

OVULATION RATE IN MEAT RABBIT

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INTRODUCTION

The ovulation rate is the physiological parameter determining the maximum potential number of young rabbits a doe can bring forth in each parturition.

Ovulating discharge, acting on the pre-ovulatory follicles, will determine the number of liberated oocytes.

There are several factors, both environmental and intrinsic of the doe, that limit or modulate the ovulation rate. This paper deals with the detection and quantification of the effects of some of such factors on the above mentioned trait as well as the establishment of the possible relationships among them.

MATERIAL AND METHODS

The does used in this work were the same used in the work intitled "Mating behaviour and induction of ovulation in meat rabbit" presented at this same Congress. Both the conditions of housing and the distribution of the experimental data were also described in it.

Ovulation rate was made with a Model that was analogous to Model 3 (see above mentioned work). The three most intense colours of vulva were considered as only two does with pale vulva presented ovulation and their data were not included in the analysis.

The estimates of parameters and effects of this model has been made by least square analysis for unequal class number (HARVEY, 1975) including a test about the significance of the triple interaction. The model have been reanalyzed eliminating covariables in order to assess how the estimates of the effects and the variance of error were modified, what allows to know more directly the degree of association between covariables and factors within the models.

RESULTS

The results are shown in Table 1. The average rate of ovulation was 10.98 ovules per doe. The number of suckling rabbits had a negative effect on ovulation rate. The higher the -

live weight of the doe the higher the ovulation rate (a weight increase of 1000 g determined a rise of ovulation rate of 1.5 ovules). The effects of these covariables, nevertheless, were not significant. No-nulliparous does showed a favourable intrinsic effect on ovulation rate (+0.81 ovules). This effect was not significant in the model. In the model without covariables the effects due to them added to the intrinsic effect of level of parturition explained a rise of the effect estimated (+0.97 ovules) that reached a level of significance of 2.5%.

The effects of season and colour of vulva were not significant, although a favourable effect of the colour of vulva on the ovulation rate was observed.

Table 1. Analysis of ovulation rate. Covariables, number of suckling rabbits and live weight of the females.

MEAN	MEAN VARIANCE	VARIANCE FOR ERROR		DEGREES OF FREEDOM FOR ERROR	
		MODEL 4	NC	MODEL 4	NC
10.98	0.18	6.15	6.24	56	58
		TOTAL	SEASON	VULVA COLOUR	PARTURITION
Means of number of suckling rabbits		1.68	1.75 spring summer 1.61 autumn winter	2.40 Pink 1.24 Red 1.33 Violet	0 Nulliparous 3.08 No-Nulliparous
Means of live weight of females		3505	3575 spring summer 3444 autumn winter	3628 Pink 3451 Red 3371 Violet	3230 Nulliparous 3737 No-Nulliparous
Effects of season		SPRING-SUMMER		AUTUMN-WINTER	
		Model 4		F <sup>*</sup> SIGNIF.	
		NC		0.05 N.S.	
Effects of vulva colour		PINK	RED	VIOLET	
		Model 4		0.72 N.S.	
		NC		0.73 N.S.	
Effects of parturition		NULLIPAROUS		NO-NULLIPAROUS	
		Model 4		1.94 N.S.	
		NC		5.44 0.025	
Regression coefficient of number of suckling rabbits		-0.12±0.15		0.62 N.S.	
Regression coefficient of live weight of females		0.0015±0.00097		2.43 N.S.	

Interactions between two and three factors are not significant

\* NC = Without covariables x ± standard error ± = Snedecor F

- = Level of significance

#### DISCUSSION

The average number of suckling rabbits of no-nulliparous does accepting mating was 4.77 as that of no-nulliparous presenting ovulation was 3.08. This was to be expected as it has been stated previously that the higher the number of suckling rabbits the lower the probability of ovulating.

Among the ovulating does the number of suckling rabbits also had a negative influence on ovulation rate, but it was not significant. TORRES (1977) appreciated no correlation between the number of suckling rabbits and the ovulation rate, although the number of suckling rabbits was expressed by the size of the previous litter.

FOXCROFT AND HASNAIN (1973) have observed that ovulation rate in lactating does ( $10.18 \pm 0.29$ ) was significantly higher (1%) than in no-lactating ( $8.91 \pm 0.29$ ).

It has been observed in former works using carcass weight (GARCIA, 1982) a positive effect (highly significant) of doe weight on the ovulation rate. In this experiment, using live weight, the effect acted in the same way but it was not significant. Several authors (VENGE, 1950; HULOT and MATHERON, 1979) have also observed and discussed similar effects of doe weight in different breeds.

The global favourable effect of no-nulliparous (NC) on the ovulation rate was essentially due to the favourable effect of parity itself increased by the positive effect caused by the higher weight of does with larger number of parturitions (3.737 g opposite to 3.230 g) and counterbalanced, to a certain extent, by the negative effect of the presence of suckling rabbits. This agrees with the results obtained by HULOT and MATHERON (1979, 1980). Because of the small number of does with pale vulva that presented ovulation they have not been included in the analysis. No significant effect of the colour of the vulva has been appreciated although the more intense the colour the greater the ovulation rate.

No effect of season on the ovulation rate was recorded in disagreement with the results, sometimes contradictory, obtained by other research workers (HULOT and MATHERON, 1981).

#### CONCLUSIONS

A negative, but not significant, effect of the number of suckling rabbits on ovulation rate was appreciated. The global positive effect of no-nulliparous (NC) on ovulation rate was mainly due to the addition of the favourable effects of parturition and the higher weights of does with more parturitions slightly counterbalanced by the negative effect of the presence of suckling rabbits in no-nulliparous.

Doe weight was one of the most influencing factors on the ovulation rate.

No effect of season on the ovulation rate was appreciated.

No significant effects of the colour of vulva on the ovulation rate were detected, as the does with pale vulva were not included in the analysis because most of them did not have

ovulated. Taking into account only the other three groups there was a favourable effect of colour on the ovulation rate.

#### SUMMARY

The factors determining the ovulation rate were studied in does of medium size specialized in meat production. The does, accepting the buck were slaughtered at seven or twelve days after the mating that would produce the first, second or third parturition and in different seasons.

Does weight seemed to be the most determining factor on the ovulation rate.

#### RESUMEN

Se han estudiado, en conejas de tamaño medio especializadas en la producción de carne, - varios factores que influyen sobre la tasa de ovulación. Las conejas que aceptaban la monta se sacrificaban a los siete o doce días del apareamiento que hubiese producido, en diferentes estaciones, el primero, segundo o tercer parto.

El peso de la coneja pareció ser el factor más determinante sobre la tasa de ovulación.

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