

Reflections of a Retired Flavorist Before He Forgets:

Vanilla—A Requiem?

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As I look back—covering parts of seven decades—no flavor has been surrounded with more controversy than vanilla. Vanilla was once considered to be number one in popularity but I very much doubt if it is still the favorite. On my recent volunteer projects to Egypt and Columbia, it was disappointing to see vanilla as a minor flavor in their lines. There was little true vanilla in these countries; that might explain its lack of popularity. In my opinion, commercial vanillas sold in the United States, for the most part, have not deserved the number one spot for some time.

My first full-time position in flavors was at the Drew Corporation of America (long defunct, its assets purchased by Virginia Dare some time back). Vanilla was their principal product and there I fell in love with the rich flavor of true vanilla.

How would one describe this unique richness? If vanillin, the characterizing flavor component of cured vanilla beans, is a flute solo then pure vanilla flavor, properly cured and extracted, is like a complete symphony orchestra. Like a symphony orchestra, it has the ability to enhance the performance of the voice or any instrument without detracting anything from the soloist. However, the need to be competitive has resulted in practices that dilute the flavor potential of the real thing.

Single strength vanilla extract should contain 13.35 ounces of beans per gallon of extract. In the '40s and '50s beans were approximately \$4-6 per pound. Today they are approximately \$50 per pound. Since much vanilla extract is purchased on price, using less than the required amount of beans gives one a competitive edge. By my observation most commercial extracts 40-50 years ago contained approximately eight ounces of beans per gallon. Concentrated extracts contained even less. Vanillin was added to get a normal vanillin content. Organic acids, or natural products high in organic acids, were added to increase the lead number value and vanillin polymers were added to increase color and resin values. Of course the flavor was diluted, and in some cases, covered by the additions.

Analytical research, sponsored by FEMA,* discouraged these practices but the need to get a competitive edge still exists. One way to achieve this is to purchase dry beans and

calculate the level in the extract on a dry weight basis assuming an average moisture for the standard 13.35 ounces at 25% or higher. Invariably this results in the use of inferior beans. There is relatively little demand for beans that have been allowed to ripen properly and cured to a final moisture level of 25-30%, although these make a delightfully flavored extract. Bean producers were equally at fault. Improperly picked beans cured to a high moisture content have the appearance of high quality beans but give an inferior flavor. They gave the curer a greater return however.

I recall an indignant Mr. Drew telling me of the nerve of a visitor who offered to sell him chopped exhausted beans, sprinkled with vanillin. Other employees told me that Mr. Drew actually took the visitor, a Mr. L.V. Towt, by the seat of his pants and the collar of his jacket and guided him to the street. Sometime later I read about Mr. Towt's patent¹ on the quick curing of vanilla beans which involved first chopping the green beans in a similar manner to what users did prior to extraction.

In 1947 I took a position with Van Ameringen-Haebler. My superior, Dr. McClumphy, agreed to allow me to attempt to produce the best pure vanilla extract that I could regardless of price. One of our bean suppliers, The Camax Manufacturing Co. of Philadelphia, was an enthusiastic supporter of this project. My contact, Mr. Joseph Maxwell, introduced me to his associate, Rufino Cagigal, who had practical experience in vanilla curing and vanilla quality. Lengthy conversations, plus visits to their facilities and examination of many lots of beans, gave me a real appreciation of vanilla bean quality.

Although properly ripened and cured beans could hold a high moisture content, the flavor was not hurt by reducing moisture to 15-25%. Improperly ripened and/or cured beans always gave an inferior flavor, regardless of moisture content. Good splits or cuts (beans that split open during ripening or curing) did not have the appearance of top quality beans and were naturally lower in moisture, but they could give an excellent end product. Unfortunately they were often mixed with inferior beans. Too low a moisture content (below 15%) generally was obtainable from poorly ripened beans which had less soluble solids. Even with good quality beans, low moisture generally resulted in loss of vanillin and other volatiles.

* Flavor & Extract Manufacturer's Association

Vanilla cultivation and curing, in the various producing areas, is tedious and requires much hand labor. The beans ripen unevenly and must be picked individually. The next step is wilting which enables the enzyme system to do its work. Immersion in hot water, scratching, heating in an oven or in the sun are techniques used in different producing areas. The beans are then conditioned for some time while the enzyme system continues to work and the moisture content is reduced. The final step is drying to the desired moisture content.

The high price of vanilla, the difficulty in selecting beans that you know were properly harvested and cured, and the lack of uniformity could all be less of a problem if a quick cure could be developed that gave a consistently good flavor and an optimum and consistent moisture content.

The only real research conducted on vanilla production and curing was done at the Puerto Rican Agricultural Experimental Station (this work has long been curtailed) and I devoured their reports. Can't recall how I made the contact, but a Charles Pennington, who was striving to grow vanilla in Puerto Rico and refine the curing process, contacted me. Mutual interest led to regular correspondence and in the mid 1950s he forwarded me green vanilla beans for some preliminary experiments in quick curing. The results were published in *Food Technology*.² The principal conclusion, and what I felt were deficiencies in previous

quick cures and some curing techniques, was the need for the moisture content to be maintained near its original level during the conditioning stage so that the enzyme system had the opportunity to develop the optimum flavor.

The question might rightly be asked, has further work on quick curing been done and is it utilized today? My guess is yes. Further work has been done and some of the results have modified the curing process. However, a quick-cured product offered to most bean users would probably evoke the same response that Mr. Towt's offering to Mr. Drew prompted.

A large producer of vanilla extract, with direct contacts with bean producers, is in the ideal spot to develop and utilize a quick cure. Such a producer would likely go one step further. Attached to the green bean is a vanilla stem that contains the same glucoside as the bean but at lower levels and without the necessary enzyme system to develop flavor. By grinding the stem with the vanilla pod and quick curing together, one is likely to obtain greater yields and get a competitive edge without sacrificing flavor quality.

I am concerned that the unreasonable demand for "natural" flavors and the introduction of "natural" vanillin will lead to the practical extinction of real vanilla flavor. It is commonly accepted in the industry that one ounce of vanillin is equal in strength to one gallon of vanilla extract containing approximately 0.25-0.3 ounces of vanillin. Obviously there are other flavor components that are respon-

sible for the full flavor of true vanilla.

Relatively little has been published on the flavor components of true vanilla which are present in trace amounts compared to the vanillin content. The work that has been done indicates the presence of ingredients common to the balsams and typical of lignin breakdown aromatics. Of these I consider cinnamates and related aromatics of prime importance. By odor and flavor, traces of substituted phenols and some fatty acids also contribute to the final flavor.

Recognizing that vanillin alone is not vanilla, flavorists have been adding other ingredients to vanillin to round off the flavor. In most cases these additions are not designed to reproduce the flavor of true vanilla but rather to give a satisfactory flavor in the finished product.

Vanillin sublimates and is quickly lost where fairly high temperatures are involved. To withstand the conditions in the manufacture of baked goods, candies, etc., ingredients such as dihydro coumarin, heliotropine, anisaldehyde, oil of balsam Peru and butter flavors are common additives. The final flavor is pleasant but not true vanilla.

In beverages, esters such as ethyl butyrate are added for lift, as well as some of the above ingredients.

Few flavorists have had the opportunity to familiarize themselves with the true flavor of a properly prepared vanilla. Cinnamic alcohol, which adds much, is seldom used. Should a flavorist develop a flavor that reproduced the

character to true vanilla, it probably would have little market because it would not only be different from what is commonly accepted as vanilla flavor, but in today's market it could not be labelled "natural."

As I leave the industry behind, with much gratitude and few regrets, perhaps it is symbolic that the flavor I loved best is fading away. I had felt that the pioneering work of Towt, Pennington, and the Puerto Rican Station scientists would lead to a practical quick cure and make real vanilla flavor available to consumers at a fair price.

I had hoped to investigate the possibility of culturing the enzyme system from vanilla beans and adding it to various lignin sources in the hope of developing a more economical but realistic vanilla flavor. When the possibilities are close at hand, it is a shame that seemingly irreversible factors have led to the demise of the delightful flavor of real vanilla beans. True vanilla flavor does not call attention to itself. It has the property of adding richness to the end product when used alone or to enhance the acceptance of other flavors when blended with them.

References

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1. US Patent 2,621,127, LV Towt (December 9, 1952)
2. JJ Broderick, *Food Technol* 10(April) 184-189 (1956)

