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NEW METHOD OF PROCESSING IMPROVES MARKETABILITY OF HONEY

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U. S. Department of Agriculture

A radio talk by Dr. C. A. Browne, Bureau of Chemistry and Soils, delivered in the Department of Agriculture period, National Broadcasting Company, Thursday, November 15, 1934, and broadcast by a network of 50 associate NBC radio stations.

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I believe that you producers of honey, regardless of whether you sell to packers or directly to retailers or to consumers, will be interested in the efforts which are being made to improve the market for honey. Therefore, I want to tell you something about the new method of processing honey that has been developed as a result of investigational work carried on by the Bureau of Chemistry and Soils of the U. S. Department of Agriculture.

In our chemical research on honey, we have found that the finely divided particles of suspended matter which are present in extracted honey are mainly responsible for some of the trouble producers and packers have in handling honey and preparing it in attractive form for market. For example, suspended matter and fine air bubbles are either the main cause of, or at least play a part in causing, turbidity, or cloudiness; formation of surface scum in packaged honey; retention of air bubbles; darkening; and granulation.

It is apparent from these examples that the small amount of suspended matter present in honey is of considerable importance in preparing extracted honey for market. The honey packer of course is interested in these things, since they determine to a considerable extent the choice of a process to be used in packing honey attractively. The honey producer is interested because processing honey so that it presents an attractive appearance makes a market for more pounds of his product.

Of still greater importance is the matter of handling extracted honey so as to preserve its delicate flavor and aroma. Honey is produced by bees from the nectar of various flowers. So it is an unexcelled sweet. No one can complain about the work of the bees, for they have produced an excellent product. Owing to the great care the bees take in gathering, curing and storing the honey, the very delicate flavor and aroma of the flowers from which the nectar is gathered are readily apparent in the finished honey. Our chief concern then is to handle honey after it is taken from the comb so that it will keep its full flavor, perhaps its most valuable characteristic.

Because honey is a very concentrated sweet, it tends to granulate soon after it is taken from the comb. This tendency is inherent in honey of most types. There are a few exceptions -- tupele, sage, and possibly some of the darker honey-dew types. It is rather unfortunate in one respect that most honey granulates so readily after extraction from the comb. In order to overcome this tendency partially, it is usually necessary to heat

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extracted honey before bottling. The main purpose of the heat treatment is to control granulation. Incidentally, it also tends to make air bubbles and particles of suspended matter rise to the surface. There they form a scum and can be removed in part. But heating causes only very imperfect separation of air and suspended matter. The honey still remains distinctly cloudy and is still subject to formation of surface scum when packed.

Then, too, heat treatment may injure flavor and color of extracted honey, especially if the heating is prolonged for an extended period of time. This loss of flavor in processing has led to rather extensive marketing of honey in granulated form in Canada and in certain European countries. When sold in this form, the honey is not subjected to any process of heat treatment.

In our studies we have found that heat treatment of honey generally drives off the more volatile flavoring constituents which give honey its fine flavor and aroma. Of course, the extent to which this occurs depends upon the temperature to which the honey is heated and the length of the heating period. I don't wish to give the impression that all extracted honey is spoiled by heating, but I do wish to emphasize the fact that there is always potential danger of injury from this source. The danger is greater when inexperienced operators carry out the processing, or when the equipment is inadequate or unsuited for the purpose.

The new method of processing that we have developed begins by intimately mixing a small proportion of inert filter aid with the honey. I might explain that the filter aid used for this purpose is an inert material of a very porous nature and is used solely for the purpose of assisting the filtration process. It has no effect whatever on the honey and is completely removed in the process. Then the honey is passed through a metallic coil immersed in water and kept at the desired temperature, usually between 140 and 160° Fahrenheit. As the honey passes through the coil, it quickly reaches the proper temperature and so is kept in the coil only a few minutes. From the coil the honey passes into an enclosed filter press which is maintained at approximately the same temperature as the coil, so as to prevent cooling of the honey as it enters the filter. The added filter aid is, of course, removed in the filter press. Upon passing from the filter press the honey is ready for bottling. The time required for the honey to pass through the whole process is about 15 minutes. That is only a very small fraction of the time required by the methods in present use.

The particles of suspended matter and small air bubbles that are largely responsible for the cloudy appearance of some extracted honey are removed during filtration. Therefore, the honey is quite clear and sparkling. Also honey processed by our method has no tendency to form surface scum layers later on, since the air and suspended particles responsible for this occurrence are removed during filtration. Owing to the very short period of exposure to processing temperature, the processed honey keeps all its delicate flavor and aroma. No difference in flavor can be detected between the processed and the original honey. This is of particular importance. Long exposure to processing temperatures results in honey of nondescript flavor, and of course it is hard to sell such a product. I believe it is safe to say that the use of improper methods of processing honey which led to loss of flavor and resulting impairment of quality is an important factor in limiting the quantity of honey consumed. Therefore, the

market for honey should be extended considerably by use of a method of processing that insures full retention of the original flavor.

Honey which has been processed by the new method retains its liquid state quite satisfactorily. You remember that the honey is heated only for a very short time and it is heated very uniformly. Therefore, no part of it is underheated or overheated, as is likely to occur when large quantities are heated in tanks or similar containers. This treatment makes it less likely that small sugar crystals will be left undissolved in the honey, to serve later on as "nuclei" to start crystallization. Any crystals not dissolved by heat treatment are held back by the filter during the filtration operation.

We have determined the chemical composition of the very small quantity of suspended matter removed from the honey by this process. Judging from its composition, there is no evidence to show that taking it out removes anything of value from the honey, nutritionally or otherwise. In fact, it appears that in large measure this suspended material enters the honey during extraction or later, so its presence in honey is incidental. The mineral constituents, biological agents such as the enzymes, and all other normal constituents of the honey are retained intact.

As an illustration, we have found that the enzyme diastase which is present in virtually all honey is unaffected by this method of processing. Now this particular substance, whose normal function is to digest starch, is very sensitive to heating or other severe treatment. It is, therefore, easily destroyed. German food authorities, as well as food authorities in certain other European countries, in testing honey frequently determine the amount of diastase present, since it serves as a sensitive test to detect overheating or other drastic treatment. This method does not affect these sensitive agents which are frequently destroyed by present methods of processing.

Time does not permit me to give more details or to discuss more fully the various features of this process. Those listeners who may be interested in a more complete description and discussion of the advantages of this new method of processing extracted honey will find an article on this subject in the November or December issues of the various periodicals devoted to beekeeping.

In conclusion, I may say that we feel that this method of processing should serve as a stimulus to sales and consumption of honey, for it keeps the original flavor and aroma intact, does not take out or destroy any of the natural constituents, and in addition greatly improves the appearance of the bottled product.

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