Sensometrics tools for the introduction of Western products in the East Asian market

Challenge

Identify taste differences in various food markets for food products (fresh potato)

> **"Introducing fresh potato products in a market far away from traditional territory. There is a distinct deference between the two products."**

Solution

Identify popular variants and attributes of fresh potatoes for a sensory evaluation

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Sensometrics is a powerful toolbox consisting of a variety of statistical methods which can be used in a product's development stages as well as in the understanding of the impact of a product on the market. Three main areas are in focus in this article:

1) Description of product characteristics through sensory evaluations of trained experts.
2) Understanding of consumer behavior and consumer likings
3) Relating product descriptors to the needs and preferences of the consumers and predicting the market response to the launch of new products.

Background

There are several product development challenges to overcome in order to seize the opportunities available within the East Asian markets. A highly successful product in Western markets is no guarantee against failure in the East. A good example to illustrate this discrepancy in consumer behavior is US wheat farmers who have not been able to gain shares in the growing markets in Asia. Despite the great effort that has been invested, even high-quality wheat products (according to US standards) have had very limited success. The most likely explanation for this failure is the East Asian demand for wheat used in noodle production. Unfortunately, US wheat is not suitable for the production of noodles with the slippery texture and color that Asians prefer. The lesson to be learnt from this can simply be stated as: "Just because we like something doesn't mean others will".

To quantify this difference between East and West, a sensory panel of experts in the USA has rated the wheat quality used in products released for the Asian market. When compared against local Asian consumer studies, the difference becomes apparent, as the following table of ratings for four different products shows:

Prod#	Thailand		Taiwan		China	
	Local Consum	US Expert	Local Consum	US Expert	Local Consum	US Expert
1	6.6	8.4	6.9	6.1	6.3	7.6
2	6.5	7.5	6.7	5.9	5.9	7.2
3	6.2	8.5	6.6	6.8	6.2	7.2
4	6.2	8.1	6.1	5.2	6.1	6.3

Table 1 - *Quality ratings of wheat by Asian consumers vs. US experts*

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Sensory analysis

To illustrate how to overcome the hurdle of taste differences between markets, a case study involving potatoes from Scandinavia is used.

Similarly to wheat products, there is an increasing trend in the East Asian market towards Western-style potato products. Such products include French fries, snack foods, crackers, functional foods as well as whole potatoes as an entrée component (only fresh potato products are considered in this text). However, it cannot in any way be guaranteed that Scandinavian potatoes will fit into this trend. This needs to be checked with adequate sensory analysis. Such an analysis is suggested to consist of the following stepwise procedure:

- Identify the most popular fresh potato products in 16 different East Asian countries.
- Characterize these 16 potato varieties using 30 different attributes (i.e. product descriptors) by an expert sensory panel consisting of 8 assessors.
- Assure quality and reliability of the sensory panel data.
- Identify significant attributes describing the potatoes in each of the 16 markets.
- Describe the composition of attributes for products in each market.

The sensory panel

Sensory evaluation of foods and other consumer products is an objective task which follows scientific testing methods. Such assessment is carried out by a group of trained assessors, usually referred to as a sensory panel. Evaluations are given as score values to a set of pre-defined attributes on each product.

Even though a sensory panel can be perfectly trained, individual assessors will give variable results stemming from differences in motivation, sensitivity and psychological response behaviors. Thus, there is a need to monitor the individual assessor's performance and use only scores from reliable assessors and significant attributes to work out a relevant product description. The Quali-Sense software package (CAMO Software AS) performs a series of tests to qualify assessors and descriptors. Below is seen an example of assessor performance for a specific attribute:

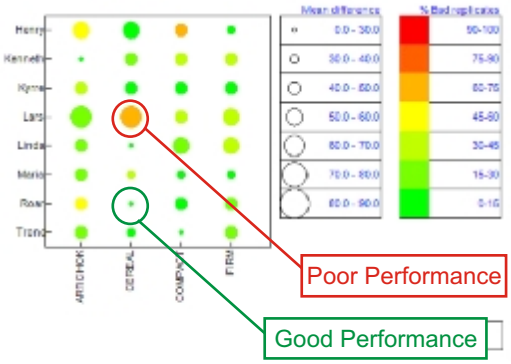

Figure 1 *- Individual assessor performance check in Quali-Sense*

Assessment of the 16 potato varieties

When the most popular potato brands were located in the 16 different countries, a sensory panel in Scandinavia made an evaluation based on 30 attributes. The Quali-Sense software revealed reliable scores from all of the 8 assessors in the panel. However, a great portion of the 30 chosen attributes indicated too much variability to have any significant effect as product descriptors. Only the following 7 attributes were used for subsequent analysis: Compact, Firm, Grainy, Mashable, Mealy, Pasty and Moist..

Attribute composition

Further investigation into how the selected attributes influence the different products requires a Principal Component Analysis (PCA). In PCA, a major objective is to look at maps displaying the relationships between attributes. Below, a map shows how the sensory descriptors are related. Attributes Compact, Firm and Grainy are closely related, and inversely correlated to Mashable. Also, Mealy / Pasty are oppositely correlated to Moist.

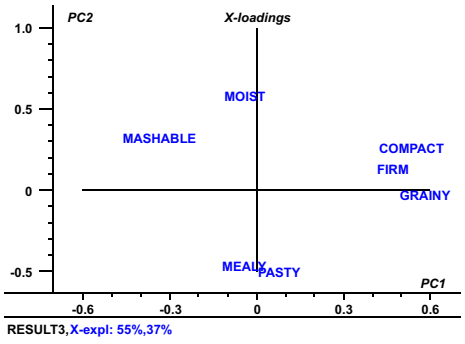

Figure 2 - Correlations of the selected attributes shown by Principal Component Analysis (PCA)

Product characterization

With the sensory evaluations from the Scandinavian sensory panel, the 16 potato varieties from East Asia have now been described by a known "vocabulary" in the sense of using attributes in which the panel is trained to recognize. It is then possible to relate Scandinavian products to the popular products in the new markets. In the map below, the descriptors (red) are combined with the 16 regional products from East Asia (country names in blue). When attributes are close to a country name it means this attribute is important for that country. Also, evaluations of a local potato brand from Norway have been projected onto the map to illustrate the difference between this typical Scandinavian brand and the preferred products in East Asia. Not surprisingly, there is a distinct difference between most of the Asian brands and the Norwegian one. However, with this information it is now possible to identify how the Norwegian product should be adjusted to meet likings in the new markets.

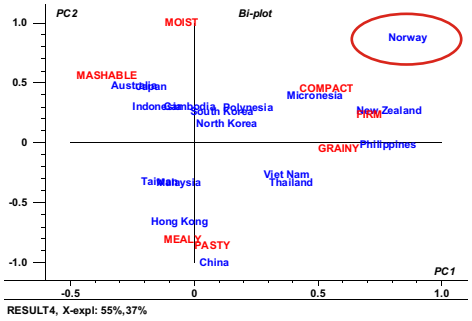

Figure 3 - Preferred products per country and their key attributes shown in a Principal Component Analysis (PCA)

Application note overview

Software	The Unscrambler 9.7, Quali-Sense
Methods	Principal component analysis (PCA), sensitivity test, reproducibility test, panel agreement test
Data type	Sensory profiling data (30 attributes), consumer likings in 16 countries
Vertical	Food (Potatoes)
Added Value	Identification of preferred product characteristics per country
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