Reproduction mode and Strain effects on Rabbit Breeding Performances

*K. Dekkiche, H. Hannani, A. Mennani, N. Ait Issad, D. Khelef and N. Mimoune**

Abstract

This study was carried out to determine the impact of the mode of reproduction and the strain (male and female) of rabbits on some zootechnical and reproduction parameters. For that, monitoring was carried out in 2019 in the region of Setif (North Eastern Algeria) on a semi-intensive breeding of 25 cross-breed rabbits. The statistical analysis showed a very highly significant effect of the mode of reproduction on the number of mating per fertilizing mating (*P*= 0.0001) with an average of 1 ± 0 in AI (Fertility rate of 80%), while it was of 1.45 ± 0.51 in natural breeding with a fertility rate of 61%. The weight of the rabbits at weaning was higher in AI than in natural mating (587.25 ± 338.19 g *vs.* 575.0 ± 375.44 g, respectively). The results relating to the number of total born, born alive, weaned rabbits, the farrowing-mating interval and the farrowing-fertilizing mating interval in natural mode were respectively of (7.4 ± 3.12), (4.55 ± 3.12), (4.55 ± 3.12), (12.65 ± 2.30), (19.15 ± 3.58); and in AI: (6.90 ± 4.12), (5.75 ± 4 .12), (5.75 ± 4.12), (11.65 ± 2.05), (18.99 ± 3.2) (*P*>0.05). Furthermore, and regarding the strains, data revealed that the females did not have any significant effect on the variables studied. On the contrary, the male had a very highly significant effect on the number of mating per fertilizing mating (p = 0.000), while it had no impact on the other parameters (*P*>0.05). To conclude, the control and the management of reproduction is the key to success in rabbit breeding, thus the combination of rearing condition and genetic effects is the main tool for making rabbit farming successful.

Key words: *strain; rabbit; reproduction; parameter; artificial insemination*

Introduction

The increasing human population in developing countries is coupled with the ever-increasing demand for animal source of protein (Fellous et al., 2012; Apori et al., 2014). In Algeria, rabbit farming can provide a significant source of protein, given the major deficiency of this nutrient (Zerrouki et al., 2004; Gacem et al., 2008). This farming has many advantages; among them, the great prolificacy of the species and its ability to transform fodder into consumable meat. It can convert the proteins contained in plants rich in cellulose, unusable by humans, into animal proteins

Khouloud DEKKICHE, Hania HANNANI, Department of Veterinary Sciences, Faculty of Natural and Life Sciences, Chadli Bendjedid University of El- Tarf 36,000, Algeria; Achour MENNANI, Department of agronomy, Faculty of Science, University of Msila, Algeria; Nassima AIT ISSAD, Djamel KHELEF, Nora MIMOUNE*, (Corresponding author, e-mail: nora.mimoune@gmail.com), Animal Health and Production Laboratory (SPA), Higher National Veterinary School, Algiers, Algeria

of high nutritional quality (Saidj et al., 2013). In the world, rabbit meat is increasingly recognized as a healthy meat food with high nutritional value (Petracci et al., 2009). Specifically, the production of rabbit meat in Algeria is estimated at 27,000 tonnes per year and could be greatly increased using local populations (Gacem and Lebas, 2000). The use of the rabbit is justified by its different attributes, since it has a short reproductive cycle, of approximately 30 to 32 days of gestation. They are prolific, with up to 40 to 60 kits per year, or approximately 8 to 12 kits per litter (Dalle Zotte, 2014). Particularly, local rabbit reared in Algeria is known to be well adapted to the climatic conditions of the area with a variable phenotype and prolificacy (Saidj et al., 2016).

Artificial insemination (AI) has become a consolidated practice in rabbit breeding; it optimizes human resources and increases the reproductive performance of animals (Dal Bosco et al., 2011). On the other hand, the development of rabbit farming in Algeria will require the introduction of AI technique in the farms. However, in this country, the application of this technology is primarily based on the determination of the reproductive capacities of both sexes. This was the background to the work we have carried out in order to study the effect of breeding methods and strains on the reproductive success of rabbit farming.

Materials and methods

Study area and period

This study was performed over a period from July 2018 to May 2019, in Setif region. From a geographical point of view, this area is located in North Eastern Algeria in the "Hauts-Plateaux". It is limited to the North by Bejaia and Jijel, the East by Mila, to the South by Batna and M'Sila and the West by Bordj Bou Arreridj. It occupies an area of 6,549.64 km2 and includes 60 municipalities distributed across 20 Daïras. It is characterized by a semi-arid continental climate, with hot, dry summers and cold, rainy winters. Rainfall is insufficient and irregular both in time and space.

Breeding conditions

Breeding building is constituted by two rooms: the maternity with an area of approximately 90 m^2 and the fattening of approximately 70 m^2. The cages are Flat Deck type, 45 for maternity and 80 for fattening with feeders fixed and linen drinkers with red teats (Figure 1).

Figure 1. Breeding building

The temperature varied between 16º-20ºC, and the humidity was between 80%-90%. For the lighting, the windows are the first source (in addition to the 1w lamps). We followed the program 16 hours of light per day. The food used was of granules (NUTRIVITAL) containing: barley (16%); sound (35%); soybean meal (12%); alfalfa (32%); limestone (0.5%); phosphate (0.5%); crushed straw (3%); CMV (1%).

Animals

The animals used consisted of cross-breed rabbits (25 rabbits: 20 females and 5 males), with a size and a weight that varied depending on the breed (between 3.5 kg -6.5 kg for females and 5.5 kg -6 kg for males), aged between 5 months-2 years.

In this study, we took the mode of reproduction, and the strain of male and female as factors to determine their effect on zootechnical parameters. We were interested to analyze the following variables: The number of total rabbits born, rabbits born alive and dead, weight at weaning, number of mating per fertilizing mating (M/FM), farrowing-mating interval (FMI), farrowing-fertilizing mating Interval (FFMI).

Reproduction protocol

Two methods of reproduction used on the same doe in a range of a litter at 21 days after farrowing: natural mating and artificial insemination.

Natural mode

We check if the female was in heat, so that the mating will be effective. To know if the rabbit was in the hormonal stage, so it will accept the male, the vulva must have a dark pink to red color, and of course, be in good health (Figure 2). In the cage of the male, the mating must take place. Once introduced into the cage, the

Figure 2. Natural mating

female was in the position: stretching and slightly raising its hindquarters. The male was then riding her and the mating was quickly carried out. We ensured that the female has been mated twice before removing her from the cage.

Artificial insemination

Preparation of a complete kit (artificial vagina + pyrex type + condom); Warming up the artificial vagina to reach the natural vagina temperature (37-40°C) using boiled water-Measuring the temperature of artificial vagina with a thermometer-Lubrication of artificial vagina with a lubricating gel to facilitate penis penetration and avoid trauma-Semen collection.

We placed the warning tube in polystyrene to avoid the negative effect of light on the sperm. Then, we measured out a drop of semen using a pipette on the slide. The observation of sperm was done under a microscope to have the mobility and viability of sperm. The semen was diluted with a pre-heated diluent to avoid thermal shock with the respect of the volume (3cc), then observed under a microscope. After that, AI was performed (Figure 3). During the protocol, we injected 0.2cc of PGF2α intramuscularly into each inseminated female to induce heat.

Ethical statement

All the animal studies were conducted with the utmost regard for animal welfare, and all animal rights issues were appropriately observed. No animal suffered during the course of the work. All the experiments were carried out according to the guidelines of the Institutional Animal Care Committee of the Algerian Higher Education and Scientific Research (Agreement Number 45/DGLPAG/DVA.SDA. 14).

Statistical analysis

Data were analyzed using PASW statistics software Version 18. Descriptive analysis and the Student 's T test were performed to study the effect of the mode of reproduction and the male and female strain on the success of the different zootechnical parameters. Data were expressed as Mean ± Standard deviation. The difference was considered as significant when $P<0.05$.

Results and discussion

Reproduction mode effect

The improvement of rearing conditions of the local rabbit requires a characterization of zootechnical and genetic parameters of breeding (Mefti korteby, 2016). Reproduction represents the first stage of production for breeders. It is crucial for the creation and transmission of genetic progress. The production comes mainly from local white populations with different colors of the fur (Saidj et al., 2013).

According to the statistical analysis, the results grouped in the table 1 demonstrated that the mode of reproduction had a very highly significant effect ($P=0.000$) on the number of M/FM with a mean of 1.22 ± 0.42. On the other hand, this parameter, had no impact on the number of total rabbits born, the number of rabbits born alive, weaned rabbits, weight at weaning, FMI and FFMI.

Other works reported different number and percentages about the same parameters in different countries (Some in agreement with our data, others not); weight at weaning joined the rabbit production standard which is 500 g (Kennou et Lebas, 1990; Jaouzi et al., 2006). On the other hand, the total weight was higher in crossbreed litters (Abdel-Azeem et al. 2007). In Algeria, Fellous et al. (2012) recorded the following results: 7.98 totals born, 7.59 born alive, 6.67 weaned per litter and 37.1 rabbits weaned per female. The average

Figure 3. Artificial insemination protocol

weights noticed at birth and at weaning of the young rabbit were respectively 52.1 g and 650 g. Mortality rates were 5.02 % for the stillbirth and 12.2 % between birth and weaning. More recently, in the same country, Boudour et al. (2020) revealed good prolificacy in a study performed in rabbits of the Algerian synthetic strain "ITELV 2006", conducted under artificial insemination (AI) with a semi-intensive rhythm: 9.5 ± 2.4 total births, including 8.4 ± 2.9 live births per farrowing and 7.4 ± 2.6 weaned per weaning, with fertility rates of 85.6 ± 35.1% at palpation and 69.7 ± 45.9% at farrowing. Adult weight of females at AI was 3584 ± 391 g. Rabbits weighed an average of 63 ± 13 g at birth and 490 ± 81 g at weaning. These authors found better

Table 1. Effect of reproduction mode on zootechnical parameters

Parameter	Mode of reproduction		Mean ± SD	*P value*
	Natural mating	AI		
Total born rabbits (n)	7.4 ± 3.12	6.90 ± 4.12	7.15 ± 3.61	0.66 (NS)
Rabbits born alive (n)	4.55 ± 3.12	5.75 ± 4.12	5.15 ± 3.66	0.30 (NS)
Weaned rabbits (n)	4.55 ± 3.12	5.75 ± 4.12	5.15 ± 3.66	0.30 (NS)
Weaning weight (g)	575.0 ± 375.44	587.25 ± 338.19	581.13 ± 343.51	0.91 (NS)
M/FM	1.45 ± 0.51	1 ± 0	1.22 ± 0.42	0.000***
FMI	12.65 ± 2.30	11.65 ± 2.05	12.65 ± 2.27	1 (NS)
FFMI	19.15 ± 3.58	18.99 ± 3.20	19.01 ± 3.54	1 (NS)

(NS): not significant

fertility parameters results than those reported by other authors on the same strain managed in natural mating system.

The divergence of the results can be linked to the breeding management (including AI technique), environmental conditions, and hormonal and physiological status of the animals (Mimoune et al, 2017; Belabbas et al., 2023a). Particularly, it can be attributed to the feed composition (Benali et al., 2018) not being adapted to the rabbit's physiological needs, and to genetic factors (Fellous et al., 2012).

Bolet et al. (2004) revealed that the more extensive the breeding conditions were, the better the performances were and the intensive farm with AI, recorded the worst results (maybe due to sanitary problems related to the gathering in one place of animals from many breeds and herds).

Akpo et al. (2018) during a work carried out in Benin, noticed that the number of the total born and live births were influenced by the receptivity of the females and that the color of vulva and lactation status influenced pregnancy rate. These authors concluded that their artificial insemination data in rabbit farming have been encouraging.

Male strain effects

It is well known that the reproductive performance of male is of economic importance. Male rabbits are one of the founding blocks of reproductive success, since one single male can impact the fertility and prolificacy of approximately one hundred females (Vizzarri et al., 2019).

In our study, data indicate that the male had a significant effect (P=0.02) on the number of M/FM (with an average of 1.22 ± 0.42). On the other hand, this strain didn't show any influence on the remaining variables (Table 2). According to the previous data, Ben Hamouda et al. (1990) found, after using bucks of improved exotic strains in mating local breed female, that the male had a positive effect on the number of rabbits weaned, the weight at weaning and at 77 days. In AI protocols, semen of old bucks generally presented worse quality (Laghouati et al., 2023).

Boudour et al. (2020) mentioned that research of the effect of the male can con-

Table 2. Effect of male strain on reproduction and zootechnical parameters

Variable	Male strain					Mean ± SD	*P value*
	1	3	8	10	12		
Total born rabbits	6.75 ±4.99	9.33±1.15	9.67±1.52	6.07±3.99	7.31±3.36	7.15± 3.61	0.43(NS)
Rabbits born alive	4.25±4.34	4.67± 4.16	4.33±0.57	4.50± 4.05	6.19±3.54	5.15± 3.66	0.72(NS)
Weaned rabbits	4.25 ±4.34	4.67 ±4.16	4.33±0.56	4.50±4.05	6.19±3.54	5.15 ±3.66	0.72(NS)
Weaning weight	612.50 ±440.4	333.33 ±305.5	950.00 ± 86.6	588.57 ±367.72	544.06 ±300.51	581.13 ±343.51	0.26(NS)
M/FM	1.5 ± 0.57[a]	1±0 [a]	2±0[b]	1.07± 0.26[a]	1.19±0.40 [a]	1.23±0.42[a]	0.02(**)
FMI	13± 2.44	10± 0	15 ±0	12.71± 2.19	12.56±2.33	12.65±2.27	0.10(NS)
FFMI	20.75± 4.57	20± 0	18.67±6.35	19.14 ±3.15	18.69 ±3.63	19.15± 3.54	0.87(NS)

(NS): not significant**, 1**: California, **3**: New Zealand, **8**: Rex, **10**: Bouscaud white, **12**: French giant butterfly.

Table 3. Effect of female strain on the different parameters

Parameter	Female strain								Mean ± SD	*P value*
	1	2	3	6	7	8	9	11		
Total born rabbits	8.50 ±5.68	5.50 ±3.78	8 ±2.78	5.5 ±6.36	5.50 ±5.52	6.75 ±1.25	8±0	5 ±7.07	7.15 ±3.61	0.75 (NS)
Rabbits born alive	6.75 ±5.31	2.50 ±2.38	5.67 ±3.36	2 ±2.82	5 ±4.76	5.25 ±3.59	6±0	5 ±7.07	5.15 ±3.66	0.71 (NS)
Weaned rabbits	6.75 ±5.31	2.50 ±2.38	5.67 ±3.36	2 ±2.82	5 ±4.76	5.25 ±3.59	6±0	5 ±7.07	5.15 ±3.66	0.71 (NS)
Weaning weight	476.25 ±328.26	687.50 ±462.55	635.56 ±306.69	500.70 ±07.10	521.50 ±421.06	475 ±340.34	725 ±176.77	375 ±530.33	581.13 ±343.51	0.91 (NS)
M/FM	1.25 ±0.50	1.5 ±0.57	1.22 ±0.42	1.5 ± 0.7	1±0	1±0	1±0	1.5± 0.7	1.23 ±0.42	0.54 (NS)
FMI	12.50 ± 2.82	13.5 ±1.73	13 ±2.37	15±0	11 ±1.15	11 ±1.15	10±0	15±0	12.65 ±2.72	0.07 (NS)
FFMI	18.50 ± 4.04	20.50 ±6.35	19.22 ±3.59	15±0	20±0	21 ±1.15	20±0	15±0	19.15 ±3.54	0.37 (NS)

(NS): not significant, **1**: California, **2**: butterfly, **3**: New Zealand, 6: goat, **8**: Rex, **9**: half-giant, **11**: chinchilla.

tribute, in addition to the sexual receptivity of the females at the time of AI, to improving the expression of the rabbits' reproductive performance. An important aspect is to determine the conditions under which the male is used, in order to obtain an optimum quantity and quality of sperm and therefore semen.

Female strain effects

The genotype of the mother and the fetuses plays an essential role in determining birth weight, parturition rate, and weaning, while the resulting litter weight depends essentially in addition to the genotype of the fetuses, on the mother's breast milk (Abdel-Azeem et al., 2007). More specifically, Belabbas et al. (2022) reported that the low birth weight of kits is affected by the uterine space per fetus and depended also on the blood supply, which could lead to physiological immaturity and failure to maintain the necessary body temperature, for kit survival in the first hours after farrowing.

Our results presented in table 3, showed that the female had no effect on the zootechnical parameters. Fertility, number of total born, born alive, and weaned were significantly higher ($P<0.05$) in male than female synthetic strains. Data are similar to that found by Brun and Rouvier (1988) who reported no interaction between the genotype of the mother and parity either for the total number born or the number of born alive. On the other hand, Brun et al. (2002) revealed that reproductive performances were predominantly influenced by the physiological status of the does at insemination (lactation stage and receptivity). Furthermore, a high rate of dead kits was noticed, in multiparous rather than nulliparous females and in lactating compared to non-lactating doe (Belabbas et al., 2023b).

Conclusion

At the end of our study, we can conclude that the control and management of reproduction is the key to success in rabbit breeding. The combination of breeding methods and the effect of genetics is the main tool for making breeding profitable. In particular, we have noted the effect of male strain as well as the mode of reproduction on the number of M/FM. The encouraging results obtained on the use of AI in these rabbits have shown the interest that its development represents in Algerian breeding.

References

1. ABDEL-AZEEM, A. S., A. M. ABDEL-AZIM, A. A. DARWISH and E. M. OMAR (2007): Litter traits in four pure breeds of rabbits and their crosses under prevailing environmental conditions of Egypt. The 5th Inter. Con. on Rabbit Prod. in Hot Clim., Hurghada, Egypt, pp. 39-51.
2. ABDEL-AZEEM, A.S., A. M. ABDEL-AZIM, A .A. DARWISH and E. M. OMAR (2007): Litter traits in four pure breeds of rabbits and their crosses under prevailing environmental conditions of Egypt. The 5th International Congress on Rabbit Production in Hot Climate. Hurghada, Egypt, pp. 39-51.
3. AKPO, Y., I. O. DOTCHÉ, P. TOBADA, Y. DJAGO, I. YOUSSAOABDOU KARIM and M. T. KPODÉKON (2018): Artificial insemination of common breed rabbits in Benin: diluters based on local products. Livest. Res. Rural. Dev. 30 (8).
4. BELABBAS, R., I. ILÈS, M. J. ARGENTE, R. EZZEOUG, H. AINBAZIZ and M. L. GARCÍA (2023a): Environmental and genetic factors affecting litter size components in rabbits. World Rabbit Sci. 31, 117-131. 10.4995/wrs.2023.18680
5. BELABBAS, R., R. EZZEROUG, A. BERBAR, M. DE LA LUZ GARCIA, G. ZITOUNI, D. TAALAZIZA, Z. BOUDJELLA, N. BOUDAHDIR, S. DISS and M. J. ARGENTE (2022b): Genetic Analyses of Rabbit Survival and Individual Birth Weight. Animals 12, 2695. 10.3390/ani12192695
6. BELABBAS, R., R. EZZEROUG, M. L. GARCÍA, A. BERBAR, G. ZITOUNI, D. TALAZIZA, Z. BOUDJELLA, N. BOUDAHDIR, S. DIS and M. J. ARGENTE (2023): Prenatal factors affecting the probability of survival between birth and weaning in rabbits. World Rabbit Sci. 31, 11-20. 10.4995/wrs.2023.18268
7. BEN HAMOUDA, M., S. KENNOUS and J. EL GAIED (1990): Croisement de lapins locaux avec la souche Hyla: résultats des performances de reproduction et de croissance en première génération. In: Rouvier, R. (ed.). *Races et populations locales méditerranéennes de lapins: gestion génétique et performances zootechniques*. Zaragoza: CIHEAM 103-108.
8. BENALI, N., H. AINBAZIZ, Y. DAHMANI, B. DJELLOUT, R. BELABBAS, S. TENNAH, S. ZENIA, M. CHERRANE and S. TEMIM (2018): Effet de la teneur énergétique de l'aliment sur les performances et certains paramètres biologiques de lapins en croissance. Livest. Res. Rural. Dev. 30 (3).

9. BOLET, G., J. M. BRUN, S. LECHEVESTRIER, M. LOPEZ and S. BOUCHER (2004): Evaluation of the reproductive performance of eight rabbit breeds on experimental farms. Anim. Res. 53, 59-65. 10.1051/animres:2003043.
10. BOUDOUR, K., H. LANKRI EL, N.D. ZERROUKI and A. AICHOUNI (2020): Performances of Algerian-synthetic-strain rabbits managed with artificial insemination: Effect of the season. Rev. Elev. Med. Vet. Pays Trop. 73, 91-98. 10.19182/remvt.31880.
11. BRUN, J. M. and R. ROUVIER (1988): Genetic parameters of litter and maternal weight traits in the cross of two selected rabbit strains. Genet. Sel. 20, 367-378.
12. BRUN, J. M., M. THEAU-CLÉMENT and G. BOLET (2002): The relationship between rabbit semen characteristics and reproductive performance after artificial insemination. Anim. Reprod. Sci. 70, 139-149. 10.1016/s0378-4320(01)00197-x
13. DAL BOSCO, A., P. G. REBOLLAR, C. BOITI, M. ZERANI and C. CASTELLINI (2011): Ovulation induction in rabbit does: current knowledge and perspectives. Anim. Reprod. Sci. 129, 106-117.
14. DALLE ZOTTE, A. (2014): Rabbit farming for meat purposes. Anim. Front. 4, 62-67.
15. FELLOUS, N., K. BEREKSI REGUIG and H. AIN BAZIZ (2012): Reproductive performance of local breed of Algerian rabbits raised in experimental station. Livest. Res. Rural. Dev. 24 (3).
16. GACEM, M. and F. LEBAS (2000): Rabbit husbandry in Algeria. Technical structure and evaluation of performances.7th World Rabbit Congress, Valencia Spain, 4-7 Juillet. World Rabbit Science, 8 (supplement.1) B pp. 75-80.
17. GACEM, M., N. ZERROUKI, F. LEBAS and G. BOLET (2008): Strategy for developing rabbit meat production in Algeria: creation and selection of a synthetic strain. In: 9th World Rabbit Congr. Verona, Italy, 10-13 June, pp. 85-89.
18. JAOUZI, T., A. BARKOK, L. EL MAHARZI, A. BOUZEKRAOUI and B. ARCHA (2006): Etude sur les systèmes de production cunicole au Maroc. Cunicult. Mag. 33, 99-110.
19. KENNOU, S. and F. LEBAS (1990): Résultats de reproduction des lapines locales tunisiennes élevées en colonies au sol. Options Méditerranéennes. Série Séminaires 8, 93-96.
20. KOUTINHOUIN G. B., A. K. I. YOUSSAO, T. M. KPODEKON, Y. DJAGO and R. HOUENON (2009): Impact of mother-litter separation on the fertility of lactating rabbits and litter size in southern Benin. Bulletin of Agronomic Research of Benin, 66, 13-18.
21. KPODEKON, M., Y. DJAGO, S. FAROUGOU, P. COUDERT and F. LEBAS (2004): Results of the technical management of four rabbit farms in Benin. Proceedings - 8th World Rabbit Congress - September 7-10 2004 - Puebla, Mexico, pp. 555-561.
22. LAGHOUATI, A., R. BELABBAS, S. MATTIOLI, A. DAL BOSCO, A. BENBERKANE, E. BRAVI, V. SILEONI, O. MARCONI and C. CASTELLINI (2023): Effect of an extender enriched with Algerian date palm pollen on chilled semen characteristics of rabbit bucks at different ages. World Rabbit Sci. 31, 133-145. 10.4995/wrs.2023.18703
23. MEFTI korteby, H. (2016): Heritability and correlation of the zootechnical performance of the Algerian local rabbit. Int. J. Adv. Res. Biol. Sci. 3, 36-41.
24. MIMOUNE, N., C. R. MESSAI, D. KHELEF, O. SALHI, M.Y. AZZOUZ and R. KAIDI (2017): Reproductive parameters and metabolic profile of repeat breeder cows. Livest. Res. Rural. Dev. 29 (8).
25. PETRACCI, M., M. BIANCHI and C. CAVANI (2009): Development of rabbit meat products fortified with n-3 polyunsaturated fatty acids. Nutrients 1, 111-118.
26. RISAM, K. S., G. K. DAS and V. BHASIN (2005): Rabbit for meat and wool production in India: A review. Indian J. Anim. Sci. 75, 365-382.
27. SAIDJ, D., H. AINBAZIZ, O. SALHI, J. L. HORNICK and N. MOULA (2016): Effect of dietary energy on productive and reproductive performance of Algerian local rabbit does and their litters. Anim. Nutr. Feed Technol. 16, 107-117.
28. SAIDJ, D., S. ALIOUAT, F. ARABI, S. KIROUANI, K. MERZEM, S. MERZOUD, I. MERZOUD and H. AINBAZIZ (2013): Farming rabbit in Algeria: a significant source of meat for rural families. Livest. Res. Rural. Dev. 25 (8).
29. SID, S., M. T. BENYOUCEF, H. MEFTI-KORTEBY and H. BOUDJENAH Variation in the Prolificacy of Local Does According to Genotype (Synthetic Strain and White Population). Revue Agrobiologia 8, 1001-1008.
30. VIZZARRI, F., M. PALAZZO, D. CASAMASSIMA, L. ONDRUSKA, M. MASSANYI, F. TIRPAK, G. FORMICKI, A. GREN and P. MASSANYI (2019): Lippia citriodora (verbascoside) extract supplementation: Effect on rabbit semen quality in vivo and in vitro. Czech J. Anim. Sci. 64, 1-10.
31. ZERROUKI, N. and F. LEBAS (2004): Evaluation of milk production of an Algerian local rabbit population raised in the Tizi- ouzou area (Kabylia). 8th WRC, Sept 7-10, Mexico 378-384.
32. ZERROUKI, N., R. HANNACHI, F. LEBAS and M. BERCHICHE (2008): Productivity of rabbit does of a white population in Algeria. 9th WRC, June 10-13, Verona-Italy, pp. 1643-1648.

Utjecaj načina reprodukcije i soja na učinkovitost razmnožavanja kunića

Khouloud DEKKICHE, Hania HANNANI, Department of Veterinary Sciences, Faculty of Natural and Life Sciences, Chadli Bendjedid University of El- Tarf 36,000, Algeria; Achour MENNANI, Department of agronomy, Faculty of Science, University of Msila, Algeria; Nassima AIT ISSAD, Djamel KHELEF, Nora MIMOUNE*, Animal Health and Production Laboratory (SPA), Higher National Veterinary School, Algiers, Algeria

Ova studija je provedena u svrhu utvrđivanja utjecaja načina reprodukcije i soja (za mužjaka i ženku) kunića na neke zootehničke i reprodukcijske parametre. U tu svrhu je 2019. godine obavljen nadzor u regiji Setif (sjeveroistočni Alžir) poluintenzivnog uzgoja 25 kunića križanaca. Statistička analiza je pokazala vrlo značajan utjecaj načina reprodukcije na broj parenja po parenju koje je dovelo do začeća (P=0,0001) s prosjekom od 1 ± 0 kod umjetno osjemenjivanja (stopa plodnosti od 80 %), dok je iznosila 1,45 ± 0,51 u prirodnom parenju sa stopom plodnosti od 61%. Masa kunića kod odbića je bila veća kod umjetnog osjemenjivanja nego kod parenja (587,25 ± 338,19 g, odnosno 575,0 ± 375,44 g). Rezultati u svezi s brojem ukupno okoćenih, živorođenih i odbijenih kunića te interval od okota do parenja koje je dovelo do začeća prirodnim načinom bio je (7,4 ± 3,12), (4,55 ± 3,12), (4,55 ± 3,12), (12,65 ± 2,30), odnosno (19,15 ± 3,58); a kod umjetnog osjemenjivanja: (6,90 ± 4,12), (5,75 ± 4,12), (5,75 ± 4,12), (11,65 ± 2,05), odnosno (18,99 ± 3,2) (P>0,05). Nadalje te u svezi sa sojevima, podatci su pokazali da ženke nisu imale značajnog utjecaja na proučavane varijable. S druge strane, mužjaci su imali vrlo značajan utjecaj na broj parenja po parenju koje je dovelo do začeća (P= 0,000), dok nije bilo utjecaja na druge parametre (P>0,05). Zaključno, kontrola i upravljanje reprodukcijom ključ su za uspjeh u uzgoju kunića, stoga je kombinacija uvjeta uzgoja i genetičkih učinaka glavni alat za uspješan uzgoj kunića.

Ključne riječi: *soj, kunić, reprodukcija, parametar, umjetno osjemenjivanje*