A LIQUID REINFORCER FOR THE CAT¹

F. T. CRAWFORD AND D. R. KENSHALO

FLORIDA STATE UNIVERSITY

The cat has a popular reputation for independence which may be observed in the laboratory situation when adequate motivation is lacking. The widespread use of the cat in physiological studies makes a reliable reinforcement for operant conditioning purposes desirable. Examples of reinforcers that have been employed are milk (Smith and Smith, 1939; Halasz, 1961), liver, spleen, kidney, or hamburger (*e.g.*, Baden and Meikle, 1964), fish mixtures (Hodos, Laursen, and Nissen, 1963; Molliver, 1963), and tactile stimulation (Wenzel, 1959). A liquid reinforcement is convenient because it permits a ready means of regulating amount of reinforcement, the addition of drugs, *etc.* The impalatability of small portions of liver or other meat solids due to drying is also avoided. The most commonly used liquid, a milk solution, is often unsatisfactory since adult cats frequently display an active dislike for milk. Homogenized calf's liver appears to be an alternative reinforcer with greater universal appeal for cats. When mixed with an equal amount of water it becomes a semi-fluid such as the "fiskefars" of Hodos *et al.* (1963), but is one of much greater convenience. It can be delivered to the test chamber by a Foringer liquid feeder on which the dipper has been slightly modified. The new dipper is constructed of brass and is $\frac{3}{4}$ in. in diameter with a wedge-shaped depression $\frac{1}{8}$ in. deep cut out. The dipper is mounted on the shaft of the feeder so that during reinforcement it extends into a $\frac{13}{16}$ -in. hole in a brass plate installed in the floor of the test chamber.

Sample records for continuous reinforcement, FI, and FR schedules are shown in

Fig. 1. The records were taken from data of four cats. Each cat was given three to four days magazine training followed by eight to 10 days continuous reinforcement. Two cats were given FI training and two were given FR training. A specific FI or FR schedule was maintained for 12 days. Subjects received training for periods between 47 and 70 days. The cats were not reduced to 80-85% body weight but were run under conditions of 23-hr food deprivation. They were maintained solely upon a daily mixture of approximately 4 oz homogenized liver and 4 oz water per 5 kg body weight. A small amount of powdered vitamin supplement was added once a week. After each training session, the cat was allowed to eat the remainder of the mixture. The effectiveness of the reinforcer can be seen in schedules such as FR 13 (Fig. 1d) during which as many as 5379 responses and 408 reinforcements were obtained within a 1-hr test period. A minor inconvenience of the reinforcer should be noted. Cats placed on this diet will show a loose stool for a brief but temporary period.

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Fig. 1. Representative records of four cats. A. Khan: continuous reinforcement. B. Lucifer: FI .5. C. B.O.: FR 52. D. Wodin: FR 13.