

# RABBIT GENETICS

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## Rabbit production and rabbit market in Romania: The most frequent breeds, half-breeds and their characterization

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**Abstract.** This study has in view to investigate grossly the Romanian rabbit market as starting point for a future deeper and larger economic approach of the Romanian rabbit market as part of the European market. In Romania, the rabbit meat is expensive (4.48 - 9.01 Euro per kg), and this is due to its low number of consumers. The local rabbit production in Romania is supported only by small farms, and these are not competitive. Rabbit meat imported from Spain is considerably cheaper than the one local produced. The profitable rabbit farming in Romania is oriented to brood-stock production and pet animals production. Such animals, sold as pure breeds, bring considerable income: 33.81 - 100.00 Euro per adult animal, depending on breed, variety, size, age, and pedigree. However, Romania has some geo-pedo-climatic advantages which could help the farmers to expand their activity also to meat production and export, and make it more profitable.

**Key words:** Rabbit farming, rabbit meat, market, meat products, price, Europe, Romania.

**Introduction.** World population is continuously increasing in number, and the world meat consumption is expected to raise in the future, putting high pressure on environment (Dordea & Coman 2007; Petrescu-Mag 2009). It is estimated in literature that need for meat for human consumption will increase in the next 50 years, mainly in developing countries (Petrescu et al 2013) so that Agricultural Economics and Agricultural Policies become more and more important (Burny 2010).

The domestic rabbit (*Oryctolagus cuniculus*) presents favorable biological characteristics as most avian species because the rabbit is characterized by a short generation interval and a high fecundity and prolificacy (Lukefahr & Hamilton 1997; Beaumont et al 2003; Sorhue et al 2013).

Rabbit meat has several important advantages that support the increase of its use for human consumption. Some of them are simply economic while others are related to the human health. Rabbit meat has excellent dietetic and nutritional properties (low cholesterol, fat and sodium levels). Small-scale rabbit farms are appropriate to supply meat and income to families in disadvantaged areas. Rabbit farming is a solution to the need of diversification in animal production. Rabbit production can function as a sustainable system, as it involves the use of renewable on-farm resources, such as local breeds, feedstuffs from forage or garden plots, local materials for hutches and other equipment, and family labour (Petrescu et al 2013).

Rabbit manure can be used as natural fertilizer for crops and gardens, it does not burn plants and can be applied directly to the plant or its roots, unlike poultry manure, and it does not have strong smell. Rabbits are quiet animals and, due to their size, they can be handled easier than pigs or cattle. They require cheap sources of feed, use inexpensive, easily constructed housing, do not compete with humans for cereals as strongly as chickens or pigs for instance (Petrescu et al 2013).

Rabbitry can be easily economic efficient due to its attributes such as high growth rate, high efficiency in converting forage to meat, short gestation period, high prolificacy and relatively low cost of production. All these features make rabbit meat a viable

solution in a sustainable development context (Lukefahr & Hamilton 1997; Akanno & Ibe 2005; Udeh 2013; Petrescu et al 2013).

This study has in view to investigate grossly the Romanian rabbit market as starting point for a future deeper and larger economic approach of the Romanian rabbit market as part of the European market.

**Breeding Systems for Meat Production in Europe.** Most farms on the Old Continent use bi- or tetra-linear hybrids for meat production. Generally, the male strains are selected for high daily weight gain (giant breeds), while the female strains are selected for litter size, number of nipples, and milk yield (Maertens et al 2006). That means the farms need to maintain permanently the parental breeds/strains because each start of new cycle needs them. Compared to bi-linear systems, the tetra-linear systems involve also keeping of the different F<sub>1</sub> generations before obtaining the final hybrid for slaughtering. It is true, in large-sized farming this is the most productive breeding system. In such cases, rabbits are slaughtered at the age of 12 - 13 weeks weighing 2.0 - 2.2 kg live weight.

**Breeding Systems in Romania.** Comparing the Romanian rabbit producers with the European ones, one should note that the size of the farm is the most relevant difference. There are many countries in Europe having good tradition in rabbit meat consumption (France, Germany, Hungary, Spain, Italy and several others). In such countries production of rabbit meat is high and prices are acceptable for the consumer; also the producers are large-sized. In countries with poor tradition for rabbit meat consumption the rabbit meat market is poor developed and the prices of these products are high.

Although there are many preliminary observations which show that Romanians are aware about the good quality of rabbit meat and the impact of its consumption on human health, the culinary behavior of Romanian citizen is still oriented to pork and chicken. In such conditions, the big rabbit-producing companies are completely absent in Romania. Their place was always taken by small farms: farming of subsistence, backyard farming, producers of brood stock, producers of pet animals, associations with stocking and hunting activities, biomedical laboratories etc.

Small-size rabbit farming is one which makes impossible production of hybrids. Small space, small brood stock, the need to maintain different strains or generations, poor qualified personnel in genetics and lack of knowledge are only a few impediments in production of meat hybrids in small farms. Therefore, most farmers in Romania decide to grow pure breeds, having in view to sell pure breeds as brood stock, at higher prices. In this specific case no parental strains or intermediary hybrids are needed; no special knowledge or material on genetics is necessary; any generation can be sold or slaughtered; while the brood stock can be recovered from the young anytime. In Romania, on the opposite side is the farmer who is not able to distinguish between the breeds or, if he is, he is not able to improve and homogenize his permanently changing multicolor brood stock. For such reasons, this second category of Romanian rabbit farmers will produce heterogenic half-breeds and their price will be much lower. Most often the only destination of these rabbits is the slaughter point, and meat is always cheaper than brood stock.

**Breeds and Half-Breeds Maintained in Romania.** Both the popular breeds and half-breeds marketed in Romania can be studied on the free market, on-line, or analyzing the exhibition catalogs.

**Breeds Presented in Local and National Exhibitions.** A number of six exhibition catalogs of the last three years (2011 - 2013) were analyzed and the name of all pure breeds presented for show were extracted, the breed's abundance being expressed (in specimens) below in Table 1. The exhibitions were local, two of them, or national, four of them. The most popular rabbit breeds in Romania are Grey Giant (called also Grey German Giant) and New Zealand White (see all figures in Table 1).

Table 1

Pure rabbit breeds presented for show in six Romanian rabbit exhibitions during 2011 - 2013

<i>Name of the breed</i>	<i>Color or variety</i>	<i>Size category</i>	<i>Number of specimens</i>
Giant	Grey	Large	260
Giant	Dark grey	Large	7
Giant	Black	Large	11
Giant	Blue	Large	6
Giant	Yellow	Large	4
White Giant	Red-eyed white	Large	87
Papillon Giant	White-black	Large	64
Papillon Giant	White-blue	Large	4
*Transylvanian Giant	Himalaya (white-black)	Large	77
*Transylvanian Giant	Himalaya (white-havana)	Large	2
German Lop	Different color varieties	Large	71
New-Zealand White	White	Medium	115
Vienna Blue	Blue	Medium	63
Californian	Himalaya (white-black)	Medium	35
Large Argente	Silver	Medium	23
Chinchilla	Large chinchilla	Medium	21
New-Zealand Red	Red	Medium	18
Weissgrannen	Silver Fox	Medium	15
Large Marten	Marten	Medium	12
Vienna Black	Black	Medium	11
*Cluj Rabbit	Chinchilla	Medium	5
Burgunder	Red	Medium	3
Papillon	Spotted red-black-white	Medium	2
*Debrecen White	White-grey	Medium	2
Deilenaar	Grey	Small	4
Small Papillon	White-black	Small	3
German Lop	Blue	Small	2
Loch	Brown-black	Dwarf	27
Hermelin	Red-eyed white	Dwarf	9
*Lion Head Dwarf	Various	Dwarf	4
Dwarf Angora	White-blue	Dwarf	2
Red Dwarf	Red	Dwarf	2
Castor Rex	Castor	Hair structured breed	35
Dalmatian Rex	Spotted	Hair structured breed	15
Black Rex	Black	Hair structured breed	5
Siamese Rex	-	Hair structured breed	4
Angora	White	Hair structured breed	2
Marten Rex	Marten	Hair structured breed	2
Havana Rex	Havana	Hair structured breed	2
Dwarf Rex	Black	Hair structured breed	2

\*Some local or foreign breeds are new and not homologated yet (see Botha et al 2011, 2013; Petrescu-Mag et al 2009, 2012, 2013).

**Breeds and Half-Breeds Reported from the Free Market.** Most of the famous rabbit breeders in Romania are pure breed rabbit breeders and they sell their products on-line, at home, or occasionally at the exhibition and trade fairs. However, they are not so numerous. A random investigation of the free market in three big Romanian towns (Cluj-Napoca, Iasi and Timisoara) shows that most farmers grow half-breeds instead of pure breeds and sell the rabbits mainly on the free market. On the free market we observed the same breeds as in the exhibitions and a few more: on the free market we found also blue Californian, red Californian, White of Pannonia, more varieties of Dwarf,

Schwarzgranen, Blue and Grey Transylvanian Giant, red Giant, Janet Papillon (full black variety), Russian and many hybrids or half-breeds resulted from crosses between different breeds, or between pure breeds and rustic rabbits. In terms of hybrids, when Romanian farmers produce them, most F<sub>1</sub> hybrids are offspring of German Giant males and New-Zealand White or Californian females.

**Prices after a Preliminary Investigation.** We investigated grossly the Romanian market in terms of: price of meat in supermarket or at the small rabbit meat producers, live animals for meat production, live animals for slaughter, live pet animals, show animals (live animals), and laboratory animals for research.

**Live Animals.** Young rabbits (at 5 - 8 weeks old) are sold at prices varying from 10 RON (Romanian New Leu) to 150 RON (2.25 - 33.81 Euro). Half-breeds are sold at lower prices (10 - 50 RON) (2.25 - 11.27 Euro), while pure breeds are more expensive (30 - 150 RON) (6.67 - 33.81 Euro). In pet shops the price of a young rabbit is 80 - 120 RON (18.03 - 27.04 Euro). As a laboratory animal, a young rabbit is sold on 90 - 120 RON (20.28 - 27.04 Euro). The most expensive young rabbits are animals with certificate of origin (pedigree of champion reflected by the parents' results in exhibitions).

The price of adult varies with age, value of its pedigree, and breed. Half-breeds are cheaper, ranging from 40 RON to 150 RON (9.01 - 33.81 Euro). Adult pure breed animals are sold on 150 - 443.72 RON (33.81 - 100.00 Euro). In pet shops the price of an adult is about 150 RON (33.81 Euro) and most of them are dwarf breeds. Adult laboratory animals are sold on 120 - 200 RON (27.04 - 45.07 Euro). Unfortunately most of these laboratory rabbits produced in the country are half-breeds and are not suitable for research.

**Meat.** The price of meat in Romania varies from 19.90 RON to 40.00 RON (4.48 - 9.01 Euro) per kg. The cheapest rabbit meat products are imported from Spain and the price of 19.90 RON/kg (4.48 Euro) is a weekly offer at the supermarket, and not a permanent offer. The most expensive rabbit meat products on Romanian market are produced in Romania.

**The Main Problems of the so Called "Pure Breeds".** The pure rabbit breeds should be characterized as populations which do not segregate in terms of color, shape, size and productivity. At least in Romania, this is not always valid: personal observation shows that many wild-type colored breeds/populations segregate; there are too many recessive color genes hidden under their "coat". Regarding the productivity, it was neglected due to the attention paid to other traits, specific to the breed. For instance, the long ears of giant breeds became too long over time, the Papillon rabbits became extremely symmetric but not so muscular, the Japanese rabbit lost his productivity due to attention paid to some specific color traits, New-Zealand White became emblematic for his rounded head rather than his daily growth rate etc.

**Conclusions and Perspectives for Future Research.** In Romania, the rabbit meat is expensive (4.48 - 9.01 Euro per kg), and this is due to its low number of consumers. The local rabbit production in Romania is supported only by small farms, and these are not competitive. Rabbit meat imported from Spain is considerably cheaper than the one local produced. The profitable rabbit farming in Romania is oriented to brood-stock production and pet animals production. Such animals, sold as pure breeds, bring considerable income: 33.81 - 100.00 Euro per adult animal, depending on breed, variety, size, age, and pedigree. However, Romania has some geo-pedo-climatic advantages which could help the farmers to expand their activity also to meat production and export, and make it more profitable.

This material is a preliminary research centered on Romanian rabbit market. Our future investigation will be deeper and larger and will have in view to dissect these aspects of the Romanian economy.

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