Reflections of a Retired Flavorist Before He Forgets:

Strawberry

By James J. Broderick, River Edge, New Jersey

When I was a young flavorist, trying to perfect the art, the D & O 5210 Strawberry was considered the target to shoot for. At a recent meeting I happened to mention to Tom Bonica (recently retired IFF VP) that his former boss, Charlie Fricke, told me that the development of the 5210 Strawberry by Jack Bouton resulted from his attempt to match Seeley's 10W Strawberry. Tom also filled in parts of the story I was unaware of.

Back in the early 1950s, at the IFT convention in Boston, a group of us used the opportunity to recruit additional flavorists with the hope of forming the Society of Flavor Chemists.

That initial group of recruiters included myself, Jerry DiGenova, Earl Merwin, Tom Bonica, Charlie Fricke, Fred Schumm and Lou Strasburger. We felt a key in establishing the Society was the selection of the right person to be our first president.

There was still a strong feeling at the management level in some companies that flavorists should not meet together or even be seen talking together. Therefore we felt that the selection of one of the "older" flavorists would discourage the younger ones but that a "younger" flavorist would lack credibility. With his reputation as the creator of the 5210 Strawberry, Jack Bouton proved to be the ideal choice since he did not qualify as either a "young" or "old" flavorist. As you can see, the creation of the 5210 Strawberry had far more influence on future events than its place as a standard.

According to Tom and Charlie, the story goes back much further. Jack Wenneiss, a man with a great reputation for personal integrity, retired as technical director of Norda (since acquired by Quest International). Previous to his employment there he worked for Monsanto and then for Seeley where he developed the 10W line of flavors. Jack apparently was the first to use methyl heptine carbonate for the green note in strawberry. (In those days we did not have the hexenyl compounds.) Jack Bouton followed the 10W lead and used methyl heptine carbonate but, to my knowledge, was the first to use maltol, albeit at low levels.

Charles Fricke, who also retired as an IFF VP, had previously worked for Polak & Schwartz (before its merger to form IFF), Seeley and Antoine Chiris. He started as a young man assisting his uncle who started the flavor department at Kohnstamm (since acquired by Universal Flavors). However when Charlie's uncle was dismissed, Charlie was dismissed also, solely because of his relationship. Charlie always jokingly commented that Kohnstamm was the only company in the industry that had any brains.

Today's chemists should realize that when Jack Wenneiss and Jack Bouton were adding green notes and maltol, nothing was known of the composition of strawberry flavor and a good portion of the raw materials available today were unknown to them. Nevertheless the 10W and 5210 Strawberries are still credible flavors.

The next big change in strawberry flavor composition was initiated by a talk given by Dr. Keene Dimick at an early Society of Flavor Chemist's meeting. His paper on the work he performed on strawberry volatiles for the Department of Agriculture was published in *Food Technology*[1] and reported on at that crucial meeting. This meeting was a turning point not only for flavorists but also for Dr. Dimick. For the flavorist it changed his approach and increased his efforts to obtain, evaluate and utilize the hexenyl com-

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pounds. For Dr. Dimick it gave the opportunity to travel to the East and line up suppliers to build gas chromatographs and start the Aerograph Company.

Just prior to my entry into the service in the early 1940s, a friend asked me to visit with Dr. Frascati, who was chief perfumer in Firmenich USA. He explained the desire of Firmenich to enter the US market after the war. In the course of the discussion he showed me a sample of a product he called Corp Praline which had a delicious and much needed sugary nuance for strawberry. It was not until Pfizer offered Veltol, after World War II, that we realized that Corp Praline was maltol. Of course, Jack Bouton saw its value when he used it in his 5210 Strawberry.

While I was a consultant on a project authorized by Bob Fries, I started in 1960 to isolate and attempt to identify the volatiles from strawberry essence, using gas chromatography. There were no really illusive components.

The work was only complicated by the complexity of the mixture. I surmised that there were series of related esters. Using standard techniques, all of the esters were cross esterified to the methyl esters, thereby greatly simplifying the mixture and the identification.

A whole series of benzoate, salicylate and cinnamate esters was recognized, supplemented by a series of even numbered γ-lactones. Here again flavorists had anticipated many of these components before their actual discovery in strawberries.

One puzzle for me was the presence of a small maltol-like peak in the general area of maltol. It was too small to deliver the kind of effect needed and it wasn't until the availability of furaneol, with its greater strength, that the puzzle was resolved in my mind. Again it points out the acumen of Jack Bouton and earlier flavorists who used the taste-alike maltols when furaneol was unavailable.

One thing this analytical work did prove to me was the fact that Aldehyde C_{16} (EMPG) was a compromise on the part of the early flavorists to reproduce effects needed and where the raw materials were not available. Although both Jacks used C_{16} and it still finds use in strawberry and other flavors, it is not found in strawberry, nor is it necessary. However it is still useful when price considerations require less of the maltols or furaneol.

The demand for "natural" flavors and the availability of "natural" ingredients (such as ethyl butyrate, ethyl 2-methyl butyrate, diacetyl, ethyl caproate, hexyl and hexenyl compounds, the aliphatic acids, methyl cinnamate, maltol and furaneol and γ C_{10} and C_{11} lactones) enable the flavorist to produce a "natural" strawberry with a minimum of juice or fruit extractives. It also verifies that Aldehyde C_{16} is not a necessary ingredient.

Reference

Address correspondence to James J. Broderick, 189 Woodland Avenue, River Edge, NJ 07661-2322 USA

1. KP Dimick and B Makower, *Food Technol* **10** 73 (1956)