forgoing standardised terminology and the use of individual attribute lists by the sensory assessors means that extensive training processes are not necessary, the heterogeneity of the data basis makes aggregation of the measurement results difficult. Consequently, the semantic evaluation of the diverse attributes may then prove time-consuming.

Descriptive analysis with following quality evaluation (DIN 10969-2001)

The **objective** of the 'descriptive analysis with following quality evaluation' is to first of all determine the intensities of previously defined analysis criteria or attributes of products and to then transfer the results to a rating or quality statement.

Application areas: Above all, this sensory method is used in the context of cross-company product tests or quality tests. DLG quality tests for food and beverages are examples of 'descriptive analyses with following quality evaluation'. Companies can use this method internally to assess products in the event of raw material changes or when using new processing technologies, to check the best-before date and the influences of packaging and storage on the product quality.

The **execution** of the analysis is generally subdivided into three sub-areas, whereby steps 1 and 2 are extensively identical to the profiling test:

1. 1. Creation of a list of attributes (qualitative profile): Different approaches can be used in this case. If, for instance, a product is to be tested against an existing product standard, it may be sufficient to simply list the attributes that deviate

from the standard. Specifying complete lists with attribute descriptions is also conceivable. If completely new products are to be analysed, corresponding attributes have to be described, collected and condensed as in the profiling method.

2. Determination of the intensity of the characteristics (quantitative profile): The intensities have to be described for the attributes in the context of individual tests; this is comparable to the execution of the profiling test.
3. Assessment of the products: In order to arrive at a rating, the descriptions of the intensities for the attributes have to be transferred to assessments. To do this, a weighting for both the characteristics and the attributes has to be defined prior to the test and rating limits and rating reductions must additionally be specified. Intensity limits, within which e.g. a quality rating reduction or even exclusion from the test occurs, must be defined in this case. Among other things, this can be used for quality assessments for award levels, for best-before periods or also for product comparisons and authenticity tests, because this is particularly where the upper and lower quality limits within which products are no longer marketable, edible or acceptable in terms of quality must be defined. The rating bases are defined and also implemented by the assessment director. He/she may also enlist the help of external persons, but the sensory assessors must not be involved under any circumstances. The number of sensory assessors is also dependent on the objective in this case.

DLG test schemes, what are called DLG 5-Point Schemes®, that have been designed and standardised for specific products, exist for DLG quality tests for food and beverages. These bring together all of the information that is relevant for the test. They encompass both the sensory test attributes (such as e.g. appearance, odour, taste, consistency/texture) and descriptive attributes that describe the respective products or possible product defects (e.g. dull, pappy, slimy, hard, rancid, foul, bitter, blood spots, bone fragments). The intensities or the extent of the identified product faults are rated with the aid of a scale. The quality number can be determined according to the description of the attributes and the indication of the intensities, taking adherence to defined limit values into consideration. The quality number forms the basis for the award level achieved, in the form of the gold, silver or bronze DLG award, or indicates when no DLG award can be assigned due to the existing quality defects. Trained sensory assessor panels are used in the context of the DLG quality tests. The sensory assessors are qualified through their professional training in the area of product knowledge and product manufacturing, are also provided with sensory training by DLG and are regularly reviewed with regard to their specialist knowledge in the context of a defined monitoring procedure. (For further details in this regard, refer to DLG Expert report ‘Sensory analysis: Overview of methods and application areas – DLG sensory analysis’ at https://www.dlg.org/en/food/topics/dlg-expert-reports.

New rapid sensory profiling methods

More and more, however, cost and time pressure in innovations as well as increasingly shorter product life cycles are necessitating the quicker availability of relevant information for decision-making. Short-term methods, called rapid sensory profiling methods, can offer an alternative in this respect and can particularly support smaller companies for which the establishment and maintenance of a panel that has undergone sensory training often cannot be implemented in practice or is not worthwhile. Apart from the fact that extensive training units for training sensory panel members are no longer necessary, as a result of which time and costs are saved, the direct integration of testing consumers’ perceptions and preferences proves advantageous, because these findings provide valuable, decision-relevant information concerning products and their sensory quality in the competitive environment. As an alternative to consumers, chefs, sommeliers and other specialist staff can also be used as sensory panel members.

Check all that apply (CATA)

The check all that apply method is a frequency-based method and is therefore an interesting alternative to intensity-based test methods in descriptive sensory analysis.

Please check all of the sensory characteristics that apply to the respective tomato juice:

	Sample 378	Sample 565	Sample 410
sweet	O	O	O
sour	O	O	O
umami	O	O	O
fruity	O	O	O
green, freshly cut grass	O	O	O
spicy	O	O	O
musty	O	O	O
…			

Fig. 6: Test form for a CATA test (example)

This method is essentially familiar due to its versatile use in market and consumer research surveys, whereby web-based checklists are often used. A higher number of testers is necessary for this method in order to achieve an appropriate degree of meaningfulness.

Objective: The CATA method is used for the sensory description of food, which can be carried out both with trained sensory assessors and also with untrained consumers, and is often paired with hedonic assessments in a single testing process.

Application areas: Above all, the CATA method is suitable for verbally describing foods of low complexity or for comparing samples that differ more extensively from one another in internal surveys. It is also often used in consumer research in order to verbally record consumers' associations when consuming products.

Execution: The CATA method is regarded as one of the 'verbal-based' methods, because it is concentrated on the sensory description of one or more presented products. The sensory assessors are usually provided with a list of specified descriptors, from which they check all that apply to the food to be tested (= check all that apply). The sequence of the terms should correspond roughly to the time of occurrence during testing or tasting. Long lists of descriptors lead to the fact that individual terms are used more rarely. On the whole, however, longer and shorter lists lead to similar results (Jaeger et al., 2015). Figure 6 shows an example of a CATA test form for comparing several products. No intensities are indicated in the context of the CATA method. The result shows how many sensory assessors use each term to describe the product. The relevance of the term options is measured based on the frequency of response and is evaluated accordingly. In addition to internal product description, the results of CATA tests can also be used in communication. In this case, the attributes that are selected most frequently by consumers can be used to prepare the formulation of sensory claims.

Similarity measurements

An additional methodological simplification, and therefore a reduction of the time required, is achieved by using analysis methods that can be summed up under the generic term 'similarity measurements'. These include the various 'sorting', 'mapping' and 'Napping®' methods. Minimal preparation effort, quick data collection and the simple visualisation of results are characteristic of these methods. Practical use can also be simplified and promoted without extensive training units and by forgoing complex evaluations. These methods are based on the principle that the testers arrange the simultaneously presented samples so that similar samples are positioned close to one other and deviating samples are positioned further away from one other. The most important similarity measurement methods are described in greater detail in the following.

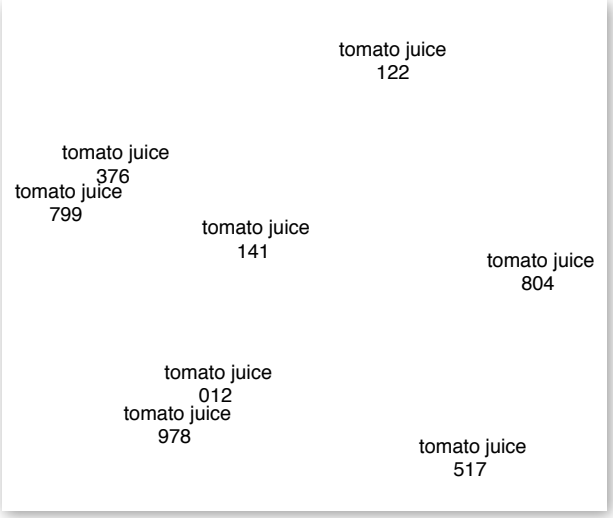
Objective: Similarity measurements are used for the sensory comparison of products in terms of their relative similarity to one other. They are methods that can be successfully implemented even in small companies.

Application areas: On the one hand, similarity measurements are used to compare a company's own products with competing products. In the context of product development, it may also be of interest to determine which prototypes of a new product are most similar in sensory terms. On the other hand, however, similarity measurements can also be used to pre-select samples for a consumer test in order to select those that differ significantly from among numerous product prototypes, for instance. The results of similarity measurements can also be linked with hedonic data and therefore provide interesting answers for market research.

Execution: Untrained sensory assessors can be, and often are, used to determine and visualise the relative sensory similarity of products. The methods are often combined with simple sensory descriptions. The following assessment methods use the above described principle and therefore belong to the similarity measurement group:

- **Sorting:** In sorting, the sensory panel, which can consist of sensory experts or also consumers depending on the degree of qualification, simultaneously tastes approximately eight to 15 product samples of a group (e.g. tomato juice) and sorts or categorises these into various groups according to their sensory similarity. The sorting process

is carried out relatively quickly and is based on a holistic product analysis. Individual, intuitive sensory categorisation on the part of the sensory assessors is characteristic in this case, because each sensory assessor decides for himself/herself how many product groups are formed and the sensory criteria according to which grouping is carried out (Fig. 7). In order to subsequently visualise the relative similarity of the products, that data that is collected is used to produce a two- or three-dimensional image using the statistical method of multidimensional scaling (MDS). This establishes a sensory 'landscape' of the product group. Verbalised sensory characterisation of the sample groups subsequent to sorting is possible, but does not belong to sorting in methodological terms, with the result that the interpretation of the results is subject to a certain degree of subjectivity. This test is easy and quick to conduct; its information content is limited. The result is global information about the similarity structure of the products in a product category. This method is often used prior to actual product development, because it is used above all to identify opportunities and gaps in the market for new products.



Visualisation of a sorting test for various tomato juices

- **Projective mapping:** In this method, untrained sensory assessors position all of the samples on a sheet of paper according to their similarity. This means that each tester directly produces an individual 'map', a similarity plot. Data analysis is carried out by means of multidimensional scaling, generalised procrustes analysis, main component analysis or multiple factor analysis.

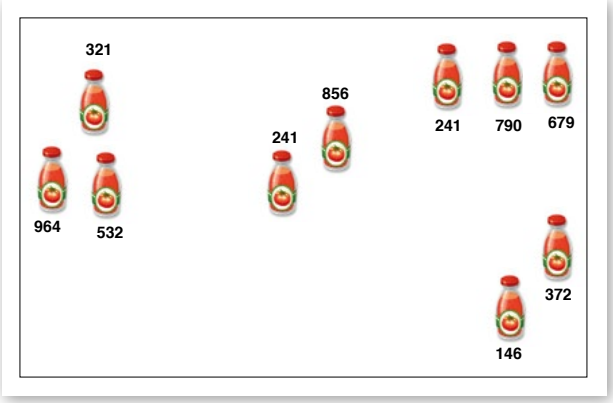


Fig. 8: Visualisation of a Napping® test for various tomato juices (without UFP)

- **Napping®:** Napping® is a further development of projective mapping. In this method, too, each sensory assessor positions all of the products that are presented at the same time relative to one other on a sheet of paper (usually a rectangular sheet of paper measuring 40 x 60 cm), which is intended to represent a two-dimensional space. In this process, products that are similar in sensory terms are positioned close to one other and different products are positioned far away from one other. On average, a maximum of 12 samples are presented to the nine to 15 sensory panel members per session. It is ideal if additional terms for describing the respective product characteristics are recorded by means of ultra-flash profiling (UFP) following the Napping® process so that the product arrangements can be interpreted accordingly (see Fig. 8). Asking the sensory assessors to concentrate on the most important product characteristics or a maximum of five descriptors is also recommended. The meaningfulness of Napping® is more differentiated compared to sorting, because the coordinates of the coordinate system and therefore its position can be assigned to each product on the sheet of paper, thus enabling sensory characterisation across all sensory

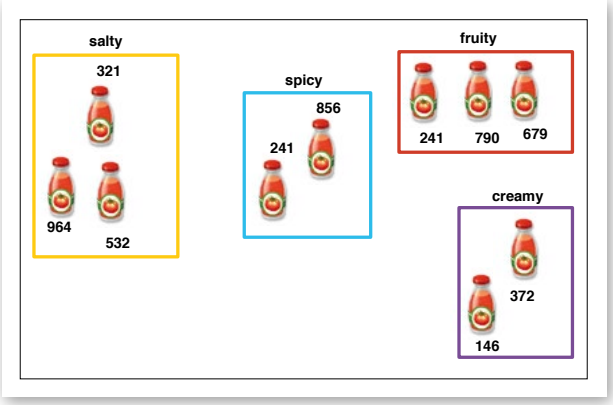


Fig. 9: Visualisation oi a sorted Napping® test for various tomato juices

modalities (appearance, texture, aroma, taste). Data evaluation is carried out exclusively by means of hierarchical multiple factor analysis.

- **Partial Napping®:** This refers to the Napping® process that is carried out separately for each sensory modality and is therefore more focused than general Napping®.
- **Sorted Napping®:** In sorted Napping®, the Napping® process is supplemented by a sorting task. Once individual products have been positioned based on their similarity, samples with the same sensory characteristics are consequently clustered (product groups) and then described verbally in terms of their characteristic sensory attributes (Fig. 9). Focus in this process is also on evaluating the sensory attributes with the highest relevance for the sensory panel members. The sorting process is relatively intuitive and is subject to the subjectivity of the sensory assessors. No absolute sample comparisons are carried out. In addition to the positioning data of individual products, statements regarding the clusters' product groups are obtained. The primary objective is to find similarities in the products that are presented and to understand how consumers group the products according to the characteristic sensory attributes of relevance to them. This method, too, can be used to select products prior to actual profiling or to support sample compilation for a multi-product consumer test (acceptance test).

With their holistic product analysis approach, the various sorting and Napping® methods have already achieved a certain degree of popularity in sensory product characterisation in some areas, particularly since they can be used with both trained and untrained sensory panel members. One of their disadvantages is that all of the samples have to be presented at the same time. Subsequently including further samples is not possible in this case. The following methods were developed as an alternative to these, because the samples to be tested are compared with a previously determined and defined product set, called 'poles', therefore making the process independent of the scheduling and timing of sensory tasting sessions.

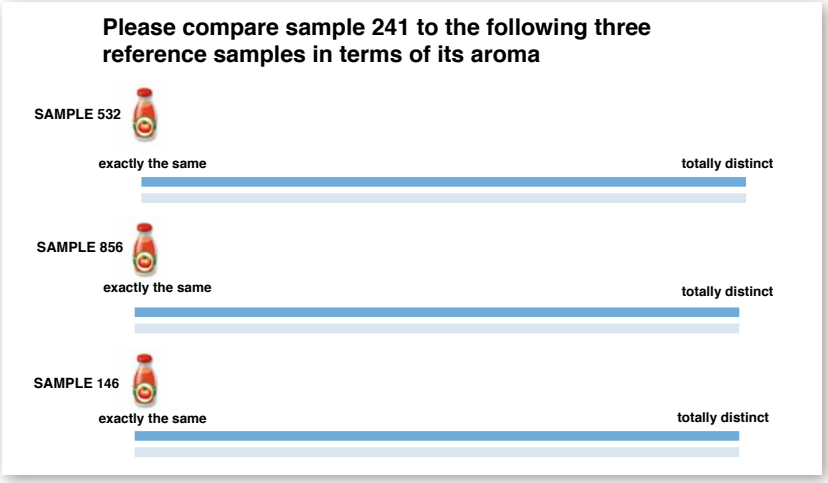


Fig. 10: Example of a test form for polarised sensory positioning tests for tomato juices

- **Polarized sensory positioning (PSP):** In this method, each test product is compared with three previously selected products that serve as 'poles'. The product's similarity to each pole is rated on a 10-cm-long, unstructured scale (Fleming et al., 2015). As the choice of poles has a significant influence on the final result, this aspect is of particular importance. Data evaluation can be carried out in various ways (multidimensional scaling, main component analysis, multiple factor analysis). An example of a PSP test form is shown in Figure 10.
- **Polarized projective mapping:** This method is a combination of the polarised sensory positioning method with a mapping process and therefore combines the advantages of both methods with regard to a) the holistic approach of Napping® or sorted Napping® and b) the possibility of comparing products that were tasted in different sessions rather than at the same time. The sensory assessors are provided with a tasting form on which the position of the three previously selected products or 'poles' is marked. They taste the three poles and the samples that are to be tested and position the latter on the sheet of paper (see Napping® or sorted Napping®) in relation to the poles. All of the samples are then briefly described in sensory terms. Data evaluation is carried out by means of multiple factor analysis (Ares et al., 2013).

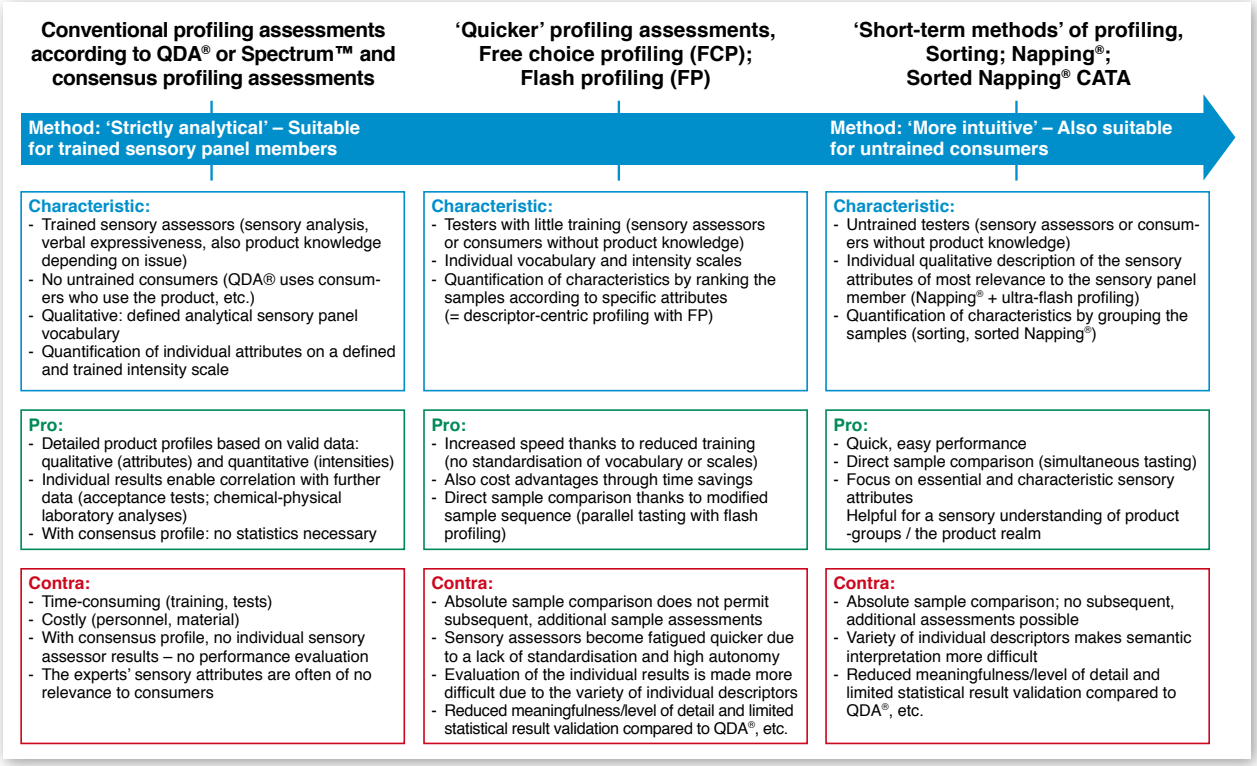


Fig. 11: Overview of descriptive analysis methods

Conclusion:

Descriptive sensory analyses, i.e. the methods of descriptive sensory analysis, are regarded as the most demanding sensory methods due to their diversity and complexity. Traditionally, they are based on the sensory perception of accordingly qualified persons, result in detailed product profiles and are often time-consuming and costly. Conversely, newer methods also enable the use of untrained sensory assessors and are usually more efficient, but also involve loss of information. Specially trained sensory assessors are used for the tasks involved in a classical descriptive analysis such as the identification, description and quantification of product characteristics that are objectively perceptible in sensory terms. The objective of these methods is to obtain a detailed product description that can be compared with other products or transposed into product recipes. This enables the product developer or the person responsible within the quality assurance department to identify the essential dimensions of their product and to compare them with company standards or with competing products. To enable statements regarding consumer acceptance to be made, this profile data must additionally be combined with further results from affective sensory analysis or hedonics (popularity assessment). Besides the multi-stage sensory method, the time-consuming training process for qualifying sensory assessors in the classic profile analyses is a major point of criticism levelled by users who are short on time.

New assessment methods, called rapid sensory profiling methods, attempt to reduce or completely eliminate this time-consuming training process and are therefore an interesting alternative for certain questions. Test methods that are relatively simple in methodological terms and native consumers as the final product users represent one side of the coin; the possibility of increased variability due to low content standardisation (e.g. sensory vocabulary specific to individual sensory assessors) as well as limited meaningfulness that is usually focused on a few, individually selected main attributes are the other side of the coin that have to be noted when using these methods. Sensory quick methods therefore ultimately help to obtain a quick overview of products and their relative similarity in terms of sensory characteristics. However, they do not result in a comprehensively accurate sensory profile of individual samples. The check all that apply method enables the collection of analytical and hedonic data within one test. These rapid methods could be interesting and initially sufficient for a number of questions, particularly for SMEs. A summary overview of the classic and new descriptive analysis methods is shown in Figure 11.

Detailed information on the topic:

- Ares G. et al.: Polarized Projective Mapping: Comparison with Polarized Positioning approaches. IN: Food Quality and Preference 28, 2013, 510-518.
- Busch-Stockfisch M: Praxishandbuch Sensorik, Produktentwicklung/ Qualitätssicherung. Loose leaf collection
- Delarue J. et al.: Rapid Sensory Profiling Techniques and Related Methods, Woodhead Publishing, Elsevier Ltd. 2015
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