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## COMPARATIVE STUDY OF THREE DIFFERENT PREGNANCY DIAGNOSIS TECHNIQUES IN RABBITS

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### ABSTRACT

Seven pluriparous non-gravid does and two matured bucks were utilized for the study. Does were all mated after 30 days of stabilization. Successful mating was confirmed by a recoil, backward or side-way fall and emission of a snorting sound by the male. Pregnancy detection was by weight gain, abdominal palpation and ultrasonography techniques at days 6, 9, 13, 18, 23. Abdominal palpation of does was carried out by gentle palpation of nodule-like tissues in the ventral abdomen. Transcutaneous ultrasonography was performed using ultrasound machine Kaixin KX2000®. Weight gain was monitored using a sensitive weighing scale. Early pregnancy was diagnosed by ultrasonography and abdominal palpation on days 6.00±0.00 and 7.5±1.29 post-copulation respectively. Pregnancy was diagnosed by abdominal palpation in 28.57% of the does on day 6 and increased to 100% on day 9 post-copulation; however diagnosis by ultrasonography was 100% on day 6. The average weight gain was 0.029±0.029kg by day 6; 0.057±0.4 by day 13, which plateaued till parturition. Ultrasonography could therefore be used effectively for pregnancy diagnosis as early as day 6 of gestation in rabbit does while abdominal palpation could serve in absence of ultrasonography by day 9 of gestation. Weight gain is a positive adjunct to other pregnancy diagnostic techniques.

**Key words:** pregnancy, diagnosis, rabbit

### INTRODUCTION

Rabbit pregnancy is traditionally diagnosed by palpation of the uterus through the abdominal wall on 12-14 days post coitum or 10- 12 days by experienced practitioners (Hagen, 1974). Developing kits can be felt along either side of the abdomen; they are found in two parallel lines extending up the does body. Foetuses may be felt by gentle abdominal palpation as early as 10 days post breeding as 1 to 1.5cm masses in the caudal ventral abdomen. At 18 days they should be 2.5 to 3cm in length (Richardson, 2000).

Some other techniques and the earliest time of diagnosis had been developed over the years which include changes in body weight with average gain of around 300-400gm from mating to 30 days (TNAU, 2013); placing the buck near the doe for mating (a buck may not mate the pregnant one); uterine length may increase to 12 mm in 9 days after mating which may attain 20 mm in 13 days. Only experienced keeper may be able to predict the changes accurately. Weight gain is an indication of pregnancy but lacks reliability since weight gain cannot always be attributed

to pregnancy. It is therefore more reliable to consider it with other factors, also does must be weighed prior to breeding and placed on a daily ration without change if weight gain is to be a useful statistic. Until about the middle of pregnancy, that is about the 15<sup>th</sup> day, there is relatively little increase in the size of the doe's organs or the embryos. During the last half of pregnancy however, such increase is usually very great. Ultrasonography could detect pregnancy as early as day 7 (Sorooret *et al.*, 2008) or 8 (Ypsilantis and Saratsis, 1999). Ultrasonography has been widely applied for the diagnosis of early pregnancy in domestic animals like the cow (Raja *et al.*, 1994), Mare (McKinnon *et al.*, 1993) sheep (White *et al.*, 1984), goat (Hesselink and Taverne, 1994), sow (Inaba *et al.*, 1983), bitch and queen (Burke and Badertscher, 1986). This useful technological innovation allows early, accurate and practical detection of pregnancy (Harkness *et al.*, 2013). With early pregnancy diagnosis comes productivity in animals, hence the importance of improving and developing skills for early pregnancy diagnosis.

## MATERIALS AND METHODS

### *Experimental animals and management*

Seven randomly selected pluriparous non-gravid Chinchilla breed of rabbit weighing between 2.0 and 2.6 kg and two sexually matured Chinchilla bucks were utilized for the study. They were fed with commercial standard ration supplemented with grass while water was given *ad libitum*. The rabbits

were stabilised for 30 days before the commencement of the experiment.

### *Mating and Pregnancy diagnosis*

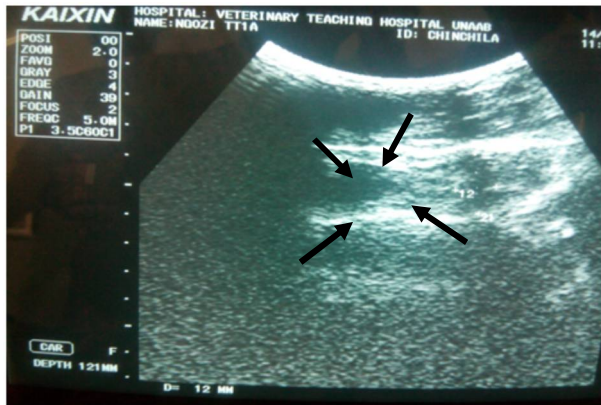
The does were mated after stabilisation and a successful mating was confirmed by signs of recoil of the male, a fall backwards or sideways and emission of a snorting sound. Count down of gestation began 10 hours after successful mating. Pregnancy detection was by weight gain, abdominal palpation and ultrasonography techniques at days 6, 9, 13, 18, 23. Abdominal palpation of does was carried out by gentle palpation of nodule-like tissues in the ventral abdomen. Transcutaneous ultrasonography technique was performed using portable ultrasound machine Kaixin KX2000®. Weight gain was monitored with the use of a sensitive weighing scale.

## RESULT

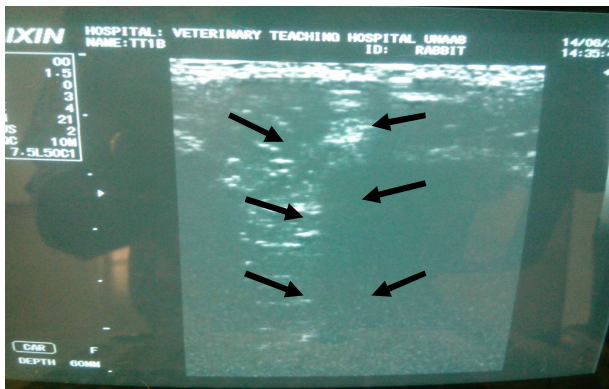
Earliest pregnancy diagnoses by ultrasonography and abdominal palpation were on days  $6.00 \pm 0.00$  and  $7.5 \pm 1.29$  respectively. Pregnancy diagnosis by abdominal palpation on day 6 was successful in 28.57% of the does which increased to 100% on day 9, however ultrasonographic diagnosis of pregnancy was 100% on day 6 (Table 1). Embryonic vesicles were observed in ultrasonography on day 6 (Fig. 1). By day 13, the size of embryonic vesicles had increased. Foetal ossification and foetal heartbeat was detected on day 18 and by day 23 a clear outline of foetal skeletal structures was seen (Fig 2).

**Table I: Percentage positive pregnancy diagnosis using abdominal palpation (AP) and ultrasonography (US)**

6th day		9th day		13th day		18th day		23rd day	
A P	US	A P	US	AP	US	AP	US	AP	US
28.57%	100%	100%	100%	100%	100%	100%	100%	100%	100%



**Fig 1: Transcutaneous abdominal ultrasound of 7 months old plurigravida doe on day 6 of gestation (Black arrows point to embryonic vesicle)**



**Fig. 2: Transcutaneous abdominal ultrasound of 7 months old plurigravida doe on day 23 of gestation (Arrows point to skeletal outline of foetus)**

The weight of pregnant does was observed to increase within the first 14 days of gestation initially by  $0.029 \pm 0.029$  kg and then by  $0.057 \pm 0.0374$  making a total of approximately 90g. Subsequent days up till gestation witnessed no weight gain in all the does.

## DISCUSSION

Earliest pregnancy diagnoses by ultrasonography and abdominal palpation recorded on days  $6.00 \pm 0.00$  and  $7.5 \pm 1.29$  respectively were in contrast with the report of Akar

and Canooglu (2009) where earliest pregnancy diagnoses by ultrasonography and abdominal palpation were on days  $10.80 \pm 1.26$  and  $12.27 \pm 1.49$  respectively. Breed difference, sensitivity of ultrasound machine and expertise of the technician might be the reasons for this disparity. Embryonic vesicles observed in ultrasonography on day 6 is at variance with the submissions of Sorooriet al. (2008) who detected them on day 8 and Ypsilantis and Saratsis (1999) who reported observation of a low echogenicity area in uterine lumen on day 7.

The weight of pregnant does increased within the first 14 days of gestation initially by  $0.029 \pm 0.029$ kg and then by  $0.057 \pm 0.374$  making a total of approximately 90g. This is less than the 300 to 400g reported by TNAU (2013) from coitus to gestation. Subsequent days up till gestation witnessed no weight gain in all the does contrary to the report of Johnson and Johnson (2013) that weight gain was great during the last week of gestation. This disparity in observations may be due to breed differences.

### CONCLUSION

It was concluded that ultrasonography could be used effectively for pregnancy diagnosis as early as day 6 of gestation in rabbit does while abdominal palpation could serve in absence of ultrasonography by day 9 of gestation. Weight gain is a positive adjunct to other pregnancy diagnostic techniques.

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