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UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH ADMINISTRATION  
Bureau of Agricultural and Industrial Chemistry  
Eastern Regional Research Laboratory

To: P. A. Wells, Director

From: J. W. White, Jr., In Charge, Honey Section, Biochemical Division

Subject: Report of trip to New York City, November 1, 1950, to discuss possible RMA contract on evaluation of dried honey-skim milk in prepared baking mixes with Mr. Zenas Block, Research Director for Doughnut Corporation of America.

Conclusion

It is recommended that the Doughnut Corporation of America be given serious consideration as the recipient of this contract; they are very well equipped from the technical viewpoint since they are engaged in exactly this process for their own benefit - that of evaluation of ingredients for prepared dry mixes and of developing new mixes from laboratory scale to production. They have research laboratories, pilot plant and full-scale equipment for this purpose.

The laboratories of the Doughnut Corporation of America (hereafter DCA) at 42 Stone Street, New York, were inspected and discussions held with Mr. Zenas Block, Director of Research and Development. The laboratories are on five floors of a six-floor building and were occupied in the summer of 1949. They contain complete facilities for testing, evaluating, and developing formulae for prepared dry mixes from laboratory to production scale.

DCA has plants at Trenton, Ontario; Noblesville, Indiana; Oakland, California; and Ellicott City, Maryland as well as flour mill and several egg-drying plants. They produce bulk prepared dry mixes for their own and commercial and retail bakers' use. No retail packaged mixes are produced. They are reported to make 138 prepared mixes and 68 doughnut mixes, and have been reported to produce ingredients for about 60 percent of the commercial doughnuts made in this country.

DCA is highly interested in the possibilities of incorporating honey in various products, primarily for the purpose of improving shelf life of the baked product when unpackaged or in non-moisture proof packages. They have been trying to incorporate invert sirup in dry mixes and doughs for this purpose without marked success. The proposed phases of investigation in the contract work were outlined and commented on by Mr. Block. Most important, of course, is the question of whether any advantage would accrue from use of dry honey-skim milk. If so, the main problem is one of materials handling in preparation of the mix. There are problems that may not appear

on pilot plant scale but would on production scale, and vice versa. They would, therefore, prefer to evaluate finally on production scale. Mr. Block thought the main problem would be getting it into the mix, rather than the shelf life or packaging of the mix. As far as shelf life is concerned, the problem is how much dry honey-skim milk could be used without shortening the present required 90-120 day life of the bulk product. Modifications in mix formula could be made but no change in packaging (5 ply valve bag, asphalt interliner).

The milk solids in the honey-milk product would limit the amount of honey that could be used in a formula. However, Mr. Block estimated at 8 percent honey (wet basis) on a formula, 10 million pounds of honey would be required annually. In response to questions on types of their mixes in which he believed dry honey-skim milk might be valuable, he listed:

1. Hand cut cake doughnut mixes
2. Machine cut cake doughnut mixes
3. Hand cut yeast raised doughnut mixes
4. Machine cut yeast raised doughnut mixes
5. Sweet dough mixes
6. Pancake and waffle mixes
7. Cake mixes: white, yellow, devils food, spice, ginger
8. Muffin mixes: corn and whole wheat
9. Macaroon mix
10. Drop cookie mix
11. Glaze mix

In response to questions as to why not substitute invert sugar for honey, I pointed out the flavor advantage and advertising value.

Mr. Block stated that they would consider it a privilege to have a contract from the Department of Agriculture. It was pointed out that public announcement of the product is impending, and having a contract would not, of course, mean exclusive use of the product during that time.

The question of the quantity of dry honey-skim milk to be available for work was raised. Since production scale evaluation would be almost required, he stated that at a 10 percent level in a mix on one mixing battery for one day would require 5000 pounds of material. The upper limit of 1000 pounds available from BDI was mentioned and it developed that DCA has egg drying facilities (Swenson) which conceivably could be used for manufacturing sufficient dry honey-skim milk.

Mr. Block mentioned that they had undertaken research on evaluation of soy flour for the Northern Regional Laboratory (probably under cooperative agreement).

It was estimated with dry skim milk at 15 cents (their cost) and honey solids at 14 cents, an increased cost at the 10 percent level of addition would be about 0.4 cents per pound of mix. This he did not regard as excessive if superior keeping qualities were obtained.

Mr. Block mentioned the product "Beacream" of Beatrice Foods, a stabilized dried emulsion of 72 percent shortening and 28 percent milk solids. This

eliminates the necessity for grease-resistant packages in mixes. He inquired if any work had been done on drying honey with other materials, such as flour or gelatinized starch; this would eliminate addition of excessive milk in obtaining a satisfactory honey level.

After consulting with DCA officials, Mr. Block will submit a proposal together with approximate cost estimates. This will be in several phases with estimates for each. It was requested that he include time and personnel data also.

Later he stated that their company uses about one million pounds of fat annually. They had used hydrogenated lard but are now investigating ordinary lard. They have not had any difficulties to date but rather expect to because of the wide variability of lard on the market. He also stated that they were investigating beef tallow for this purpose.

Also, other possible premixed honey products for the baker were suggested. Mr. Block stated that a dried honey-egg yolk product should find acceptance and suggested about a 20-25 percent honey level; he also suggested frozen honey-sweetened egg yolk, at 10 percent honey level.

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