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CHEMISTS SEEK NEW USES FOR HONEY

A radio talk by C. A. Browne, Bureau of Chemistry and Soils, delivered in the Department of Agriculture period of the National Farm and Home Hour, broadcast by a network of 48 associate NBC radio stations, Tuesday, November 14, 1933.

I believe I may safely assume that all of you producers of honey are interested in the efforts that are being made to obtain greater popular recognition of the value of honey as a food. Efforts to extend the market for honey are primarily along two lines: (1) increase in direct consumption and (2) use in various food products and in products derived from honey. I am going to discuss briefly the assistance which scientific research may render along the line last mentioned.

The solids in honey consist principally of the sugars dextrose and levulose which are widely distributed in many plants and as sweetening agents of fruits. The specific character of honey, however, is due largely to certain substances which are present in very small amounts. Among these substances are the flavoring compounds, which impart to honey the delightful flavor and aroma of the flowers from which it is derived. No other saccharine liquid possesses the great variety of flavors characteristic of our domestic honeys. It is the diversity and attractiveness of these flavors which offer the greatest possibility of developing new uses. You may perhaps be interested in two or three instances of work conducted in the Bureau of Chemistry and Soils.

In our chemical research on honey we found accidentally that it can be frozen to produce a very palatable dessert. Quick freezing of honey, using solid carbon dioxide gas, commonly called "dry ice", in powdered form with rapid stirring, yields a product of very smooth texture, resembling sherbet in appearance and consistency.

The honey is first diluted with approximately 2 parts of water to each part of honey. Freezing may also be accomplished with an ordinary ice cream freezer and an ice and salt mixture. This dessert possesses all of the delightful honey flavor, which is even accentuated to a remarkable extent. In view of the manner in which the natural flavor is intensified or "brought out" by freezing, a much better appreciation of the diversity and attractiveness of various honey flavors should result from the consumption of honey in this form. In general, mild flavored honeys gave the best results, although producers of the darker honeys who take pride in the full rich flavors of their products will find in this frozen dessert an even greater appreciation of these flavor qualities.

We are now investigating the possibility of utilizing honey, particularly those types that do not at present find a ready market for table consumption, for production of vinegar of superior quality. The utilization of low-grade honey and honey wastes for vinegar production has been investigated in the past. However, it is the possibility of using honeys of certain types for producing vinegars of superior quality which might command a premium on the market that particularly interests us. Here, we are again attempting to capitalize the aroma and flavor of honey and to ascertain if

the aroma of honeys of certain types is carried over in the fermentation process, perhaps in a modified form, to impart a desirable "bouquet" to the resulting vinegar.

In many ways honey is an ideal material from which to prepare vinegar, since it keeps well and requires only the addition of the requisite amount of water and perhaps a small amount of certain mineral substances for preparing the stock solution for fermentation. In view of the great variety of flavor and color possessed by our domestic honeys, the possibility of producing honey vinegars of superior and distinctive quality appears promising.

The low temperature at which honey darkens and loses characteristic flavor when it is heated has interfered with more extensive use in certain food industries, such as baking and confectionery. Greater use could be expected if this difficulty due to so-called caramelization were reduced.

In our research on honey we have discovered new facts regarding the chemical reactions which are responsible for the darkening of honey when heated. Honeys of different types differ considerably in their tendency to darken in color and lose their characteristic flavor. Hence, a suitable selection of honeys will reduce this difficulty somewhat. There is also a possibility that this tendency of honey to caramelize when heated can be controlled to some extent and the darkening in color and change in flavor correspondingly reduced. It is also possible to produce certain kinds of honey confections by a cold process or with minimum heating, thereby eliminating this difficulty.

There are many other interesting possibilities for utilizing honey and derived products and these are being investigated as rapidly as possible. Unfortunately, the time allotted to me does not permit further discussion. It must be borne in mind that, in such uses, honey should not be utilized merely as a sweetening agent to replace sugar, for to do so is to ignore one of the principal assets which honey possesses over many other saccharine liquids, namely, flavor.

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