ABSTRACTS

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Spermatogenic function in cats

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INTRODUCTION AND AIM: Three methods of feline semen collection have been reported [1-3], but the artificial vagina method (AVM) may be the best for testing semen qualities. However, there are problems with AVM, such as the necessity of training males and having a female cat in estrus. Because of these problems, there have only been a few studies in which feline semen was collected employing AVM and the qualities were observed, and there have only been 2 studies in which experiments were performed in consideration that cats consecutively copulate [1,4]. Tanaka et al. [1] observed the influence of intervals between ejaculations on the semen qualities in cats, and Oba et al. [4] observed changes in the semen qualities when cats ejaculated 4 consecutive times. However, sperm productivity in cats has not been clarified. Thus, we planned to clarify the daily sperm productivity by preparing a sperm-starvated state through frequent semen collection employing AVM and investigating the number of days required to recover the number of sperms before starvation test.

MATERIALS AND METHODS: Five male mix cats at 4.5-5.2 years of age (mean: 4.8±0.1 (SE)) and weighing 3.9-5.1 kg (mean: 4.6±0.2 kg) with copulation ability and fertility were used. For female cats, those in estrus were used at an appropriate time. Semen was collected following the method reported by Tanaka et al. [1], and the semen volume and number of sperms were measured. In frequent semen collection, reduction of the number of sperms to below 5 x 106 was judged as being starvated, and the qualities of semen collected by this timing were combined. In the experiment, the starvated state was prepared by frequent semen collection at 2, 4, 6, 8, or 10 days after the first starvation, and the semen volume and number of sperms were recorded. After the starvation experiment performed at 2-10 days after the starvation test, a 14-day resting period (control) was set, in which sufficient sperm may have been stored in the epididymis.

RESULTS: The mean number of ejaculations to reach starvation was 5.5±0.3 in the control group, and those in the groups with a resting interval of 2-10 days were 3.8±0.4, 4.6±0.4, 4.8±0.7, 5.4±0.4, and 4.6±0.4, respectively, showing that the volume decreased as the interval shortened, but no significant difference was noted among the groups. The mean total number of sperms was 20.0±1.2 x 107 (19.2-21.8 x 107) in the control group, 17.9±2.2 x 107 in the 10-day interval group, similar to this in the 8- and 6-day interval groups, and 211.2±27.8 and 197.1±15.3 µl in the 4- and 2-day interval groups, respectively, showing that the volume decreased as the interval shortened, but no significant difference was noted among the groups. The mean total number of sperms in the 2-day interval group was significantly different from those in the 6-day or longer interval groups (p<0.01). Significant differences were also noted between the 4- and 8- day interval groups (p<0.05) and between the 2- and 4-day interval groups (p<0.01). No significant difference from the control group was noted in the 6-, 8-, and 10-day interval groups, showing that 6 days were necessary to recover the number of sperms before starvation test. Thus, the total number of sperms was divided by the number of days in the interval as sperm productivity per day in the 2- to 6-day interval groups. The mean sperm productivity per day was 3.0 x 107 (2.9-3.2 x 107).

DISCUSSION AND CONCLUSION: Feline spermatogenic function was investigated by frequent semen collection using AVM. Since cats consecutively copulate, frequent semen collection caused no problem. In addition, the accessory reproductive glands are highly functional and maintain the semen volume even after a short resting interval. Thus, there was no problem in counting sperms, although the number of sperms decreased. The findings were stable due to these characteristics, although the number of experimental cats was only 5.

It was clarified that cats after a 6-day or longer interval ejaculated a number of sperms similar to that ejaculated in the control group after a 14-day resting period, and the feline sperm productivity per day was 3.0 x 107 sperms.
