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1. Introduction

Since its first mention in literature, several studies¹ have proven the applicability of Flash Profiling as a fast and inexpensive Descriptive Method to get insights into the perception of foods.

In this study Flash Profiling has been applied for the first time concerning olfactory perception of food with a slightly modified approach. For gustatory sensation of cordials it is practicable to use the Free-Choice Profiling.

2. Main objectives

The main purpose of this study was the objective acquisition of olfactory and gustatory characteristics from **eight cordials** through untrained persons. It had to be verified, whether widely untrained persons are able to create reliable, valid profiles and to discriminate between olfactory and gustatory heterogeneous products. Moreover the research focuses on possible influences and interactions between odour- and taste-stimuli which result in discrepancy.

3. Modified Flash Profiling and Free-Choice Profiling

Flash Profiling is an inexpensive, time-saving descriptive procedure. The intensity of sensory descriptors has been measured descriptor-by-descriptor. In order to correspond with the characteristics of the olfactory perception (classification, identification and intensity problem)² the procedure was modified concerning certain aspects. The major difference to conventional Flash Profiling is the acquisition of olfactory perception by similarity comparisons instead of intensities.

Free-Choice-Profiling was applied in a traditional way to gather the gustatory data.

4. Test design

4.1. Free-Choice-Profiling for gustatory perception

20 panellists between 20 and 55 years were chosen to provide taste profiles of the eight cordials. The collected data of this method are unstructured and indefinite because no mean descriptive profiles can be calculated. So it needs to be compressed by several statistical procedures to receive a better overview. For example similar words and meanings were subsumed under a generic term by using correlation or cluster analysis.

The Profiling with reference to the gustatory positions of the samples provides the following 11 compressed descriptive words – which explain and discriminate best between the eight cordials.

| | | | | | |
|-------|-----------|---------------------------|------------------|------------|--------------|
| sweet | fruity | Christmassy (gingerbread) | alcoholic/ sharp | artificial | ripe |
| mint | medicinal | bitter/ tangy | tastily | | musty/ smoky |

4.2. Modified Flash Profiling for olfactory perception

21 panellists between 20 and 50 years were chosen to provide odour profiles of the eight cordials.

Due to the particularities in perception and processing of olfactory product information global similarities were collected instead of intensities. Therefore all panellists had to decide on their own which cordial represents each descriptor best. This typical cordial is reference for the appropriate descriptor. This means that product samples had to be directly compared in view of each olfactory descriptor and its reference.

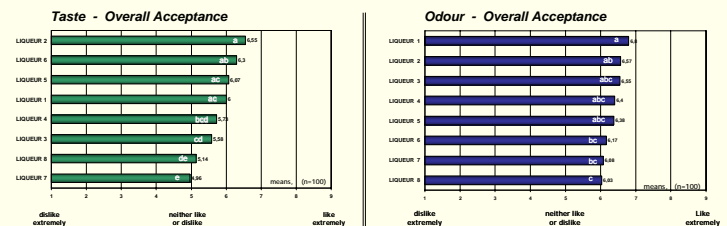
The following table shows 10 descriptor segments - out of 121 descriptors raised individually from the panellists - which describe and discriminate best between the eight cordials.

| | | | | |
|---------------------------|-----------|-------------|-----------|---------------|
| liquorice | herbal | mild/smooth | fruity | aromatic |
| Christmassy (gingerbread) | medicinal | tangy/sharp | fruit gum | bitter almond |

4.3. Affective consumer test

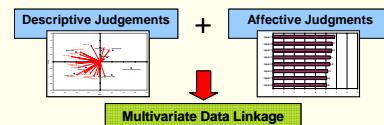
The Flash Profiling and Free-Choice-Profiling procedures provide no information about impelling or inhibiting acceptance components. To gather relevant information for marketing or R&D, it is necessary to connect these descriptive data with affective consumer acceptance data in laboratory tests. For these purposes a laboratory test with 100 untrained consumers who usually consume cordials has been carried out. The gender splits was 75% men and 25% women. Four evenly spread age groups were built from 30-65 year-old subjects.

The results below are shown in the form of mean values. The higher the value the better is the evaluation of the product. Significant differences are characterized by different letters, same letters refer to a statistically not significant mean value difference.



4.4. Multivariate data linkage

With combining affective and descriptive data, olfactory and gustatory preference drivers and preference inhibitors can be won.

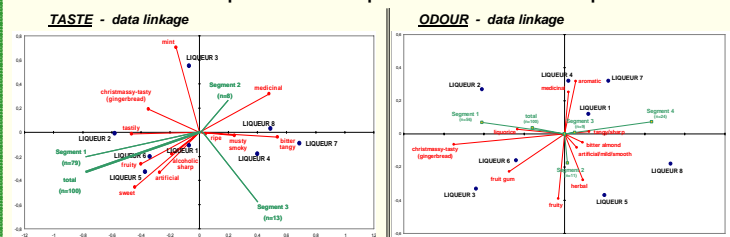


5. Key findings

The results owing to both Profiling procedures lead to the position of the products in a 2-dimensional space. The closer two products are positioned in this space the more similar the products are.

The panellists' descriptors (red lines) can be added so the closer a cordial (liqueur) is to a term the better the term describes it. The meaning of the data linkage requires the consumers' acceptances in the 2-dimensional space. Based on the data, no generally accepted cordial was distinguished. In fact for odour a taste acceptances different segments had been identified (green lines). For each of the segments preference driving and preference claiming odour and taste components can be determined.

Visualization of panellists' descriptors and consumers' acceptance



The overall acceptance and segment 1 lean towards Liqueur 2 and also Liqueur 6 and 5. Segment 2 drifts between Liqueur 3 and 8 whereas the third segment leans towards Liqueur 4 and 5. By linking the consumer acceptances with the panellists' judgements, it has been found that tastily, fruity and sweet sensations were preferred. Additionally, alcoholic sharp and artificial components and tastes which provide an association to gingerbread are common accepted.

The overall acceptance and segment 1 lean towards Liqueur 2, segment 2 drifts between Liqueur 5 and 6 whereas the third and fourth segment leans towards Liqueur 1.

By linking the consumer acceptances with the panellists' judgements, it has been found that the smell of liquorice and odours which provide an association to Christmas were preferred.

The rank of taste and smell acceptance of cordial 6 vary widely. Just as cordial 1 which is convincing with a very good odour-profile but gives a disappointing taste-sensation. A comparison between odour and taste outcome provides an additional insight with reference to the identification of possible discrepant characteristics of a product and a starting point of optimization.

This study reveals Flash Profiling and Free-Choice-Profiling as noted efficient methods of gathering customer perception data. Considering all results of the research project these Profiling techniques – in combination with consumer data – can be used as a first step to develop or optimize various products. The main advantages are the fast, inexpensive way for data ascertainment.

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