SHAKE-UP IN SUGAR

Herbert Hoover was president, no one had ever heard of tv dinners or OPEC, and sugar was a gleam in every child's eye. Fifty years ago almost all sugar produced was used in the home, in preparation of baked goods, candy and desserts. All sugar was derived from sugar beets and sugar cane.

Today more than two-thirds of sugar produced in the United States is used by industry and practically all of this in the fantastic number of processed foods available to consumers. These foods are produced for an extremely diverse population of consumers with specialized demands.

The many needs of the consumer and the great product diversity created by industrial growth has led to the development of corn sweeteners, including increasing sugar use has opened the market to corn sweeteners, including dextrose, regular corn syrup and blends such as the recently developed high-fructose corn syrup.

Last year, sugar use in processed foods accounted for per cent of total deliveries last year while beverages, primarily soft drinks, totaled per cent.
High fructose corn syrup is an entirely new concept in sugar composition. In this syrup a portion of glucose has been isomerized to fructose or levulose. Inexpensive commercial production of this corn syrup has become a reality only in the past few years.

The high sugar prices of 1974-1975 coincided with a technological breakthrough in the isomerization of high fructose corn syrup. This price increase stimulated the use of non-sucrose caloric sweeteners. Since the vast majority of U.S. consumption is indirect, in the form of processed foods and drinks and many instances where non-sucrose sweeteners can be used, the abundance and relative inexpensiveness of contributed to this state of affairs.

The development of this product has already had a significant impact on these product areas where its use is more convenient than sucrose. High-fructose corn sweetener is often used in beverages because of its liquidity. HFCS, as it is often referred to, differs from conventional corn syrup in that it has a greater sweetening capacity per unit of measure, which makes it less expensive to use.
There is a large variety of foods in which HFCS can be used, but nevertheless sucrose use in beverages and foods increased overall in 1976. Within the food industry the increase was nearly twenty percent in processed foods, but nearly twenty percent in confectionaries.

One reason HFCS did not achieve expected inroads in this area is its incompatibility with some foods. For example, while it is technically possible to use HFCS in candy, it is often not very practical because of the shorter shelflife of the corn sweetener. HFCS also absorbs water and this limits its applicability in most candy and in many other foods as well. The new corn sweetener is almost never used in baked goods because no practical process for crystallizing the blend has been developed.

The confectionary and bakery industries require sucrose in the form of granulated crystals ranging from Confectioners AA, an extremely large crystal approximately one-eighth inch, to powdered sugars used to produce the creamy frosting or icing on cakes. This variety and exactness of grain size required in many industries precludes the use of high-fructose corn syrup.

Early in 1976 the corn sugar industry in the United States anticipated sales of 1 million short tons (dry basis) for high-fructose corn syrup. However, because sugar prices declined, it became
These high expectations were not met. High-fructose corn syrup shipments in 1976 totaled nearly 800,000 tons, a healthy increase over the 300,000 tons shipped in 1975, but well below earlier projections.

Even though the corn refining industry has a production capacity of nearly 10 million tons of HFCS annually, actual shipments are not likely to exceed 4.5 million tons, barely half that capacity. An HFCS domestic market of 2 to 2.5 million tons by 1980 seems more probable than the 3 million plus tons projected by the corn sweetener industry in 1976. Increases in corn prices are also likely this year due to the strong domestic and foreign demand as well as the dry weather in grain producing areas.

Corn sweetener prices are naturally responsive to these changes as much as to the price of sugar. If sugar prices rise, then HFCS will be more competitive and production will increase.

In the United States high-fructose corn sweeteners are not competing only with sucrose sweeteners, but also with conventional corn syrup and dextrose. Dextrose is the most costly corn syrup to produce.
and HFCS exceeded dextrose consumption for the first time in 1976. Per capita consumption of dextrose was five pounds, while HFCS averaged four pounds, six pounds more than its 1975 total. In 1976, conventional corn syrup was consumed at a per capita rate of eight pounds, virtually no increase from 1975. Future consumption forecasts predict that dextrose and regular corn syrup totals will match and slightly exceed last year's figures. HFCS consumption, however, is expected to gain an increase of two to four pounds per capita.

While high fructose corn syrup is making inroads in the U.S. market, it does not now constitute a threat to sucrose consumption in most other high-income countries. First of all, the price of corn is higher as a result of tariffs and other fiscal realities. Secondly, sugar producers in Europe are concerned about competition from non-sucrose sweeteners since they are already working with an export surplus. (This threat is diluted, however, by European import needs for grain; the European economic community currently imports about fifteen million tons of corn each year.) Lastly, HFCS is not as popular in the world market for the simple reason that sugar consumption abroad involves a smaller percentage of processed foods, even in Europe. However, the growth of processed foods is a trend in every industrialized country and likely to remain so. This fact will have a long-range effect on the world sugar economy.
Another influence on the impact of HFCS and the state of the world sugar market in general is the changing rate of sugar consumption. Since 1940, the per capita consumption of sugar in the United States has stayed virtually the same at 100 pounds per person, a level which seems to be the peak in other developed countries as well. Developing countries, however, have a per capita consumption of sugar well below the 100 pounds of the United States.

During the 1974-1975 period of high prices, the rate of consumption in developing countries dipped only slightly. In low-income importing countries, however, the effect of the price rise was much more sharply felt, and consumption was reduced thirty to sixty percent and more. Because these countries account for such a small segment of world consumption, however, the trimmed world prices reduced world-wide consumption by only two million tons. In fact, the net drop was only one million tons, because consumption rose in low-income exporting countries during this period.

Today, 90 percent of the current yearly increase in sugar consumption is in the developing areas where the rate of population growth is staggering. At the present time, non-sucrose sweeteners cannot take advantage of this consumption demand since processed foods are not widely available and many countries lack the starch hydrolyzing industries necessary for the production of high-fructose corn syrup. With corn sweeteners shut out of this market, the worldwide demand for sucrose will continue to increase at a considerably faster rate than within the United States.
World sugar consumption is on the rise and, yet, the immediate situation is not good for sugar producers worldwide, based on the simplest law of supply and demand. It is true that 1977 world consumption will reach 82.8 million metric tons, up 2 million tons from 1976. Sugar stocks are already at adequate levels and will soon be increased by an additional 4.2 million tons.

With an expected surplus darkening the international sugar picture, what is the future of high-fructose corn syrup? HFCS has many limitations in regard to product use, and is currently restrained from greater production by low sugar prices. Eventually, however, the low-cost production, availability, and greater compatibility achieved through new research will bring HFCS a better share of the market. Furthermore, as manufacturers attempt to take advantage of every possible use, the long-range impact of HFCS is likely to be great. No matter how you look at it, high-fructose corn syrup is here to stay. In the words of the Wall Street Journal, "A major segment of the food business may never be the same again."