



# Natural Flavors—A Marketing Perspective

By Michael Broekhof, PFW Division of Hercules Incorporated, Middletown, New York

**I**n the past, the flavor industry attempted to imitate nature through creative chemistry. Today, it attempts to imitate chemistry's achievements through nature.

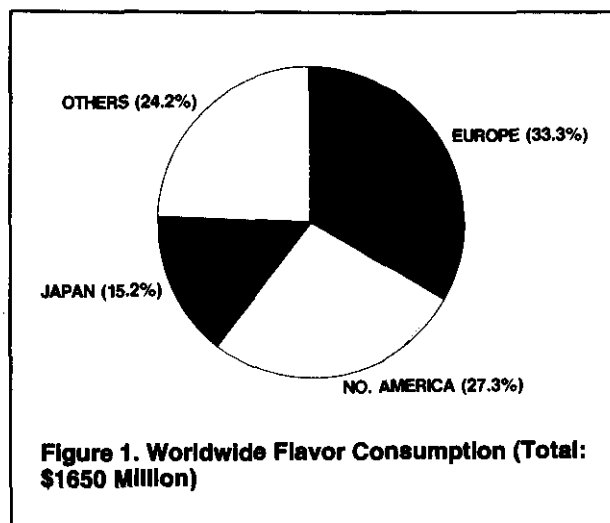
The current U.S. lifestyle emphasizing health has had a strong influence on sales of natural flavors.\* In the beginning of the 1980s, the growth of natural flavors might have been considered a passing phenomenon, but the current sustained sales increase certainly indicates that the trend toward natural flavors is now well established. As yet, it shows no signs of weakening. Whether the status of natural flavors will remain as important in the twenty-first century as it is today, however, remains to be seen; but in the meantime, the results of continuing research are radically altering the flavor industry.

## Consumption Estimates

The 1986 worldwide consumption of compounded flavors is estimated at \$1.65 billion. Europe and North America combined account for 60.6% of this amount, with consumption esti-

mated at \$550 and \$450 million, respectively. At 15.2% Japan accounts for \$250 million, and at 24.2% the rest of the world, \$400 million (figure 1).

Natural compounded flavors' consumption follows a similar pattern. It is estimated that 30% of Europe's total flavor consumption is in the natural form, while the figure for the United States is estimated at 40%. Consumption of natural compounded flavors by Japan and the rest of



\*In this article, natural flavors are limited to compounded products, and exclude foods, spices, essential oils, extracts, distillates and protein hydrolysates.



the world account for, respectively, some 10% and 5% of their total annual volume (figure 2).

Growth estimates through 1990 from our internal market research results show Europe at 6%, North America at 20%, Japan and the rest of the world at 10% each (figure 3).

## Europe and North America

The importance of natural compounded flavors in both Europe and North America necessitates a closer look at the two regions. Although the markets are similar in size, Europe is fragmented in more ways than North America, which comprises Canada and the United States.

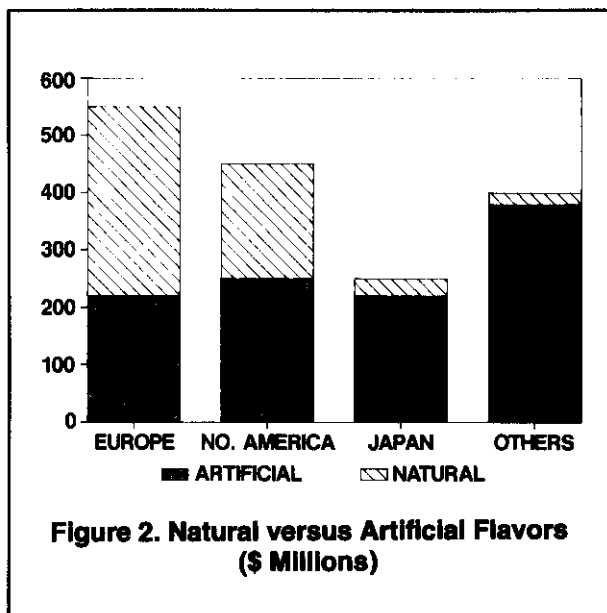
Most European countries have unique legislation applying to flavors and their use. Major flavor houses, headquartered in the larger countries such as England, West Germany and France, reflect their country's flavor legislation to a large extent in development activities. Locally available raw materials provided the impetus for natural flavor development as well, as is obvious in West Germany and France. Europe's consumption of natural compounded flavors is now lower than that of North America, both in dollar volume and as a percentage of total flavor consumption. Demand for natural flavors is strongest in England, followed at some distance by Scandinavia, Germany, Benelux and Austria. In France, natural flavors have long played an important role but their demand has not escalated as in England. In contrast to the United States where foods with a health image such as yogurt contain only natural flavors, Europe fully accepts both natural and nature identical flavors. Europe's largest potential for natural flavors appears to be in the soft drink industry.

North America traditionally consumed more artificial than natural flavors. This continent is particularly geared toward nationwide distribution of foods and beverages, and as a result, emphasis was placed on transportability and shelf life. This picture changed in the beginning of the 1980s in response to a fundamental change in lifestyle: health increasingly became a more important aspect of the quality of life. Marketing translated this into such terms as "fresh," "natural," "low calorie," and "lite." These and other health claims can now be found in virtually all food and beverage categories, including applications such as confectionery and snacks which were previously the domain of artificial products, including flavors. The health trend in North America shows no sign of weakening. On the contrary, it is vigorous in finding new expressions. With an aging population new niches will, undoubtedly, continue to appear.

Development of natural flavoring ingredients for use in the creation of natural compounded flavors is undertaken on both sides of the ocean. These natural flavoring ingredients can be obtained, for example, through physical means such as extraction and distillation or via fermentation, enzymolysis or plant tissue culture methods. The first type of process is not new to the flavor industry and continues to receive great attention with the growing sophistication of separation techniques. The real growth in natural flavoring ingredients, however, has taken place in the area of biotechnology.

## Factors Affecting Growth

The worldwide growth of natural flavors is restrained by the high cost in use of many natural flavoring ingredients. For example, natural benzaldehyde is currently about seventy times more



**Figure 2. Natural versus Artificial Flavors (\$ Millions)**

expensive than artificial benzaldehyde. This higher cost factor has several causes.

- **Investments.** High R & D investments and capital outlays are needed for one to play a role as a major manufacturer and/or supplier of natural flavoring ingredients. Flavor houses that own large-scale fermentation facilities, for example, are few; therefore, toll processing is often sought as the route to obtain the necessary materials.
- **Sources.** Locating sources or developing processes for natural flavoring ingredients adds to their cost. Some natural flavoring ingredients such as butyric acid, ethyl butyrate, and ethyl acetate can be rather easily obtained or produced from several sources. However, other natural flavoring ingredients may occur in only minute



amounts in sources that have limited availability. Obtaining them often involves time-consuming processes and sophisticated equipment.

- **Fragmentation.** The scale on which the flavor industry operates is much smaller than that employed by manufacturers in the bulk chemical industry. Frequently, batch (as opposed to continuous) processes are used. The flavor industry requires relatively small amounts of a large number of ingredients to compound a flavor. Each company manufactures a multitude of flavors, primarily on demand, and needs to keep inventories at a reasonable level. In addition, the market is fragmented by a large number of competitors.

- **External factors.** Climate and political ramifications may further affect the availability and cost of sources that provide natural flavoring ingredients.

terpart. The cost in use of a flavor in a finished food is relatively low compared with that of other ingredients and with those associated with marketing and distribution. But flavor costs are more easily influenced or controlled. Food and beverage purchasing agents wield great influence over flavor cost, owing to the fragmentation of the flavor industry. Therefore, flavorists have genuine restraints placed on them during the creation of a natural flavor, and the restraints may result in their using less of the more expensive natural flavoring ingredients than of artificial counterparts.

Major challenges for any flavor house wishing to enter the field of natural flavors or play a larger role in their development and use are, therefore, to locate high-content and consistently available sources, develop low-cost production methods, and produce or procure a large range of ingredients so their flavorists can create a wide variety of products.

## The Future

As mentioned earlier, it is easier to project what will happen in the twenty-first century than in the next five or ten years. This also applies to the natural flavor trend. North America's 20% growth rate for natural flavors will level off. However, at the beginning of the growth curve, it is uncertain just when that will occur. Efforts on the part of the flavor industry to make low-cost, abundantly available and widely varied natural flavoring ingredients will enable food and beverage marketers to continue their claim of natural ingredients and to offer an attractive consumer price as well. The analogy with vitamins is irresistible. Hardly any consumer is concerned about taking synthetically produced vitamins these days. Generally, it is believed that their effect is the same as that of natural vitamins. The next century may well see a similar attitude toward flavors and their contribution to foods and beverages.

The flavor industry has come almost full cycle: nature was the ideal to emulate through creative chemistry. Now we find the industry attempting to emulate synthetic achievements through natural means. The aim is to create natural flavors that have the strength and character of their synthetic counterparts. In the process, research will undoubtedly discover new processes and complex ingredients to broaden the flavorist's palette and scope and to change the face of the industry.

Address correspondence to Michael Broekhof, Manager, Aroma Chemicals Specialties, PFW Division, Hercules Inc., 33 Sprague Ave., Middletown, NY 10940.



Figure 3. Natural Flavor Growth (\$ Millions)

## Challenges

In general, consumers worldwide treat the organoleptic effect of a flavor as more important than whether or not it is natural. In North America, however, the safety of a food (often identified by the term "natural") has become a prominent marketing feature. Even foods such as confectionery, which used to be an artificial-flavor domain, are becoming more readily available with natural flavors. The consumer is willing to pay a proportionally higher price for this feature, but not if other expenditures have to be sacrificed.

The food and beverage manufacturer, therefore, should aim to market a finished product that claims a natural feature, but at a price as close as possible to that of its artificially flavored coun-