EFFECT OF BODY WEIGHT AT FIRST MATING ON REPRODUCTIVE PERFORMANCE OF RABBIT DOES

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ABSTRACT
Eighteen mature nulliparous rabbit does with initial body weight between 1600g-2500g were used to evaluate the effect of body weight at first mating on reproductive performance of rabbit does. These rabbits were assigned into three treatments, with T1, T2 and T3 weighing (1600-1900), (1901-2200) and (2201-2500) respectively. The study lasted for 5weeks. The does were mated with buck at ratio 1:3. The reproductive parameters evaluated were number of does that kindled, litter size at birth, breeding efficiency, litter size at weaning, pre-weaning loss. All data collected were subjected to descriptive statistical representation. The highest number of kindled does was 5 in T2 and T3; T1 had the lowest number (3). Breeding efficiency of 83.33% was recorded in T1 and T2 while T3 had 50.00%. T3 had highest average birth weight (49.51g) and T2 had the least (41.51g); litter size at birth and weaning ranged from 18 -28kits and 15-24kits respectively.T2 does recorded highest value in both parameters, T3 does recorded same value (28kits) for litter size at birth. Highest pre-weaning loss of 7kits was recorded from does in T3 while T1 and T2 recorded 4kits. It was therefore concluded that does with weight range 1901g – 2200g had better reproductive performance with highest breeding efficiency and lower pre-weaning loss.
Key words: Rabbit does, body weight, reproductive performance

INTRODUCTION
Rabbit farming is becoming more attractive to many animal breeders due to its high fecundity, high mothering ability, adaptability to a wide range of conditions, high genetic variability, high roughage utilization and low cost of production (Das and Yadav, 2007). Reproductive performance is the main factor which assures high productivity on rabbit farms. This requires that the management practices take into account the physiology and behaviour of the animals. For great profit a special attention must be focused on these traits, so studying factors that directly affect them are so important and must be taken into consideration during breeding of any productive species. Rabbit does experience a severe energy deficit during the first lactation; they tend to lose weight after their first litter until the kindling of second litter. This is due to the high energy needs of foetal growth combined with the drop in the feed intake during the last 10 days of gestation. This weight loss by first litter doe accounts for a drop in reproductive performance and a high replacement rate of young does (Rommers *et al*., 2002). Likewise does are often fed to appetite during rearing, and first mating is recommended at approximately 75 to 80% of mature body weight (Lebas *et al*., 1986). In modern management, young does are not mated at a fixed body weight but at a fixed age. Under *ad libitum* feeding conditions during rearing, heavy does can develop according to their growth potential, and body weight differences at first mating will be substantial. At the same age, heavy does can benefit from the extra amount of body weight at the end of rearing to withstand the energy deficit during first lactation. Rommers *et al*. (2002) reported that body weight did affect productive performance in the first parity. Although heavy does were heavier at first mating and remained heavier throughout the reproductive period, they followed a similar body weight curve after weaning the first litter as small and medium does. Hence, this study evaluated the effect of body weight at first mating on reproductive performance of rabbit does.

MATERIALS AND METHODS
Experimental Site
The experiment was carried out at the Rabbitry Unit, Teaching and Research Farm Development (TREFAD), College of Animal Science and Livestock Production Farm, Federal University of Agriculture Abeokuta. It falls within the rainforest vegetation zone of South West Nigeria on the latitude 7◦S 13'49.66'N and longitude 3◦ 26'11.98 E 76m above sea level (Google earth, 2018). The

climate is tropical humid with a mean annual rainfall of 1037mm, a temperature of 43◦C and a relative humidity of 82%.

Experimental Animals and Management

A total of 18 mature nulliparous rabbit does and 6 bucks (mixed breeds) were purchased from a reputable farm in Abeokuta, Ogun State. The does were distributed into three treatments, of six does per treatment. Each treatment was further subdivided into six replicates consisting of one does per replicate. On the arrival of the rabbits, they were given feed and water containing anti-stress (Maxiyield). The rabbits were allowed to acclimatize with the environment for one week (7 days) before the commencement of the experiment. The hutches and equipment that were used were thoroughly washed and disinfected with morigard before stocking the rabbits. The rabbits were kept in hutches equipped with concrete pots of feeders and drinkers. They were supplied with clean water in concrete drinkers and fed on commercial diet (Table 1) in concrete feeders and were also given *Tridax procumbens* twice a week. The droppings were swept off every day, and the rabbit were observed for any sign of illness.

Table 1: Nutrient Composition of the Commercial Feed (As Declared)

Parameter	Value
Crude Protein (%)	16.00
Fats and Oil (%)	5.00
Crude Fibre (%)	7.00
Calcium (%)	1.60
Available Phosphorus (%)	0.45
Lysine (%)	0.75
Methionine (%)	0.36
Salt (%)	0.30
Metabolizable Energy (kcal/kg)	2450

Experimental Procedure

The does were mated with a mating ratio of 1:3. The doe were hand mated in the morning and evening; the bucks were allowed to ride 3-4 times before the does were withdrawn. Pregnancy test was carried out on the does by palpating at the 14th and 20th day after mating. Clean and well disinfected kindling boxes were provided for the does to make nest of fur in preparation for birth. The rabbits were weighed on the day of kindling and subsequent weighing was done every week. Gloves were used for handling the kits.

Eexperimental treatments

Treatment 1: Does weighing between 1600 – 1900g
Treatment 2: Does weighing between 1900 – 2200g
Treatment 3: Does weighing between 2200 – 2500g

Data Collection

Data were collected on breeding efficiency (percentage of kindled does), litter size at birth (number of kits per doe at birth), litter size at weaning (number of kits per doe at weaning), average birth weight (weight of kits of a doe at birth divide by the total number of the kits), pre weaning loss (number of kits that died before weaning) and gestation length (difference between conception date and kindling date).

Statistical Analysis

All data obtained was analysed through the use of descriptive statistical tools.

RESULTS

The effect of body weight at first mating on reproductive performance of rabbit does are presented in Figure 1 and Figure 2 below. Figure 1 shows the effect of body weight at first mating on number of kindled does, gestation length and breeding efficiency. The number of does that kindled ranges from 3 to 5 with the does in T2 and T3 recording the highest breeding efficiency (83.33%) and does in T1 recording the lowest breeding efficiency (50.00%) respectively. The gestation length is longer in does in T1 and T3 with duration of 32days while the does in T2 recorded shorter with duration of 31days. The effect of body weight on average birth weight, litter size at birth, litter size at weaning and pre-weaning loss is presented in figure 2. The average birth weight of the kits ranged from 41.57g to 49.57g. Kits from does in T3 had highest (49.57g) while kits from T2 recorded the least (41.57g) average birth weight. Litter size at birth and weaning ranged from 18 to 28 and 15 to 24 respectively with the does from T2 recording the highest values for both parameters while does from T3 also recorded the same value (28) for litter size at birth. The highest pre-weaning loss of 7 was recorded from does in T3 while does in T1 and T2 recorded same pre weaning loss of 4 kits.

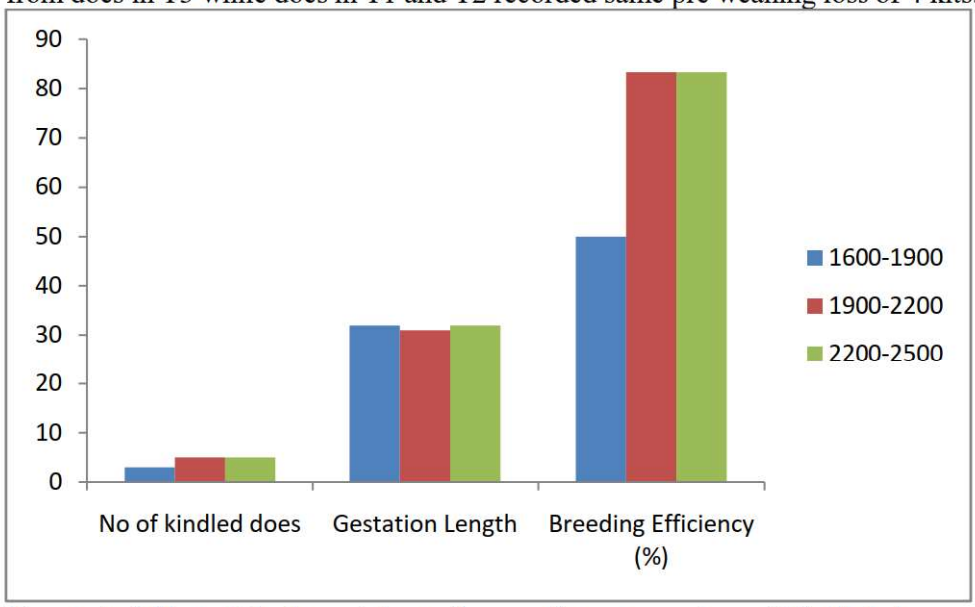


Figure 1: Effect of body weight at first mating on number of kindled does, gestation length and breeding efficiency.

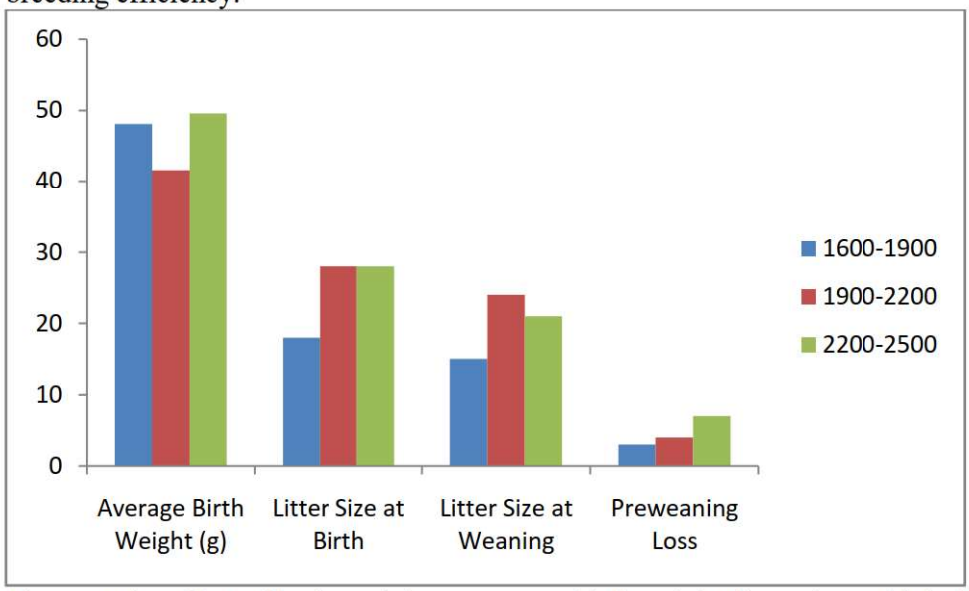


Figure 2: the effect of body weight on average birth weight, litter size at birth, litter size at weaning and pre-weaning loss.

DISCUSSION

The result obtained from does with weight between 1600-1900g having lower breeding efficiency, litter size at birth and litter size at weaning could be as a result of small body size and insufficient body reserve with a possible reduction in the milk production of the does and hence resulting in lower reproductive performance. This result is in line with the report of Szendrő *et al*., (2002) that the insemination of animals with lower body weight has been related to lower fertility and smaller litter size at first parturition (Rommers *et al*., 2001 and 2002). Rabbit does are susceptible to a severe energy deficit during first lactation (Xiccato, 1996), resulting in a decreased reproductive performance. Heavy does are more matured and have more body reserves (protein and fat tissue) which enable them to better resist energy deficit during first lactation, resulting in a better performance (Rommers *et al*., 2004).Gestation duration ranged from 31 to 32days gestation length in rabbit respectively is fixed and only varies within a very narrow gap as observed in this study; similar observation was made by Ajayi *et al*., (2005).The highest numerical value recorded for litter size at birth and weaning by does weighing between 1900 and 2200g shows that increased body weight improved reproductive performance at first parity. According to Inglis (1980), litter size and birth weight vary depending on the breed and size of the dam. Factors that increase litter size include the age at which the does are served and the optimum weight at service, which is an index of breed (Hafez and Hafez, 2000).

CONCLUSION

The study concluded that does with weight range 1901g – 2200g had better reproductive performance with highest breeding efficiency and lower pre-weaning loss.

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