

Morphological and reproductive traits of Turopolje breeding sows: A preliminary evaluation

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SUMMARY

ADDITIONAL KEYWORDS

Body weight.
Body length.
Age at first farrowing.
Litter size.
Weaned piglets.

The Turopolje pig (TP) is an endangered Croatian autochthonous breed. This preliminary study aimed to determine the morphological and reproductive traits of TP breeding sows reared extensively in a traditional outdoor system. Body measurements were performed on a total of 40 sows, while reproductive data for 34 (out of 40) sows were collected from the available records in the TP breed Herdbook. The mean (\pm standard deviation) age and body weight of sows were 67.5 ± 26.0 months and 96.6 ± 18.4 kg, respectively. The mean height at withers and rumps were 65.2 ± 2.8 cm and 68.4 ± 2.9 cm, respectively, while the average chest girth was 111.2 ± 10.4 cm. Average lengths of the body, head, ear and tail were 126.0 ± 6.5 cm, 27.0 ± 0.90 cm, 22.5 ± 8.3 cm and 29.9 ± 2.01 cm, respectively. The mean age at first farrowing was 23.3 ± 5.7 months. The average number of piglets born alive was 4.47 ± 1.96 , of which 3.08 ± 2.17 were weaned. It is concluded that the analysed population of TP breeding sows showed a typical morphology, with smaller body frame compared to modern breeds and generally low prolificacy. However, a high variability of reproductive traits indicates that improvements are possible, primarily through better management of sows.

Parâmetros morfológicos e reprodutivos de porcas reprodutoras da raça Turopolje: uma avaliação preliminar

RESUMO

O porco Turopolje (TP) é uma raça suína autóctone Croata em perigo. Este estudo preliminar tinha como objectivo a determinação de parâmetros morfológicos e reprodutivos de porcas reprodutoras TP criadas de forma extensiva no Sistema tradicional ao ar livre. As medições corporais foram efectuadas num total de 40 porcas e os dados reprodutivos recolhidos em 34 dessas 40 porcas inscritas no livro genalógico da raça TP. A idade média (\pm desvio padrão) e o peso corporal das porcas era de $67,5 \pm 26,0$ meses e $96,6 \pm 18,4$ kg, respetivamente. A altura média na cernelha e garupa eram, respetivamente de $65,2 \pm 2,8$ cm e $68,4 \pm 2,9$ cm, enquanto que o perímetro torácico era de $111,2 \pm 10,4$ cm. Os comprimentos médios do corpo, cabeça, orelhas e cauda eram de $126,0 \pm 6,5$ cm, $27,0 \pm 0,90$ cm, $22,5 \pm 8,3$ cm e $29,9 \pm 2,01$ cm, respetivamente. A idade média ao primeiro parto foi de $23,3 \pm 5,7$ meses. O número médio de leitões nascidos vivos foi de $4,47 \pm 1,96$, dos quais $3,08 \pm 2,17$ foram desmamados. Conclui-se que a população de porcas reprodutoras TP analisada apresenta uma morfologia típica, com um tamanho corporal menor que as raças modernas e uma baixa prolificidade. No entanto, a grande variabilidade nos parâmetros reprodutivos indica que é possível o seu melhoramento, desde logo através dum melhor manejo das porcas.

PALABRAS CHAVE ADICIONAIS

Peso corporal.
Comprimento corporal.
Idade ao primeiro parto.
Tamanho da ninhada.
Leitões desmamados.

INFORMATION

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INTRODUCTION

The Turopolje pig (TP) is an autochthonous Croatian breed, originated during the early Middle Ages in the Turopolje region, in Central Croatia. It is a medium-sized, primitive-type, fatty pig breed. Due to its modest

rearing requirements, resistance and good adaptation to local marsh meadows and oak forests, the TP breed has been an important food source for the local population for centuries (Robić, 2002). However, the rapid penetration of imported lean pigs in the second half of the 20th century, as well as the ban of forest grazing,

significantly reduced the interest in this breed. The result was a drastic decrease in the population size. Currently, despite the government support, the TP breed is still endangered, with a population of only 132 sows and 30 boars kept in 16 farms (Figure 1, Croatian Agricultural Agency, 2016).

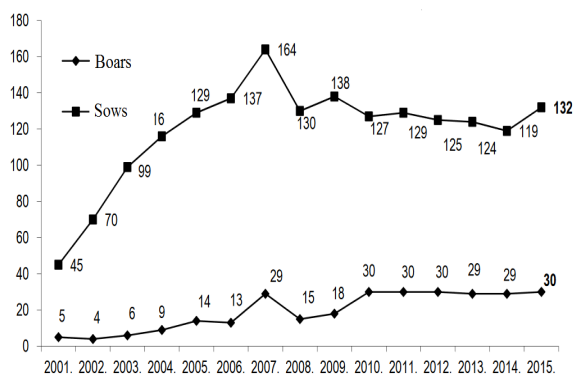


Figure 1. The number of Turopolje breed pigs from year 2001 to 2015 (CAA, 2016) (Número de reprodutores Turopolje entre 2001 e 2015).

Hence, a new conservation strategy, based on purebred animals, is needed for renewing the TP breed, which should be preserved as a resource for local livestock production and sustainable development. Unfortunately, no recent data on the morphological and reproductive traits of TP are available. The aim of the present study, therefore, was to determine these traits on representative individuals of the few TP breeding sows currently present and reared in a traditional outdoor system.

MATERIAL AND METHODS

Data were collected on sows ($n=40$) of different ages reared at a farm with the largest current population of TP (Lukavec, Plemenita općina turopoljska). At this farm, the sows are kept outdoor all the time, except during farrowing and the first few weeks of lactation, periods when they are held in shelters and fed separately from the rest of the herd. The morphological measurements performed included records on body weight (kg) by using a digital portable livestock scale, height (cm) at withers and rumps by using a Lydtin rod device, and body, head, ear and tail length (cm), and chest girth (cm) by using a measuring tape. All animals were measured standing symmetrically on a flat solid surface (within the scale). Description of the anatomical location of morphological measurements is given in Table I.

Data on age (months) and reproductive traits (age at first farrowing, number of piglets born alive, number of weaned piglets) for 34 (out of 40) sows were obtained from the available records (in total 101 farrowing included) in TP Herdbook of Croatian Agricultural Agency. The descriptive statistic (mean, standard deviation, minimum, maximum, coefficient of variability) was given.

Table I. Description of the anatomical localisation of morphological measurements (Descrição das localizações anatómicas das medições morfológicas).

Trait	Description
Height at withers	Distance from the flooring surface to the top of the back at shoulder blades.
Height at rump	Distance from the flooring surface to the top of the hipbone (sacrum).
Chest girth	Maximal distance around the animal (circumference) measured at the chest, behind the shoulder blades.
Body length	Distance from the external occipital protuberance to the base of the tail on the dorsal line.
Head length	From the external occipital protuberance to tip of nasal bone.
Ear length	From central point of the base to the most distant point of the external ear.
Tail length	From insertion of the tail to the tail tip.

RESULTS AND DISCUSSION

In Table II, the descriptive statistics of morphological and reproductive traits of TP breeding sows are shown.

From the data presented, a general homogeneity of morphological traits can be perceived, except for ear length, chest girth and, particularly, body weight, which showed a higher degree of variation among sows, probably due to age differences. From the results for body weight and length, height at withers and chest girth, it seems that the TP breed belongs to the type of medium-sized pig breeds, with generally smaller body frame (e.g. around 17 % lower height at withers

Table II. Morphological and reproductive traits of Turopolje pig breeding sows. (Parâmetros morfológicos e reprodutivos de porcas reprodutoras de raça Turopolje).

Trait		Mean	SD	Min	Max	CV%
Age	months	67.5	26.0	30.0	135.0	38.5
Live weight	kg	96.5	18.4	59.0	135.1	19.0
Height at withers	cm	65.2	2.8	59.0	71.0	4.3
Height at rumps	cm	68.4	2.9	63.0	76.0	4.3
Chest girth	cm	111.2	10.4	93.5	134.0	9.3
Body length	cm	126.0	6.5	110.0	138.0	5.2
Head length	cm	27.0	0.9	25.0	29.0	3.3
Ear length	cm	22.5	1.9	19.0	27.0	8.3
Tail length	cm	29.8	2.1	25.0	34.5	6.9
Age at 1 st farrowing	months	23.3	5.7	13.0	36.0	24.3
Piglets born alive	n	4.47	1.96	0	9	44.0
Piglets at weaning	n	3.08	2.17	0	9	70.5

and nearly 18 % smaller chest girth) compared to modern breeds like Landrace or Duroc (McManus et al. 2010). In addition, some of the morphological features, like the longer head and ears, indicate a primitive breed's type, as it was previously discussed by Đikić et al. (2007). In comparison with the available morphological data on TP sows from the past (e.g. Findrik, 1948; Ritzoffy, 1931), the population of TP sows in the present study shows a similar phenotype, especially in terms of height at withers, chest girth and ear length, but with slightly shorter head and lower hips. In relation to local pig breeds from the region, TP sows show a similar body development at comparable live weight as Moravka sows (Petrović et al. 2007) and several varieties of Mangalitsa breed (e.g., Hungarian swallow-bellied, Hungarian red and Romanian red) reported by Nistor et al. (2012). However, in Mangalitsa females having greater body weights, a larger height at withers and rumps were reported (Miclea et al. 2012). Nevertheless, the body length of TP breed seems to be longer than in the Mangalitsa or Moravka breed. The TP breed is generally smaller in body size than the Krškopolje pig breed (Kovač & Malovrh, 2015).

The reproductive parameters of TP sows were much more variable, especially regarding number of weaned piglets (CV=70.5%). The number of piglets born alive in TP was much lower compared to the modern breeds in the same area (Škorput et al. 2014). Similar results were obtained by Đikić et al. (1999). Litter sizes from analysed data were comparable to the reported breed standard for the Mangalitsa pig (Egerzegi et al. 2003; Miclea et al. 2012). Higher litter sizes were found in the Moravka breed (Petrović et al. 2007) and the Black Slavonian pig (Senčić et al. 2001). However, litter size is a trait strongly dependent on the production conditions. The high variability observed in the present study in the number of born alive piglets and the number of weaned piglets might be attributed to the variable production conditions in extensive systems. Moreover, this breed exhibited an older age at first farrowing compared to other breeds, such as the Krškopolje pig, which had an average age at first farrowing of 15 months (Kovač et al. 2015). This is not only an indicator of late maturity of the breed, but is probably also the result of an inadequate management. In conclusion, the population of TP breeding sows analysed in present study showed a typical morphology and generally low prolificacy. However, a high variability of reproductive traits indicates that improvements are possible, primarily through better management of sows.

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