BRIEF COMMUNICATION

**AN IMPROVED ARTIFICIAL VAGINA
FOR COLLECTING RABBIT SEMEN**

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Summary. An inexpensive artificial vagina has been developed which can be cleaned and sterilized without disassembly, thereby simplifying semen collections in rabbits. Quantitative semen studies are facilitated because sperm losses in collection can be virtually eliminated.

Numerous studies with rabbit semen were stimulated by the introduction of an artificial vagina (AV) for collecting rabbit semen (Macirone & Walton, 1938). While this device and modifications of it (Walton, 1958; Gregoire, Bratton & Foote, 1958) have worked satisfactorily, considerable time was required to assemble, disassemble and clean the equipment when a large number of semen samples were collected. Thin-walled rubber liners were easily torn by frequent assembly, and thicker liners were less effective in stimulating bucks to ejaculate. Furthermore, it was difficult to regulate the length of the AV to accommodate bucks of varying sizes. Often this resulted in sperm cells being ejaculated on the liner.

In a series of eighteen ejaculates collected with an AV 9 cm long the number of sperm flushed from the surface of the liner was equivalent to 10 % of the cells counted in the collection tube. This loss was reduced to 3·4 % when seventy-two ejaculates were collected with AV's about 6 cm long. Other minor difficulties included occasional loosening of the clamp which retained the water pressure during collection, or trapping of the whole ejaculate within the liner. In the latter instance sperm motility was found to be impaired when the water temperature was elevated to 55° C to stimulate an occasional buck with little libido.

A simple, inexpensive artificial vagina shown in Text-fig. 1 has been designed for the rabbit which overcomes most of the difficulties listed here. This artificial vagina is constructed of two pieces of reinforced rubber casing each 3·5 cm long. The larger casing has an inside diameter of 2·5 cm and the smaller casing an inside diameter of 1·8 cm, and an outside diameter of 2·7 cm. Thus, the smaller casing fits tightly inside the larger casing. A piece of thin surgical drainage tubing about 1·5 to 2 cm in diameter and cut about 11 cm long serves as a liner. Special tapered liners could be made but are unnecessary. The collection tube is graduated for ease in measuring semen volume and is of proper diameter to fit the AV snugly. The cut end of a 15 ml graduated centrifuge tube is of convenient size for this purpose, but any tube of similar diameter can be used. In Text-fig. 1

space between the collection tube and the casing has been left to show the parts more clearly.

When the AV is first assembled it is desirable to cement the two portions of the reinforced rubber casing together to make a permanent seal. The liner is inserted through this tubing, stretched over the larger end and secured with a rubber band. This larger end is placed face down upon a table top with the liner protruding upward from the smaller end. The space between the casing and liner is nearly filled with diethylene glycol. This substance does not react with the liner and little is lost by evaporation through the liner. The free end of the liner is stretched over the smaller rubber casing and secured with a rubber band. To insert the collection tube a small amount of glycerol is spread over the outside lip of the tube allowing it to be inserted to any depth desired. By

TEXT-FIG. 1. Diagram of the artificial vagina for rabbits.

this means pressure at the opposite end of the AV is regulated and the overall length of the collection device controlled. A small amount of glycerol applied to the open end of the AV provides sufficient lubrication to cause ejaculation.

A convenient way to warm artificial vaginas to a uniform, effective and safe temperature is to place them in an incubator at 50° C about 30 min before semen collections are to be made. Semen is collected in the usual manner, and normally it appears to be ejaculated directly into the collection tube. The tube can be removed for processing the semen or, if the study involves quantitative analysis of sperm output, any sperm adhering to the liner can be flushed directly into the collection tube without disassembly by directing a stream of saline over the liner from a conventional plastic wash bottle. A similar procedure has been reported previously for the recovery of bull sperm (Foote & Heath, 1963).

The AV is cleaned and sterilized after each semen collection, without dis-

assembly, by placing it in a warm detergent solution, scrubbing it with a test tube brush and thoroughly rinsing it with water and alcohol. The AV can be re-used within a few minutes by returning it to the incubator for drying.

Between collection periods the AV is stored at room temperature. About once a month a new liner is inserted and the diethylene glycol replaced. Replacement of the diethylene glycol at more frequent intervals usually is not necessary, although it can be injected by needle and syringe through the rubber casing.

With this artificial vagina practically all of the attempted collections with any trained buck can be completed within 1 min. One person can collect twenty semen samples per hour and clean each AV after use (semen evaluation excluded) provided enough AV's are available for additional collections while used washed ones are drying. The simplicity, efficiency and flexibility of the AV described would seem to offer advantages over types previously available.

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