

Evaluation of productivity of imported crossbred pigs (Landrace × Yorkshire × Duroc)

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Abstract: *Evaluation of productivity of imported crossbred pigs (Landrace × Yorkshire × Duroc).* The aim of the conducted studies was to determine the run of fattening and slaughter value of imported hybrid pigs: L × Y × D. The uniform nutrition and management was employed; the pigs were fattened from body weight 30 to 115–120 kg. For 4433 animals, who completed fattening and were slaughtered, very good production results were obtained: mean daily body gains – 989 g, feed conversion – 2.88 kg/kg; meatiness – 58.86%; participation of carcasses in classes S and E – 92.9% in total. The obtained results indicate a very good, and, first of all, repeatable quality of the examined hybrid fatteners in respect of traits which are economically important for meat producers and meat industry. They are also the evidence of high and stabilized genetic potential of purebred populations of animals, employed in three-breed commercial crossbreeding, serving for production of piglets for fattening.

Key words: crossbred fatteners, production parameters

INTRODUCTION

In pig management, good quality of animal material is the condition for obtaining satisfying economic results. Its improvement is based on measurements of live animals and accurate post-slaughter evaluation (Blicharski 1999). The selection-breeding work, oriented to the betterment of utility traits of pigs,

including meatiness of carcasses, has caused that at present, the animals differ in utility, conformation and growth rate as compared to those ones who were at the disposal of breeders several years ago (Różycki 2004). The breeding work and high import of pigs for domestic breeding have brought about the change of in relationships between the particular slaughter traits and meatiness (Żak et al. 2008). The animals, imported to Poland, were bred within the frames of various programmes. Their assumptions differed often each other because the level of utility traits of the animals in the particular countries was different as well as the expectations of the receivers of breeding material, live pork and of the consumers (Różycki and Żak 2001). The genetic breed and environmental (feeding) factors have an impact on the carcass fat content and distribution as well as its composition – fatty acids' profile (Scheeder 2004, De Smet et al. 2004, Wood et al. 2008). The quality of carcass is also dependent on the meat content (Orzechowska et al. 2012).

After the entrance of Poland to the EU structures and opening of the European market, the national producers of live

pork began to buy material for fattening not only from Polish piggeries but also from abroad. It was supported by the offer of delivering greater, uniform and healthy lots of animals at competitive prices.

The reached considerable progress in meatiness of domestic and imported animals, the changes in the systems of feeding the pigs, abbreviating fattening period and the introduced prophylactic programmes are favourable for obtaining good results (Różycki and Żak 2001). From the economic point of view, at the present level of live pork purchasing prices, the parity income may be obtained when selling at least several hundreds (300–500) fatteners during a year.

The aim of the work was to evaluate productivity and repeatability of the

result of imported hybrid pigs, fattened in private farm in the standardized (uniform) conditions of nutrition and management.

MATERIAL AND METHODS

The crossbred piglets (Landrace × Yorkshire × Duroc) were intended for fattening at body weight of 30.5 ± 0.5 kg. The pigs were *ad libitum* fed in the two-stage system. Initially, a ready granulated feed for weaners was used and then, the feed for fatteners and/or the own mixture, containing cereals and concentrate was administered (Table 1). Fattening of pigs was conducted in the building with the area of 360 m² (30 × 12 m) in 14 pens on a deep litter, with maximum density of 450 head (one

TABLE 1. Composition of raw materials and nutritional value of mixtures

Specification	Grower (BW 20–35 kg)	Fatteners (BW 35–70 / 80 kg)	Concentrate weaner / fattener (20 / 17%)
Raw material composition	Cereal meals: corn, wheat, barley, triticale, animal pork fat, mineral-vitamin and enzymatic additives, tryptophan		Vegetal by-products of spirit products' manufacture, products of pork blood, mineral-vitamin and enzymatic additives
	Extraction soy and rape meal, wheat brans, wheat protein		
Nutritional value of 1 kg of mixture (g)			
Specification	Grower (20–35 kg m.c.)	Fatteners (35–70 / 80 kg)	Concentrate weaner / fattener (20 / 17%)
Crude ash	44.60	43.32	126.23
Crude protein	165.00	160.00	399.98
Crude fat	37.65	29.70	35.99
Crude fibre	39.88	43.07	56.90
Calcium	7.00	6.50	33.00
Phosphorus	5.80	5.70	15.80
Sodium	2.00	2.00	10.00
Lysine	11.30	10.00	40.00
Methionine	3.71	2.77	10.75

lot). The animals were kept in standard management and nutrition conditions. After completion of fattening of a lot of pigs, manure was removed and the premises were cleaned, washed and disinfected, using jodosol preparation and lime milk. During the observation period, the requirements concerning animal welfare were satisfied (EU 1999, EU 2001). In ten successively fattened groups, 4433 animals were produced in total. After reaching body weight of ca. 115–120 kg, the pigs were slaughtered according to the procedures, obligatory in the meat industry. The mean daily body gains and feed conversion per 1 kg of body weight gain were determined. Meatiness of carcasses was assessed using choirometer (Sydel CGM) and then, they were qualified into appropriate classes in EUROP system. The results were given in tables and figures as the weighed means.

RESULTS AND DISCUSSION

The obtained fattening parameters are given in Table 2. They are found within the ranges established by the receiver of live pork – ANIMEX Group SA and the mentioned limits should be found below 900 g/day, with feed conversion on the level of 2.99 kg/kg of body weight gain. Better results were obtained in own studies; daily gains were higher by 89 g (+10.99%), feed conversion was lower by 0.11 kg/kg of body weight gain (Figs 1 and 2). It means saving of ca. 10 kg of feed per fattener in relation to threshold value, established by the receiver. It may be stated that Danish hybrids have good body weight gains as well as they utilize feed well in the appropriate management conditions; they had such conditions ensured during the monitored fattening period. Their meatiness was very high (Table 3). Classes S and E included 92.9% of carcasses in total.

TABLE 2. The selected indicators of fattening and slaughter value (10 groups of fatteners; n = 4433)

Group of fatteners	Quantity in the group	Period of fattening (days)	Body weight of fatteners at slaughter (kg)	Dressing percentage (%)	Mean meatiness (%)
1	414	94.68	119.17	79.35	59.39
2	442	85.23	119.15	79.41	58.87
3	441	93.83	120.91	77.64	57.65
4	440	85.00	118.70	79.03	59.08
5	432	87.85	119.54	79.29	59.56
6	475	92.14	124.21	78.77	59.09
7	458	97.34	124.29	79.07	58.30
8	458	92.89	119.53	78.70	59.02
9	443	96.84	124.05	79.07	59.02
10	435	85.82	116.60	79.39	58.64
Mean	443.3	91.30	120.81	79.05	58.86

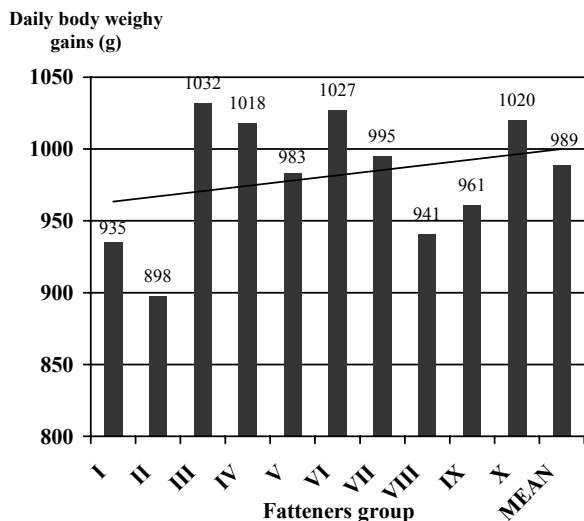


FIGURE 1. Daily body weight gains of fatteners in groups

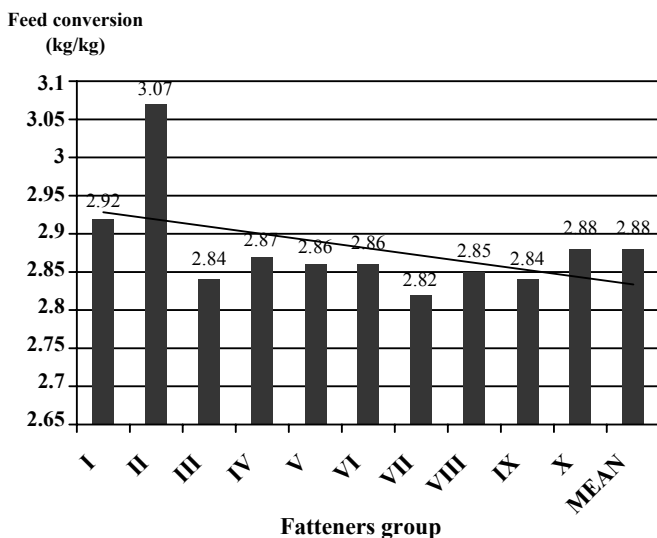


FIGURE 2. Feed conversion by fatteners in groups

The mean meatiness of the fatteners from 10 groups was comparable with the results of Siczowska et al. (2009) and Moczowski (2010).

The comparison of results of the study of Różycki and Żak (2001) versus own analysis indicates to differences

in meat percentage in carcass and feed conversion per 1 kg of body weight gain (PIC – 58.06% and 3.09 kg/kg, HYPOR – 53.27% and 2.97 kg/kg, PENAR LAN – 54.30% and 2.96 kg/kg), in favour of own study (58.86% and 2.88 kg/kg). The maximal difference in meat in carcass

TABLE 3. Evaluation of carcasses according to EUROP scale (10 groups of fatteners; n = 4433)

Class of fatteners	Number of fatteners in class (heads)	Number of heads in class (%)	Mean meatiness (%)	Mean weight of carcass in class (kg)
S	1606	36.2	61.35	95.59
E	2512	56.7	57.97	93.43
U	302	6.8	53.51	93.99
R	13	0.3	47.89	89.70
Total	4433	100	58.86	94.24

amounted to 5.59 percentage points. Significant time difference between the two studies has to be, however noted.

Meatiness of fatteners was by 3% higher as compared to the threshold value, established by meat factories and higher than the national mean for mass population, evaluated in the years 2011–2012. In case of a very good meatiness, feed conversion per 1 kg of gain was equal to 2.88 kg what affected positively the effectiveness of production. If we compare the consumption of feeds in the own studies and the consumption of the mixtures by the animals PEN AR LAN, we will find a difference – 0.08 kg/kg of gain. In case of fattening, lasting 91.3 days, it means saving of feed on the level of 7.22 kg per animal (with assumption adopted by Animex SA group, it is 9.94 kg/head). In case of the group of fattened pigs equal to 450 heads (one lot), it means demand on feed versus PEN AR LAN, as being lower by 4 t. In relation to the assumptions of Animex SA group, the demand on the feeds for the whole quantity of fatteners (n = 4433 heads) amounted to more than 44 t (44,064 kg) what gave a guarantee of good fattening effectiveness. Moczowski (2010)

analyzed a group of crossbred pigs produced on the grounds of the breeds, managed in Poland (PLW × PL) × Duroc and (PLW × PL) × Pietrain and Danish and Dutch breeds – (Landrace × Yorkshire) × Duroc. In case of production of more than 6.3 thousand animals, deaths in experimental fattening period were as follows: Polish (P) – 3.1%; Dutch (H) – 6.3%; and Danish (D) – 2.5%. In the structure of the sold pigs, the participation of fatteners P, H and D was 37.07, 26.07 and 36.86%, respectively. The participation of carcasses in classes S and E was as follows: Polish fatteners – 25 and 59%, Dutch fatteners – 14 and 46% and Danish fatteners – 46 and 49%, respectively. The results, obtained for Polish fatteners were considered by Moczowski (2010) as satisfying, however, the relatively low participation of the pigs in class S decreased the incomes. In evaluation of the cited author, a low meatiness of Dutch fatteners resulted, first of all, from the state of induction of immunological system. A very good meatiness of Danish fatteners confirmed their high genetic potential in respect of slaughter traits. Siczowska et al. (2009) emphasize

that the Danish pigs are characterized by a very good quality and technological suitability with preservation of high, 58%-percentage-meatiness. The meatiness on the level of 58–59% for a big group of Danish fatteners was also obtained in the studies of Moczowski (2010). Sieczkowska et al. (2009) recognize the mentioned level of meatiness as being good. The results of Różycki and Żak (2001), Eckert and Orzechowska (2002), Rybarczyk et al. (2004), Borzuta et al. (2008), Strzelecki et al. (2008) and Grześkowiak et al. (2010) also confirm a good quality of slaughter hybrid pigs. High meatiness of fatteners in the own studies is, *inter alia*, the effect of a very good nutrition. The animals with a high growth potential require the mixtures with a high concentration of energy and nutrients (Rekiel and Olejniczak 2009). *Ad libitum* nutrition is the simplest method for intensive fattening; the excessive fatness of carcass is its defect. It may be prevented when limiting the quantity of the consumed feed by the animals for the period of a few weeks before slaughter and, as it was revealed in the studies of Affentranger et al. (1996), by a decrease of the quantities of energy in the mixture during the final stage of fattening. It lowers the costs of fattening and causes depositing of by 2–3% greater quantity of lean meat in the carcass.

CONCLUSIONS

The obtained results indicate a very good and, first of all, repeatable quality of the examined hybrid fatteners in respect of

the traits, being economically important for meat producers and meat industry. They are also an evidence of a high and stabilized genetic potential of initial, purebred populations of animals, used in three-breed commercial crossbreeding.

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Streszczenie: Ocena produktywności importowanych świń hybrydowych landrace × yorkshire × duroc. Celem przeprowadzonych badań było określenie przebiegu tuczu i wartości rzeźnej importowanych świń mieszańców L × Y × D. Stosując ujednoczone żywienie i utrzymanie, świnię tuczono od masy 30 do 115–120 kg. Dla 4433 zwierząt, które ukończyły tucz i były ubite, uzyskano bardzo dobre wskaźniki produkcyjne; średnie przyrosty dobowe – 989 g, wykorzystanie paszy – 2,88 kg/kg, mięsność – 58,86%, udział tusz w klasach S i E – łącznie 92,9%. Uzyskane wyniki wskazują na bardzo dobrą, a przede wszystkim powtarzalną jakość badanych tuczników hybrydowych w zakresie cech ważnych gospodarzo dla producentów i przemysłu mięsnego. Dowodzą też wysokiego i ustabilizowanego potencjału genetycznego czystorasowych populacji zwierząt używanych w 3. rasowym krzyżowaniu towarowym, służącym produkcji piasiat do tuczu.

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