Journal of Science and Multidisciplinary Research
Volume 6, No. 1, 2014
ISSN: 2277-0135

EFFECT OF DIFFERENT MATING INTERVALS ON LITTER SIZE OF RABBITS

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Abstract: The experiment was carried out to find out the different mating intervals on litter size of (0 day, 7days, 14 days, 21days and 28 days) after kindling. 15 mature rabbit does of New Zealand White were used for the experiment, each treatment was replicated 3 times. Water and feed were given *ad libitum* with forage like *Panicum maximum* as supplement. The experiment lasted for five (5) months. Simple description statistics and analysis of variance (ANOVA) were used to analyze the data collected while the New Duncan's Multiple Range Test was employed to compare treatment means. Results showed that litter size, litter weight, weaning weight, Doe weight at kindling, gestation and mortality were significantly (P<0.05) influenced. It further shows that Doe weight at weaning was non-significantly affected (P>0.05). The result of the study showed that mating of does at 0 day and 14 days after kindling improved litter size.

Keywords: Rabbit Breed, Productive Traits, and Seasonal Effect.

INTRODUCTION

The production of short-producing cycle animals such as rabbits, pigs and poultry through proper breeding management in the developing Countries have been suggested to increase meat supply to consumers as a veritable source of protein. This pressing need for daily protein requirement by man have necessitated the need for a continual increase in production of monogastric animals like rabbit and pig. Recently, poultry which used to be a more available source of protein have not met the requirement of protein intake per head per day, and following the last outbreak of the avian influenza (HSHI) otherwise called bird-flu disease, in Nigeria and some other developing Countries. It is against this backdrop that effort should be made to increase rabbit production to fill up the gap created b the break in poultry production due to bird-flu and possibly improve and complement the quantity and quality of meat supply in the country.

According to Bamgbose and Kudi (1996) rabbit production is currently being encouraged in Nigeria as a means of improving the daily protein intake of individuals. Owen (1976) reported that rabbits are beginning to make useful contribution to the meat supply in tropical countries especially developing ones. The key factor to the efficiency and economy of rabbit enterprise was tagged to doe productivity (Khalil *et al,* 1988). A doe if properly managed can produce 4 – 5 litters (of 4 – 8 offsprings) per year in the tropics. (Owen, 1976) studies carried out by (Dickson, 1960) proves that birth weight and litter size increase with increasing parity especially from first to second births and during this interval, maternal size usually increase which increases the placental size and this may account for much of the observed difference in birth weight and litter sizes (cited by Ikeobi, N.A).

According to Jange, K. (1985), kindling rate, the litter size at 3 weeks of age and at weaning and the litter weight and the individual kit body weight were independent of age at first artificial insemination.

Bivin and King (N.A) were of the view that litter size of rabbit at birth is probably the most important trait in the reproductive performance of animals which give birth to more than one offspring such as rabbits. (According to mybunnyfarm.com, 2006), higher productivity in terms of prolificacy can be improved by slow methodical selection and careful management of the rabbitary environment. Its opinion is that shortening of kindling to mating interval will help to increase the litter size.

MATERIALS AND METHODS

The experiment was carried out at the rabbit unit of the Teaching and Research Farm, Abia State University, Umuahia location, faculty of Agriculture and Veterinary Medicine. The experimental animals consisted of fifteen (15) does of New Zealand White breed. The rabbits were housed in a wire gauze, protected with wire mesh hutch. The hutches were partitioned into four (4) and each had a dimension of 180cm length, 18cm width and 80cm height. The hutches were placed intensively with corrugated roofing sheets, the side wall up to 1m high and the remaining part of the sides made with wire mesh. The rabbits were fed using concentrate (grower mash), in the morning and forage (potato vine, *Panicum maximum, Centrosema pubescence*) in the evening time.

The rabbits (does) were divided into five (5) treatments, each treatment having three (3) replicates which contained one (1) doe. One buck of New Zealand White breed was used during the experiment. The nest boxes were lined with shredded newspaper. Does that did not pull hair to line the boxes were helped in pulling the hair on their underside to line the nest boxes. In cases where the does kindle on the floor of the hutch; the kits were carefully removed and placed in the nest boxes. The kindling dates were noted, and the litter weight were taken and recorded immediately kindling was discovered or few hours thereafter. Kits were then weighed on a weekly basis and mortalities adequately recorded. Talcum powder was sprinkled on the kits and rubbed on the nose of the doe after each handling of the kits. The kits were weaned 4 weeks old. Data collected was subjected to analysis of variance (ANOVA) according to the method of steel and Torrie (1960), while the experiment design was Completely Randomized Design (C.R.D).

Results and Discussion

Observation showed that almost all the does mated during their first introduction to the bucks when they were about 150-180 days old. It was also observed that pregnant does refused mating 4 days post partum. The fecundity performances of all the treatments are as shown in label 2. The litter size at birth varied significantly between 6-8 kits ($P<0.05$). The treatment 2 (7days) had the lowest value. The values decreased somewhat with increase in re-mating interval. But this was in disagreement to Dickerison, (1960) as cited by Ikeobi, (2006) that litter size increases with increasing parity especially from first on second births.

The litter weights were significantly difference ($P<0.05$) in the litter weight of the kits. Treatment 2 (7days) had the highest litter weight followed by treatment 4(21 days), treatment 3 (14 days), treatment 5 (28days control) and treatment 1(0 day,) with the least men value. This could be attributed to the number of litters at birth. This is in line with Venge (1953) that litter decrease in average litter weight at birth with increasing size of litter. Secondly, it may be due to the doe`s weight. This is in contrast to Ikeobi (2006), that doe weight had no significant effect on litter weight at birth.

In weaning weight, he result showed no significant difference (P>0.05) on litters. In table 2 below, treatment 5 (28days) had the highest weight at weaning followed by treatment 4, treatment 2 and treatment 1 gad the least value. This may be due to the weight of the doe, which disagrees with Ikeobi (2006) that doe weight significantly affected litter weight at weaning. Doe weight at kindling had no significant difference (P>0.05).The table below shows that treatment 4(21days) had the highest weight followed by treatment 5 (28days, control), treatment 2 (7days), treatment 3(14days) and treatment 1 (0 day) respectively. This could be attributed to flushing of the doe with crude protein (CP). This is similar to the report by Ozimba *et al.* (1991) that does flushed and maintained on 16% or18% crude protein (CP) during pregnancy had a lower weight at birth.

Doe weight at weaning also had no significant difference (P>0.05) at weaning stage. Treatment 2 (7days) had the highest weaning weight followed by treatment 5(28days control), treatment 4 (21 days), treatment 3(14 days) and treatment 1(0 day) respectively. This may be due to the low body weight of the doe. This is disagreed by Ikeobi (2006) that a higher body weight at weaning results in a better productive performance in the first parity.

Mortality, the result shows a significant difference (P>0.05) on the litter mortality. In the table below, treatment 1(0 day) had the highest rate of mortality followed by treatment 2(7days) and treatment 3(4days), while treatment 4(21 days) and treatment 5(28days, control) had no mortality case. This may be due to energy intake by the doe and seasonal influence. The reason on energy agrees with the report by Quevedo *et al.* (2006) that does receiving high-energy diet before parturition had lower mortality. While reason on seasonal influences as reported by Yahaya (1993), agrees that does that kindled in the hot-dry and cool wet-wet season.

Gestation had no significant difference (P>0.05) in the gestation period. Treatment 1 (0 day), treatment 2 (7 days) and treatment 4 (21 days) had the highest number of gestation period, followed by treatment 5 (28 days) and treatment 3(14 days) respectively. This may be due to low-energy intake of the doe received during the first 4 weeks of gestation. This is in line with Quevedo *et al.* (2006) that does receiving low-energy diet until 28th day of gestation showed a significantly low number of kits born alive.

CONCLUSION

It can be concluded from the study that line of mating that gives a higher litter size with no adverse effect on litter weight, doe weight, gestation and mortality are to be considered. Based on this, T_1 and T_3 with the mating intervals of 0 day and 14 days after kindling had the highest litter sizes with good average litter and doe weights, gestation, while mortality was recorded in T_1 while no mortality in T_3, followed by T_4 and T_5 with the mating intervals of 21 and 28 days respectively, while the least in litter size is T_2 with 7 days mating interval after kindling.

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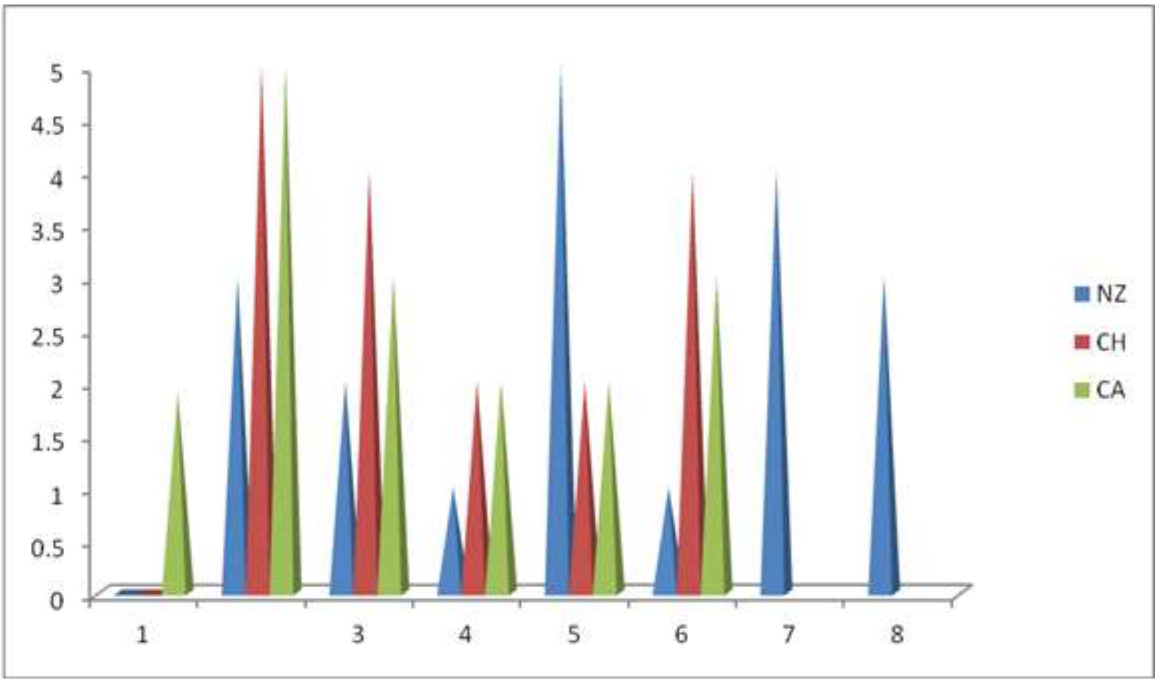
Table 1: Effect of Crossing Rabbits on Litter Traits Performance

Parameters	Treatment					
Litter size	**0**	**7**	**14**	**21**	**28**	**SEM**
Litter weight (g)	8^{a}	6^{c}	8^{a}	7^{b}	7^{b}	0.75
Weaning weight	75^{c}	150^{a}	100^{b}	110^{b}	100^{b}	24.41
Weaning weight	200^{c}	200^{c}	250^{b}	263^{b}	300^{a}	38.46
Doe weight at kindling	1800^{c}	2010^{d}	2000^{d}	2500^{a}	2400^{b}	264.30
Doe weight at weaning	1950^{a}	2115^{a}	1950^{a}	1981^{a}	2000^{a}	60.96
Mortality	4^{a}	1^{b}	0^{b}	0^{b}	0^{b}	1.55
Gestation	30^{a}	30^{a}	28^{c}	30^{a}	29^{b}	0.80

a, b, c, d- values within the same row with different super scripts have significant variations ($P<0.05$).



Numbers of Youngs Kindled Alive

Figure 1: Frequency Distribution for Number of Young Kindled Alive

NZ - New Zealand White
CH - Chinchilla
CA - California

Reference to this paper should be made follows: P.C. Okiyi, and H.C. Edoh (2014), Effect of Different Mating Intervals on Litter Size of Rabbits. *J. of Sciences and Multidisciplinary Research,* Vol. 6, No. 1, Pp. 41 – 45.