

# Describing Flavor Using Fewer and Simpler Terms: An Example with Cheese



Martin Talavera-Bianchi<sup>1</sup>, Delores H. Chambers<sup>1</sup>, and Edgar Chambers IV<sup>1</sup>



<sup>1</sup>The Sensory Analysis Center, Kansas State University, Manhattan, Kansas 66506, USA

## INTRODUCTION

Descriptive sensory analysis is widely used to describe appearance, flavor, and texture characteristics of a wide range of different foods. Sensory descriptive terms or “attributes” are used to explain these characteristics and they need to be clearly defined and referenced to avoid confusion and different interpretations between panel members (Giboreau *et al.* 2007). Because these terms have been developed by specialists in research and development, mainly with the purpose of finding descriptors that are discriminative and non-redundant (Civille and Lawless, 1986), understanding of sensory data may be difficult for marketing or consumer purposes. Descriptive analysis can introduce a large number of terms to describe characteristics of food. Therefore, descriptive terms might also need to be simplified or reduced to more general sensory “hits” for marketing use.

## OBJECTIVE

This study examined the use of a simplified lexicon for cheese to determine if a similar level of understanding of relationships among samples would be achieved as with the more complex set of attributes.

## MATERIALS AND METHODS

### Samples and Preparation

A chart containing information about flavor profiles of forty-two international cheeses and thirty flavor attributes was given to each panelist. This information was previously developed by Heisserer and Chambers (1993). In addition to this chart, cheese samples matching the ones in the chart were also provided to help the panelists familiarize themselves with the flavor of each cheese. General preparation of cheeses for flavor testing was described by Heisserer and Chambers (1993). Professional panelists of the Sensory Analysis Center at Kansas State University (Manhattan, KS) participated in this study.

### Test procedures

- 1 Panelists received a chart containing information about flavor profiles of forty-two international cheese samples.** In most cases, they also received a matching sample to help familiarize themselves with the flavor of the cheese being tested.
- 2 Panelists were asked to review the information in the chart, taste the cheese, and after general discussion, select the terms which described the major flavor “hits” present in each sample.** The number of terms they gave depended on the complexity of the flavor of each cheese. Panelists needed three sessions of 90-minutes each to go through all of the samples. Before testing, panelists went through one 90-minute orientation session to become familiar with the flavor of cheese, the terminology, and the testing procedures.
- 3 Cluster analysis procedure (average method) was used to analyze the information and classify the cheese samples according to their flavor characteristics.** Because numeric values were needed to analyze this information, and because intensities were not assigned, numbers were assigned to the attribute depending on the response from the panel. A “0” was assigned to all attributes that were on the chart, but were not considered by the panel at this time. A “1” was assigned to the attributes that panelists believed were slightly present, and a “2” was assigned to the attributes that were present at a moderate to high intensity. For example, Brick cheese was described as buttery, sweet, slightly nutty, and slightly sour. This means that buttery and sweet attributes were assigned a “2”; nutty and sour attributes were assigned a “1” and the rest of attributes shown in the chart and evaluated by Heisserer and Chambers (1993) were assigned a “0”. This analysis was performed by the Statistical Analysis System version 9.1 (SAS, 2001).

## RESULTS AND DISCUSSION

In the chart with published profiles, cheeses were described on a 15 point scale using thirty flavor attributes classified into dairy, fatty acid/animal, fungal, feeling factors, basic tastes, and others, depending on their flavor complexity. In this research, panelists reduced the number of attributes per sample to one to five terms that described the main flavor characteristics or “hits” of each cheese.

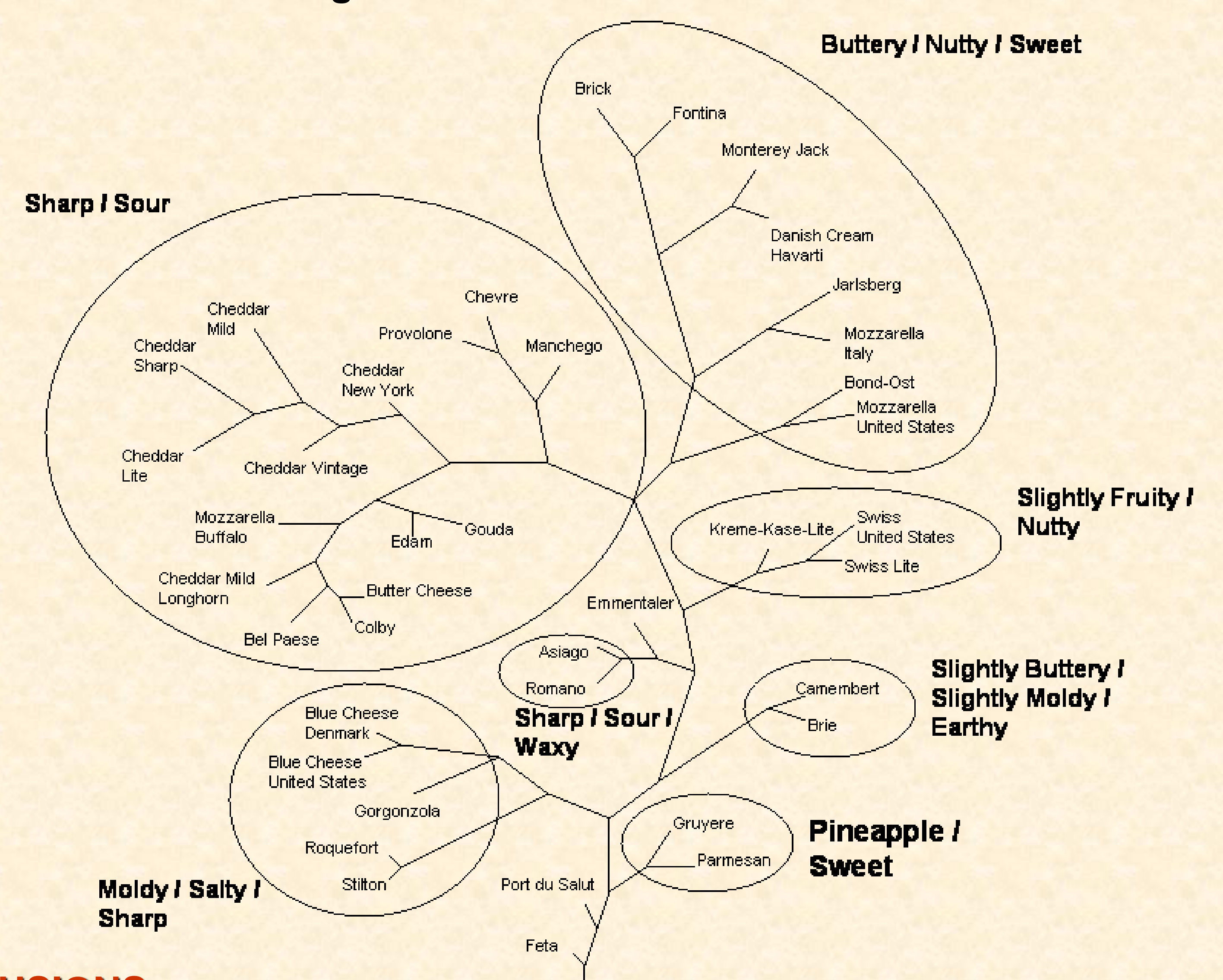
For example, in the flavor profiles, Brie cheese scored at low to moderate intensities for 20+ attributes. In this study, Brie was described only as earthy, buttery, and moldy. The level of intensity was given only as slight, moderate, or strong. The data were analyzed using a clustering procedure in order to classify cheeses according to their flavor characteristics and to compare the results with the classification from the full flavor profiles. Seven groups of cheeses with common flavor “hits” were formed.

Table 1. Major flavor “hits” from different cheeses evaluated by a descriptive panel

Cheese	Country	Milk <sup>1</sup>	Hits
Asiago	Italy	Cow	Sharp, sour, waxy, slightly nutty, slightly fruity
Bel Paese	United States	Cow	Buttery, slightly sour, slightly sharp
Blue Cheese	Denmark	Cow	Strong, sour, moldy, salty, sharp
Blue Cheese	United States	Cow	Strong, sharp, moldy, sour, salty
Bond-ost	United States	Cow	Buttery, dairy, slightly sweet
Brick	United States	Cow	Buttery, sweet, slightly nutty, slightly sour
Brie	France	Cow	Earthy, slightly buttery, slightly moldy
Butter Cheese	West Germany	Cow	Buttery, sour, slightly sharp
Camembert	Austria	Cow	Slightly moldy, slightly earthy, slightly buttery
Cheddar-Lite	United States	Cow (ps)	Sharp, dairy, sour
Cheddar-Mild	United States	Cow	Dairy, sour, slightly sharp
Cheddar-Mild Longhorn	United States	Cow	Sharp, slightly buttery, sour
Cheddar-New York	United States	Cow	Sharp, sour, dairy, slightly bitter
Cheddar-Sharp	United States	Cow	Sharp, sour, dairy
Cheddar-Vintage	United States	Cow	Sharp, sour, dairy, salty
Chèvre	France	Goat	Sharp, goaty, sour
Colby	United States	Cow	Buttery, sour, slightly sharp
Danish Cream Havarti	Denmark	Cow	Buttery, slightly nutty
Edam	Holland	Cow	Sharp, salty, sour, slightly buttery
Emmentaler	Switzerland	Cow	Nutty, waxy, slightly sharp, slightly sweet
Feta	Greece	Sheep	Sharp, sour, salty, sauerkraut, slightly goaty
Fontina	Sweden	Cow	Slightly nutty, sweet, buttery
Gorgonzola	United States	Cow	Sharp, moldy, salty, sour
Gouda	Holland	Cow	Sharp, buttery, sour, salty, slightly nutty
Gruyere	Switzerland	Cow	Sweet, pineapple, slightly nutty
Jarlesburg	Norway	Cow	Sweet, nutty
Kreme Kase-Lite	Denmark	Cow (ps)	Slightly nutty, slightly fruity, sour, buttery
Limburger	West Germany	Cow	Very strong, sharp, animalic, sweaty, bitter
Manchego	Spain	Sheep	Sharp, sour, slightly goaty, slightly pineapple
Monterey Jack	United States	Cow	Buttery, slightly sweet, slightly nutty
Mozzarella	Italy	Buffalo	Slightly sour
Mozzarella	Italy	Cow	Sweet, slightly nutty, slightly sour
Mozzarella	United States	Cow (ps)	Dairy, slightly salty
Parmesan	Italy	Cow	Sharp, sweet, pineapple, waxy
Port du Salut	France	Cow	Sharp, buttery, bitter
Provolone	Italy	Cow	Sharp, goaty, sour, dairy
Romano	Italy	Cow	Sharp, sour, salty, waxy
Roquefort	France	Sheep	Sharp, strong, goaty, salty, moldy
Sap Sago	Switzerland	Cow (ps)	Sharp, soy sauce, salty, animalic, goaty
Stilton	England	Cow	Sharp, strong, moldy, goaty, salty
Swiss	United States	Cow (ps)	Nutty, slightly sour, dairy, slightly fruity
Swiss-lite	United States	Cow (ps)	Sweet, nutty, slightly fruity

<sup>1</sup> ps = Part Skim

Figure 1. Cheese “tree” showing relations between samples according to their flavor characteristics using the “reduced” lexicon



## CONCLUSIONS

Product clusters and relationships were similar to those from the previously published research and suggest that this simplified lexicon may provide adequate information for general understanding of a product category.