

Sweeter Ice Cream Preferred

study indicates consumers prefer ice cream with higher sugar content than the 15% level usually considered to be optimum

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An essential ingredient—sugar—affects palatability, body and texture, freezing point and storage properties of ice cream.

The sugar content of ice cream usually is not altered during manufacture when other changes in composition, such as butterfat or milk solids, are made and—except for the sugar in the flavoring material itself—the sugar level is seldom adjusted for different flavors. The dairy industry has accepted—for many years—a sugar level of 15% as about right for most people. However, little or no effort was made to establish optimum sweetness levels for various flavors of ice cream by interviewing the consuming public directly until a two-year study of consumer reactions to vanilla and strawberry ice creams was initiated at Davis.

Vanilla Ice Cream

Preliminary studies involved presenting samples of vanilla ice cream—differing by a 2% increment in sugar—to a taste panel of trained laboratory personnel who found the levels to be easily distinguishable. The butterfat content was standardized at 12% because the panel was unable to distinguish between samples containing 12% and those containing 15% butterfat. Similarly, sucrose was used as the only sweetener because the panel found little difference between 15% sucrose and 12% sucrose plus 4% corn sweetener. Therefore, the vanilla ice cream prepared for consumer testing contained 11%, 13%, 15%, 17% or 19% sucrose. The adequacy of the sweetness range was verified in a test with 69 businessmen convening in Davis. Each person received two 4-oz. samples and indicated his preference, unaware of the sugar variation. The sweeter sample within each pair was preferred by 72% of the group who interpreted the additional sweetness as richer, smoother, creamier, more flavorful, or better textured ice cream.

Consumer Appraisal

A mass consumer appraisal of five ice cream samples was obtained at the California State Fair in Sacramento when the general public was served samples of ice cream at a tasting booth. A reception-

ist recorded each consumer's sex, age group, height and weight, and frequency of consumption of ice cream. The consumer was given a score card—indicating one of 10 possible paired combinations—which he presented at a window where he was served two 2-oz. samples of ice cream and was asked to check his preference.

Over 6,000 people participated in the preference survey which attracted slightly more females than males. The largest group was composed of children under 16 years of age, an age group that consumes the greatest amount of ice cream in this country.

Taste Preferences

Total preferences indicated that sugar levels of 15%, 17% and 19% were equally well liked and were significantly superior to ice cream containing 11% or 13% sugar. The 11% sugar level was the least liked of the five. There was no difference in preferences when tasting was done on very warm days—maximum 99°F—or on cooler days—maximum 79°F. Although the men preferred ice cream slightly sweeter than did the women, age seemed to have little influence on sweetness preferences. Approximately 21.5% of the consumers interviewed were underweight—compared against life insurance tables—44.8% were of normal weight; and 33.7% were overweight. No significant influence of body size on sweetness preferences was observed. A total of 4,933 people reported they ate ice cream several times a week; 1,084 ate ice cream several times a month; and 99 consumers ate ice cream only several times a year. The more frequent users showed a greater preference for the sweeter samples than did people who ate ice cream less frequently.

Strawberry Ice Cream

Preliminary reports indicated that the strawberry flavor of ice cream could be enhanced by increasing the amount of sugar in the formula. Consequently strawberry ice cream with 12% butterfat was prepared and the trained tasters found that maximum strawberry flavor was perceived at a 19% sugar level followed by 17%, 15%, and 21% sugar. A consumer

panel of 210 families was selected at random from the Woodland telephone directory.

In August 1957, two pints of strawberry ice cream—varying in sugar content and coded—were delivered to each selected household. The participants consisted of 326 males and 324 females; 225 people under 25 years of age and 425 over 25 years of age. The greatest preference was expressed for sugar levels of 19%, followed by 21%, 17%, and 15%. Little difference in preference between males and females was noted, but children under 16 and adults between 25 and 39 tended to prefer sweeter ice cream than did people in other age brackets. Total consumption of ice cream in general showed that 75% of the families served ice cream more than once a week. Strawberry ice cream was consumed more than once per week by 10% of the surveyed families; more than once per month by 45% and more than once per year by 42%. Only 3% reported they did not serve strawberry ice cream at any time.

Comments indicated that the sweeter ice creams contained more apparent strawberry flavor and seemed to be richer tasting.

To estimate buying behavior, a hypothetical price differential was established between the two samples of ice cream and the homemaker was asked to indicate which of the two she would purchase if the first sample cost 5¢ a pint more than the second; if the second cost 5¢ a pint more than the first; or if both samples cost the same. The answers showed that only when the families liked the samples equally well would they purchase the cheaper product. The majority of the homemakers reported that they would pay 5¢ more per pint for the ice cream they designated as having more flavor.

Adjusting the sugar content of ice cream upward—from the usual 15% level—apparently results in a more flavorful product that the majority of the consumers like and for which they are willing to pay a slightly higher price.

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