

**PHEASANT AND HARE REARING IN CONTROLLED ENVIRONMENT AS A  
MEASURE FOR SECURING THEIR NUMBERS AT THE HUNTING GROUNDS**

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**Abstract**

In this paper we have given the review of domestic as well as foreign experiences connected to pheasant and hare controlled breeding with goal to inhabit them at hunting grounds that with heavily changed habitat.

Technology of rearing pheasant in pheasant farms is almost brought to perfection. Production per peahen is couple of tens of chicks during year (in Serbian farm conditions 18-27). This technology has two segments: a) rearing the mother flock and production of incubation eggs; b) rearing of chicks up to the age of 8 weeks and their inhabiting at the hunting grounds. Except proper rearing conditions (housing, temperature...) it is very important to provide good diet for all age categories. Compared to pheasant farms, rearing hares in controlled environment has not given significant results. Per couple during year it is possible to get kindle of only 2-2.5 kits, which does not justify the finances invested in their rearing. Even today the best solution is to capture live hares from hunting grounds where they are in large numbers and their transporting to the other grounds where they are in smaller numbers.

**Key words:** *pheasant, hare, breeding farm.*

**Introduction**

Pheasant and hare are the favourite and the most numerous wild game species in Serbia. In recent years, it is evident a significant reduction in the number of population of these game here and in Europe. This reduction in the case of hare population in many countries is alarming (Jennings et al., 2006). The reasons are numerous, but the most important are significantly modified living conditions, which reduce the ability of natural reproduction and limited natural food resources (Đorđević et al., 2008, 2012), with increased hunting percentage (Popović et al., 2012). In such changed conditions there are two possibilities: one is the protection of certain populations of pheasants and hares (complete prohibition or limitation of hunting ...) and the second is the settlement of the animals from other hunting grounds (hare) or grown in the facilities - aviaries and cages (pheasant, eventually hare). Protection of game populations with hunting prohibition gives limited results. Therefore, it is being intensively worked on finding the most effective solutions for artificial breeding of pheasants and hare and settlement of the hunting grounds. For the practice significant results were achieved in the pheasant breeding in aviaries, after which they were settled in the hunting grounds (Đorđević et al., 2010a, 2012c), whereas the hare breeding in facilities still have no greater significance due to a number of unsolved problems.

### Pheasant breeding in the facilities

The main reasons for the evident reduction in the number of pheasants in the hunting grounds in Serbia are: significantly reduced range, bad natural resources of food, agriculture machinery and chemicals use, various predators and others. In experiments, Hoodles et al. (2001) has shown that additional feeding of pheasants in the nature during the spring breeding period did not affect the number of laid eggs. Therefore, the pheasant breeding is controlled in the breeding house and the bred offspring with the appropriate age and after an appropriate adaptation is settled in hunting grounds (Đorđević et al., 2011a).

There are over thirty registered breeding unit in Serbia and the largest pheasant farm is "Ristovača" in Bač, owned by PC "Vojvodina sume", whose capacity is about 11,000 units in the parent flock (Popović et al., 2011a). Breeding technology is consisted of several segments: parent flock breeding, eggs production for incubation and breeding of pheasant chickens under controlled conditions until the age of 6 weeks (Popović et al., 2011b). Farm hatchery involves keeping different categories of pheasants in large numbers in a small area that is a major health risk (Đorđević et al., 2012d).

There are two basic modes of production, one is the completed process (production of eggs in the parent flock, egg incubation, breeding of the pheasant chickens), and the second involves only breeding pheasant chickens (originating from other pheasant farm is ). In the completed process parent flock of pheasants is kept in aviaries with the floor area per unit of 5-10 m<sup>2</sup>. In earlier years, it was practiced the holding of the parent flock in families, with a sex ratio 1:8 in favour of females. Today collectively keeping is applied (80-140 birds per box), which proved to be more practical. In this method of holding, the capacity is from 5 to 10% lower, but the percentage of fertility ranges from 80 to 95% (Popović and Stanković, 2009). Feeding and egg collecting is done twice a day.

The pheasants began to lay eggs in mid-April (selected parental flock and earlier) and laying period lasts until the end of June and beginning of July. The pheasant's needs are different out of egg laying period and in the laying season. Abstained need for pheasants in captivity amounts 40-55 g of grains or a simpler mixture. However, the needs of the pheasant hens and pheasant chickens are significantly higher. The pheasant hen in the nature lays 12-18 egg mass of 28-29 g per egg, while in the aviary lays up to 60 eggs for about 3 months (Popović and Đorđević, 2009). The parent flock of pheasants should be fed with cattle feed containing for layers from January. In the laying period, the daily amount of the pelleted concentrate is 80 g, respectively, for the entire period of laying approximately 7,2 kg.

Pheasant chickens are exclusively obtained by incubating the eggs for 24 days. In Serbia is registered 15 pheasant farm dealing with incubating eggs, 14 of which have their own production of hatching eggs. However, used equipment (incubators) is very old and only three pheasant farm have incubators that are manufactured after 2000. (Popović et al., 2011a). Homemade testing on pheasant farms of Vinik and Rit have confirmed the existence of large differences in the percentage of hatched chickens as a result of various factors (Table 1).

Standard way breeding pheasant chickens up to 6 weeks of age is based on the floor or breeding battery cage system. After the second week of age, pheasant chickens can come out from the closed facility through drains, and after 30 days (eventually 35) they are settled in aviaries. From that moment begins the preparation for the settlement in the hunting grounds (the so-called getting wild). Pheasant chickens old eighth weeks should be fully prepared for the life in the hunting grounds. Feeding in the breeding house is very intensive and early breeding of the pheasant chickens it is exclusively conducted with concentrates (Popović and Đorđević, 2009). Later, in order to imitate natural food, meals are supplemented with grainy

and green food (Kokoszynski et al., 2008). According to the NRP (1994) levels of protein in the mixtures for the first phase of breeding pheasants (0-4 weeks) was 28% for the second (4-9 weeks) it was 24% and for the third (9-16 weeks) it was 18%.

Ristić et al. (1995) state that in Ireland about 70% of the pheasant chickens of settled hunting grounds get killed for various reasons until the age of 12 weeks. That is why more and more pheasant chickens are settled gradually, from the special facilities-shelters. In these facilities pheasant chickens got food and water for some time, until completely customize the hunting conditions. Young pheasants should be supplemental fed until hunting season to reduce mortality and increase the hunting supply (Đorđević et al., 2009, 2010b,c, 2011b, 2012b). In some Western countries, this measure is a regular in the hunting ground management (Sage et al., 2002).

Table 1. The percentage of hatched to the number of eggs to lay (Popović and Stanković, 2009)

Pheasant farm	Year	Number to lay eggs	Percentage to lay out of eggs laid	Total number of hatched pheasant chicken during the season	Percentage hatched pheasant chicken of total to lay eggs in a season	Average number hatched pheasant chicken per pheasant femail per year
Vinik	2002nd	27,720	91.14	14,109	50.90 <sup>b</sup>	21.12
	2003rd	20,135	94.69	14,027	69.66 <sup>a</sup>	27.67
	2004th	24,172	99.30	14,800	61.23 <sup>ab</sup>	26.76
Rit	2002nd	25,000	55.87	17,700	70.80 <sup>ns</sup>	18.04
	2003rd	34,000	77.16	23,410	68.85 <sup>ns</sup>	23.89
	2004th	40,000	76.00	28,210	70.53 <sup>ns</sup>	24.24
Significance examined the impact of factors						
Year		-	-	-	P > 0.05	-
Pheasant farm		-	-	-	P < 0.05	-
Year × Pheasant farm		-	-	-	P < 0.05	-

### Growing hares in facilities

According to Popović et al. (2012) in the last decade, the largest number of hares was found in Serbia in 2005 (629 639 animals) followed by decrease, with the exception of Vojvodina (Beuković et al., 2011a). At the same time, there has been an increase in the percentage of hunting, from 14.26% to 18.02%. For obvious trend of decreasing of abundance the most responsible are: significantly modified living conditions, increased use of herbicides, as well as a variety of infectious diseases (Popović et al., 2008) and should be added the direct influence of man. The biggest impacts on the size of the game population in the hunting grounds have the users of the hunting grounds through the degree of utilization of the game populations.

Attempts of the cage breeding of the hares for the settlement of the hunting grounds so far have not been satisfactory, in order to be widely accepted in the hunting industry. On this issue so far is mostly done in Italy and France. As stated Gajić and Popović (2010), in technology of the hares breeding cage there are many problems, and just few have been solved until now: a) feeding forages (dry and fresh), b) hygiene of boxes, and prophylaxis and

c) releasing three months young hares in the hunting ground d) the profitability of production. Problem of the hares feeding in cage system was partly solved by using pelled food (Beuković et al., 2011b). Should have in mind that feeding hares is very diverse in the nature and it is based on green foods. Frylestam (1986) in Sweden found that hares prefer wild plant species and their feeding is significantly varied in areas with natural grasslands (37 species consumed) of the relation to the area under monocultures (14 species consumed). Reichlin et al. (2006), stated that although in the European hares feeding dominated cultivated plants, the animal prefers weeds and wild grass, if they are available. As for the other problems, cage hygiene and prophylactic measures can be well controlled, although sometimes there are some increased losses. However, releasing „semi tame” hares in the hunting grounds has not been solved in an appropriate manner until now so that predators (Popović et al., 2009) kill a significant number of young.

Production of the hares is carried out in the cages consisting of open and closed (wired) part. For easier hygiene, floors are made of wire. Males and females are separately held throughout the year and they are together only during the mating season. Good results are considered when per litter gets 4-5 of young during 3-4 braking (Gajić and Popović, 2010). In studies Slamečka et al. (1997) in three-year period of the cage breeding hares decided upon 3.6 to 6.9 young, although the authors give very different results found in the available literature. There are great losses of young that are 19 to 36%. Reproductive period is similar in wild hares, and gestation lasts 42 days. However, these results are less profitable than pheasants breeding of the in aviaries (Mertin et al., 2010). Intensive work on solving the remaining problems, such action may become significant in the near future to maintain the number of hares.

### **Conclusion**

The abundance of pheasants and hares in the hunting grounds of the Serbia in recent years is constantly decreasing. Reproduction of pheasant in the pheasants farm is crucial to maintain the number of population of the game, while of the hares cages breeding does not give good results. For the maximum use of the potential of a large number of pheasant farm in Serbia it is necessary to fix the financial situation of hunting organizations that will buy young pheasants (for example, improvement of hunting tourism as a source of income). In addition, it should continue to examine the opportunities for greater survival of young pheasants that are settled in the hunting grounds (for now only 30%). In contrast, for the hares cage breeding is necessary to increase profitability, and significantly improve the preparedness of young rabbits for settlement.

### **Acknowledgement**

The autors are grateful to the Ministry of Education and Science of the Republic of Serbia which financed this Project investigation within the No. TR-31009.

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