

CONSUMER EVALUATIONS: Cross-cultural issues

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While cultural factors are acknowledged as perhaps the most powerful determinants of the foods that we consume (Rozin and Vollmecke, 1986), there has been relatively little cross-cultural research on determinants of food consumption. This is surprising, given the motivation of the food industry internationally to produce foods for export, particularly for rapidly growing Asian consumer markets.

A primary issue from a food industry standpoint is understanding the differences between cultures in preferences for the sensory characteristics of foods, since this will allow foods to be tailored to specific markets. Determining the origins of cross-cultural differences in preference also requires investigation of cross-cultural perceptions of food qualities such as tastes, flavours or textures, since perceptual differences may underlie differences in preference.

In particular, there is a considerable need to undertake systematic studies of consumer markets which focus upon the important sensory characteristics of the product. During the past few years, we have been conducting studies which have compared the taste and food perceptions and preferences of Japanese and Australians. More recently, we have also undertaken studies of other east and south-east Asian cultures, e.g. Korea. At the time we commenced our research, most of the information on Japanese food preferences resided in the kind of folk-lore told in company boardrooms by marketing, advertising and food company executives. It consisted largely of beliefs about the different nature of Japanese consumers, mostly derived from experiences with failed products in the Japanese market. The Japanese consumer, for instance, is believed to be "highly sensitive" to tastes and even more highly sensitive to smells. This, so the anecdotes have it, predisposes them to reject any product with the slightest perceived defect in quality, or to switch to another in the slightest improvement has been made. The food industry has consequently been operating on a "trial and error" basis when attempting to formulate products for the Japanese market.

Our research in Japan and other countries in Asia has included cross-cultural studies of taste discrimination, hedonic responses to taste in solution and in foods, and comparisons of perceptions of, and preferences for, the sensory characteristics of a variety of common foods. In collecting these data, we have been able to puncture some of the myths surrounding the Japanese consumer. It is highly likely that some degree of mythology surrounds any consumer group which lies outside a food producer's traditional target market.

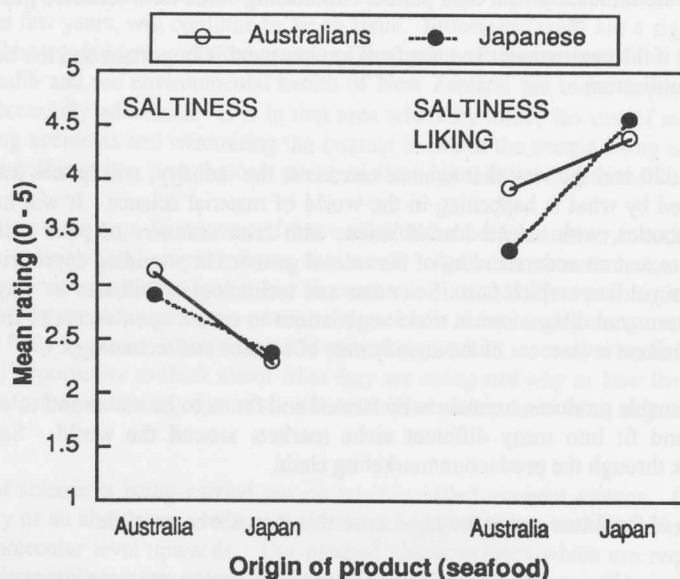


Figure 1. Australian and Japanese ratings of the saltiness and saltiness liking for processed seafood sourced from both Australia and Japan. While the Australian and Japanese panels agreed on the intensity of the Australian samples (more salty than Japanese products), the Japanese panel nevertheless liked the saltiness of the Australian product less than did the Australian panel. This suggests that familiarity with the overall product may be the most important determinant of liking for individual sensory attributes.

One means of overcoming potentially misleading impressions of a target market is the use of consumer sensory evaluations. Thus, our own data has suggested that Japanese and Australians have few, if any, differences in the way they perceive tastes or in their ability to finely discriminate taste differences (Prescott et al., 1992; Laing et al., 1993; Prescott et al., 1997). This implies that perceptual differences do not always underlie differences in preference (see, for example, Figure 1). Instead, a variety of non-sensory factors, including dietary experience and other cultural factors, may be important, suggesting that future research needs to assess preferences for sensory characteristics of foods not in isolation, but as one important factor amongst others that will determine food consumption.

Factors which relate both to the product and to the consumer include:

The context within which sensory properties of foods are evaluated.

Investigations of the sensory properties of foods need to be placed in a broader context. To what extent, for example, are there cross-cultural differences in the degree to which sensory factors determine the overall acceptability of a food product? Surveys of Japanese consumers have found that taste, in the generic use of the term, is rated the most important determinant of purchasing decisions for processed food (Japan Ministry of Agriculture, Forests and Fisheries, 1988). Does preference for taste, flavour or other sensory characteristics determine food purchasing decisions in other Asian markets? One of the key questions will be not just what flavours are important for a market in Asia, but what aspects of a food: its flavour, image, packaging, brand, size, 'healthiness', price or origin. In particular, what do we know about the impact of labelling a meat product as "Produce of New Zealand" on consumer preferences for the sensory qualities? It has been demonstrated that product labelling can have an impact on the acceptability of sensory characteristics (Cardello, 1992). Newer techniques such as conjoint analysis allow investigations of the relative importance of sensory factors in combination with factors such as price, origin, or image. However, there has to date been little or no attempt to apply these techniques within cross-cultural studies.

The relationship of consumer characteristics to preferences.

Consumers characteristics also need to be considered, and related to perception and preference data. Such characteristics include not only demographic and product usage information, but also individual behaviour in relation to food. This aspect tends to be ignored by market research primarily since the expertise comes from psychology and other behavioural sciences. Examples of this include cultural expectations in relation to foods or food sources, as well as the willingness of consumers to experience new foods, which might also be conceivably be a function of their cultural norms. These inter-relationships are illustrated in Figure 2.

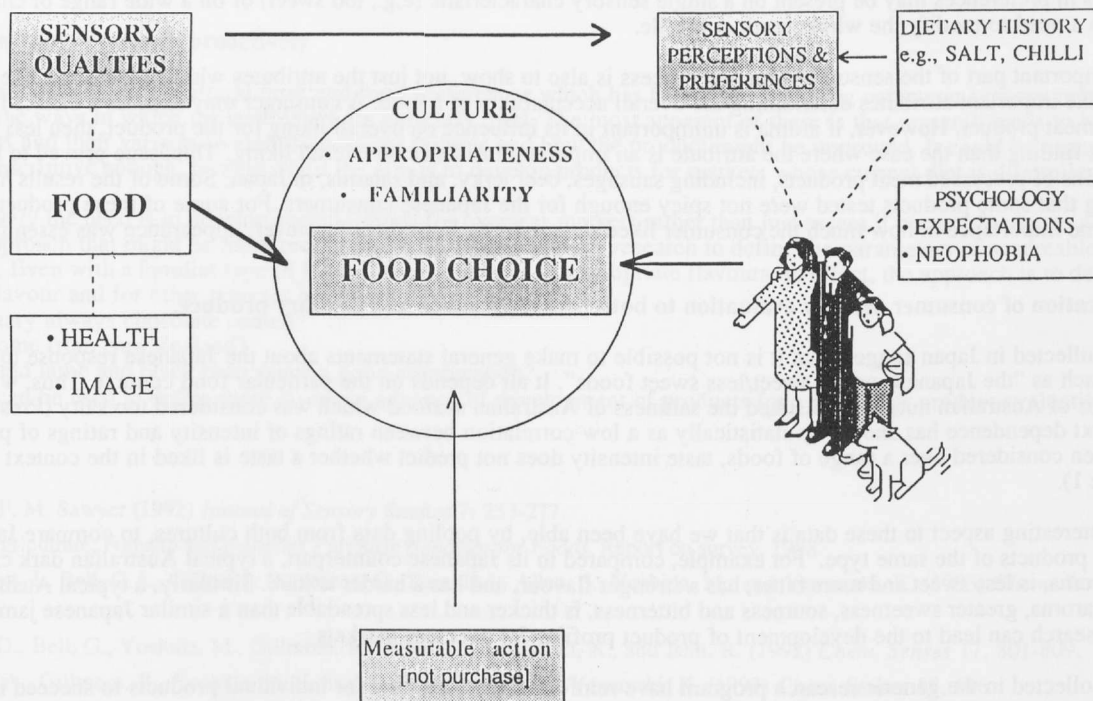


Figure 2. Schematic showing some of the important factors which interact with and influence sensory perceptions and preferences and, ultimately, food choice.

Communicating across different languages

An issue common to all cross-cultural studies, but seldom addressed in studies of food or sensory preferences, is that of communicating across different languages. While the logistical problems involved in actually undertaking sensory evaluations in another culture can be overcome by use of bilingual staff, the more crucial problem is that of agreement on the nature of the sensory qualities to be measured. Such qualities do not always have direct equivalents in different cultures. The best studied example of this is the use of the term *umami* by Japanese consumers to describe the taste of foods rich in glutamate and nucleotides. By contrast, there is no equivalent term in English. Similarly, in studies of Korean consumers, we have encountered the term *kusu*, which again has no English equivalent, but which emerges as an important determinant of preference for noodles. The problem is not merely one of definition, but rather has implications for the actual perception of the qualities themselves.

Clear objectives in conducting cross-cultural studies.

The relatively small amount of data on cross-cultural factors in sensory aspects of food acceptance reflects the logistical difficulties in studying groups that are sometimes separated by thousands of kilometres, as well as the potential scope of the field of study. Findings from one culture are not necessarily or even likely to be applicable in another. However, what it also reflects is the absence of unified objectives in conducting cross-cultural studies. Clearly needed, however, is a greater emphasis on investigating the origins of differences in sensory preferences. For example, few studies have attempted to correlate dietary intake with cross-cultural sensory responses. In particular, with countries in Asia now increasingly open to dietary influence from Europe, North America and Australasia, the influence of a changing diet on perceptions of, and preferences for, sensory qualities can be investigated.

Complex sensory aspects of foods

Another important issue, for both domestic and cross-cultural studies, is the need to focus on more complex sensory aspects of foods from which information can assist in food development. Foods are complex systems in which perceptions of, and preferences for, sensory characteristics are interdependent, and cross-cultural research should reflect this complexity. One example is the fact that preference for sweetness levels in many foods is dependent upon the fat content, and vice versa (REF). In relation to meat products, a simple example here might be the investigation of preferences for processed meat products with differing fat content and spice levels, which also could be expected to interact. Many Asian cultures consume foods with high levels of pungency, commonly due to chilli. It is important that investigations reflect the fact that tastes, aromas, and other characteristics such as pungency do interact within foods and influence preference.

Determining which sensory characteristics are important.

Most foods can be evaluated using a wide variety of attributes including those relating to taste, texture, aroma or appearance. Differences in preferences may be present on a single sensory characteristic (e.g., too sweet) or on a wide range of characteristics, pointing to a need to modify the whole product profile.

Another important part of the sensory evaluation process is also to show, not just the attributes which consumers like or dislike, but which are the important attributes determining the overall acceptability of a food. A consumer may express a dislike for the aroma of a processed meat product. However, if aroma is unimportant in its influence on overall liking for the product, then less attention can be paid to this finding than the case where the attribute is an important influence on overall liking. This issue proved to be important in investigations of processed meat products, including sausages, beef jerky, and salamis, in Japan. Some of the results have been surprising, e.g. finding that some products tested were not spicy enough for the Japanese consumers. For some of these products, the appearance was of prime importance in how much the consumer liked the products. For others, however, appearance was essentially unimportant.

The application of consumer sensory evaluation to both processed foods and primary produce.

Our data collected in Japan suggest that it is not possible to make general statements about the Japanese response to sweetness or saltiness such as "the Japanese prefer sweet/less sweet foods". It all depends on the particular food context. Thus, while Japanese like the saltiness of Australian nuts, they disliked the saltiness of Australian seafood which was considered too salty (Prescott et al., 1993). This context dependence has shown up statistically as a low correlation between ratings of intensity and ratings of preference. In other words, when considered over a range of foods, taste intensity does not predict whether a taste is liked in the context of a particular food (see Figure 1).

Another interesting aspect to these data is that we have been able, by pooling data from both cultures, to compare Japanese and Australian products of the same type. For example, compared to its Japanese counterpart, a typical Australian dark chocolate has a stronger aroma, is less sweet and more bitter, has a stronger flavour, and has a harder texture. Similarly, a typical Australian apricot jam has a stronger aroma, greater sweetness, sourness and bitterness, is thicker and less spreadable than a similar Japanese jam. Thus, consumer sensory research can lead to the development of product profiles for overseas markets.

The data collected in the generic research program have reinforced the view that for individual products to succeed in Japan, food producers need to undertake sensory evaluations which provide detailed, quantitative data on the consumer's response to the sensory qualities of their products. This information can then be used to tailor the sensory characteristics of the food in the direction, and to the degree, suitable for the Japanese palate (see Table 1). Alternatively, if a range of products varying in some critical attribute were tested, evaluation would give a clear indication of which of the formulations was most suitable. Where necessary, further sensory evaluation could then be done to "fine tune" the product.

AUSTRALIAN PRODUCT	ADJUSTMENT REQUIRED for Japanese consumers
SWEET FOODS	SWEETNESS
• Biscuit A	↑
• Biscuit B	↑
• Chocolate (white & plain)	↓
• Chocolate (dark)	-
• strawberry soy drink	↓
• ginger beer	↑
SALTY FOODS	SALTINESS
• seafood	↓
• soup	↑
• snack foods	-

Table 1. Some changes required to customise Australian products to make them acceptable for the Japanese consumer. Even within a category (sweet foods or salty foods) there were examples of foods in which the tastant level needed to be increased (↑), decreased (↓), or was currently acceptable (-). Such a group of findings illustrate the difficulties in making generalisations about taste preferences in overseas markets.

This similar approach can also be taken in consumer evaluations of primary produce, including meats such as beef or lamb. Among the wide variety of foods that we evaluated using Japanese consumers was Australian beef. The sensory evaluation techniques that we use have been able to differentiate a wide range of cooked beef types, which varied according to feed type and location, on a variety of appearance, texture, taste, and aroma characteristics. One outcome was that the information gained shed light on the relationship between consumer preferences and extent of grain feeding. Also, importantly, comparisons between the Australian samples and their Japanese and U.S. counterparts allowed an examination of the perceived strengths and weaknesses of the sensory properties of the Australian product.

Using consumer sensory research proactively

Despite the valuable data on cross-cultural taste and food preferences which has been gathered using consumer sensory research, there are limitations in the ways in which the techniques are currently used. The most apparent of these is that research tends to be undertaken on current products and their variants to identify possible failures and how the product might be improved. It could be argued that this approach is not prescriptive enough, particularly if the aim is to develop products for markets whose current diet is dissimilar to our own.

In other words, surely the need is to develop specific foods for overseas markets rather than just assess if current foods are acceptable. One alternative approach that might be more productive is the use of sensory research to define the parameters of acceptable flavours in particular markets. Even with a familiar type of food, there is the issue of appropriate flavours. In effect, the approach is to determine expectations for flavour and for other relevant attributes

- is confectionary always chocolate coated?
- do biscuits come from New Zealand?
- is New Zealand lamb and black bean sauce a good combination?

Sensory research can be used to define these issues in advance of development of products for a market & product evaluation.

References

- Cardello, A.V. and F. M. Sawyer (1992) *Journal of Sensory Studies* 7: 253-277.
- Japan Ministry of Agriculture, Forestry and Fisheries *Purchase Behavior for Foods*, Report on survey, 1988.
- Laing, D.G., Prescott, J., Bell, G.A., Gillmore, R., James, C., Best, D.J., Allen, S., Yoshida, M., and Yamazaki, K. (1993) *Chem. Senses* 18, 161-168.
- Prescott, J., Laing, D., Bell, G., Yoshida, M., Gillmore, R., Allen, S., Yamazaki, K., and Ishii, R. (1992) *Chem. Senses* 17, 801-809.
- Prescott, J., Bell, G.A., Gillmore, R., Yoshida, M., Laing, D.G., Allen, S., and Yamazaki, K. (1993) *Chem. Senses* 18, 616.
- Prescott, J., Bell, G.A., Gillmore, R., Yoshida, M., Korac, S., Allen, S., and Yamazaki, K. (1997) *Food Quality & Preference*. 8(1), 45-55.
- Rozin, P. and Vollmecke, T.A. (1986) *Ann. Rev. Nutr.* 6, 433-456.

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References (cont)

- Prescott, J., Laing, D., Bell, G., Yoshida, M., Gillmore, R., Allen, S., Yamazaki, K., and Ishii, R. (1992) *Chem. Senses* 17, 801-809.
- Prescott, J., Bell, G.A., Gillmore, R., Yoshida, M., Laing, D.G., Allen, S., and Yamazaki, K. (1993) *Chem. Senses* 18, 616.
- Prescott, J., Bell, G.A., Gillmore, R., Yoshida, M., Korac, S., Allen, S., and Yamazaki, K. (1997) *Food Quality & Preference*. 8(1), 45.
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