Metabolism Cages

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In laboratories which only occasionally engage in metabolism experiments with rats, it may be difficult to obtain quickly a suitable arrangement of cages. The unit to be described is efficient, easily constructed, and requires few items not usually stocked. The complete unit has gradually evolved over a period of years, and therefore proper credit cannot be given to individuals who have contributed ideas.

The ordinary round cage used in nutrition experiments may be used (Fig. 1). This cage, as shown, has an efficient

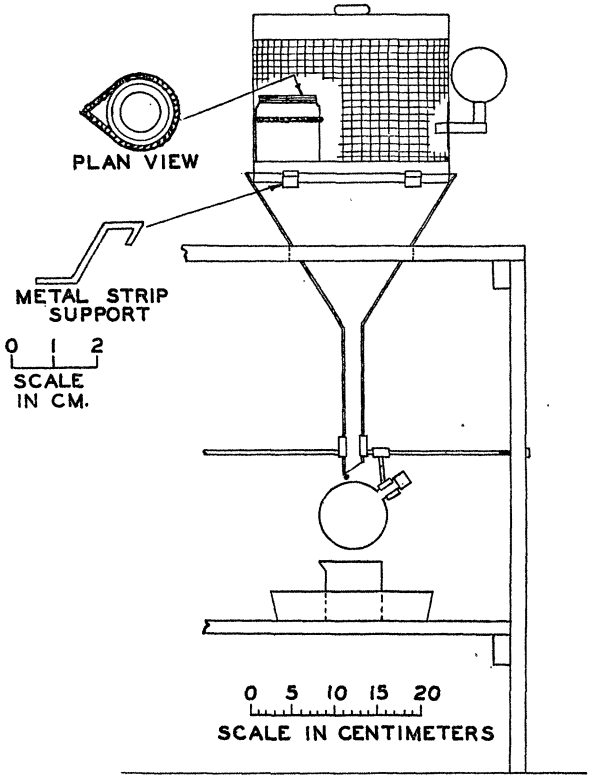

FIG. 1. Arrangement of metabolism cage and stand.

watering device, but the trough, unless cleaned often, tends to accumulate particles of food from the mouth of the rat. If this is objectionable, a drinking tube may be pushed between the wire meshes in the top of the cage, with an inverted bottle outside the cage. The food receptacle is held in place against the cage by a weak spring, which encircles the upper part of the jar. The spring also permits easy removal or replacement of the food jar. For most of our work we use half-pint Mason jars, with Kerr screw caps, a circular opening, 3.5–4 cm. in diameter, being cut through the center of each lid. Although the lids may be dispensed with, their use often helps prevent the animals from throwing out and wasting food.

The cage rests upon four strips of stainless steel or other metal (each about 12 mm. wide), bent on one end to fit over the edge of a funnel, 250 mm. in diameter, and bent up on the other end to form a firm ledge for the cage bottom. These strips may be lifted off for cleaning. The glass funnel fits into a hole in the wooden stand and is gripped by a burette clamp near the lower end of the stem. A 200-ml., round-bottom, short-ring flask (balloon flask) is held by a burette clamp beneath the stem of the funnel. Feces drop between the meshes of the cage and, falling through the stem of the funnel, are deflected by the rounded surface of the flask into a pan or large evaporating dish. Urine passes down the funnel onto the surface of the flask and follows the curve of the flask to the lowest portion, whence it drips into a beaker, or Erlenmeyer flask, placed directly beneath the balloon flask.

The wooden stand, 109 x 63 x 30.5 cm., has three openings, 15.2 cm. in diameter, to support the funnels, and a shelf 19 cm. from the floor to support the receptacles for the urine and feces. A metal rod, 0.9 cm. in diameter and 38 cm. from the floor, runs the entire length of the stand. To this rod are fastened the various burette clamps.

The stand described is designed for three cages, which provides a unit easily moved by one person and conveniently stored.

Sharp Interfacial Precipitin Reactions in Capillary Pipettes[1]

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The capillary pipette precipitin technique, which was developed for grouping and typing hemolytic streptococci (*2*), has proven adaptable to other investigations in which precipitin tests are required. The obvious advantages lie in the great saving of both precipitating serum and bacterial extracts or other antigenic substances. With moderately to strongly reacting reagents, easily detectable precipitates are formed in capillary pipettes having an external diameter of 1.0 ± 0.02 mm., in which the two reagents readily mix. With weaker precipitating sera, or with sera in which prozoning is liable to occur, particularly with those which react with the group-specific carbohydrates of streptococci, it is often necessary to employ larger capillary pipettes (*i.e.* 1.5 ± 0.02 mm.). With such pipettes, however, it is frequently difficult to obtain as clear-cut reactions as occur in small test tubes in which the antigen is carefully layered over the serum so that a sharp ring of precipitate forms at the interface between the two reagents (*1*). It has long been recognized that ring, or interface precipitin reactions are at times convenient in developing satisfactory precipitin tests. A difficulty encountered in trying to obtain sharp layering in capillary pipettes is the tendency for the two reagents to mix—a tendency roughly proportional to the movement of the interface. This move-

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