

RABBIT GENETICS

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Rabbit statistics overview: production, trade, market evolution

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Abstract. The paper presents a concise overview of available statistics for rabbit livestock production and compares it with other meat production (chicken, pig, cattle). Data reflects quantities for production, trade, at European and world level and for Romania.

Key Words: rabbit meat, production, Europe, Romania, economics.

Introduction. Rabbit meat has several advantages that support the increase of its use for human consumption. The need for meat will increase in the following decades, especially in developing countries (Kanaly et al 2010). Rabbit meat has excellent nutritional and dietetic properties (Dalle Zotte & Szendrő 2011). Consumers' need for healthier food can stimulate consumption of rabbit meat, as it has lower cholesterol than other meat; other consumers' preferences driven by the increase in their income, desire of diversification, access to information, nutritional education make them look at hedonistic quality, sensory properties, cooking easiness and swiftness, price (Dalle Zotte 2002), increase rabbit meat demand and offer. Small-scale rabbit farms are appropriate to supply meat and income to families in disadvantaged areas. 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 (Lukefahr 2007), rabbit manure can be used as fertilizer for crops and gardens (it doesn't burn plants and can be applied directly to the plant or its roots, unlike poultry manure), it doesn't have strong smell. Rabbits do not make much noise, can be handled easier than pigs or cattle, require small amounts of feed, use inexpensive, easily constructed housing, do not compete with humans for grains as strongly as chickens (Moreki & Seabo 2011). Rabbit production can be easily economic efficient due to its attributes such as high growth rate, high efficiency in converting forage to meat, short gestation period, and high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat which includes low fat, sodium, and cholesterol levels (Mailafia et al 2010).

All these features make rabbit meat a viable solution in a sustainable development context. However, data on rabbit production, number of farms, trade is scarce and most research related to rabbit meat focus on biological aspects (rabbit genetics, nutrition, pathology, reproduction etc) and less on economic aspects (consumer behaviour – preferences, consumption habits, economic efficiency etc).

Rabbit meat statistics overview, at European and global level. World meat consumption is expected to raise in the future, putting high pressure on environment. FAO statistics show an increase during over 50 years, in past consumption and estimations (Table 1).

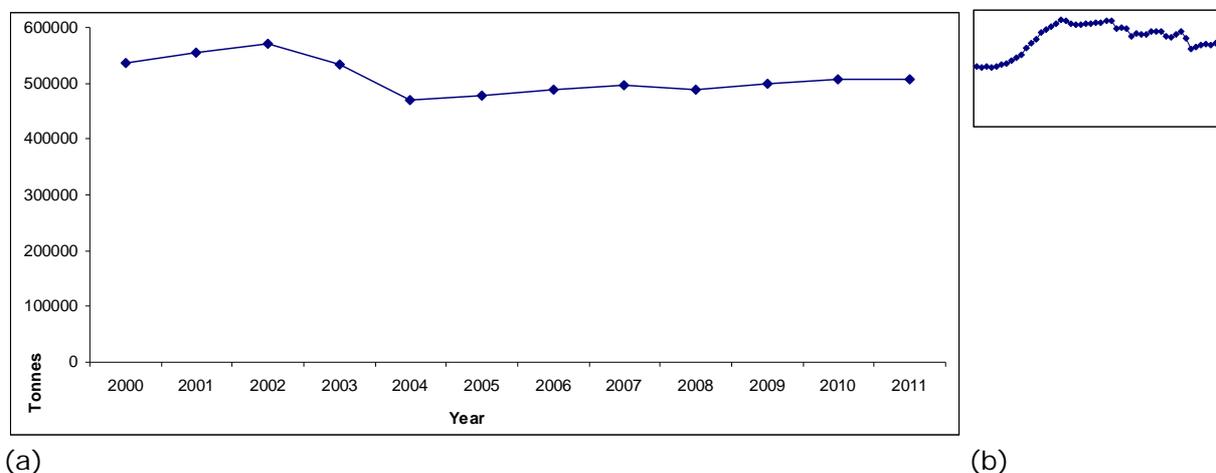
Table 1

Per capita world consumption of meat 1964-1999, estimations for 2015, 2030 (kg per capita, carcass weight equivalent)

Year	1964/66	1974/76	1984/86	1994/96	1997/99	2015	2030	1964-2030
World	24.2	27.4	30.7	34.6	36.4	41.3	45.3	

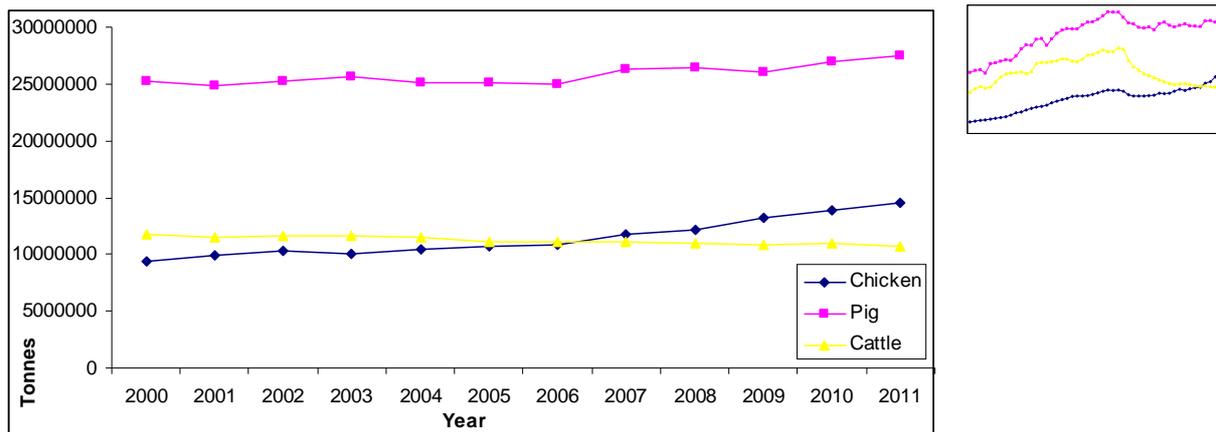
Source: Bruinsma (2003), <http://www.fao.org/docrep/005/y4252e/y4252e05b.htm>

As income level in developing countries raises, changes in lifestyle, including meat consumption will occur, in the sense of its increase. Meat production has also grown, since half of past century and is expected to maintain this trend. Rabbit meat production, as reflected by FAO statistics, has decreased by 5% in 2011 compared to 2000 (and has increased by 41.4% over 50 years, 1961-2011) in Europe (Figure 1 a and b). Graphics reflect registered data: number of countries is different from one year to another and not all production activities are reported by a country. Production is in tonnes, it refers to livestock primary products, which include products from live and slaughtered animals. Products from slaughtered animals include meat, offals, raw fats, fresh hides and skins; products from live animals include milk, eggs, honey, beeswax and fibres of animal origin; all data shown relate to total meat production from both commercial and farm slaughter; data are given in terms of dressed carcass weight, i.e. excluding offals and slaughter fats; production of beef and buffalo meat includes veal; pig meat includes bacon and ham in fresh equivalent; poultry meat includes meat from all domestic birds and refers, wherever possible, to ready-to-cook weight (<http://faostat3.fao.org/home/index.html#METADATA>).



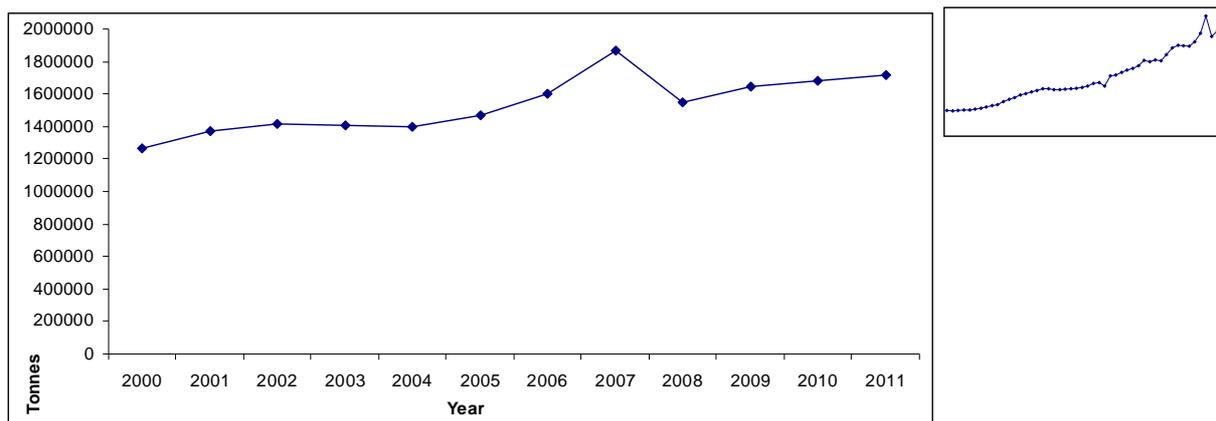
(a) (b)
Figure 1. Production of rabbit meat reported by FAO: Europe, 2000-2011 (a), 1961-2011 (b). Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Chicken production increased by 55%, pig by 7% between 2000-2011 in Europe and cattle decreased by 9%, as shown in Figure 2a (and during 1961-2011, chicken production increased by 444%, pig production by 93% and cattle by 10%; Figure 2 b). Rabbit meat production is much lower than other meat, like pork, beef, poultry, and its level compared to other meat decreased over time. At European level, 2011, chicken production was 29 times higher, pig production was 54 times higher, cattle production was 21 times higher than rabbit production, according to FAO data, reflected in Figure 1 and Figure 2; in 1961, registered chicken production was 8 times higher, pig production was 40 times higher, cattle production was 27 times higher than rabbit production).



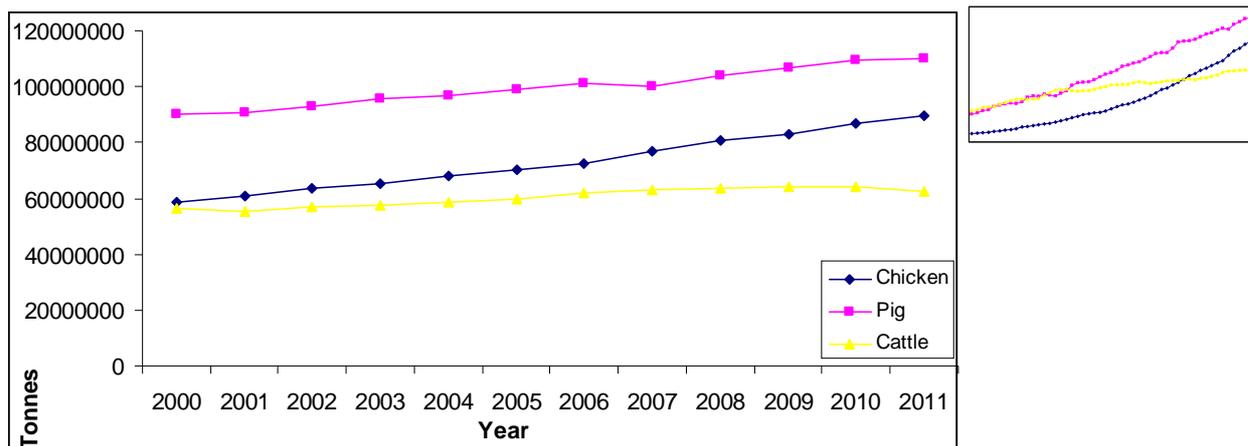
(a) (b)
 Figure 2. Production of chicken, pig, cattle meat reported by FAO: Europe, 2000-2011 (a), 1961-2011 (b). Source: data retrieved from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

At world level, reported rabbit meat production (in tones, livestock primary products) was by 35% higher in 2011 compared with 2000 (and with 331% in 2011 compared to 1961; Figure 3).



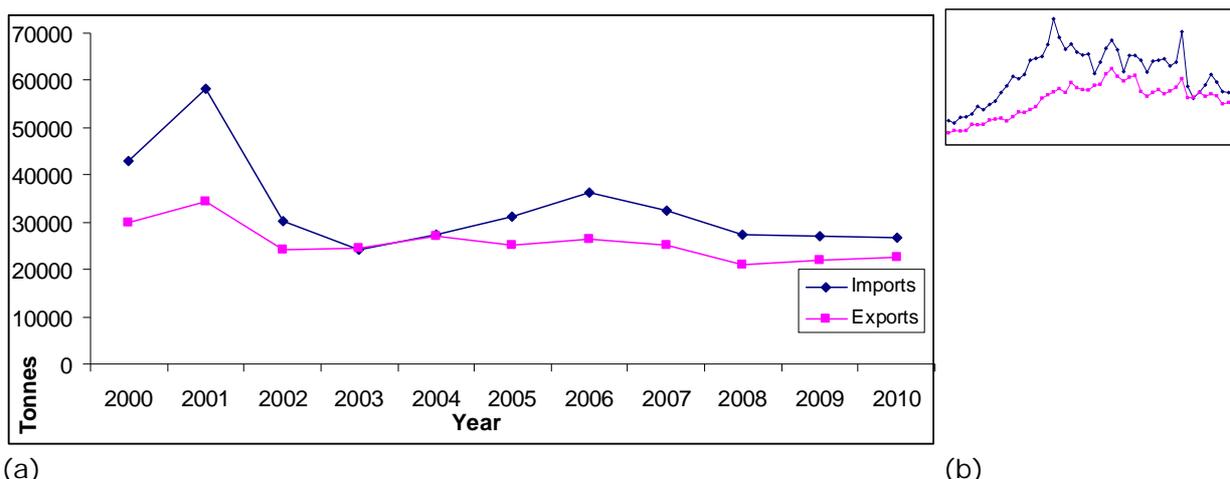
(a) (b)
 Figure 3. Production of rabbit meat reported by FAO: world, 2000-2011 (a), 1961-2011 (b). Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

The same ascending trend visible in rabbit production is present at world level for chicken, pig and cattle production: chicken production increased by 52%, pig by 22%, cattle by 11% in 2011 compared to 2000 (and chicken increased in 2011 by 1083% compared to 1961, pig production by 345% and cattle by 126%). At world level, rabbit production is small compared to other meat production (from chicken, pig, cattle). In 2011, chicken production was 52 times higher, pig production was 64 times higher, cattle production was 37 times higher than rabbit production (and in 1961, chicken production was 19 times higher, pig production was 62 times higher, cattle production was 70 times higher than rabbit production, according to FAO data, reflected in Figure 3 and Figure 4).



(a) (b)
 Figure 4. Production of chicken, pig, cattle meat reported by FAO: world, 2000-2011 (a), 1961-2011 (b). Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Reported foreign trade with rabbit products decreased in Europe, according to FAO statistics: imports decreased by 38% in 2010 compared to 2000 and export by 24% (and, according to registered data, imports increased by 114.1% in 2010 compared with 1961, exports increased by 269.2% in 2010 compared with 1961). Imports were constantly higher than exports: in 2000 imports were 1.4 times bigger than exports, in 2010, they were 1.2 time bigger (Figure 5).



(a) (b)
 Figure 5. Imports and exports with rabbit livestock production reported by FAO: Europe, 2000-2011 (a), 1961-2011 (b). Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Reported imports and exports in Europe with chicken, pig, cattle livestock production increased during 2000-2010: chicken imports increased by 59%, exports by 73 (Figure 6 a), pig imports increased by 86%, exports by 68% (Figure 6 b), cattle imports increased by 3% and exports by 35% (Figure 6 c) in 2010 compared with 2000.

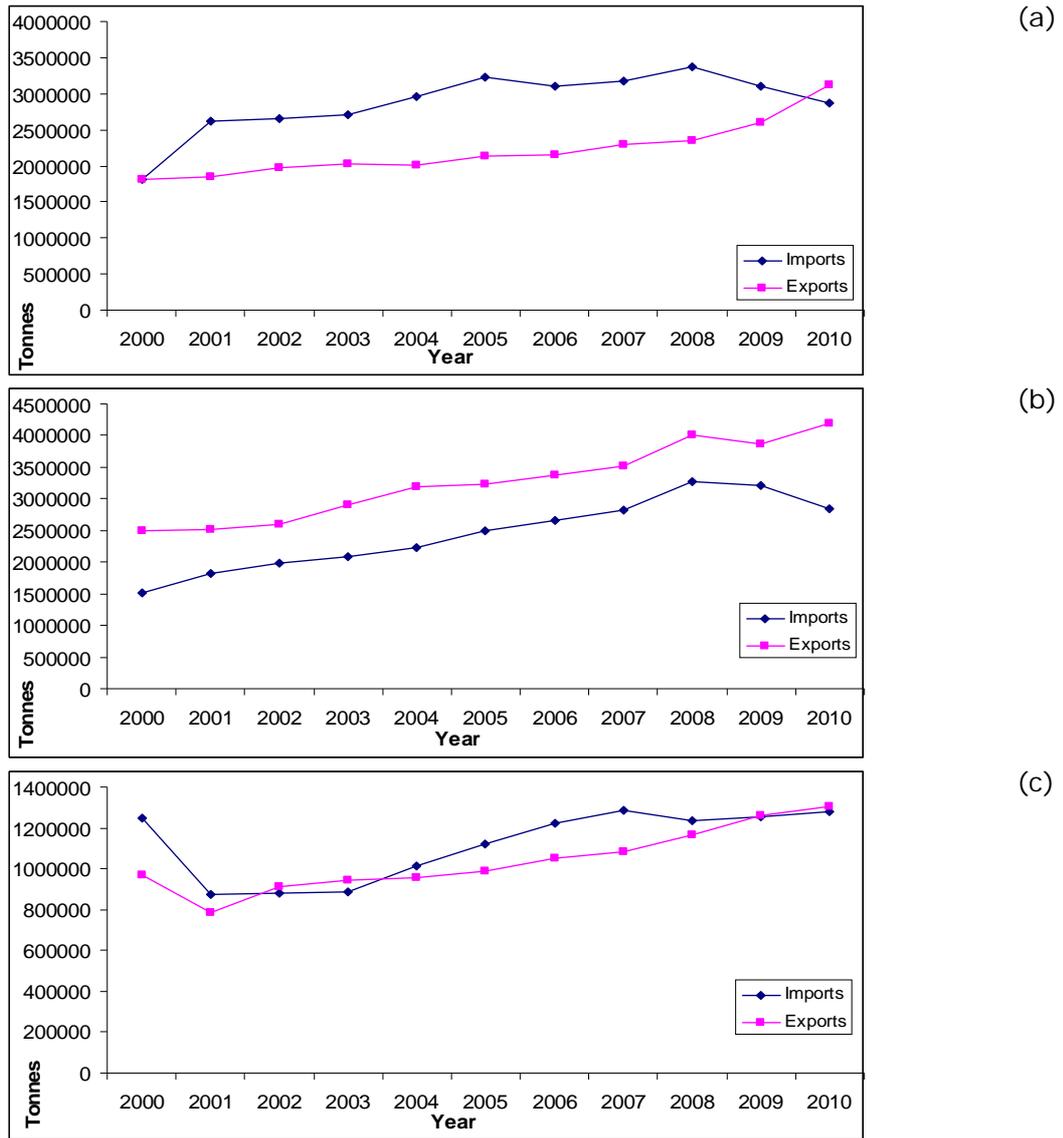


Figure 6. Imports and exports with chicken (a), pig (b), cattle (c) livestock production reported by FAO: Europe, 2000-2010. Source: data retrieved from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Country data: rabbit statistics for Romania. At national level, in Romania, registered data on rabbit production show a drastic decrease (Figure 7).

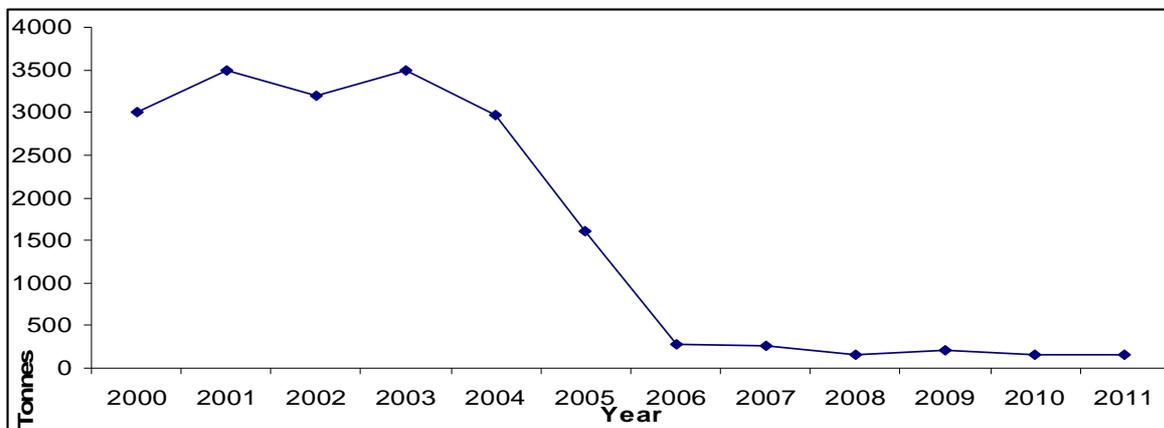


Figure 7. Production of rabbit meat reported by FAO: Romania, 2000-2011. Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Other livestock productions from Romania, visible in FAO statistics, show: an increase by 26% for chicken, a decrease of 10% for pig and a decrease of 12% for cattle in 2011 compared to 2000 (Figure 8).

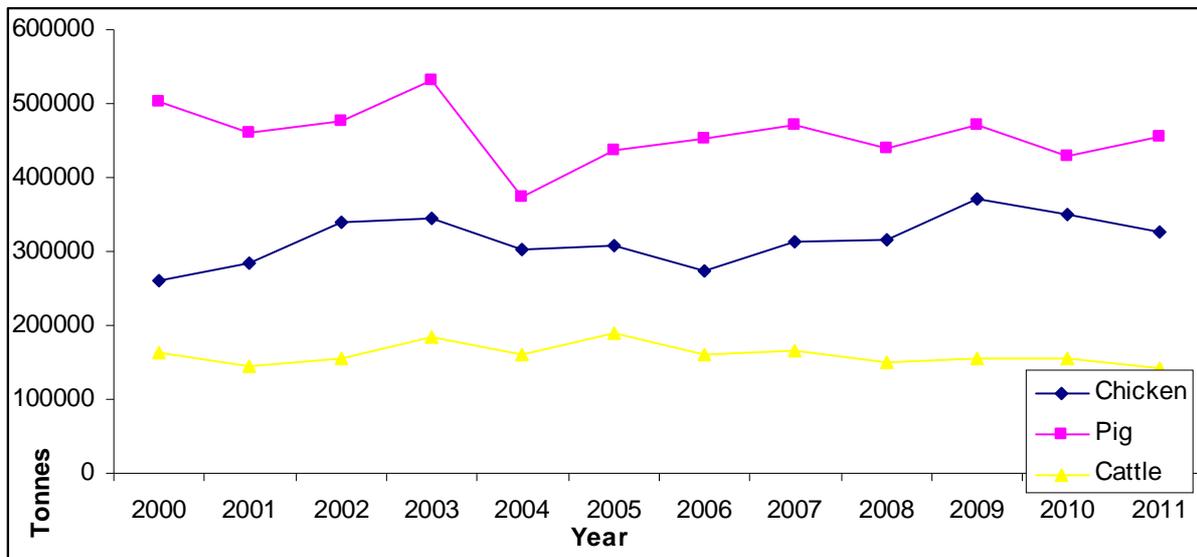


Figure 8. Production of chicken, pig, cattle meat reported by FAO: Romania, 2000-2011. Source: data from <http://faostat3.fao.org/home/index.html#DOWNLOAD>

Taking into account empirical observation and analysis of available data, it can be understood that no reliable statistics and reports are available in Romania on rabbit production and/or consumption. This goes hand in hand with the high price of rabbit meat on market, lack of tradition for rabbit meat consumption and lack of local rabbit breeds. To cover this lack of local breeds, two were recently created, maintained and developed by a group of Romanian researchers and hobbyists: the Transylvanian Giant Rabbit (Petrescu-Mag et al 2009-2013) and Cluj Rabbit Breed (Botha et al 2013).

Transylvanian Giant Rabbit (TGR) is a large sized breed of 4.5-9 kg and was created mainly for meat production. It has its origins in many distinct populations of rabbits: the common Romanian rabbit, the German Grey Giant, the Giant Papillon and the Californian (Petrescu-Mag et al 2009). The genetic formula for coat color is c^{hc^h} wherein c^h is the recessive gene Himalaya situated at locus C. Most of the other giant rabbit breeds have some inconveniences such as: low fertility, vulnerability to diseases, low slaughter efficiency/ears too long, low muscular development in the first 3-4 months and others. The creators of TGR planned to eliminate these drawbacks in their new giant rabbit breed. According to the European Standards rules (2010) for giant rabbit breeds, the body weight of TGR will be of over 4.5 kg. There is no other giant breed expressing the Himalaya colour pattern.

Beside the Transylvanian Giant Rabbit a new rabbit breed is currently under development in Cluj-Napoca, Transylvania, Romania: The Cluj Rabbit breed (CR). However, its number of animals and breeders is still low. According to the European Standard for the judgment of the exhibition rabbit acknowledged by European Association (2010), regarding the body weight, CR fits in the medium size breeds, with a minimum of 3.50 kg and a maximum of 5.50 kg limit. Yet, there is no other breed that brings together the Chinchilla colour pattern with a New Zealand White (NZW) show phenotype. The NZW appears to be the principal breed for commercial meat production. For this reason, the genetic improvement of CR will follow the same traits of commercial rabbits (prolificacy, milk yield, maternal instinct, weaned kits, number of capitalized young/doe, growth rate, forage capitalization, slaughter indicators, advantageousness) (Botha et al 2011).

Conclusions. Rabbits have been used as food by many people across the world since ancient times. Due to industrialization of agriculture and economy of scale, rabbit meat was forgotten in many countries in favour of pork, beef and chicken. Currently, needs and trends related to health concerns, environment protection, food supply for low-income families combined with rabbit meat qualities, such as quick-breeding source of low-fat, high-protein meat, good taste, interest in lower fat diets and healthy eating, ongoing pursuit of chefs and foodies of novel and locally produced foods etc make rabbit meat popular again, because it gives answers to health, environmental, economical concerns. FAO statistics presented here include data only from several countries, available at FAO website, and do not reflect the whole livestock production of the Europe or the world at a certain moment in time; thus, the data presented here represent figures registered by FAO. The number of reporting countries increased from 1961 to 2011. Therefore, the difference between the beginning and the end of the analysed period is partially generated by additional countries included in the last years compared to the first.

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