

# BREEDING OF THE BLACK SLAVONIAN PIG IN EXTENSIVE CONDITIONS

Kristina BUDIMIR <sup>1</sup>, Vladimir MARGETA <sup>1</sup>, Polona MARGETA <sup>1</sup>

## ABSTRACT

Intensification of pig production has resulted in exploitation of the maximum genetic potential of pigs which has reached the limit of their physiological maximum. Black Slavonian pig is part of the cultural and traditional heritage that is passed on for generations, and makes this breed true autochthonous breed of this area. Extensive production system of Black Slavonian pigs has positive effect on the pigs' health, is more friendly to environment and animal welfare and investment costs are lower. Production systems must provide self-employment, sustainable production and rural development. Although during the 19<sup>th</sup> century this was the most widespread breed in the area, its number began to decline to the point that it came in a group of endangered breeds. It is necessary to develop and implement the programs for protection and preservation of the breed. Exceptional quality of muscle and adipose tissue are good basis for the production of traditional meat products.

**Key words:** autochthonous breed / Black Slavonian pigs / extensive rearing

## 1 INTRODUCTION

There are two autochthonous breeds of pigs present today in Croatia, the Black Slavonian and Turopolje pigs. Pig production until the middle of 20th century was based on Black Slavonian pigs. Later, population size began to decline. Since 1996 Croatia has signed the "Biodiversity Treaty" and delivered "Breeding Program for Black Slavonian breed" and "A Survey of the State of Biological and Environmental Diversity of Croatia with Protection Strategy and Action Plan", which significantly contributed to the preservation and enhancement (Fig. 1) of the population size (Uremović *et al.*, 2003; Karolyi *et al.*, 2010). Production system of the breed must be in accordance with minimum welfare standards and good livestock practices (Eurogroup for animals, 2010) The outdoor housing system has a positive effect on the environment and health of pigs. Compared to the modern pig breeds, Black Slavonian pig has a higher resistance, longevity and adaptability to the extensive conditions and these are the main reasons of the economic profitability

for rearing these pigs (Karolyi *et al.*, 2010; Karolyi *et al.*, 2004, Uremović *et al.*, 2003).

Black Slavonian pig was developing by breeding practice during 19th century in Orlovnjak nearby Osijek, on the estate of Count Karl Pfeiffer. It is also known as "fajferica". Breeds which participated in its creation were Lasasta Magnolica (also known from literature as Mangalitsa) and Berkshire. Later on, some Poland China and Cornwall Black were used. Selection was carried out with the aim of improved breeds of pigs that were then used, which were Šiška pig, Bagun and Magnolica. As a breed it was recognized in 1873 on economic exhibition on Vienna. Since then, Black Slavonian pig became the most important breed of Eastern Slavonia. It was fatty type of pig adapted for extensive outdoor farming system (Karolyi *et al.*, 2004; Karolyi *et al.*, 2010; Margeta, 2013). Sow fertility and litter size have a great impact on economic results. In Black Slavonian breed, the fertility is 6–8 newborn piglets per litter, with parity index 1.5 (Luković *et al.*, 2012).

<sup>1</sup> Poljoprivredni fakultet Sveučilišta J. J. Strossmayer u Osijeku, Kralja Petra Svačića 1d, Osijek, Croatia, e-mail: kbudimir@pfos.hr

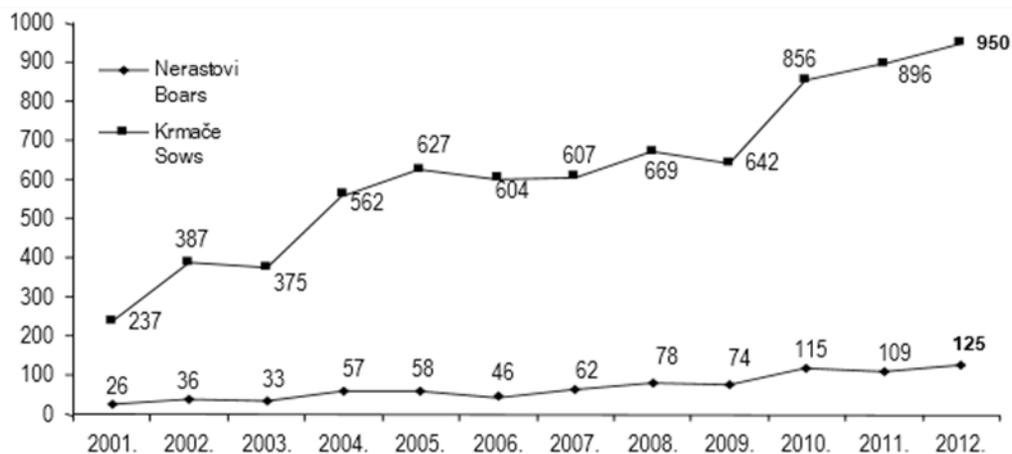


Figure 1: Changes of population size in Black Slavonian pigs since 2001 (HPA, 2013)

## 2 HUSBANDRY AND FEEDING MANAGEMENT

Traditionally, Black Slavonian pigs were reared in extensive conditions in which pigs were exploiting the food found in forests (mainly acorns) and pasture. If their nutrition is improved with corn, the pigs can achieve weight of 150 kg at the age of 10–20 months (Uremović *et al.* 2003; Margeta *et al.*, 2013). Uremović and Janeš (2000) found that pigs fattened in extensive conditions grew up to 105 kg on the average with growth rate around 478 g/day (close to 500 g/day). By improving housing conditions, growth rate can be improved (640 g/day was reported by Uremović *et al.*, 2003; or more than 700 g/day by Hrasnica *et al.*, 1958). Feeding of pigs should be based on green forage, grain and fodder grains and legumes. The suggested diets are based on corn, barley and field pea: i) for sows and fattening pigs 60% corn, 20% barley and 20% field pea, ii) for boar 50% of corn, 20% field pea, 20% oats and 10% barley, iii) for piglets 50% corn, 30% field pea and 20% barley (Karolyi *et al.*, 2010; Margeta, 2013).

Rearing conditions and feeding have a major impact on growth and body composition. One of the most significant differences in terms of chemical composition of meat between modern breeds and Black Slavonian breed is the content of intramuscular fat which determines the palatability and technological properties of meat. Depending on the feeding management percentage of intramuscular fat ranges from 4% to 8% (Petričević *et al.*, 1988, Kralik *et al.*, 1988). Compared with conventional breeds, Black Slavonian pig has smaller capacity for growth of meat and much higher for fat than modern breeds or hybrids. The average thickness of the meat and fat over the MLD (*Musculus longissimus dorsi*) was 64 mm and 63 mm, respectively, while hybrids between

Black and White Slavonian pigs had larger (73 mm) for meat and lesser (30 mm) for fat thickness of MLD (Karolyi *et al.*, 2010). The meat of this breed is used for the production of traditional meat products such as sausages, bacon and “*Slavonian kulen*”. Slavonian kulen is type of dry sausage that is produced from a mixture of minced leanpork from the most valuable cuts (Radman *et al.*, 2005; Luković *et al.*, 2009; Škorput *et al.*, 2011).

In the case of Black Slavonian Pigs, extensive system of pig production refers to outdoor systems with shelters and pastures (Fig. 2). Area of 1 ha may hold up to 4 breeding sows (along with fattening pigs, piglets, gilts and boars). Production area must be split into partitions, and facilities that are located on that area must be constructed from natural materials and in a traditional style. Facilities for sows and gilts depends on the number of animals and for five sows or gilts, (Fig. 3) according to few authors Karolyi *et al.* (2010); Karolyi *et al.* (2004), Margeta (2013) should be semi-opened area of 30 m<sup>2</sup>.



Figure 2: Pigs on the pasture. Source: [www.poljoprivredni-forum.com](http://www.poljoprivredni-forum.com) (Margeta, 2013)



**Figure 3:** Facilities for sows and gilts. Source: [www.poljoprivredni-forum.com](http://www.poljoprivredni-forum.com) (Margeta, 2013)

The floor should be covered with litter. Animals are fed in troughs or on the ground, while the drinking water can be supplied by different waterers or water wells. Farrowing units consist of farrowing pens with size 6 m × 1.5 m. Piglets stay with a nursing sow for 7 weeks before weaned. At weaning, sows return into groups for mating. Weaners are kept in a separate unit in groups. Facilities should be fenced with wire mesh to 100 cm in height or with an electric shepherd. Fattening lasts up to the age of 1.5 years when pigs weigh between 130–150 kg.

### 3 IMPROVEMENT OF THE BREED

Extensive conditions have led to the mixing of the Black Slavonian pigs with wild boars as well as modern breeds. Although black coat colour is dominant, mixing breeds caused other coat colour piglets to be born in F2 generation. For this reason, all purebred animals need to pass genetic tests. The program of preservation and development of the breed will only be possible once it is determined which animals are pure bred (Margeta *et al.*, 2009).

Breeding program will be based on a selection of male and female parents, forming the nucleus herd using the following criteria: animal origin, exterior of animal and molecular genetic analysis of the DNA. In order to increase genetic variability, the introduction of English Large Black boars was proposed, because this breed was introduced when creating Black Slavonian pig. The program should be under the strict control of the Croatian Agricultural Agency (HPA) and scientific institutions because of the exceptional significance and importance for the survival of the breed. Animals for nucleus herd will be chosen only if they fulfil all criteria and get positive assessment by the Breeding commission (Margeta, 2013).

### 4 CONCLUSION

Fattening of Black Slavonian Pigs is better adapted to higher health and welfare standards, contributing to a better image and consumers' acceptability of their products. In the future, more information should be given to consumers about the nutritional value of these products to advance market success, which if achieved would provide the necessary potential also for breed preservation or even revival.

### 5 REFERENCES

- Eurogroup for animals. 2010. Overview of the animal welfare payment measure in EU Member States rural development programmes 2007–2013
- Hrasnica F, Stančić D., Pavlović S., Rako A., Malcelj A. 1958. Specijalno stočarstvo. Poljoprivredni nakladni zavod. Zagreb. 336–339
- Hrvatska poljoprivredna agencija 2013. Godišnje izvješće 2012. Svinjogojstvo
- Karolyi D., Luković Z., Salajpal K., Đikić M. 2010. Black Slavonian pig – a breed for extensive husbandry (A review). *Acta Agraria Kaposváriensis* 14(2): 221–227
- Karolyi D., Salajpal K., Sinjeri Ž., Kovačić D., Jurić I., Đikić M. 2004. Meat quality, blood stress indicators and trimmed cut yield comparison of black slavonian pig with modern pigs in the production of slavonian kulen. *Acta agriculturae slovenica*. (1): 67–72
- Kralik G., Petričević A., Levaković F. 1988. Slaughter value of pigs of different production types. In: Proceedings of the 34th International Congress of Meat Science and Technology. Chandler, C.S., Thornton, R.F. (eds.). Brisbane, Australia, 29 August–2 September 1988: 88–90
- Luković Z., Karolyi D., Klišanić V., Mahnet Ž., Gantner V., Škorput D. 2012. Genetic parameters and trends for litter size in Black Slavonian pigs. Proceedings of the 7<sup>th</sup> International Symposium of the Mediterranean pig, Córdoba, Spain, 14–16 October 2010. De Pedro E.J., Cabezas A.B. (eds.). Zaragoza, CIHEAM/UCO, 2012, 677 p., Options Méditerranéennes, Series A, no. 101: 71–73
- Luković Z., Kaić A., Škorput D., Karolyi D. 2009. Effect of breed and rearing system on intramuscular fatty acid profile of *M. Semimembranosus* in raw Slavonian ham. *Italian Journal of Animal Science* 8(3): 255–257
- Margeta V. 2013. Perspectives of black slavonian pig keeping in Croatia in the context of EU accession. 48th Croatian and 8th International Symposium on Agriculture. Dubrovnik, Croatia. 17–22. February. 22–29
- Margeta V., Budimir K., Kralik G., Margeta P. 2013. Uzgoj crne slavonske svinje u funkciji zaštite okoliša. 6. Međunarodni znanstveno-stručni skup „Poljoprivreda u zaštiti prirode i okoliša“. 27–29 May, 2013. Vukovar. Croatia
- Margeta V., Kralik G., Dovč P., Jakšić D., Margeta P. 2009. A simple DNA based method for determination of pure Black Slavonian pigs. Proceedings of the 17th International Sym-

- posium Animal Science Days, Padova, 15–18 Sept., Italian Journal of Animal Science, 8, 3: 92–94
- Petričević, A., Kralik, G., Petrović, D. 1988. Participation and quality of some tissue in pig carcasses of different production. In Proceedings of the 34th International Congress of Meat Science and Technology. Chandler, C.S. and Thornton, R.F. (eds.). Brisbane, Australia, 29 August–2 September 1988: 68–70
- Radman M., Karolyi D., Kovačić D. 2005. Consumer satisfaction with Slavonian Kulen from Black Slavonian or modern pigs. Italian Journal of Animal Science 4(3): 181–183
- Škorput D., Morić V., Đikić M., Luković Z. 2011. Heritabilitet za veličinu legla crne slavonske svinje. 46th Croatian and 6th International Symposium on Agriculture. 14–18. Feb. 2011, Opatija. Croatia: 390–393
- Uremović, M., Janeš, M. 2000. Uzgojni program crne slavonske pasmine svinja. Hrvatski stočarski selekcijski centar, Zagreb: 1–10
- Uremović, M., Uremović, Z., Luković, Z., Konjačić, M. 2003. The Influence of genotype and production conditions on the fertility of sows in outdoor system. *Agriculturae Consectus Scientificus*, 68, 4: 245–248