

## STUDIES ON THE PRODUCTION EFFECT OF RABBIT DOES IN DIFFERENT REPRODUCTION RHYTHMS

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**Resumo:** Este estudo foi baseado na sincronização estral e na tecnologia da inseminação artificial e comparou a produtividade de coelhas em diferentes ritmos reprodutivos, buscando-se ritmos mais adequados para criações em larga escala na China. Os resultados experimentais mostram que: em quatro ciclos consecutivos, totalizando 761 inseminações artificiais, a fertilidade das coelhas foi estável e mais de 74% dos partos foram obtidos dentro de um intervalo entre partos (IE) de 49 dias; A fertilidade das coelhas se reduziu significativamente no IEP de 42 dias. O tamanho e peso da ninhada, número de nascidos vivos e peso dos láparos tiveram também uma melhoria significativa dentro do IEP de 49 dias. O peso corporal das coelhas obtidos dentro do IEP de 49 dias apontam a uma tendência de desenvolvimento mais estável. O peso corporal obtido no quarto parto apresentou ligeira mudança quando comparada ao terceiro. A partir do quarto parto as coelhas apresentaram estabilização em seu desenvolvimento corporal. O crescimento e desenvolvimento do láparos no IEP de 49 dias foi melhor que aqueles observados em IEP de 42 dias. Assim, o IEP de 49 dias se apresentou melhor ajustado para coelhas reprodutivas que o IEP de 42 dias.

**Keywords:** reproductive performance, rabbit does, 49-days reproduction rhythm, 42-days reproduction rhythm



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### Introduction

The periodical breeding model is based on the technique of estrus synchronization and artificial insemination, and carries out the reproductive work of the female rabbit through a fixed cycle, and realizes the synchronization of estrus, breeding, delivery, weaning and slaughter of the batch females. The reproductive cycle adopted by large-scale rabbit farms is generally very short, usually 49 days, 42 days or 35 days. This reproductive cycle requires high female breeder selection and body condition. Because the female's gestation period accounts for most of the reproductive cycle, when the female rabbit is in the lactation phase, artificial insemination is performed. Therefore, the lactation period of the female rabbit overlaps with the gestation period. In the 49-days of reproductive rhythm, the pups were weaned for 35 days. After weaning, the female does were given 14 days' rest time for the nest of the labor. There are a small number of rabbit farms that adopted this 49-days reproductive rhythm in China. The 42-days reproductive rhythm was achieved by artificial insemination on the 11th day after birth in the breeding female rabbit. Most farms in Europe use a 42-day reproduction model.

In this study, we compared the 42-days of reproductive rhythm and 49-days of reproductive rhythm. It is convenient for scientific and planned production management in large-scale rabbit farms.

### Material and methods

Two hundred and sixteen rabbit does were divided into two groups. The two groups of rabbit does were reared under 42-days of reproductive rhythm and 49-days of reproductive rhythm and we compared the three aspects on the reproductive performance of does, the change of does' body condition (body weight) and young rabbits' growth and development. The lighting schedule was 16L: 8D from 6 days before AI to 11 days after AI, with lighting from 06:00 am to 22:00 pm every day. The rest of the time, they were in natural light. All animal experiments and treatments

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were approved and supervised by the Animal Welfare Committee of China Agricultural University (Permit Number: XK662).

### Results and discussion

The experimental results show that in four consecutive tires totaling seven hundred and sixty-one times artificial insemination, the fertility of does was stable and more than 74% in the 49-days reproductive rhythm; the fertility of does significantly decreased in the 42-days reproduction rhythm, the fertility of does of the fourth parity (57.14%) was significantly lower than the first three parities. Litter size, live litter size, litter weight and kit weight also had a significant advantage with the 49-days reproduction rhythm (Table 1).

Table 1 Comparison the reproductive performance of 49-days reproduction rhythm with 42-days reproduction rhythm

Reproduction rhythm	parity	No. of AI	Kindling rate (%)	Litter size	live litter size	litter weight(g)	kit weight(g)
42-days	1th	108	88.89 a	9.13±0.27a	8.70±0.29a	441.68±15.40b	52.70±0.71c
	2th	104	79.81 ab	7.76±0.32b	6.59±0.34b	364.35±16.01c	53.05±0.87c
	3th	99	71.72 ab	9.03±0.35a	8.71±0.38a	568.00±21.28	64.88±1.44b
	4th	70	57.14 c	9.24±0.51a	8.70±0.51a	611.06±29.08a	72.63±2.21a
49-days	1th	105	82.86 a	9.37±0.30b	9.02±0.32b	448.54±14.41c	52.01±0.81c
	2th	102	82.35 a	8.49±0.38b	7.88±0.40c	444.01±21.30c	56.19±0.86b
	3th	97	74.23 a	9.58±0.43b	9.30±0.42b	599.58±21.28b	65.32±1.49a
	4th	76	75.00 a	11.19±0.44a	10.88±0.45a	797.35±30.53a	70.67±2.64a

Different letters in the same column (a, b, c) represent significant differences,  $P < 0.05$ .

According to kits growth and development, we can figure out that the growth and development of young rabbits of the first parity in two groups were insignificant. But with the increasing of the parity, the growth and development of young rabbits in the 49-days reproduction rhythm is better than the kits in the 42-days reproduction rhythm (Table 2). Thus, the 49-days reproduction rhythm was more moderate for rabbit does than the 42-days reproduction rhythm.



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CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

Table 2 Comparison the growth and development of young rabbits of different reproduction rhythm

reproduction rhythm	1th parity		2th parity		3th parity		4th parity	
	42-days	49-days	42-days	49-days	42-days	49-days	42-days	49-days
Litter size								
7d	7.22±0.16a	7.13±0.17a	5.98±0.21b	7.04±0.17a	7.96±0.15a	7.65±0.21a	7.00±0.20b	8.34±0.14a
14d	7.22±0.18a	7.16±0.16a	5.93±0.21b	6.55±0.15a	7.94±0.19a	7.61±0.21a	6.81±0.19b	8.15±0.17a
21d	7.20±0.16a	6.91±0.20a	5.90±0.19b	6.56±0.17a	7.85±0.22a	7.58±0.20a	6.72±0.18b	7.62±0.19a
28d	7.14±0.19a	6.83±0.22a	5.88±0.17b	6.45±0.19a	7.61±0.29a	7.55±0.22a	6.71±0.15b	7.62±0.30a
35d	7.03±0.17a	6.71±0.23a	5.84±0.19b	6.38±0.17a			6.39±0.21b	7.34±0.28a
litter weight (g)								
7d	863.37±22.72a	812.05±25.17a	641.60±25.66b	983.45±27.71a	1152.29±29.07b	1400.65±34.39a	1239.06±44.22a	1489.43±32.06a
14d	1487.93±34.35a	1446.35±36.12a	1329.05±49.37b	1582.62±37.11a	1901.66±49.33b	2424.64±72.70a	2102.78±66.60b	2503.37±66.56a
21d	2059.58±42.67a	2007.92±59.24a	1768.47±54.14b	2400.21±53.59a	2871.89±74.14b	3147.18±84.34a	3486.53±93.90b	3998.37±78.11a
28d	3143.11±79.57a	3110.32±93.77a	3451.32±90.59b	3917.21±111.85a	4027.83±179.7a	4343.08±119.01a	4639.29±137.98b	5239.06±147.97a
35d	5039.47±108.31a	4945.90±198.23a	4921.87±136.54b	5322.43±145.03a			5976.69±225.86b	6756.60±220.34a
kit weight (g)								
7d	119.12±2.13a	114.99±2.53a	107.87±2.61b	140.07±2.40a	146.16±2.31b	186.10±2.91a	177.32±4.29a	171.58±18.39a
14d	209.99±3.46a	202.82±3.38a	228.51±6.25b	244.41±3.53a	239.92±3.21b	320.32±5.53a	309.40±7.17a	303.07±6.96a
21d	290.03±4.51a	293.57±4.67a	306.15±9.15b	373.24±6.12a	374.00±8.50b	424.24±6.26a	521.32±9.13a	519.93±9.72a
28d	441.65±6.44b	464.90±8.97a	582.51±10.14b	613.00±10.03a	537.67±6.49b	573.98±8.01a	690.56±13.76a	686.45±7.90a
35d	724.74±9.64b	751.80±20.80a	849.70±21.71a	848.65±12.74a			930.52±16.87a	921.32±14.48a

Different letters in the same column (a, b, c) represent significant differences,  $P < 0.05$ .

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### Conclusion

We concluded that the reproductive performance and the growth and development of young rabbits in the 49-days reproduction rhythm is better than the kits in the 42-days reproduction rhythm.

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