

PRELIMINARY STUDY ON THE EFFECT OF EJACULATION FREQUENCY ON SOME CHARACTERISTICS OF RABBIT SEMEN

BODNÁR K.¹, TÖRÖK I.², HEJEL P.¹, BODNÁR E.¹

¹ University of Agricultural Sciences, Debrecen, College of Agriculture, H-6801 Hódmezővásárhely, P.O.B. 79. Hungary
² Erzsébet Hospital, H-6801 Hódmezővásárhely, Dr. Imre József u. 2., Hungary

Abstract - The effect of frequent ejaculations was studied on the volume, the motility, the concentration and the vitality of the rabbit semen. 12 Pannon White bucks were used in two groups (A = 6, B = 6). In the group A the semen was collected once in every three days, and in the group B once daily. The study period went on until the day when the males in group B weren't ready to copulate. That occurred after 27 days. All the traits were gradually decreased in group B by the time. Significant difference was found between group A and the frequently ejaculated group B in the volume (0.79 and 0.54 ml), concentration (286.14×10^6 and 231.66×10^6 spermatozoa/ml) and percent of living spermatozoa (78.6 and 73.2 %) of semen, but not in the motility (4.00 and 3.19).

INTRODUCTION

The optimal use of bucks is controversial in the opinion of rabbit producers and different authors, but all of them agree that the frequency of serving (or ejaculation) has a great effect on the quality of the semen and the reproductive performance of the male, and also determines the buck-doe rate in the herd.

Data about this topic are varying in a wide range.

A mature vigorous buck may even be used every day for a few days in an emergency. However, in normal use it should not be used for more than two or three services a week (TEMPLETON, 1968), because the very frequent service reduces the volume and the concentration of the semen (TACKE *et al.*, 1995.). Maximum sperm counts occurred on the average every 3.16 days (WEISBROTH *et al.*, 1974).

OSHIO *et al.* (1986) have found that daily service for 5 days decreased the volume, the concentration and motility day-by-day with number of ejaculations. However, the work of SCHLOLAUT (1985) suggests that the very frequent ejaculations reduce the volume only slightly, but do diminish sperm concentration.

In another opinion the bucks produce the best quality of semen by once a day mating (VETÉSI, 1990).

The sperm production is highly variable between bucks as well as between successive ejaculates from the same male, but most of the ejaculates in natural service have given a satisfactory result, except if it is totally devoid of sperm (aspermic ejaculate) (CHEEKE *et al.*, 1982).

The aim of this study was to study the effect of frequent ejaculation on the volume, the motility, the concentration and the vitality of the rabbit semen.

MATERIAL AND METHODS

12 young, but sexually matured (8 months old) Pannon White bucks were divided into two groups (A=6, B = 6). The average body weight of the males was 3803.8 ± 81.8 g.

In the group A the semen was collected once in every three days, and in the group B once daily. The bucks were kept in single cages, and provided with a commercial food and water *ad libitum*. The experiment was carried out in summer, and the average room temperature was $23,1 \pm 0,8$ °C during this period.

The semen was collected with artificial vagina, and a matured doe was used for stimulating the males. The ejaculates were stored in waterbath of 37°C until the evaluation, which was realised as soon as possible after collection.

The following traits were evaluated:

1. Quantity of semen
The volume of semen in ml.
2. Motility of semen
A drop of semen was placed on a slide under a glass cover. The microscope had a temperature regulated plate with the constant temperature of 37°C. The motility was estimated by the percent of forward moving spermatozoa, and it was evaluated with a point system: 0=0%, 1=1-20%, 2=21-40%, 3=41-60, 4=61-80, 5=81-100%.
3. Sperm concentration
Number of spermatozoa/ml was counted in Buerker's chamber.
4. Percent of living spermatozoa
This trait was evaluated with Eosin-Nigrosin vital staining. About 200 cells were counted, and the percent of living spermatozoa was calculated.
5. Sex drive
males had only 5 minutes to start copulation. The buck who can not copulate within this time was taken out from the experiment, we didn't collect more times semen from it. So the length of the experimental period was determined by this trait.

Statistical analysis (ANOVA) was processed by STATGRAPHICS ver.5.0.

RESULTS AND DISCUSSION

Sex drive

The longevity of the period of semen collection was determined by the sex drive of the bucks in the group B. The exhaustion of the bucks in this group occurred between 23rd and 27th days of the experiment. On the 27th day was the last two males taken out, so this was the finishing day of the experiment (Figure 1).

During this period sample was collected 10 times from the group A. In this group the libido of the bucks didn't change, they were ready for service on all the days of semen collection.

Quantity of semen, sperm concentration, percent of living spermatozoa

All this traits were on the same level in the two groups at beginning of the experiment, but all of them decreased as a result of frequent ejaculation in the group B by the time (Table 1.,

Figure 1 : The evolution of the number of bucks in group B

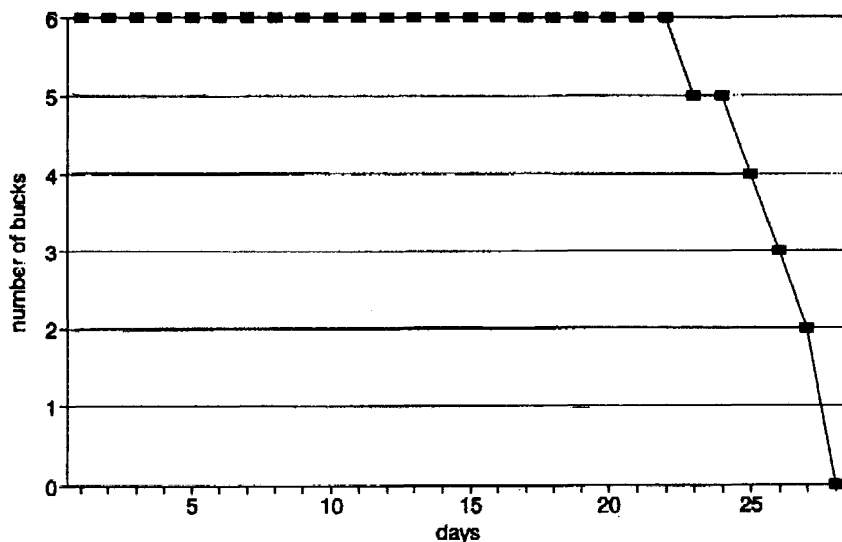


Table 1 : The mean values of semen traits

| Trait | group A | group B | Significance level |
|---|-------------|-------------|--------------------|
| Quantity of semen (ml) | 0.79±0.07 | 0.54±0.03 | P<0.01 |
| Motility of semen (valuated 1-5) | 4.00±0.33 | 3.19±0.20 | N.S. |
| Concentration of semen (10 ⁶ spermatozoa/ml) | 286.14±4.98 | 231.66±9.66 | P<0.01 |
| Percent of living spermatozoa (%) | 78.60±0.51 | 73.20±1.19 | P<0.05 |

N.S. - not significant

Figures 2-4.). The difference between the mean values of the different traits was significant.

This result tallies with the opinion of most of the authors (HADDAD *et al.*, 1992, TACKE *et al.*, 1995). The daily semen collection during this period never occurred an aspermic ejaculate, and the sperm concentration was always above the 100 million spermatozoa/ml which amount was mentioned by CHEEKE *et al.* (1982) for a good fertility result.

Motility of semen

The result of motility was remarkable, because in contradiction with expectation no significant difference was observed between the mean values of the two groups. Although the sperm motility in the group B slightly decreased, but the samples was varied in wide range also in the group A (Figure 5.).

It seems by the results that most of the seminal characteristics show a significantly lower value, if the use of the males is more frequent, than the optimal service regimen. However the sexual desire (libido) falls off earlier, than the fertility.

Figure 2 : The evolution of the quantity of semen

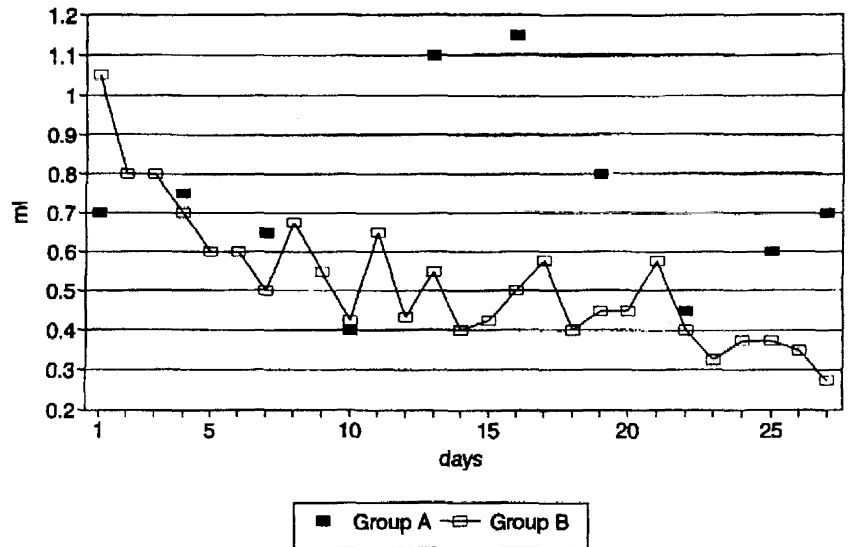


Figure 3 : The sperm concentration

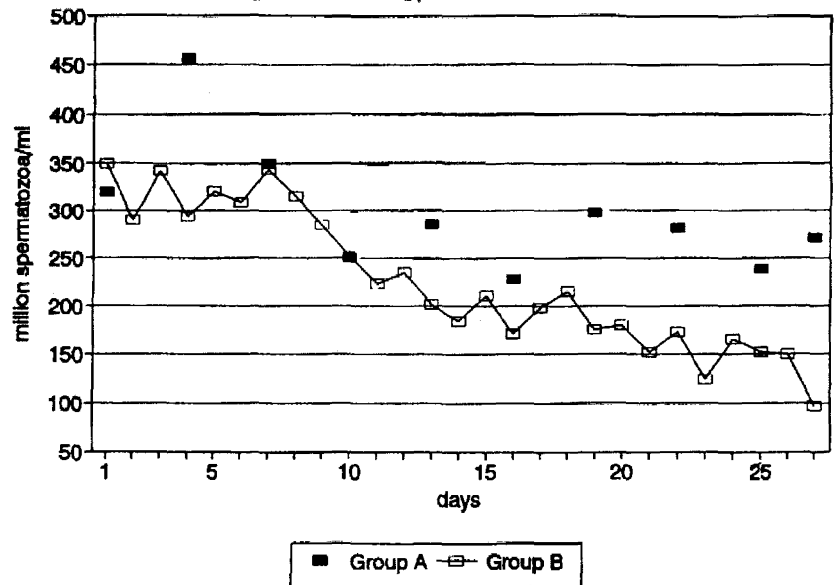


Figure 4 : Percent. of living spermia

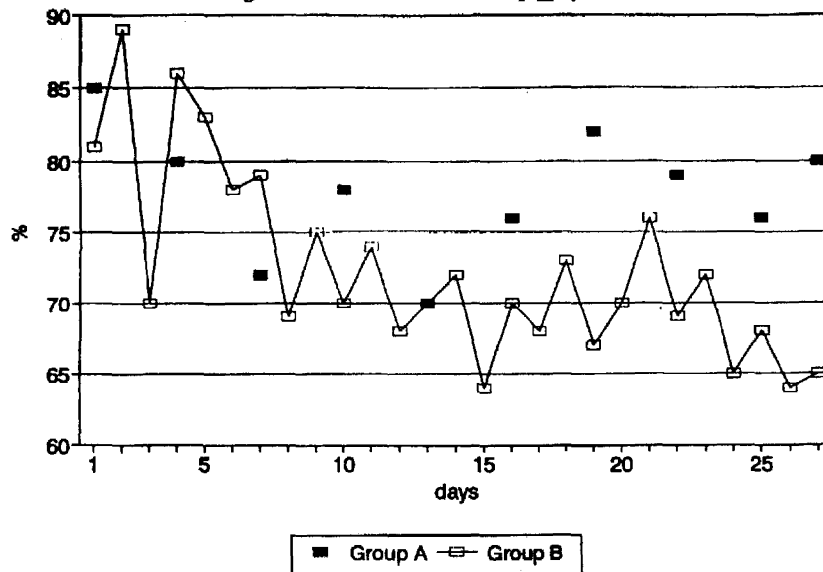
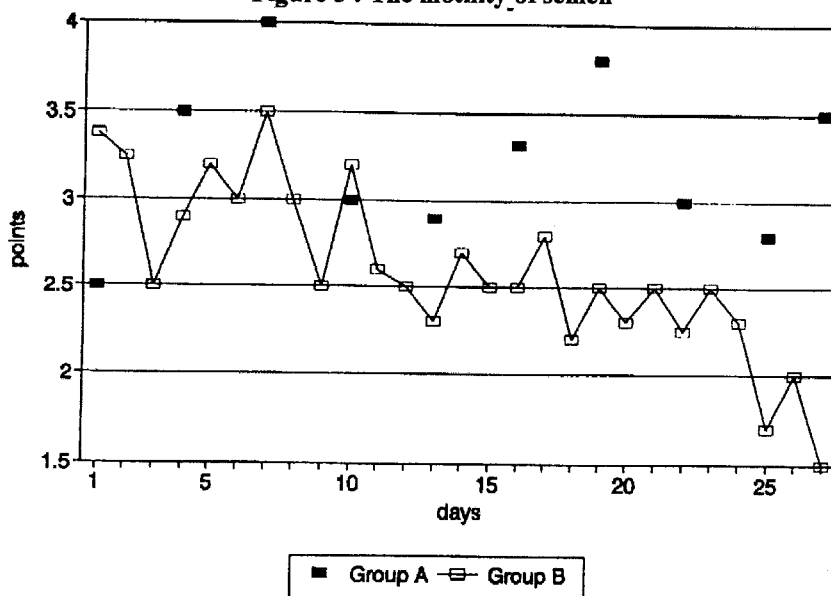


Figure 5 : The motility of semen



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Einige Kennzeichen des Kaninchenspermas bei häufiger Ejakulation Ausgeübte Wirkung der Voruntersuchung - Es wurde die ausgeübte Wirkung auf die Menge, Motilität, Konzentration und Lebensfähigkeit des Spermas bei häufiger Ejakulation untersucht.

12 Pannon-Weiss Rammler wurden an dem Tag beendet, an dem die "B" Gruppe nicht mehr zur Paarung bereit waren. Dies trat am 27. Tag ein.

In der "B" Gruppe verschlechterten sich mit vorgeschrittenem Stadium sämtliche untersuchten Eigenschaften. Zwischen der "A" und "B" Gruppe wurden signifikante Unterschiede bezüglich der Spermamenge (0.79 und 0.54 ml), der Konzentration (286.14×10^6 und 231.66×10^6 Sperma/ml) und des prozentualen Anteils der lebenden Spermien (78.6 und 73.2 %) gefunden. Die Motilität der Spermien zeigte jedoch keinen signifikanten Unterschied (4.00 und 3.19) auf.