GROWTH EFFICIENCY IN PRESTICE BLACK-PIED PIGS

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Abstract

The objective of this study was to estimate the effect of piglet birth weight on future growth intensity of fatteners in Přestice Black-Pied breed. Sixty-four piglets were divided into three groups according their birth weight (BW1 less than 1 kg of birth weight, BW2 from 1.1 to 1.5 kg and BW3 more than 1.51 kg). The average daily weight gain from birth to the slaughter of all pigs was 484.30 ± 93.68 g/day. The pigs with lower birth weight achieved a lower growth intensity than pigs with higher live weight at birth. The differences in live weight among groups are statistically significant at all stages of age. The difference in slaughter weight between BW1 and BW3 group was 12.42 kg of live weight. The piglets with the lowest birth weight achieved 465.37 g of weight gain from birth to slaughter in comparison with the heaviest piglets (525.58 g).

Key words: Pig; birth weight; growth parameters

Selection for litter size has enabled marked advances in sow productivity (Knauer and Hostetler, 2013). However, as litter size increases, birth weight decreases and the number of small piglets (<1 kg) increases (Quiniou et al., 2002; Boulot et al., 2008). The piglet birth weight is an important metric for survival (Fix et al., 2010). Despite technological advances in intensive pig production, low body weight (BW) at birth and high within-litter variation are two of the most important factors impairing profitability in pork production. The increased litter size was unfavorably correlated with piglet birthweight and within-litter homogeneity (Knol et al., 2001; Quinton, et al., 2006; Wolf et al., 2008; Kim et al., 2009). These parameters have been shown to have significant effects on piglet subsequent mortality rate, growth performance, carcass, and meat quality traits (Quiniou et al., 2002; Rehfeldt and Kuhn, 2006; Bérard et al., 2010; Fix et al., 2010). A critical birth weight of 950 g has been proposed, below which the development of myofibers and lipids may be modified. Low birth weight results from intrauterine growth retardation during gestation. Small piglets form a lower total number of skeletal muscle fibres during prenatal development compared with their larger littermates (Gondret et al., 2006). The birth weight of piglet is 1 % from its slaughter weight. The piglets with birth weight higher than 1.2 kg are considered to be viable and reach the maximum of its production efficiency (Herčík, 2003).

The objective of this study was to estimate the effect of piglet birth weight on future growth intensity of fatteners in Přestice Black-Pied breed. This autochthonous breed is characterised by many valuable traits, such as a high degree of adaptability to environmental conditions, resistance to climate stress, local parasites and pathogens, and better use of local feed sources. Under normal intensive fattening conditions, it is characterized by less favourable carcass value and cannot be compared with performance of modern meat breeds and hybrids (Matoušek et al., 2013).

Material and Methods

The objective of this study was to estimate the effect of piglet birth weight on future growth intensity of fatteners in Přestice Black-Pied breed. Sixty-four piglets were divided into three

groups according their birth weight (BW1 less than 1 kg of birth weight, BW2 from 1.1 to 1.5 kg and BW3 more than 1.51 kg). Pigs were weighed and individually identified within 24 h of birth. Live weight of animals was measured at age of 28 days (weaning) and in regular monthly interval. Pigs were slaughtered at average live weight 96.22 kg. Pigs were fed standard commercial feed mixtures for appropriate weight categories. The average daily weight gain was calculated. Standard statistical parameters were calculated using QCExpert program (TriloByte Statistical Software, s.r.o. Pardubice, Czech Republic).

Results and discussion

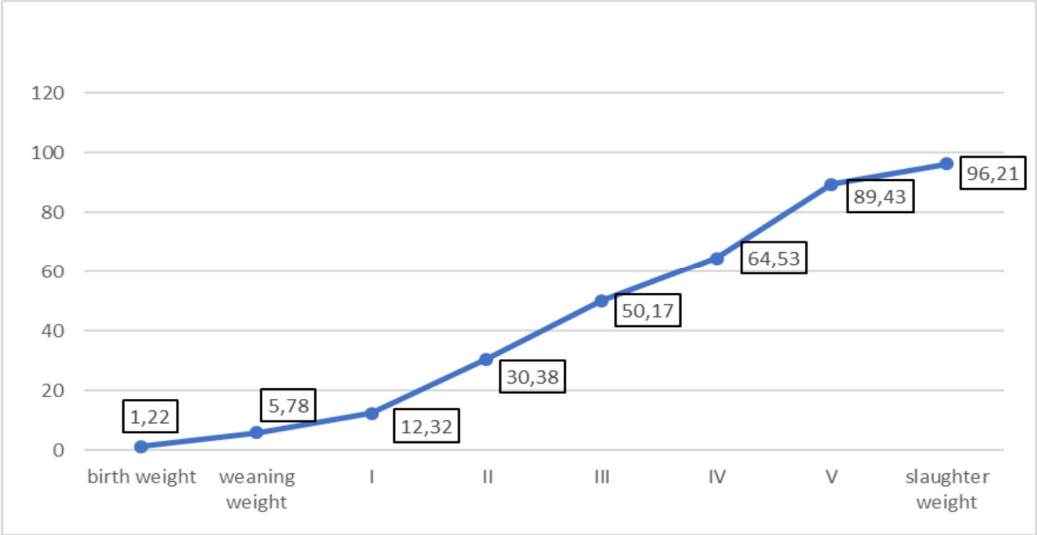
The effect of birth weight on growth parameters in Prestice Black-Pied pigs were evaluated. The live weight gains (without effect of birth weight) in individual stages of fattening are given in Table 1.Dostálová et al. (2012) states that at the same length of fattening period, the Přeštice Black Pied pigs reach a lower weight, at the age of 186 days the weight of hybrid pigs of the combination (BUxL) x (HxPN) is 114 kg, but in Přeštice Black Pied pigs 92 kg. This corresponds to the average weight gain of 860 resp. 650 g/day. The growth curve of Prestice Black Pied pigs is iluustrated in Figure 1. The average live weight of pigs in monitored fattening periods was significantly affected by birth weight (Table 2).

The pigs with lower birth weight achieved a lower growth intensity than pigs with higher live weight at birth. The differences in live weight among groups are statistically significant at all stages of age. Pigs with birth weight less than 1000 g achieved the lowest weight gain from the birth to the weaning and also from the birth to the slaughter (Figure 3). The highest average daily weight gain was found in pigs with birth weight higher than 1500 g. Gondret et al. (2005) studied the influence of piglet birth weight on postnatal growth performance. They found the differences between piglets with light birth weight (0.8-1.1 kg) and heavy birth weight (1.75-2.05 kg) in growth intensity. Average daily gain in smaller piglets was reduced by 31 % during suckling period. But the growth performance during the growing-finishing period was similar in both groups. The data presented in our study are consistent with previous studies showing that light pigs at birth required a greater number of days to reach the same slaughter weight than their heavier littermates (Wolter et al., 2002). Bérard et al. (2008) also studied the effect of birth weight on growth, carcass and pork quality. They found that average daily gain of piglets with different birth weight was similar in the preweaning period. This finding is in contrast with results reported by Quiniou et al. (2002) showing that during lactation heavier piglets grow faster than lighter piglets. These authors assumed that heavier piglets have a greater ability to occupy the best-performing teats, to stimulate and to drain them, thereby, to induce a larger milk flow. According to Alvarenga et al. (2013), under Brazilian commercial conditions, high-birthweight piglets (1800-2200 g) have better carcass yield than piglets weighing 800-1200 g at birth.

Table 1. Average daily weight gain of Prestice pigs

	Live weight gain (g/day)
Birth – weaning	166.18 ± 56.38
Weaning – slaughter	534.47 ± 102.82
Birth - slaughter	484.30 ± 93.68

Figure 1. Growth of Prestice Black-Pied Pigs



I – one month after weaning, II – two months after weaning, …

Table 2. Effect of birth weight (BW) on live body weight of pigs in different fattening periods

	BW 1 (<1 kg) N=18	BW2 (1.1-1.5 kg) N=31	BW3 (1.51 kg <) N=15	SEM
Weaning	3.67 ^{AB}	6.17 ^{A}	7.69 ^{B}	0.360
I	8.72 ^{aA}	13.10 ^{a}	15.29 ^{A}	0.808
II	26.89 ^{a}	29.64 ^{b}	36.35 ^{ab}	1.272
III	44.11 ^{a}	49.39 ^{b}	59.5 ^{ab}	2.124
IV	56.11 ^{a}	63.96 ^{b}	76.50 ^{a}	2.679
V	79.78 ^{a}	88.50 ^{b}	103.71 ^{ab}	3.168
Slaughter	91.40 ^{a}	96.48	103.82 ^{a}	3.173

I – one month after weaning, II – two months after weaning, …

^{ab} means with the same superscripts differ significantly P<0.05
^{A} means with the same superscripts differ highly significantly P<0.01

Figure 2. Effect of birth weight on live body weight of pigs in different fattening periods

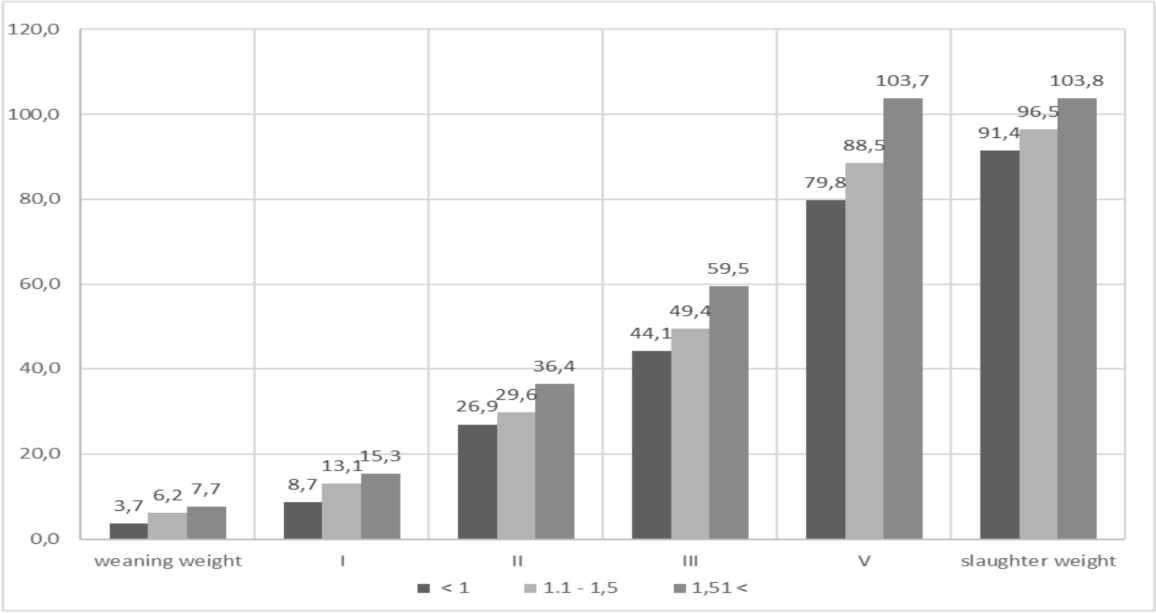
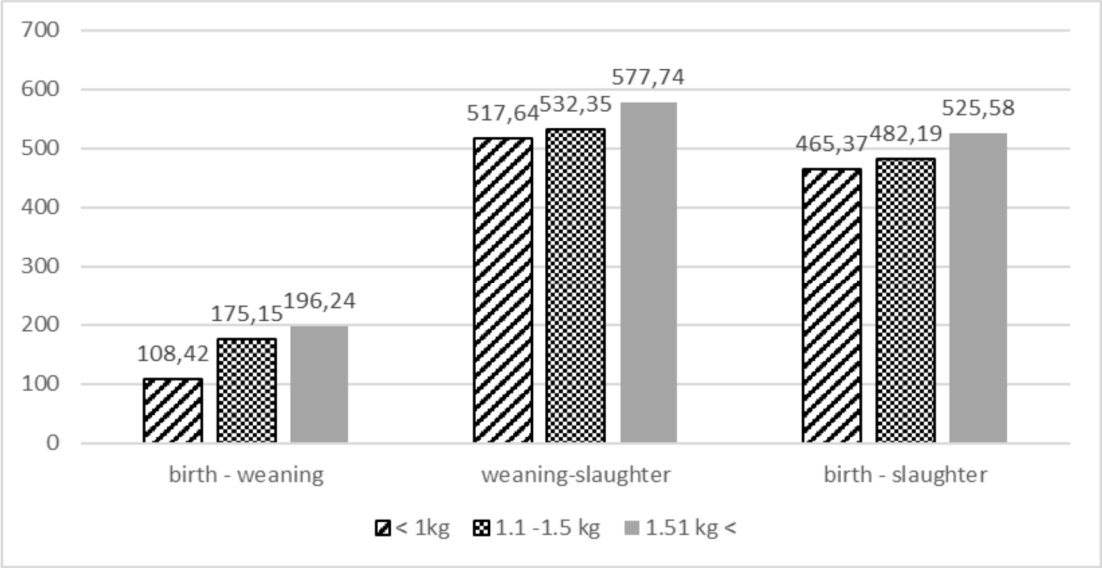


Figure 3. Effect of birth weight on average daily weight gain



Conclusion

Birth weight of pigs impacts their growth ability. Pigs with low birth weight achieved a lower weight gain during all phases of production and they are lighter at the end of fattening period.

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