

# THE BREEDING OF HIGH-YIELDING RABBIT HYBRIDS IN RUSSIA

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With the purpose of increase the productivity of agricultural animals, obtaining species with a sound constitution and high resilience, as well as in order to develop new breeds and hybrids, animal breeding uses not only inter-breed crossing (interline crossing) but the crossing of different breeds as well. On this basis new high-yielding national rabbit breeds were developed (Soviet chinchilla, black brown, Russian stoat, Soviet marder, Butterfly, White wool breed and others). This approach was also used on farms, where heterosis is used to increase the productivity via two-way or three-way crossing [1].

In France over 20 years ago meat rabbit breeding was carried out but such companies as "ELKO", "INRA", "HILLA", and "DIVERS". Scientists of these companies came to the conclusion that in industrial rabbit breeding the optimal time for slaughter for meat was of rabbits with 2,2 – 2,4 kgs of live weight at 10 – 11 weeks of age (70 – 77 days).

Despite the detailed descriptions of the productive qualities in rabbit offspring there was no information about how to obtain the nucleus or parent stock.

At the present moment there is a number of large industrial enterprises (farms) in our country working with rabbits from French breeding, who are regularly required to

bring in day-old rabbit kits from abroad in order to keep up their parent stock. In order to decrease the dependability of domestic farmers on international supplies of stock we find a required and important task in the development of native hybrid cross breeds of rabbit.

Since 2011 at the experimental farm of the Scientific Research Institute of Fur-bearing Animal and Rabbit Breeding we have carried out research into the development of a meat rabbit hybrid (through crossing parents of three breeds – Soviet Chinchilla (SC), White Giant (WG) and Californian (C)) with the use of genetic markers for productivity. The primary goal is to obtain a low-fat meat in a short period of time. The starting material and the male parent as well as the best combination of breeds – male WG (male parent) and female SC (female parent) for a mixed breed meat rabbit hybrid [1]. At the present time, as a result of breeding in accordance with a specialised plan, the fourth generation has been obtained, which possesses noticeably higher levels of body weight gain than control groups. The average live weight of young rabbits in the experimental groups, at the age of 77 days, reached high quality levels and  $2,6\pm 0,05$  –  $2,9\pm 0,07$  kg. Growing stock liveability during fattening is 90-100%.

With the purpose of breeding rabbits hybrids at a molecular level, genetic productivity markers were used. The groups of young rabbits were analysed for the possession of a polymorphism of two SNP-mutations of the gene myostatin (MSTN): in the second intervening sequence in the position 34C>T and in the nontranslated 3'-region 194A>G. four complex genotypes were found in the test populations, characterised by the following frequency of occurrence: AACC – 0,47, AGCT – 0,26, GGTT – 0,21, GGCC – 0,05. Genotype AA is inherited only with NN, AG with CT, genotype GG does not occur with the heterozygous on the second mutation. A tendency was observed for rabbits with the genotype GG and CT (separately) to have a bigger live mass at 90 days of age [2]. The obtained results allow the following conclusion to be made: two SNP-mutations in the myostatin gene of rabbits can be used for genotyping with the aim of marking groups on the intensity of their growth and carrying out breeding work to achieve a higher live mass at slaughter in shorter spaces of time.

Considering that in the last few years the production of rabbit meat has steadily risen, while the consumption of rabbit meat per capita remains relatively low as well as a high market capacity for the meat, an interest in the breeding of the suggested rabbit hybrid can be anticipated not only from enterprises of the Moscow region, but from other regions of Russia as well.

## References

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