SEASONALS PARTICULARITY OF THE REPRODUCTIVE PERFORMANCES OF DOMESTIC RABBITS AND OPPORTUNITIES OF THEIR RECOVERY

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Abstract

The influence of the season on the main reproductive indices of rabbits and possibilities of their correction was studded. The experiment concerning evaluating the reproductive performances of rabbits depending on the season: fecundity, prolificacy, viability and survival rate of kittens (young rabbits) and the influence of the bio additive „Spiru^{Zn}" administration. According to the results established, concerning the indices reflecting the seasonal influence on rabbits' reproduction results, the lowest values of fecundity were established in the case of mating made in the period of autumn-winter months. The smallest prolificacy was established in the case of births in the winter months. The lowest kitten viability at birth was in the case of autumn births and kitten survival at weaning - in the case of summer births. Thus, the season influences differently rabbits' reproductive indices. The bio additive „Spiru^{Zn}" administered to does in the autumn months contributed to a significant improvement of fecundity, does prolificacy, kitten viability and kitten survival in the period birth-weaning, compared with the witness group.

Key words: Rabbitts. Reproductive performances. Seasonal particularity. Bio additive „Spiru^{Zn}"

INTRODUCTION

At the basis of rabbits' biological potential, as well as of other animal species, there is the genetic improvement of animal populations [1; 2; 5] and also of the breeding techniques. Therefore, to improve the reproductive activity it is necessary to know thoroughly the physiological peculiarities of rabbits' reproduction and also the factors determining the efficiency of rabbits' reproduction.

In order to achieve the objectives established in the Final Paper, during the year we have accomplished an analytical study of the indices which characterize the reproductive capacity of females raised in the individual farm.

According to the data from literature, the main indices revealing the functioning of the genital apparatus are influenced by numerous external factors, especially by the seasonal ones, and also by the geographical zone, as the temperature, duration of daylight and nutritional factors very much [2; 3].

The purpose of research – to study the influence of the season on the main reproductive indices of rabbits and possibilities of their correction.

MATERIAL AND METHOD

The represent researches have been carried out during the period 2014 - 2015, within an individual farm which raises Soviet Chinchilla breed of rabbits and rabbit hybrids (♀Soviet Chinchilla x ♂ Grey Giant; ♀Soviet Chinchilla x ♂White Giant). The experiment concerning evaluating the reproductive performances of rabbits depending on the season: fecundity, prolificacy, viability and survival rate of kittens (young rabbits) and the influence of the bio additive „*Spiru*^{Zn}" administration on the reproductive indices. The bio additive „*Spiru*^{Zn}" is obtained in the laboratory „Collections of microorganisms" of the Institute of Microbiology and Biotechnology of ASM [4] from *Spirulina Platensis* algal biomass and it is presented in green-blue

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powder: proteins (61 + 68%), essential and non-essential aminoacides, carbs (10,9 – 12.2%), lipids (5.46–7.05)%, Gamma-linolenic acid, the precursor of arachidonic acid, is important in the synthesis of prostaglandins PGF_2 and $PGF_{2\text{-alifa}}$ (1.1%), ficobiliproteins (9–10%), zinc, one of the main antioxidant and immunomodulation bio elements (0.3–0.39%).

The preparation was administered with combined fodder during 15 days before the planned mating and 15 days after the mating, 250 mg powder/per capita/days, in september and October, periods when the fecundity reduces sharply from 80 - 85% to 20 - 25% [5].

RESULTS AND DISCUSSIONS

Data analysis regarding the influence of the season on the fecundity of females from the breeding nucleus indicates that the results differ essentially during the whole year. According to the analyzed figures, the best results of the fecundity rate were obtained in the period spring-summer.

Does fecundity in may was of 100%. In June this index was of 83.33%. In winter, females' fecundity varied from 66.67% to 75.0%. The lowest results were established in september when this index equaled 50%. In december, the rate of inseminated females was of 60.0%.

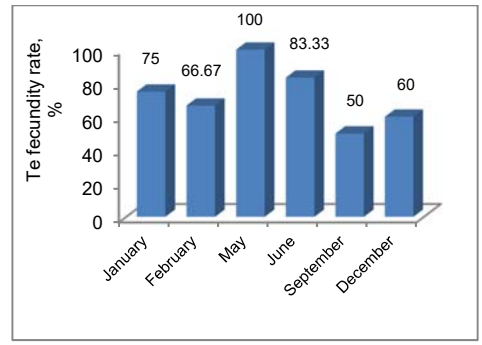

Fig. 1 The influence of season on the fecundity rate of does

The obtained experimental data (Tab. 1) indicate that the prolificacy of does has a seasonal character. Both the total number of kittens and the number of viable kittens in the nest at birth is the highest in the period spring-summer (april, may and june).

Table 1 Average value of the reproductive indices of rabbits raised in the individual farm

Specification	Fecundity, %	The number of kittens in the nest at birth, *heads*		Viability at birth, %	The number of viable kittens in the nest at weaning, *heads*	Survival rate, %
Winter	70.83	7	6.8	97	6.6	97.06
Spring	100	8	7.75	97.87	7.5	97.77
Summer	83.33	8	8	100	7.5	93.75
Autumn	50	7.5	7	93.33	6.8	97.14
$X \pm m_x$	76.04± 10.53	7.6± 0.24	7.39± 0.29	97.05± 1.39	7.1± 0.23	96.43± 0.91

The best results regarding kitten viability were obtained in the period of summer (June). In this period, kitten viability in the nest was of 100%.

In winter, both the number of kittens in the nest at birth and the number of viable kittens was smaller in comparison with the value of these indices in other seasons.

When rabbits give birth in the spring months (april-may), there can be noticed a decrease of viable kittens in the nest by 0,25 heads or 2,13%, if compared to summer period.

The birth in the autumn months (September-december), the number of kittens in the nest (prolificacy) and viability of kittens at birth continue to decrease. The prolificacy decreases by 0,5 heads or 6,25%, if compared to the value established in the spring-summer months, and kitten viability in the nest at birth is smaller by 9,68% in comparison with the same indices established in the spring months.

The lowest results were established in the case of winter months' births (december,

february). The number of kittens in the nest at birth reduced compared with the period spring-summer by 12.5% and by 6.67% compared with the autumn period.

Kitten viability in the nest at birth (viability) reduced by 12.26% compared with the value of this index in spring and compared with the births in the summer period, the rate of viable kittens was smaller by 15,0%. Kitten viability compared with the autumn months is smaller by 2.86%.

On the basis of established data (Tab. 1) we can underline that in the breeding and feeding conditions created in the individual farm both the prolificacy of does and the viability of kittens, during the year, differ from a season to another and also certain individual peculiarities can be noted within the group. It is necessary to take into consideration all these facts when elaborating the plan of mating (natural insemination), in order to use completely the reproductive potential of the female rabbits.

The kitten viability in the nest oscillates in the limits of 93.33% - 100% during the year. The highest results have been noticed in summer with insignificant deviations in winter and spring births.

Kitten survival in the lactation period represents the number of viable kittens at weaning. This is a very important zoo-economic index which characterizes the efficiency of young rabbits' survival.

According to the results presented we can mention that the viability of kittens differs significantly during the year. The highest results were established when female rabbits gave birth during the period spring-summer. At weaning, there have been obtained 7.5 kittens from a single doe. When comparing these results with the values established in other seasons, we find out that there is a decrease of kitten viability by 9.34%. In the case of winter births, there was a decrease of the total number of weaned kittens by 12.0% compared with the period spring-summer and by 2.95% compared with the period of autumn. Similarly to the values of kitten prolificacy and viability at birth, the lowest results have been recorded when female rabbits gave birth in the winter period. During this period there haven't been recorded significant losses and kitten survival rate at birth till the weaning varied from 93.75% in the summer period up to 97.77% in spring. On average, kitten survival rate per year constitutes 96.43 % (Tab. 1)

According to data presented in table 1., on average, per year, female rabbits fecundity constitutes 76.04%, their prolificacy – 7.6 kittens, the rate of viable kittens in the nest at birth is about 97.05%, constituting 7.39 kittens/doe.

During the period birth-weaning, kitten losses constituted 3.57%. On average, at weaning there have been obtained 7.1 viable kittens. Kitten survival rate was of 96.43%. The highest results of survival have been recorded in the period of spring-summer months.

According to the results established during the year 2014-2015 concerning the indices reflecting the seasonal influence on rabbits' reproduction results, the lowest values of fecundity were established in the case of mattings made in the period of autumn-winter months (september, december). The smallest prolificacy was established in the case of births in the winter months (January, February). The lowest kitten viability at birth was in the case of autumn births (September, October) and kitten survival at weaning - in the case of summer births. Thus, the season influences differently rabbits' reproductive indices.

In order to improve the reproductive indices we experienced the influence of administering the bio additive „*Spiru*^{Zn}" on the prolificacy, kitten viability, survival rate and mortality of kittens. The obtained results regarding female fecundity after mating are presented in table 2.

Table 2 The influence of the „*Spiru*^{Zn}" on female fecundity

Specifi-cation	Insemina-ted females, *heads*	Preg-nant females, *heads*	The fecundity rates, %
1.Witnes group	9	5	55.5
2.Expe-rimental group	10	7	70

The presented data (Tab. 2) show that the administration of the bio additive „*Spiru*^{Zn}" to does in the preparation period for mating, as well as after the mating, has a positive influence on the fecundity. In the experimental group, the fecundity constituted 70% compared with 55.5% in the group of females that didn't receive this preparation. The difference between the value of this index in the experimental group and in the witness group was of 14.5%.

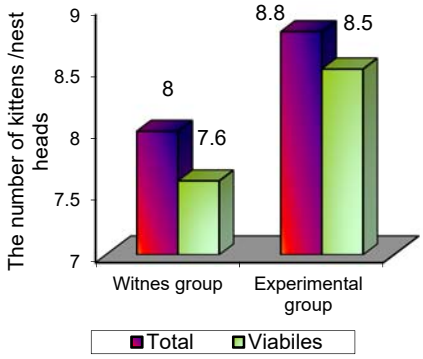

Fig. 2 The influence of the „*Spiru*^{Zn}" on the prolificacy and viability of kittens

The established experimental results (Fig. 2) prove that the administration of the bio additive to does produced positive effects on the prolificacy and viability of kittens in their prenatal development. Thus, the number of kittens in the nest at parturition in the experimental group prevails the results established in the witness group by 10% (Tab. 3).

The number of viable kittens in the nest at birth is bigger in the experimental group by 11,8% compared with the results obtained in the witness group. The rate of nonviable kittens in the witness group constituted 5,% compared with 3.41% in the experimental group or it reduced up to 1.59% in the experimental group.

The obtained experimental data regarding kitten survival from birth till the weaning are presented in figure 3.

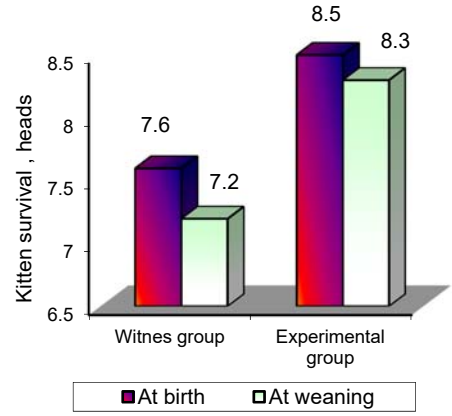

Fig. 3 The influence of the bio additive „*Spiru*^{Zn}" on kitten survival in the period birth-weaning

The analysis of presented data (Fig. 3) proves that kitten survival in the analyzed period is in favor of the experimental group. During this period, there have been recorded kitten losses in the witness group up to 5.27%. At the same time, kitten losses in the experimental group constituted 2.35%.

Table 3 The influence of the „*Spiru*^{Zn}" on female fecundity

Specification	Fecundity, %	Prolificacy, *heads*	Kitten viability, %	Kitten survival %
1.Witnes group	55.5	8	95.0	94.73
2.Experimental group	70	8,8	96.59	97.64
± with Witnes group,%	+14.5	+ 10.0	+1,.59	+2.91

Consequently, the administration of the bio additive „*Spiru*^{Zn}" to females stimulates and enhances kitten resistance, fact that enabled to increase the number of viable kittens at birth, reduce their mortality rate and obtain a greater number of young rabbits at weaning in the experimental group (Tab. 3).

CONCLUSIONS

The season influences differently the indices that characterize the reproduction results of rabbits:

- Females fecundity and prolificacy prevail in the spring-summer period; the lowest results of fecundity were established in the case of mating in the autumn-winter months (september, december).

- The greatest results regarding kitten viability at birth were established in the period spring-summer.

- Kitten survival in the period birth-weaning prevailed in the case of spring births.

- The bio additive „*Spiru*^{Zn}" administered to does in the autumn months contributed to a significant improvement of fecundity, does prolificacy, kitten viability and survival in the period birth-weaning, compared with the witness group.

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