THE EFFECTS OF LACTOSE AND GALACTOSE ON BEES CAGED WITH COMB PIECES[1]

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ONE OF the major objectives of the Bee Breeding and Stock Center Laboratory is to develop accurate and repeatable laboratory tests to replace or supplement field tests. In developing laboratory tests, it is desirable to know what factors affect the performance of the bees. The experiment discussed here was designed to test the effect of adding lactose (milk sugar) or galactose to sucrose (table sugar) syrup on the rate of removal of the syrup and on the longevity of bees caged with comb pieces available for syrup storage. The results are summarized here; the details and a more extensive discussion are published elsewhere (Sylvester 1978).

Groups of 30 newly emerged worker bees less than 24 hours old were obtained from 8 colonies and placed in small cages that contained comb pieces. Each cage was fitted with a water vial and a syrup vial, and the cages were held in the dark at 95° F and 50% relative humidity. Sucrose syrup (50% wt/wt) was used as the control solution and as the base for the 4 test solutions. Lactose or galactose (4 and 10% wt/vol) was added to the sucrose solution.

The 10% concentrations of lactose and galactose significantly reduced the removal of sugar syrup by the bees. The 4% concentrations did not.

I conclude that reduced removal occurs because syrup containing the 10% concentrations of lactose or glucose is less acceptable to bees. However, this reduced acceptability is only manifested when the bees are able to store removed syrup, since Barker and Lehner (1976) found that consumption was not affected by the dosage of lactose. Thus more information can be obtained about the acceptability of sugar solutions to bees when hoarding is made a part of an experiment than when it is not. Since the bees in any given cage were not allowed a choice, this experiment demonstrates nothing about preference.

Lactose and galactose at both concentrations were toxic to the bees, which confirms the work of Barker and Lehner (1976).

Bees may therefore be able to differentiate between at least some toxic and nontoxic sugars in nature. Since bees collect amounts of nectar that are beyond their immediate needs and store the excess as honey, they may avoid nectars containing detectable amounts of toxic sugars. However, if their immediate needs are not satisfied, they may collect the toxic sugars.

[1] In cooperation with Louisiana Agricultural Experiment Station.

REFERENCES

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