Bakula, Marion. Saint Louis University, Missouri. Food preference testing in D. melanogaster adults.

A simple, economical apparatus has been designed to test the preferences of adult Drosophila when presented with two different nutrient sources (Figure I). Etherized flies are placed in the center chamber (A) and allowed to move freely for 24 hours. At the end of 24 hours the test tubes (C) containing the foods being tested are removed and the flies in each tube counted. 24 hours has been found to be the minimum time necessary for approximately 100 flies to distribute themselves nonrandomly between an agar-Brewer's yeast medium containing either 0.8% sucrose or 0.8% lactose. The two sugars were selected in order to test the reliability of the apparatus since the threshold concentration of sucrose is low while that of lactose is relatively high in Phormia (1) and Calliphora (2). In addition, although Drosophila larvae develop equally well on 0.8% sucrose or lactose (3), survival of adult flies is good on sucrose and poor on lactose (4). It was therefore expected that Drosophila adults would prefer sucrose both on the basis of threshold levels in other Dipterans and on the apparently poor nutritional utilization of lactose. (Preference of Pseudosarcophaga larvae for nutritionally optimal diets has recently been demonstrated by House (5).)

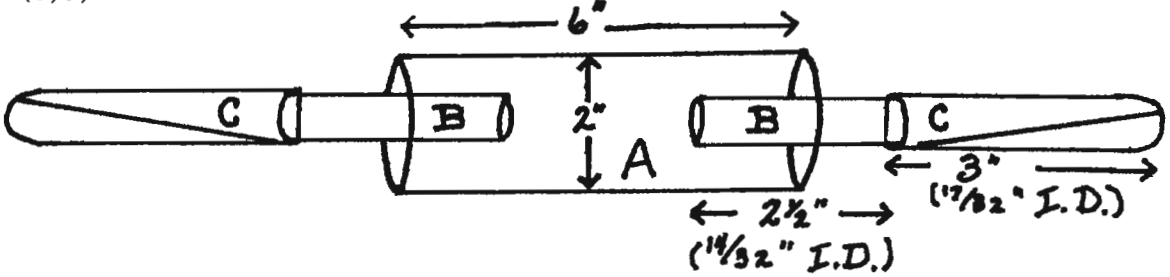


Figure I. Taste testing apparatus. Etherized flies are placed in the center chamber (A), and after awakening are free to move through the connecting tubes (B) to the food tubes (C). Sterile nonabsorbent cotton holds the connecting tubes in place while permitting ventilation of the apparatus. The food tubes slide over the connecting tubes and may be easily removed for fly counting, and may be changed without interrupting the experiment.

The movements of the flies within the testing chamber was tested by removing the food tubes (C) at intervals, counting the number of flies in each tube and marking the wings of flies on lactose medium with black ink. The results over a 24 hr. period are shown in Table I. The results would suggest that nearly all of the flies move back and forth before making a final choice, often remaining stationary in the center chamber, and it is only towards the end of the test period that a significant difference in distribution occurs. In one experiment the flies were kept in the apparatus for 48 hours without significant change in distribution from 24 hours. The flies were not starved before the experiments and it is probable that hunger prompts the final selection of an optimal carbohydrate. Results obtained using less than 75 flies are unsatisfactory, no significant distribution being obtained in about 50% of the experiments. When more than 125 flies are employed the food tubes become too crowded, and many flies are pushed into the food and immobilized, the final distribution however, being equivalent to that obtained with 75-100 flies.

Table I. Random movement of Drosophila melanogaster adults.

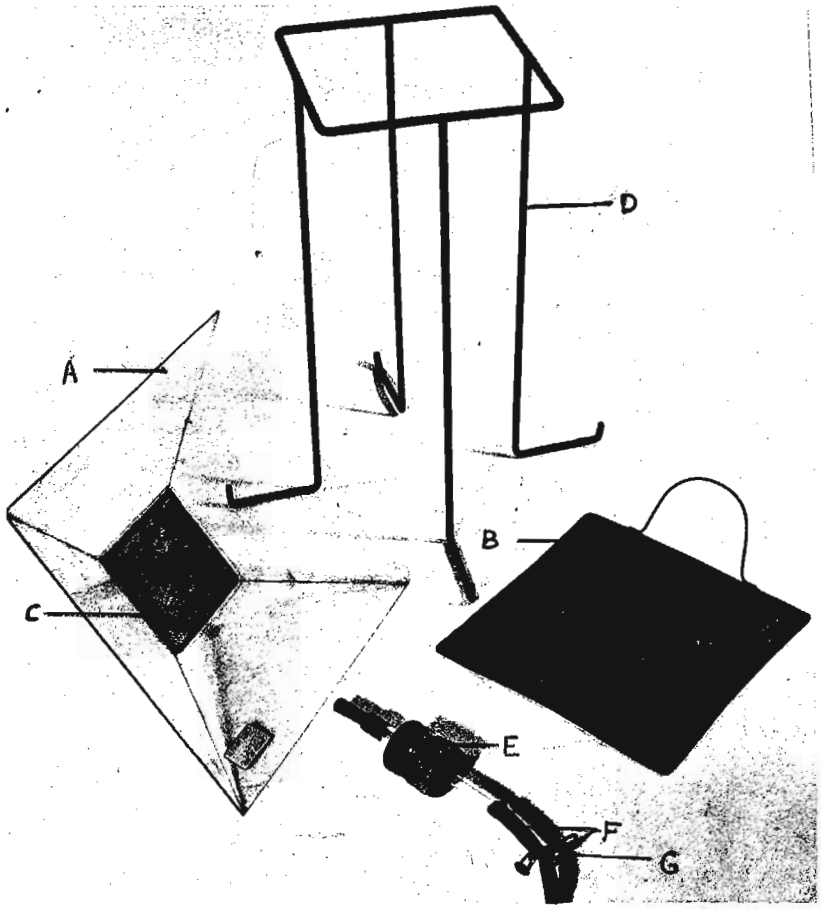
No. of hours after start of test (0 hrs.)	No. of flies on Lactose		No. of flies on Sucrose	
	Total No.	No. previously on Lactose	Total No.	No. previously on Lactose
1	5	-	3	-
2	17	2	6	0
4	14	3	4	0
6	35	9	8	0
18	18	4	12	0
24*	29	16	66	38

* chi^2 calculated on an expected 1:1 distribution assuming no food preferences = 13.5 ($P<0.5\%$)

References. (1) Evans, D.R. 1961. Science 133: 327-328. (2) Minnich, D.E. 1929. Z. vergl. Physiol. 11: 1-55. (3) Sang, J.H. 1956. J. Exp. Biol. 33: 45-72. (4) Hasset, C.C. 1948. Biol. Bull. 95: 114-123. (5) House, H.L. 1967. Canad. Entomol. 99: 1130-1321.
(This investigation was supported by PHS Training Grant No. GM00989 while the author was a postdoctoral trainee in the Department of Zoology, University of Michigan.)

Rey, B.M. and W.F. Kirschbaum. Atomic Energy Commission, Buenos Aires, Argentina. A simplified "ovitron".

Since it was not possible for us to obtain an "ovitron"of the type described by Yoon and Fox (Nature, 206(4987): 910-913, 1965), we designed a simpler, less expensive model which could be made in our shop. It consists of a large square shaped lucite funnel, held in a metal frame and provided with the appropriate screens and egg-collecting apparatus.



Although this apparatus is not as convenient to use as the Yoon and Fox model, it has given good results. In figure 1, A is a square lucite funnel, 29 X 29 cm., B is a movable bronze screen, and C is a fixed bronze screen. D is a metal support for the funnel. E is a glass recipient whose removable base holds a fine cloth filter which collects the eggs. Rubber tubes (E) connect the parts and the system is closed or opened by a Mohr clamp (G).

Cuperus, P., J.A. Beardmore and W. van Delden. Central Electronics Service and Genetics Institute, University of Groningen, The Netherlands. An improved circuit diagram for an electronic fly-counter.

An improved circuit diagram for the fly-counter described in DIS 44: 134 is available on request from the senior author.