

## "Floc" in White Sugar

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It has been noted for a number of years that certain sugars, both cane and beet, produce, in low pH soft drinks, a floc-like material, white in color, which in the case of beet sugar settles on the shoulders of the bottle of beverage. The objection to this material, even though tasteless, is that the consumer thinks it is foreign matter and, therefore, objects to it. The composition of the floc is not known exactly. It is believed, however, that it is of colloidal nature whose isoelectric point is near the pH of the beverage. Investigations are presently being conducted by several agencies to determine the composition of the floc.

The 1951 campaign is the first year that Holly Sugar Corporation has made use of the floc test as a routine test. The procedure used follows very closely that proposed by Dr. Cole of the Seven-Up Company. A 500-ml. Florence flask is used as a container. Fifty grams of sugar are dissolved in distilled water and made to volume *in* the flask. One ml  $\pm$  of hydrochloric acid diluted one to sixteen is added. (The pH of the sugar solution is to be 2.70). The flask is heated to 100° C. for one hour and examination is made after twenty-four hours standing. Results are reported as follows:

0 = No definite general floc.

+ = Barely visible, very fine general floc.

++ = Very definite but fine pin point type floc.

+++ = Larger (1/64 inch) but pin point (not loose) floc.

++++ = Large loose snowflake-type floc with clearing of solution.

In all sugars tested a haziness became apparent. This, however, is not considered as floc. A great deal of confusion existed at first on grading the floc, in that the different laboratories could not check results. All floc tests for the entire company are now run at one laboratory. The light used for grading was a Quebec Colony Counter, which provided very strong illumination laterally through the flask.

During the spring campaigns the occurrence of floc in the sugar correlated very nicely with pan purity. Sugar from pans of 91.4 purity were floc positive, while sugar from 92.5 purity pans showed no floc. In fact, predictions were made on which strikes would be floc positive and, in almost all cases, these predictions proved to be correct after floc had been determined. During the fall campaign the floc test was made on all bottlers' sugar strikes. Floc rejection was very slight, since all the sugars produced as bottlers' sugars were treated with a .3 pound decolorizing carbon per bag of sugar, and the white pan purity was maintained at as high a point as possible.

At the present time under the auspices of Sugar Information, Inc., representatives of both the bottling industry and the sugar manufacturers are setting up overall standards for bottlers' sugar". Although the standards at the present writing have not yet been formulated, it is our understanding that they will include ash, color and floc. We feel that, in order to meet any very stringent standards on ash and color, which probably can only be accomplished by high pan purity, use of carbon and superior machine work, the floc problem will be automatically taken care of and will cause sugar manufacturers very little trouble.

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