

Relation between vulva color and reproductive performance in rabbits using AI technique

Abdel-Ghaffar A.E., Agag M.A.

in

Baselga M. (ed.), Marai I.F.M. (ed.).
Rabbit production in hot climates

Zaragoza : CIHEAM
Cahiers Options Méditerranéennes; n. 8

1994
pages 299-303

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=95605305>

To cite this article / Pour citer cet article

Abdel-Ghaffar A.E., Agag M.A. **Relation between vulva color and reproductive performance in rabbits using AI technique.** In : Baselga M. (ed.), Marai I.F.M. (ed.). *Rabbit production in hot climates*. Zaragoza : CIHEAM, 1994. p. 299-303 (Cahiers Options Méditerranéennes; n. 8)



<http://www.ciheam.org/>
<http://om.ciheam.org/>

RELATION BETWEEN VULVA COLOR AND REPRODUCTIVE PERFORMANCE IN RABBITS USING A.I. TECHNIQUE

A.E. ABDEL-GHAFFAR

M.A. AGAG.

Department of theriogenology

Fac. of Vet. Med. (Moshtohor),

Zagazig Univ. Benha., Egypt

SUMMARY

A total number of 307 female Newzealand White rabbits were used to study the relationship between the color of the vulva and the reproductive performance. using of A.I. technique, the conception rate, pregnancy rate and litter size were recorded. Four groups were classified according to the vulva color; congested red, pink, purple and pale. Highly significant variations were recorded between the four groups in all parameters studied. The highest C.R., shortest P.D. and largest L.S. were recorded for the congested red group. The pale vulva group failed to conceive.

Key words : Rabbit, Artificial insemination, vulva color, conception rate.

INTRODUCTION

A relationship has been detected between the color of the vulva and the efficacy of A.I. Failure in does with pale vulva is wellknown, (*Battaglini, 1982 and Roca, 1986*). The vulva is closely related with does rejecting the mounting which agrees with the negative influence of low sexual receptivity on the efficacy of A.I. (*Delaveau, 1978 and Gosalvez, 1986*).

Diaz et al. (1987) studied the relationship between the color of the vulva on the day of mating and ovulation rate and level of fertility. Does were presented to the male until they accepted mating for a maximum of seven consecutive days. The ovaries and uterine horns of does mated were examined by laparoscopy 10 days after mating. Most of the does that were mated had red (54.1%) or rose (39.6%) vulvas. The proportion of does that ovulated was higher in does with red vulva than in those with rose coloration (84.6 vs 68.4%). Besides, the group of does with red vulva, showed a less difference between the percentages of does that ovulated and does with pregnancy (84.6 vs 80.7%), than in the group of does with rose vulva (68.4 vs 52.6%). Each female was assigned to a high or low sexual receptivity level (HSR and LSR) according to *Gosalvez (1986)* using the color of the vulva as a predictor of

sexual behaviour. Does with pale or violet non turgent vulva were assigned to L.S.R. and does with red, rose and violet turgent vulva were assigned to H.S.R. *Stoufflet and Caillol (1988)* observed females with white vulva in early pregnancy and after parturition. The proportion of females with a pink vulva remained high during pregnancy (72%), then decreased at parturition while proportion of females with purple vulva was maximum. A red vulva was observed in small number of pregnant rabbits.

The present work aimed to determine the relation between the vulve color and some reproductive parameters as conception rate, pregnancy duration and litter size using A.I. to exclude the effect of the male.

MATERIAL AND METHODS

A total number of 307 females newzealand rabbits were used in this work. They were housed in individual cages, fed and watered and libitum. They were distributed in four groups based on the color of the vulva at the time of insemination. The color was varied from congested red, pink, purple to pale. Ovulation was induced by a synthetic analogue of Gn-RH (Receptal-

Hochest) administered in doe of 0.2 ml for each does at the time of insemination. All females artificially inseminated by semen diluted in yolk-glucose citrate extender, using 0.5 ml contained 50×10^6 motile sperm cells for each doe. The conception rate, pregnancy duration and litter size were recorded.

RESULTS AND DISCUSSION

One of the main problems in breeding rabbits is to determine the proper time of remating after kindling to achieve a maximum fertility rate. The time of insemination is a very important factor. Many authors recorded a high conception rate and litter size when inseminating does in the first and second day respectively after kindling, (*Hammond and Marshall, 1925; Adams, 1967; Harned and Casida, 1969; Hafez, 1970; Partridge et al., 1981; Scehlolaut et al., 1981; Partridge et al., 1984; and Abdel-Ghafar, 1992*). Others recorded a reduction in the ovulation, fertility, pregnancy rates and litter size when does remated 1-2 days after kindling, (*Foxcroft and Hasnain, 1973; Harris et al., 1982; Kawinska et al., 1976 and Mendez et al., 1986*). In the current results a highly significant C.R. L.S. and P.D. (table 1 & 2) were obtained, depending on the color of the vulva, rather than the day of insemination.

Because the female rabbit does not exhibit a distinct heat period and will mate and conceive at almost any time there is exposure to an aggressive male (*Arrington and Kelly, 1976*). We have to find a predictor to the sexual activity to be sure that the sperm will meet a viable ovum. From the present study, we can consider the congested red vulva an indicator to the sexual activity in female rabbit (Fig.1,2,3). Consequently, mating can be successfully applied. These results are in complete agreement with *Gosalvez (1986)* who use the color of the vulva as a predictor of sexual behaviour.

Although females do not exhibit a definite heat period, they often do exhibit a period of activity which indicates a time of receptivity. This is evident by the doe rubbing her chin on the feed cups or other objects and a slight aggressive restlessness. The vulva or external genitalia may be slightly swollen and pink. Breeding at this time will likely be easier and less time consuming, but it does not indicate the only time that the female will mate, (*Arrington and Kelly, 1976*). However, *Stoufflet and Caillol (1988)* observed that there is no relationship between female sexual receptivity and color of the vulva. In our results we used the A.I. technique, so we did not evaluate the receptivity in does.

A highly significant variations in all parameters were recorded between the four groups as revealed by Chi-square test and least square analysis (Tables, 2 & 3). These results are similar to those recorded by *Diaz et al. (1987)* who found higher ovulation and pregnancy rates (84.6 and 80.7%) respectively in the group of does with red vulva than those with rose vulva (68.4 and 52.6%). Our results also in coincidence with *Leyun (1982) and Pla (1984)* who recorded a positive influence of red and rose vulva color and the level of sexual activity on the ovulation response. On the other hand, *Harkins and Wagner (1989)* reported that the vulvar sign is inconstant and should not be the sole criterion for pairing and the receptivity is variably indicated by swollen, reddened vulva and by a doe that stands and allows mounting. The results of *Battaglini (1982) and Roca (1986)* confirmed our results in which does with pale vulva failed to conceive (Table 1 & Fig. 1,2,3).

We concluded that, it is advisable to inseminate does when the color of the vulva is congested red to achieve the maximum reproductive performance in female rabbits.

Table (1): Effect of vulve color on the conception rate, pregnancy duration and litter size (Mean ± SEM).

Vulve color	N1	C.R.	N2	P.D.	L.S.
Cogested red	132	87.55% a	105	30.65 ± 0.13 a	7.52 ± 0.13 a
Pink	81	61.73% b	50	31.72 ± 0.25 b	5.16 ± 0.21 b
Purple	59	8.47% c	5	33.00 ± 0.84 b	3.00 ± 0.45 c
Pale	35	0.00% d	0	----	----

Means within the same column and row with different superscripts are significantly different from each other.

N1 = Inseminated females C.R. = Conception rate
 N2 = Conceived females P.D. = Pregnancy duration
 L.S. = Litter size

Table (2): Chi-square analysis for the effect of vulve color on the conception rate.

Character	Cong. red	Pink	Purple	Pale	Total
Pregnant : O	105	50	5	0	160
E	68.795	42.215	30.479	18.241	
Nonpregnant : O	27	31	54	35	147
E	63.205	38.785	28.251	16.759	
	132	81	59	35	307

O = Observed E = Expected
 X² = 60.030 df= 3 P ≤ 0.01

Table (3): Least square analysis for the effect of vulve color on the pregnancy duration and litter size.

S.V.	df	SS	MS	F-value
Pregnancy duration				
Group	2	58.452	29.226	13.574**
Error	157	338.042	2.153	
Litter size				
Group	2	257.784	128.892	70.531**
Error	157	286.911	1.827	

** Highly significant at level (P ≤ 0.01).

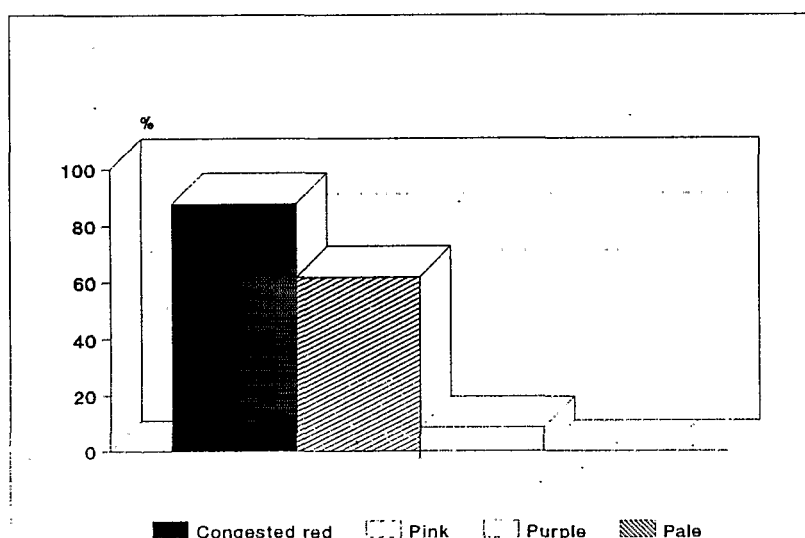


Fig.(1) Relationship between vulva color and conception rate.

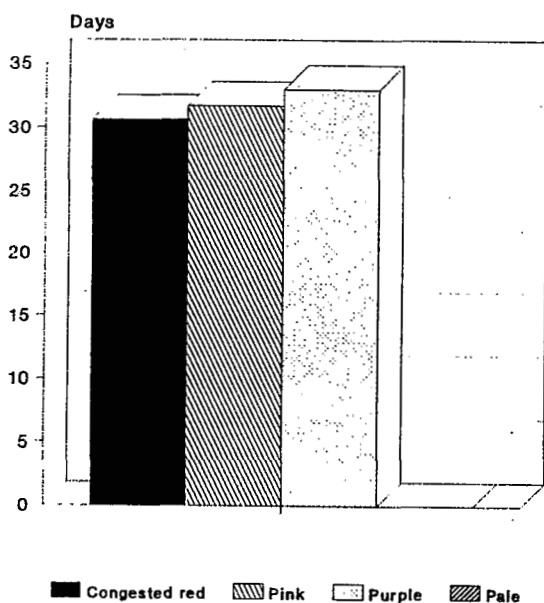


Fig. (2) Relationship between vulva color and pregnancy duration.

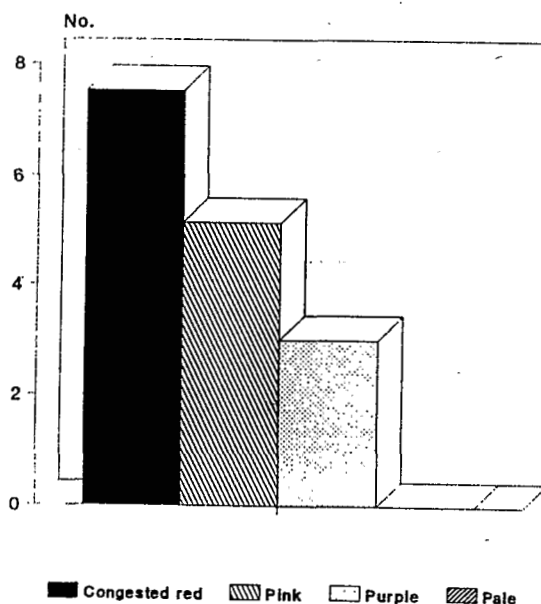


Fig. (3) Relationship between vulva color and litter size.

REFERENCES

Abdel-Ghafar, A.E. (1992): Some studies on the artificial insemination in rabbits. Ph. D. Thesis, Zagaizg Univ., Benha., Egypt.

Adams, C.E. (1967): Current lactation and pregnancy in the rabbit. J. Reprod. Fert., 14, 351.

Arrington, L.R. and Kelley, K.C. (1976): Domestic rabbit biology and production. A University of Florida Book, Gainesville, PP : 58.

Battaglini, M. (1982): Inseminacion artificial en el conejo. Conigiocultura, 19 (5) 67.

Delaveau, A. (1978): L'acceptation de l'accouplement chez la lapine et ses relations avec la fertilité. Z es journées de pecherche cunicle en France. Paris.

Diaz, P.; Gonsalvez, L.F. and Rodrigung, J.M. (1987): Relationship of color of the vulva with reproductive traits in rabbits. ITEF, 18(72) 52.

Foxcroft, G.R. and Hasanain, S. (1973): Effects of suckling and time of mating after parturition on reproduction in the domestic rabbit. J. Reprod. Fert., 33, 367.

Gosalvez, L.F. (1986): Activated ovarica-de la coneja domestica despues delparto. Thesis Doctoral, E.T.S.I.A.

Hafez, E.S.E. (1970): Reproduction in farm animals. 4th. Ed., Lea & Febiger, Philadelphia and Toronto.

Hammond, J. and Marshall, F.H.A. (1925): Reproduction in the rabbit. Oliver and Boyd. London.

Harkness, J.E. and Wagner, J.E. (1989): The biology and medicine of rabbits and rodents. 3rd Ed., Lea & Febiger, London. PP : 14.

Harned, M.A. and Casida, L.E. (1969): Some postpartum reproductive phenomena in the domestic rabbit. J. Anim. Sci., 28, 785.

Harris, D.J.; Cheeke, P.R. and Patton, N.M. (1982): Effect of diet, light and breeding schedule on rabbit performance. J. Appl. Rabbit. Res., (5) 33.

Kawinska, J.; Niedzwiadek, S. and Ryba, Z. (1976): An attempt of determination of optimal mating times in rabbits. Optymalne terminy kojazenu krolikow, 513.

Leyun, M. (1982): Estudio de resultados para diferentes estados de celo en conejas su relacion con la aceptacion de la

monta. VII symposium Nacional de cunicultura, 171.

Mendez, J.; De-Blas, J.C. and Fraga, M.J. (1986): The effect of diet and remating interval after parturition on the reproductive performance of the commercial rabbit. *J. Anim. Sci.*, 62, 1624.

Pla, M. (1984): Modelos biologicos de caracteres reproductions en el conejo carne. Thesis Doctoral, E.T.S.I. Agronomos, Valencia.

Partridge, G.G., Foley, S. and Corrigall, W. (1981): Reproductive performance in purebred and crossbred commercial rabbits. *Anim. Prod.* 32, 325.

Partridge, G.G.; Allan, S.J.; Findlay, M. and Corrigall, W. (1984): The effects of reducing the remating interval after parturition on the reproductive

performance of the commercial doe rabbit. *Anim. Prod.*, 39, 465.

Roca, T. (1986): La insemination artificial encunicultura. XI symposium de cunicultura. Tereul.

Schloulou, W.; Lange, K. and Paufler, S. (1981): Einflub des thioamino sauregehaltes in futter des alters und der Geburt sauslosung mit oxytocin auf die Reproductions leistung des kaninchens bei post partaler Insemination. *Zuchtungskunde*, 53, 283.

Stoufflet, I. and Caillol, M. (1988): Relation between circulating sex steroid concentrations and sexual behaviour during pregnancy and post partum in the domestic rabbit. *J. Reprod. Fert.*, 82, 209.