



ХАРАКТЕРИСТИКА И МОНИТОРИНГ НА ГРЪЦКА АВТОХТОННА ПОРОДА СВИНЕ CHARACTERIZATION AND MONITORING OF GREEK AUTOCHTHONOUS SWINE BREED

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Резюме**

Под действието на естествения отбор различни автохтонни популации свине са се приспособили към разнообразните условия на околната среда в Гърция. Настоящата статия е фокусирана върху единствената официално призната автохтонна порода свине в Гърция и методологията, приложена за характеристика и мониторинг на породата. Породата е била считана за изчезнала в резултат на кръстосване с високопродуктивни вносни животни, но неотдавна няколко стада, пръснати из страната, са били открити и описани като съставени изключително от чистопородни автохтонни свине. За да гарантира и запази националните генетични ресурси в животновъдството и по-специално този уникален генетичен фонд за световната популация свине, в Гърция е създадена програма за идентификация и характеристика на чистопородните гръцки свине, за определяне на системата на развъждане, за наблюдение на промените в стадата и популациите. Главната цел е да се осигури целостта на породата, да се разкрият предимствата на породата по отношение на приспособимостта към промените в климата и околната среда, предразположеността към заболявания и качеството на продукцията.

Abstract

Different types of endogenous swine populations have been adapted to the various environmental conditions of Greece due to many years of natural selection. The present paper focuses on the only officially recognized Greek autochthonous swine breed and the methodology applied for breed characterization and monitoring. Although the breed was considered extinct or crossbred with other high-productivity imported animals, several herds, spread around the country, have been reported lately to consist exclusively of pure breed autochthonous swine.

In order to secure and preserve national animal genetic resources and especially, this unique gene pool for worldwide swine population, Greece has established a program for describing and identifying purebred Greek swine, determining the breeding system, monitoring herd and population changes. The main objective is to secure breed integrity, to reveal breed comparative advantages in regard to environmental and climate changes adaptability, disease susceptibility and product quality.

Ключови думи: автохтонна, свине, чистопородно, екстензивна система на отглеждане.

Key words: autochthonous, swine, pure breed, extensive breeding system.

INTRODUCTION

For thousands of years pig farming has been one of the most important livestock production sectors, in both social and environmental context, in Greece. Many pig types have been evolved to various local environmental conditions through natural selection and random crossing between populations. The autochthonous Greek swine breed is the only national, officially recognized swine breed in Greece that has been evolved through many years of selection and

adaptation to harsh environmental conditions. It is a hardy and productive animal, which exploit disadvantageous mountain areas covered by oak trees, bushes and/or low vegetation (Deligeorgis et al., 2000; Deligeorgis, 2004).

The introduction of imported high yielding improved pig breeds under intensive production systems have replaced during the previous decades the extensive, traditional breeding system and eliminated the autochthonous swine population. Consumer's demand for

high quality organic products predicated European Union (E.U.) to support the semi-extensive traditional breeding system and the production of organic meat through subsidiaries (Fig. 1). As a consequence breeders applied uncontrolled matings with wild boars to rapidly raise herd population, achieve better breeding rate, produce tolerant animals and gain in meat quality in order to claim greater amounts of the EU subsidiaries. Today, the majority of extensively and semi-extensively swine herds are consisting of autochthonous pig crossbreeds with wild boar.

Deligeorgis et al. (2000) reported 180 extensive autochthonous swine farms in Greece averaging 19 sows per farm, located in the central mainland and in the island of Crete. Today, the certified population of purebred autochthonous Greek swine breed has been eliminated to 800 animals in 10 different herds located at the northern of Greece (Hellenic Ministry of Rural development and Foods, personal communication). Though numerous farms have been reported of having a great percentage of animals that hold autochthonous breed characteristics spread all over Greece, only those previously reported fulfilled the requirements of breed phenotypic characteristics homogeneity and were distinguished as purebred farms (Fig. 2). The number of reproductive animals of the autochthonous swine breed population has been seriously eliminated and currently is facing the danger of extinction and genetic erosion.

The national organization authorized for the identification, certification and monitoring of purebred

animals are the five Institutes of Animal Genetic Improvement located in Athens, Drama, Ioannina, Karditsa and Thessaloniki. These five Institutes have the responsibility to monitor and provide consultation to purebred farms in their region of supervision, design, establish and supervise genetic improvement and breed preservation programs. Athens' department has the responsibility of establishing and keeping autochthonous Greek swine herdbook. Nowadays, the identification of purebred animals is practiced by experienced animal scientists using descriptive methodology and phenotypic characteristics. This paper is based on information from the Institute of Animal Genetic Improvement of Nea Mesimvria, Thessaloniki.

BREED CHARACTERISTICS

Autochthonous Greek swine breed has been detailed described by Deligeorgis et al. (2000). The dominant color has been reported to be black but also spotty pigs are commonly found among herds (Fig. 3). The purebred population is subdivided into two major types related to size and breeding conditions. The first type, which accounts for the great majority of the total population, has a long muzzle and a small mature body weight (50-70 kg). These small type pigs scavenge on plant roots by digging up the soil on mountainous, difficult to approach, areas with thick low vegetation. The second type pigs have a large mature body weight (90-130 kg) and scavenge on acorns and chestnuts in woods with poor low vegetation.



Фиг. 1. Автохтонната Гръцка свиня традиционно се отглежда полуинтензивно за органично производство на висококачествено месо

Fig. 1. Autochthonous Greek swine is traditionally semi-extensively bred for high-quality organic meat production



Фиг. 2. Голям брой свине с фенотипни особености на Гръцката свиня са открити в по-голяма част от хибридните стада в Гърция

Fig. 2. A number of pigs with the phenotypic characteristics of Greek swine breed have been identified in the majority of crossbreed herds in Greece

Pigs are free to scavenge year round in areas free of human activities. Special care is taken during the hunting period (October-January) that pigs are kept indoors to avoid losses. No special housing other than for night shelter is required. Sows show a seasonal reproductive activity and produce almost two litters of 8-10 piglets at birth, per year. Piglets suffer heavy losses up to natural weaning at 40 to 60 days of age, mainly due to the cold weather in wintertime and to attacks by wild animals (Deligeorgis et al., 2000; Deligeorgis, 2004; Theodoropoulos et al., 2002; Theodoropoulos et al., 2004).

BREED CERTIFICATION AND CONSERVATION PROGRAM

Experienced animal scientists specialized in breed identification visited several farms, photographed and videotaped each herd, each boar in a herd, females and piglets. Farm details and herd characteristics like size, number of boars and sows, number of piglets, type of housing, breeding conditions and dietary information collected, with special consideration to herd initial population origin and mating system. All the information was cross examined to bibliography, archive files and personal communication. Collaboration between the five Institutes of Animal Genetic Improvement led to the conclusion that only ten farms could consider pure breed of the autochthonous Greek swine breed.

Having in mind the critical effective size of the breed, the necessity to preserve and secure endogenous swine breed and the breeders need to avoid inbreeding, an *in situ* conservation program designed. The first step to this attempt is the establishment of the official herdbook, registry and performance regulation that provides the guidelines for the registration of each herd, animal identification and quantity and quality specific characteristics. The condition of an open herdbook for a period of three years is considered an opportunity for the completion of the exploration of isolated swine herds and populations that could meet the breed standard requirements and be included in the herdbook. The Institutions of Animal Genetic Improvement hold the responsibility of animal registration to the herdbook.

Registry in the herdbook is a complex and demanding procedure. For this reason, seminars have been organized for breeders to get instructions not only in the data collection but also to mating practices that could secure data accuracy and increase herd productivity. Breeders informed about special conditions required for registry such as unique herdbook registration number for each piglet born in the herd. A manuscript of instructions followed by a book of tables for keeping data was provided and explained to breeders in order to collect data on time, save time and deliver to the authority accurate information for their herds. Even though breeders committed to the responsibility of



Фиг. 3. Автохтонната Гръцка свиня е застрашена от изчезване. Програмата за съхраняване на породата е фокусирана върху опазване на разнообразието на генофонда на Гръцката свиня

Fig. 3. Autochthonous Greek swine breed is considered endangered. A preservation program is focusing on securing Greek swine gene pool diversity

delivering realistic information, it is the Institute of Animal Genetic Improvement personnel duty to make regular and temporary controls to secure the procedure certainty, data exactitude; avoid misunderstandings and correct systematic and random flaws.

These seminars also focused in creating a social – professional network of breeders on the basis of common autochthonous swine breed under the umbrella of the Ministry of Rural Development and Foods. Though purebred farms are situated in diverse prefectures, facing different breeding challenges, breeders had the chance to interact by meeting regularly, exchange views in management and breeding issues, state problems and establish collaborations aiming at their farms sustainability and financial support by promoting a high quality value product in the market.

The next step to the preservation program is to distinguish autochthonous swine breed characteristics that are related to breed phenotypic standards, productivity and product quality. According to observations both breed types, mentioned earlier, are accepted in the conservation scheme, while farms with numerous of crossbreds were advised to selectively remove animals and acquaint certified purebred males from other participants in the program. Exchange of certified purebred boars between farmers is a necessary condition for applying a program for conservation and genetic improvement. Concern is taken for the prevention of the crossbreeding phenomenon especially with wild boars

in the free-range system, which consist one of the most difficult conditions to achieve.

One aspect of the success of a preservation program is related to the number of breeders and population at the beginning and their relative number at the end of the application. In order to increase the number of purebred pigs and expand the gene pool of the breed, animal scientists responsible for breed certification have released a campaign aiming at (a) tracking purebred farms, unknown at the moment and (b) encouraging farmers living in disadvantageous areas where pigs were traditionally kept in low input breeding schemes to keep pure breed autochthonous swine, participate in the network actions to make swine breeding profitable.

The milestone of the preservation program is based on the establishment of the mechanisms that could support financially the breeding of a low productivity, rare endogenous breed production and could ensure for the breeder that their product quality would receive a relative added value in the market. So, it is important to promote the relative advantage of autochthonous Greek swine meat, certify its quality and use marketing tools to release it to the market under a brand name that would describe its origin in the dimension of breed and breeding conditions.

PRODUCT PERSPECTIVES

The free-range breeding system in which the endogenous Greek swine has developed and survived,



promotes a way, unique and gentle to the environment, of exploiting the advantages of the *flora* diversity of Greek mountainous areas. The organoleptic and nutritious characteristics, for which the variety of *flora* species is reputed, participate directly to the synthesis of the Greek swine carcass (monogastric) and determine the profile of protein and fatty acids.

Greek swine meat is considered a delicatessen product. The production of autochthonous Greek swine meat is currently limited to a small amount of quantity that each breeder delivers to only one or two distribution points (butcher, traditional restaurant, hotel, etc.) close to his farm. The demand for Greek swine meat is increasing during Christmas and/or other religious periods and holidays. Autochthonous swine breed is considered a traditional product related to returning to one's roots and that is the main reason for asking and finding such a meat quality when visiting mainland villages.

Autochthonous Greek swine carcass is served traditionally roasted, stuffed with potatoes, chestnuts, onion, garlic and apple. It is usually marinated with oregano, honey and orange juice. So, cooking Greek swine traditionally connect tastes from the whole range of Greek nature.

Nevertheless, for Greek swine meat to earn its position in the delicatessen market need to be promoted systematically for its quality. Several attempts have been made recently for the production of endogenous Greek swine products based on ancient Greek recipes (e.g. melan akrokolion-Greek prosciutto, μέλαν ακροκόλιον) that could be packaged and released. These salami and sausage type products have received excellent critics and distinctions in gastronomy festivals. For the moment, it is quite impossible to satisfy the increasing demand for Greek autochthonous swine products as it is still limited the number of certified animals; breeders have to cope with slaughtering restrictions as long as the breed is facing the danger of extinction and finally, they need to establish a collaboration frame targeting to the food market.

CONCLUSION

1. The Global Plan of Action for Animal Genetic Resources (2007) has stated the importance to the ecosystem balance to preserve and secure global and national animal genetic resources. For this reason a plan of action was promoted. Autochthonous swine breed is included among the threatened species and Greece has established a preservation program for securing breed from genetic erosion and extinction. Even though the previous decades the population of purebred endogenous swine has been seriously eliminated, a number of purebred farms have been traced, registered and monitored.
2. The conservation of the autochthonous Greek swine breed has an important social dimension for Greece by

supporting traditional family farms, located in disadvantageous mountainous areas where inputs are very limited. Endogenous pigs have been adapted to harsh environmental conditions having low nutritious requirements and utilizing pasture and by products of the farm very well. These animals have no special housing requirements, demonstrate resistant to diseases and relatively good performance of reproduction (Deligeorgis et al., 2000; Deligeorgis et al., 2004; Theodoropoulos et al., 2002; Theodoropoulos et al., 2004).

3. Semi-extensive and extensive breeding of Greek swine produce high quality carcass that meets public demand for high value products. An attempt to establish a breeders' collaboration and promote a product of certified breed origin like autochthonous Greek swine could contribute to the sustainable use of landscape, support the financial viability of low-input traditional farms and contribute to animal genetic diversity.

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