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A METHOD FOR OBTAINING AND REARING NEONATAL COTTONTAIL RABBITS

David R. Gates[1] and Vernon C. Pederson
Department of Biological Sciences
Western Illinois University
Macomb, Illinois 61455

ABSTRACT

A method is described for the obtaining and rearing of neonatal cottontail rabbits under laboratory conditions. Known-age neonatal rabbits were obtained by capturing wild, pregnant rabbits during the early part of the breeding season and holding them in an environmentally controlled animal room until parturition occurred. Forced-maternal-feeding utilizing oxytocin was used for rearing the rabbits during the pre-weaning period. A specific laboratory care strategy for the weaning and post-weaning periods is also described. Growth rates obtained with this procedure compared favorably with those of known-age wild litters. This technique made possible the study of early physiological development in the cottontail and, with modifications, may be useful for bringing other wild mammals into captivity.

INTRODUCTION

This paper describes a procedure for obtaining and rearing known-age, neonatal cottontail rabbits *(Sylvilagus floridanus)* under laboratory conditions. The method is an outgrowth of a study concerned with the development of thermoregulation in this species (Gates, 1974).

MATERIALS AND METHODS

Method of Obtaining Neonates

Newborn cottontails were obtained by holding pregnant rabbits in the laboratory for the latter part of the gestation period. The pregnant females were obtained by live-trapping during the early spring, and were then housed in an animal room,

[1]Present address: U.S. Army Corps of Engineers (PD-A), 210 N. Tucker Blvd., St. Louis, MO. 63101.

which provided a relatively quiet environment with constant temperature (28 C), and a 14 hr photoperiod (0600-2000 light). Each animal was placed in a stainless steel rabbit cage, with a cardboard nest box occupying the back half of the cage. Entry into the box was via a large frontal opening. The animals were given water and commercial rabbit ration *ad libitum*. The time of parturition was determined by inspecting the cages for litters twice daily, morning and evening.

Method of Feeding Young During Pre-weaning Period

A procedure referred to as forced-maternal-feeding was used during the pre-weaning period (days 0-7). Just prior to each feeding session, does were administered two IU of oxytocin to ensure that milk release would not be stress inhibited. The litter and doe were then placed in a shallow burlap-lined box with the doe physically held down on its side. Litters would immediately begin to suckle and within a short time would gorge themselves with milk. The young were fed twice daily, morning and evening, and were always permitted to suckle until satiated. After feeding, the litters were kept in small boxes (16 × 12 × 10 cm) lined with cloth and filled with fur pulled from the carcass of an adult. These boxes were placed in cages separate from the does.

Method of Feeding Young During Weaning Period

The basic approach to feeding during the weaning period (days 8-16) was that described by Lord (1959); that is, constant availability of greens with eventual termination of milk intake. The choice of plants was in accordance with the findings of Bailey and Siglin (1966), and Bailey (1969). From days 8-12 the plants were uprooted with soil to prevent rapid wilting, since prior to this time the young were only occasionally interested in eating plants and apparently only if the vegetation was fresh. From day 13 onward, the plants were merely cut at their bases. To avoid the potential for enteritis during this transitional feeding period, litter mates were treated with one drop (3 mg) of *Panmycin* tetracycline oral antibiotic (Upjohn Co., Kalamazoo, Mich.) at each feeding. Milk intake was terminated on day 16.

On occasion, young were observed feeding on the mother's fecal pellets. These pellets were made available to the young for whatever value they might have had. During the weaning period the litters were still caged separate from the doe, and were placed in cardboard boxes equipped with a rough non-slip bottom surface.

Method of Feeding Young During Post-weaning Period

The approach to feeding during the post-weaning period (days 17 and beyond) was the same as that described by Lord (1959); that is, constant availability of commercial rabbit ration with eventual termination of greens.

RESULTS AND DISCUSSION

An important consideration in the thermoregulation study was that a normal growth pattern be exhibited in reared young. A guideline as to what is normal growth in nestling cottontails is provided by Beule and Studholme (1942). These authors developed a "working scale" for the age determination of rabbits aged 0-16 days. This scale was based on a series of tarsal length measurements taken from 19 wild

cottontail litters, and is shown in Fig. 1 for the first ten days of life. Against this normal curve is plotted the curve of best fit for the growth of forced-maternally-fed litters. In comparing the two curves, it was apparent that normal growth was obtained using the described method of rearing.

Nine force-maternally-reared young measured for tarsal length on day 15 showed a mean value of 49.7 mm. This value compared favorably with Beule and Studholmes' value of 49 mm. Two force-maternally-reared young were held in captivity until day 30. Using the age determination data of Petrides (1951), these rabbits were judged to be about equal in growth to that of wild rabbits at six weeks of age. Aside from the possibility of individual variation, a number of explanations can be given to account for the above normal growth. The thermal stress imposed by laboratory conditions is less severe than that encountered in the wild. The animals were caged and therefore less active. The young had access to unlimited amounts of food during the weaning and post-weaning periods. Such factors as these might allow a captive animal to divert more of its energy toward growth.

Initially, two other approaches to pre-weaning period feeding were explored: tube-feeding and maternal-feeding. However, both of these methods were found to have major disadvantages. Tube-feeding was time consuming, it relied on the use of an artificial milk formula, it occasionally resulted in fatal punctures of the GI tract, and it yielded a growth rate only three-fourths that known for wild rabbits. Maternal-feeding provided a natural diet and a normal growth pattern, but was found to be an unreliable method due to the uncertainties of maternal care. On the other hand, forced-maternal-feeding provided natural milk, normal growth and consistent feeding and production of young rabbits.

The procedure made possible the study of thermoregulation development in the eastern cottontail rabbit. It is speculated that with some modification this procedure may be of utility for bringing other mammalian species into the laboratory for study, particularly other Leporids. The concept of forced-maternal-feeding may also have significance for zoological garden species where maternal care is a problem.

SUMMARY

A method has been described for the obtaining and rearing of newborn cottontail rabbits. Pregnant females were captured by live-trapping and held in the laboratory for the latter part of the gestation period. To ensure consistent maternal care and milk release during the pre-weaning period, litters were force-maternally-fed twice daily using oxytocin. During the weaning period greens were kept constantly available with milk being eventually terminated. Oral anitbiotic was given to avoid the potential for enteritis. Post-weaning period feeding consisted of constant availability of commercial rabbit ration with the eventual termination of greens. The growth pattern of rabbits reared by this method compared favorably with data available for wild rabbits. This approach was successful in bringing the eastern cottontail rabbit into the laboratory for ontogenetical study, and it is conjectured that with some modification, this strategy may have implications for other mammalian species.

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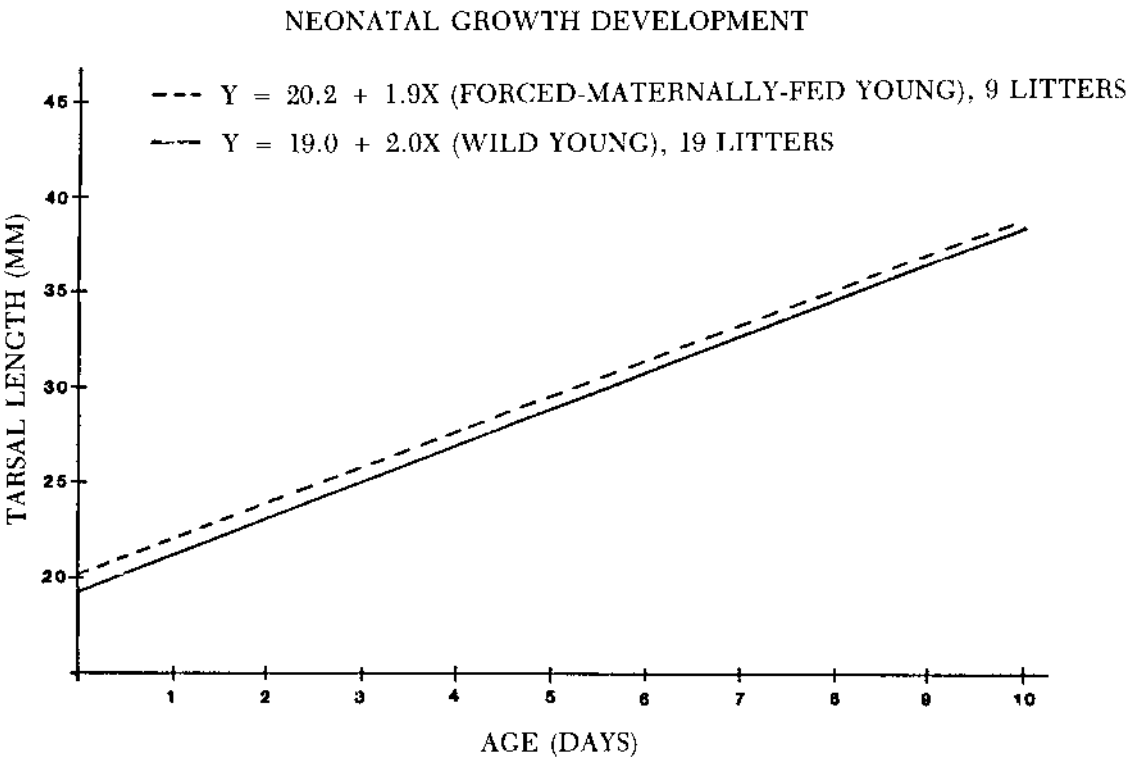

Figure: 1