

SPERMATIC EVALUATION OF MALES YOUNG FOR THE INCORPORATION TO RABBIT REPRODUCTION

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Abstract - 142 future sires from a rabbit breeding enterprise (in Havana) were evaluated. The semen extraction were carried out by the artificial vagina method using as a manikin a female of this specie, the extraction frequency and the biophysical features of the ejaculates (volume, sperm motility and concentration). Were taken into consideration for the sires selection the feasible sperm concentration concept dividing the animals into three categories : apt sires ($> 10 \times 10^6$ spz/ejaculate), doubtful sires (7.5×10^6 spz/ejaculate). According to the results, in the population studied were found a 62% apt sires, 6.3% of doubtful sires and 31.7% of non apt sires. The variance analysis indicated that the sire, ejaculate and breed effects were significant. It is concluded that it is commendable the semen evaluation of young sires before its incorporation to reproduction.

INTRODUCTION

The evaluation of the reproductive capacity of the sires should be considered as a desirable practice between rabbit breeders, since this one, allows to eliminate subfertile animals. The semen represents the own potential of the male, it is the mirror of the spermatogenic production of the testicle. It must be said that all the well-known methods that are used in the confirmation of the quality and fertility of the sperm could value only the symptoms of the essential processes of the spermatozoa, the morphological characteristics and chemistry composition. The results of these tests secure our supposition of the quality and fertility of the semen.

The artificial insemination in the rabbit species has been studied for several authors (ANDRIEU and COUROT, 1978 ; VON, 1981 ; COSTANTINI, 1986 ; REBOLLAR *et al.*, 1992) and in their group the interest of studying the biophysic characteristics of the semen has existed, that represents one of the fundamental links in the application of this technique.

In the evaluation of the reproducers of several species in the animal exploitation, indicators of the seminal quality are used, arriving to demonstrate the importance of these in the improvement of the productivity, sperm quality and fertility when the males are evaluated before their incorporation to the reproduction (NESTOR and BROWN, 1976 ; MOYA *et al.*, 1989 ; CARMENATE *et al.*, 1989, etc...). The purpose of this work was to study the biophysic characteristics of the semen of young males of rabbit species and the seminal evaluation before their incorporation to the reproduction.

MATERIAL AND METHODS

To carry out this work, 426 ejaculates were studied coming from 142 young males of the following breeds : Chinchilla, Spanish Semigigante, California and New White Zealand, with an age between 5.5 and 6.5 months. The collection of the semen was carried out using an artificial vagina, with the interval of 2 days between extractions until 3 extractions per sire were obtained.

The characteristics of the semen object of study were :

- The volume (ml) : the volume of the sperm was determined after eliminating the gel.
- The subjective motility (%) : it was studied through a microscope with an objective of 8-10 and lens of 10 x, placing a drop of pure semen in the slide in a scale of 0 to 100 %.
- The spermatic concentration (spz $\times 10^6$ /ml) : was calculated using the camera of NEUBAWER and COFFIN, 1966, after diluting the semen 1:200.
- Purity of the ejaculate.

Evaluation of sires

Verdict of the ejaculate :

For the verdict, the following indicators were considered :

1. Frequency of extraction
2. Age of the sire
3. Biophysics characteristics of the ejaculate (volume, motility and purity of the ejaculate)
4. Spermatic concentration (spz x 10⁶)

The evaluation of the sires was carried out considering the idea of live spermatic concentration, which is calculated for the following formula :

$$C_{\text{viables}} = \text{Volume (ml)} \times \text{motility (\%)} \times \text{spermatic concentration (spz x 10}^6\text{/ml)}$$

The parameters for the evaluation were done, considering the relationship of the number of viable spermatozoa that were inseminated in this species and the fertility according to OH and KIM (1972).

Parameters of the evaluation

Viable spermatic concentration (spz/ml).

Sires	CAPABLES (C) > 10 x 10 ⁶	DOUBTFUL (D) 7.5-10 x 10 ⁶	Not CAPABLES (N.C.) < 7.5 x 10 ⁶
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When the ejaculates of the first evaluation was included in the doubtful and not capable verdicts, they were gone on to two serial evaluations with intervals of two days between each extraction.

The statistical analysis was carried out through the General Lineal Procedure of SAS (Statistical Analysis Systems Institute, 1979) and was used the following mathematical model :

$$Y_{ijkl} = M + S_i + E_j + R_k + e_{ijkl} \quad \text{where,}$$

M = general mean

S_i = effect of the i-th sire

E_j = effect of the j-th ejaculate

R_k = effect of the k-th race

e_{ijkl} = effect of the random error associate with each observation

RESULTS AND DISCUSSION

In Table 1 is shown the Mean (x) and the standard deviations (SD) for the characteristics of the studied semen, which in good way coincide with the results published by the literature. The values found for the volume (x = 0.7 ml) are higher than those found by KUTTNER *et al.* (1976) and COSTANTINI (1986), the spermatic concentration found (x = 240.5) is superior to those published by BATTAGLINI (1986) and COSTANTINI (1986). A range of volume of 0.1 to 1.2 ml was observed, a concentration that oscillated from 50 to 460 x 10⁶ ml and the motility average resulted 65.6% with minimums value of 0 and maximum of 90%.

Table 1 : Mean (x) and standard deviations (SD) of the characteristics of the semen

	Volume (ml)	Motility (%)	Concentration. (10 ⁶ /ml)
x	0.72	65.6	240.5
SD	0.25	15.2	115
n	383	383	383

As it could appreciate in Table 2 the analysis of variance carried out shown that the effects of the sire, race and ejaculate resulted highly significant (P < 0.001) for all the characteristics of the studied semen. The coefficient of determination of the model (r²) varied between 18.6 for the spermatic concentration to 25.6 % for the

motility. Similar results were published by COSTANTINI (1986) and RODRIGUEZ *et al.* (1990). These results corroborate the influence of these effects in the seminal quality exposed by the literature.

Table 2 : Results of the analysis of variance for the characteristics of the semen

Source Variation	GF	Volume (ml)	Motility (%)	Concentration (106 spz/ml)
Sire	141	***	***	***
Ejaculate	382	***	***	***
Breed	3	**	**	***
r ² (%)	-	24.3	25.6	18.6

GF = Grades of freedom ; *** P < 0.001 ; ** P < 0.01

In Table 3 the results of the evaluation of sires are shown. It was observed that from a total of 142 young males evaluated, the 62% were capables, 6.3% doubtful, 17.6% not capables and 14.1% not capables, because of other causes. The fertility was evaluated in 20 capables sires of a farm in a quarter of a year achieving a 82.2%. These results evidence the importance the evaluation of the biophysic characteristics of the semen has (NESTOR and BROWN, 1976 ; MOYA *et al.*, 1989 ; CARMENATE *et al.*, 1989), getting to demonstrate the need of the evaluation of the reproductive capacity of the sires before their incorporation to the reproduction.

Table 3 : Results of the evaluation of young males

Sires	Spermatic concent. viable			Another causes	Fertility		
	Capables %	Doubtful %	Not capables %	Not capables %	Services	Pregnancies	%
142	62	6.3	17.6	14.1	-	-	-
20	-	-	-	-	370	304	82.2

CONCLUSIONS

From the results of this work, it could be inferring the following ones as the most important :

1. The volume and the spermatic concentration of the ejaculates in young males is lower than in sires incorporated to the reproduction, while the motility percentage oscillated between the established range for sires.
2. The influence of the effects of sire, ejaculates and breeds resulted significant, therefore, in the evaluation of young males these factors should be considered.
3. The seminal valuation of young males resulted satisfactory, therefore the importance of using the indicators of the seminal quality in the evaluation of the males before their incorporation to the reproduction is evident.

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