

THE EFFECT OF GROWTH RATE TO MEATINESS TRAITS IN PUREBRED AND CROSSBRED PIGS

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Abstract. The aim of this study was to analyse the effect of growth rate to leanness, backfat thickness and loin lean area formation in purebred and crossbred pigs, and to determine optimal limits of daily gain that do not have crucial negative influence on meatiness traits. In the State Pig Breeding Station, the control fattening and carcass evaluation of purebred Lithuanian Whites (LW), Large Whites (La.W), Yorkshires (Y), Landraces (L), Pietrains (P), Durocs (D) and the widely used crossbred combinations (LWxL, La.WxL, La.WxP, YxL, YxP, YxPxL, LxD, LxPxL) were accomplished by the accepted methodology. During the control fattening (from 30 to approx. 95 kg weight), conditions of housing and feeding were equal for all groups of pigs. When analysing effect of fattening intensity on the meatiness indicators, grown purebred pigs (n=235) were divided into 3 groups by the daily gain: I - till 750 g, II - 751–850 g, and III – 851 g and more. Crossbred pigs (n=341) were divided into 4 groups: I – till 750 g, II – 751–850 g, III – 851–950 g, and IV – 951 g and more.

The study indicated, that leanness of LW, La.W, Y and L breed pigs that had daily gain 851 g and more was lower by 2.2–4.0 % ($P<0.05-0.001$) and backfat thickness at the last rib was higher by 1.2–2.6 mm when compared to pigs with daily gain till 750 g. Reliable thickening of backfat was found not only to Yorkshires and Landraces, but to Durocs as well ($P<0.05-0.01$). Lean meat content of all investigated combinations of crossbreds that had daily gain 951 g and more was lower by 1.7–4.1 % ($P<0.05-0.001$, except LWxL) and backfat thickness at the last rib was higher by 2.4–5.0 mm ($P<0.05-0.001$) when compared to hybrids with daily gain till 750 g. Intensity of fattening did not have crucial influence on the loin lean area for the most purebred and crossbred pigs.

According to the investigation data, in appropriate conditions of housing and omni-valued feeding the optimal limits of daily gain (from 30 to approx. 95 kg weight) that do not have crucial negative influence on meatiness traits are the following: for purebred LW, La.W, Y and L pigs daily gain are 751–850 g. Growing purebred Durocs and Pietrains on purpose to fatten is not recommended. They are kept for a possibility to be used in crossbreeding combinations as paternal forms. For hybrids of LWxL, YxL, YxP, LxD, YxPxL daily gain are 851–950 g. For crossbreds of La.WxL, La.WxP, LxPxL daily gain are 751–850 g.

Keywords: pig breeds, crossbreds, daily gain, leanness, backfat thickness, loin lean area, dependence.

PENĖJIMOSI INTENSYVUMO POVEIKIS GRYNAVEISLIŲ KIAULIŲ IR MIŠRŪNŲ MĖSINGUMO RODIKLIAMS

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Santrauka. Tyrimo tikslas buvo analizuoti penėjimosi intensyvumo poveikį grynaveislių kiaulių ir mišrūnų santykinio raumenų kiekio, lašinių storio, ilgiausiojo nugaros raumens skerspjūvio ploto formavimuisi bei nustatyti optimalias priesvorio per parą ribas, neturinčias esminės neigiamos įtakos šiems mėsingumo rodikliams. Pagal priimtą metodiką Valstybinėje kiaulių veislininkystės stotyje atliktas grynaveislių Lietuvos baltųjų (LB), didžiųjų baltųjų (DB), jorkšyrų (J), landrasų (L), pjėtrenų (P), diurokų (D) ir plačiausiai naudojamų derinių mišrūnų (LBxL, DBxL, DBxP, JxL, JxP, JxPxL, LxD, LxPxL) kontrolinis penėjimas bei skerdenų vertinimas. Kontrolinio penėjimo (nuo 30 kg iki vidutiniškai 95 kg masės) metu visų grupių kiaulių laikymo ir šėrimo sąlygos buvo vienodos. Analizuojant penėjimosi intensyvumo įtaką mėsingumo rodikliams, užaugintos grynaveislės kiaulės (n=235) pagal priesvorį per parą buvo suskirstytos į tris grupes: I – iki 750 g; II – 751–850 g ir III – 851 g ir daugiau. Mišrūnai (n=341) suskirstyti į keturias grupes: I – iki 750 g; II – 751–850 g; III – 851–950 g ir IV – 951 g ir daugiau.

Nustatyta, kad LB, DB, J bei L, kurių priesvoris per parą 851 g ir daugiau, buvo 2,2–4,0 proc. mažiau raumeningos ($p<0,05-0,001$), o lašiniai už paskutinio šonkaulio – 1,2–2,6 mm storesni negu kiaulių, kurių priesvoris per parą iki 750 g. Nustatėme, kad patikimai storėjo ne tik jorkšyrų, landrasų, bet ir diurokų lašiniai ($p<0,05-0,01$). Visų tirtų derinių mišrūnai, kurių priesvoris per parą 951 g ir daugiau, buvo 1,7–4,1 proc. mažiau raumeningi ($p<0,05-0,001$, išskyrus LBxL), o jų lašiniai už paskutinio šonkaulio – 2,4–5,0 mm storesni ($p<0,05-0,001$) negu mišrūnų, kurių priesvoris per parą iki 750 g. Daugumos grynaveislių kiaulių ir jų mišrūnų penėjimosi intensyvumas esminio poveikio ilgiausiojo nugaros raumens skerspjūvio plotui neturėjo.

Tyrimo duomenimis, esant tinkamoms laikymo sąlygoms ir visaverčiam šėrimui optimalios priesvorio per parą (laikotarpiu nuo 30 kg iki vidutiniškai 95 kg masės) ribos, neturinčios esminės neigiamos įtakos mėsingumo rodikliams, yra: LB, DB, J ir L – 751–850 g, LBxL, JxL, JxP, LxD, JxPxL veislių mišrūnų – 851–950 g, o DBxL, DBxP ir LxPxL

veislių mišrūnų – 751–850 g. Grynavaislių diurokų ir pjentrenų laikymas penėjimo tikslams nerekomenduojamas. Jų paskirtis – mišrūnų gavimas.

Raktažodžiai: kiaulių veislės, mišrūnai, priesvoris per parą, raumeningumas, lašinių storis, ilgiausiojo nugaros raumens skerspjūvio plotas, priklausomybė.

Introduction. Pig breeding in Lithuania is a traditional branch of animal husbandry. Large White, Yorkshire, Landrace, Duroc, Pietrain pig breeds and their crossbreds are bred along the Lithuanian Whites. Pig selection carried out in breeding centres is directed towards higher litter size and milk yield and improvement of fattening and carcass traits (Klimas et al., 2011). The main task of the breeding centres is improvement and multiplication of breeding pigs and that of commercial farms – rational use of the breeding progeny in crossbreeding (hybridization) combinations.

In improvement of pigs it is important to consider such selection and genetic parameters as correlation coefficient. The magnitude of relationship between different productivity indicators of pigs depends on many factors, but some of the most important are breed, genetic structure of the herd, performance level and environmental conditions (Nicholas, 1996; Cameron et al., 1999; Latorre et al., 2008).

Contradictory interrelationships emerge between fattening and meatiness traits of various breeds of pigs (Michalska et al., 2007). In most cases, while daily gain increases, the main meatiness traits of pigs become worse: backfat thickens and relative muscularity decreases (Kapelanski et al., 2000; Michalska et al., 2000; Pierzchala et al., 2003; Citek et al., 2006; Stupka et al., 2006). In Lithuania, in stables of control fattening of the State Pig Breeding Station analogous researches were done on purebred pigs and their crossbreds that were kept in equal conditions of housing and feeding. These investigations confirmed the above-mentioned tendency (Klimas and Klimienė, 2012). Close and significant correlation between daily gain and leanness was determined in purebred Lithuanian White, Large White, Yorkshire and Landrace pigs (r =from -0.29 to -0.58) and all investigated hybrid combinations (r =from - 0.30 to - 0.48). Therefore pigs of these breeds with higher daily gain have less muscularity ($P < 0.05$ - 0.001). Besides, when daily gain increases, the backfat of above-mentioned purebred pigs and hybrids also thicken (respectively, r =from 0.12 to 0.46 and r =from 0.33 to 0.59), though this difference is not statistically significant for Lithuanian Whites. The interdependence intensity of fattening and meatiness traits of Durocs and Pietrains may differ because of the fewer investigated pigs in this research and also because these are purely fleshy breeds used in various combinations of commercial crossbreeding (hybridization) only as a paternal form.

Fat and lean meat content of carcass and proportions of these tissues determine the value of cuts for processing or sales in an unprocessed form (Blicharski et al., 2004). The factors mentioned affect the economic side of production, as they determine the price paid for the fattening pig (Pork-carcasses EUROP, 1994). Financial

profits from fattening pigs are influenced by their growth rate and feed conversion ratio, because the feedstuffs constitute about 70 % of the total cost of production (Melnikienė, 2011; Klimas et al., 2012). According to the data of control fattening (Rimkevičius et al., 2012), while daily gain increases, pigs of cultural breeds reached realization weight earlier (r =from -0.44 to -0.75) with the lowest feed consumption per kg gain (r =from -0.06 to - 0.57).

Due to increased demand for leanness and profitable pork, it is necessary to select pigs by growth rate and muscularity, though these indicators are hardly combined together. Therefore in all categories of farms (concrete environmental conditions) it is purposeful to search optimal growing rapidity that does not significantly change the percentage of muscularity. However analogical investigations mostly are accomplished in standardised conditions - in the pig testing stations (Citek et al., 2006; Michalska et al., 2007; Žak et al., 2008). The optimal limits of daily gain that do not have essential influence on the changes of meatiness traits in all purebred pigs and their crossbreds kept in equal conditions and for the same time span have not yet been investigated in Lithuania.

The purpose of this study was to analyse the effect of growth rate to leanness, backfat thickness and loin lean area formation in purebred and crossbred pigs, and to determine optimal limits of daily gain that do not have crucial negative influence on meatiness traits.

Material and methods. In 2008–2009, in the State Pig Breeding Station the control fattening and carcass evaluation of purebred Lithuanian Whites open population (LW, $n = 53$), Large Whites (La.W, $n = 43$), Yorkshires (Y, $n = 53$), Landraces (L, $n = 53$), Pietrains (P, $n = 26$), Durocs (D, $n = 7$) and the widely used crossbred (hybrid) combinations – LW x L ($n = 50$), La.W x L ($n = 59$), La.W x P ($n = 54$), Y x L ($n = 36$), Y x P ($n = 54$), Y x P x D ($n = 21$), L x D ($n = 19$), L x P x D ($n = 48$) were accomplished by the accepted methodology (Saikevičius, 2003). Groups of clinically healthy investigated pigs were formed using the principle of analogues by parentage, age and weight.

During the control fattening (from 30 to approx. 95 kg weight), conditions of housing and feeding were equal for all groups of pigs. Pigs were fed with special dry compound feed KRET- KOM58-957 GR/08, containing 1.1 feed units, 13.4 MJ of metabolizable energy and 16% of proteins per kilogram. After finishing control fattening of pigs, their age in days (from the birth until reaching 100 kg weight), average daily gain and feed consumption per kg gain (during the fattening period from 30 to approx. 95 kg weight) was calculated. Before realization (slaughtering), lean meat percentage was determined for live pigs according to accepted methods (Piglog 105

User's Guide, 1991). Backfat thickness at the last rib and loin lean area of cooled carcasses (at 0...+4⁰ C in 24-hours period) were recalculated at 100 kg of weight, using accepted coefficients of regression (Saikevičius, 2003). When analysing influence of fattening intensity on the meatiness indicators (lean meat percentage, backfat thickness at last rib, loin lean area), grown purebred pigs (n=235) were divided into 3 groups by the daily gain: I - till 750 g, II - 751-850 g, and III - 851 g and more. Crossbred pigs (n=341) were divided into 4 groups: I - till 750 g, II - 751-850 g, III - 851-950 g, and IV - 951 g and more.

The investigation data were processed using statistical package Statistica for Windows version 6.0 (StatSoft,

2001) and following the basic guide to the statistical analysis of biological data by Tucker (2003). The difference was considered significant when $P < 0.05$.

Results. Purebred pigs. It was indicated (Table 1), that muscularity of pigs in group III (average daily gain 851g and more) was smaller than muscularity of pigs in group I (average daily gain up to 750 g), namely, muscularity of Lithuanian White and Large White was less in 2.2% ($P < 0.05$), Yorkshire and Landrace respectively 3.1% and 4.0% ($P < 0.001$). Muscularity of Pietrain pigs practically did not change at all. Leanness of Durocs decreased by 2% (comparing groups II and III); though this difference is not statistically significant.

Table 1. Influence of fattening intensity on the percentage of muscularity in purebred pigs

Breed	Daily gain, g			Change of lean meat (\pm)
	Group I	Group II	Group III	
	till 750	751 – 850	851 and more	III/I
Lean meat % (<i>Piglog 105</i> data)				
LW	55.3 \pm 0.4	54.4 \pm 0.4	53.1 \pm 0.7	-2.2*
La.W	56.6 \pm 0.6	55.0 \pm 0.3	54.4 \pm 0.5	-2.2*
Y	57.1 \pm 0.3	55.0 \pm 0.3	54.0 \pm 0.5	-3.1***
L	58.6 \pm 0.4	55.6 \pm 0.4	54.6 \pm 0.4	-4.0***
P	55.4 \pm 0.4	55.0 \pm 0.6	55.8 \pm 0.6	+0.4
D	-	56.6 \pm 0.8	54.6 \pm 1.8	-2.0 (III/II)

Note: * $P < 0.05$; *** $P < 0.001$

Table 2. Influence of fattening intensity on the backfat thickness at last rib (mm) in purebred pigs

Breed	Daily gain, g			Change of backfat thickness (\pm)
	Group I	Group II	Group III	
	till 750	751 – 850	851 and more	III/I
Backfat thickness at last rib, mm				
LW	17.2 \pm 0.3	17.2 \pm 0.4	18.4 \pm 0.7	+1.2
La.W	14.8 \pm 0.4	16.5 \pm 0.4	16.5 \pm 0.5	+1.7
Y	14.6 \pm 0.3	16.6 \pm 0.4	17.2 \pm 0.6	+2.6*
L	13.0 \pm 0.4	16.6 \pm 0.4	15.6 \pm 0.4	+2.6**
P	19.4 \pm 0.8	18.8 \pm 1.3	16.5 \pm 0.7	-2.9
D	-	15.6 \pm 0.6	20.0 \pm 0.8	+4.4*(III/II)

Note: * $P < 0.05$; ** $P < 0.01$

Table 3. Influence of fattening intensity on the loin lean area (cm²) in purebred pigs

Breed	Daily gain, g			Change of loin lean area (\pm)
	Group I	Group II	Group III	
	till 750	751 – 850	851 and more	III/I
Loin lean area, cm ²				
LW	41.1 \pm 0.7	41.2 \pm 0.4	40.7 \pm 0.9	-0.4
La.W	39.3 \pm 0.6	39.0 \pm 0.5	38.4 \pm 0.6	-0.9
Y	42.0 \pm 0.5	41.2 \pm 0.6	40.1 \pm 0.7	-1.9
L	42.1 \pm 0.7	40.5 \pm 0.7	39.5 \pm 0.6	-2.6*
P	45.1 \pm 1.1	43.4 \pm 1.3	43.1 \pm 0.5	-2.0
D	-	39.5 \pm 0.8	39.3 \pm 2.9	-0.2 (III/II)

Note: * $P < 0.05$

Dependence of backfat thickness and loin lean area on the intensity of fattening is presented in Tables 2 and 3. When the daily gain increases from 750 to 851 g and more, backfat at the last rib of pigs of various breeds (except Pietrain) thickens by 1.2–2.6 mm. These differences are statistically significant to Yorkshires ($P<0.05$) and Landraces ($P<0.01$) only. Close interdependence of these traits was found in Duroc progeny as well. When their daily gain increases to 851 g and more (groups III and II), backfat thickens in by 4.4 mm ($P<0.05$). Increase of daily gain did not have any crucial negative influence on the loin lean area for the most breeds of pigs. Reliable difference was found on Landraces only: above-mentioned meatiness indicator of progeny in group III was less by 2.6 cm² than in group I ($P<0.05$).

Crossbreeds. When analysing influence of fattening intensity on the meatiness traits, crossbred pigs (from 30 to approx. 95 kg weight) were divided into 4 groups by the daily gain: I – till 750 g, II – 751–850 g, III – 851–950 g, and IV – 951 g and more. In comparison with purebred pigs, the fourth group emerges because crossbreeds grew faster and are distinguished by better muscularity as a

consequence of heterosis effect.

It was indicated (Table 4), that while daily gain increased, the muscularity essentially did not change in LWxL hybrids only (difference is statistically unreliable). Muscularity of other crossbreeds in group IV (average daily gain 951g and more) was less than in group I (average daily gain till 750 g), and the difference was from 2.3% (LxD, $P<0.05$) to 4.1 % (La.W xL, $P<0.001$). Besides, in comparison with group I, leanness of La.W xL, LxPxD and La.W xP hybrids was less by 1.9–2.4 % ($P<0.05$) when reaching limits of daily gain of 851–950 g (III group).

The data about influence of fattening intensity on the backfat thickness in crossbreeds supported the given results in Table 4: while percentage of muscularity decreases, the accumulation of subcutaneous fats becomes more active. As presented in Table 5, when daily gain increased from 750 g to 951 g and more, backfat at the last rib in hybrids of different combinations thickened by 2.4–5.0 mm ($P<0.05$ – 0.001). In comparison with group I, reliable thickening of the backfat in hybrids of two breed combinations (La.WxL, LxPxD) was already established within the limits of 851–950 g of daily gain (group III).

Table 4. Influence of fattening intensity on the percentage of muscularity in crossbred pigs

Breed combinations	Daily gain, g				Change of lean meat (\pm)	
	Group I till 750	Group II 751 – 850	Group III 851-950	Group IV 951 and more	III/I	IV/I
Lean meat % (<i>Piglog 105</i> data)						
LWxL	57.8 \pm 0.2	57.7 \pm 0.4	56.6 \pm 0.6	56.1 \pm 0.6	-1.2	-1.7
La. WxL	57.9 \pm 0.5	56.5 \pm 0.5	56.0 \pm 0.4	53.8 \pm 0.4	-1.9*	-4.1***
La. WxP	58.7 \pm 0.5	58.6 \pm 0.3	56.3 \pm 0.6	55.4 \pm 0.6	-2.4*	-3.3**
YxP	57.2 \pm 0.4	56.3 \pm 0.5	55.8 \pm 0.4	54.0 \pm 0.5	-1.4	-3.2**
YxL	57.3 \pm 0.4	57.2 \pm 0.4	55.2 \pm 0.8	54.9 \pm 0.9	-2.1	-2.4*
YxPxD	57.9 \pm 0.6	57.0 \pm 0.9	56.5 \pm 0.4	54.7 \pm 1.2	-1.4	-3.2*
LxD	58.1 \pm 0.6	58.1 \pm 0.6	57.3 \pm 0.6	55.8 \pm 0.8	-0.8	-2.3*
LxPx D	58.7 \pm 0.4	57.4 \pm 0.6	56.8 \pm 0.5	55.6 \pm 0.4	-1.9*	-3.1**

Note: * $P<0.05$; ** $P<0.01$; *** $P<0.001$

Table 5. Influence of fattening intensity on the backfat thickness at last rib (mm) in crossbred pigs

Breed combinations	Daily gain, g				Change of backfat thickness (\pm)	
	Group I till 750	Group II 751 – 850	Group III 851-950	Group IV 951 and more	III/I	IV/I
Backfat thickness at last rib, mm						
LWxL	13.6 \pm 0.2	14.3 \pm 0.7	14.4 \pm 0.3	16.4 \pm 0.7	+0.8	+2.8*
La. WxL	13.1 \pm 0.3	14.7 \pm 0.4	15.5 \pm 0.5	17.2 \pm 0.4	+2.4*	+4.1***
La. WxP	13.8 \pm 0.4	14.1 \pm 0.3	15.5 \pm 0.5	16.2 \pm 0.5	+1.7	+2.4*
YxP	15.0 \pm 0.4	16.0 \pm 0.5	16.0 \pm 0.5	17.8 \pm 0.5	+1.0	+2.8**
YxL	14.0 \pm 0.5	14.1 \pm 0.3	15.9 \pm 0.7	16.5 \pm 0.7	+1.9	+2.5*
YxPxD	13.2 \pm 0.8	16.0 \pm 0.4	16.6 \pm 0.6	16.9 \pm 1.1	+3.4	+3.7*
LxD	12.8 \pm 0.4	13.5 \pm 0.4	14.5 \pm 0.5	17.8 \pm 0.6	+1.7	+5.0**
LxPx D	13.4 \pm 0.5	15.5 \pm 0.4	16.2 \pm 0.4	16.6 \pm 0.4	+2.8*	+3.2**

Note: * $P<0.05$; ** $P<0.01$; *** $P<0.001$

Table 6. Influence of fattening intensity on the loin lean area (cm²) in crossbred pigs

Breed combinations	Daily gain, g				Change of loin lean area (±)	
	Group I	Group II	Group III	Group IV	III/I	IV/I
	till 750	751 – 850	851-950	951 and more		
	Loin lean area, cm ²					
LWxL	41.1±0.4	41.1±0.3	39.1±0.8	37.5±0.8	-2.0	-3.6*
La.WxL	41.4±0.8	41.6±0.5	40.1±0.5	39.6±0.5	-1.3	-1.8
La.WxP	42.0±0.5	41.9±0.5	41.6±0.7	41.5±1.4	-0.4	-0.5
YxP	41.2±0.9	41.5±0.6	42.6±0.6	42.8±0.6	+1.4	+1.6
YxL	40.5±0.9	39.3±0.7	37.5±1.0	36.6±0.8	-3.0	-3.9*
YxPxD	41.8±0.4	42.9±1.1	40.2±1.9	39.7±0.2	-1.6	-2.1
LxD	38.6±1.1	38.3±0.5	39.5±1.2	39.0±0.4	+0.9	+0.4
LxPx D	44.1±0.6	42.7±0.7	42.0±1.3	41.1±0.7	-2.1	-3.0*

Note: *P<0.05

Dependence of loin lean area on the intensity of fattening is presented in Table 6. Increase of daily gain did not have crucial influence on these meatiness indicators for the most breed combinations. Statistically significant difference was found in LxPxD, LWxL and YxL combinations only: the loin lean area of these crossbreeds in group IV was smaller than in group I by 3.0–3.9 cm² (P<0.05). Besides, YxP and LxD hybrids distinguished by slight positive dependence of this meatiness index on the fattening intensity.

Discussion. Actual influence of growth intensity on the meatiness traits was confirmed by correlation coefficients that were found while analysing purebred and crossbred pigs raised in Lithuania (Klimas and Klimienė, 2012). In most cases, when daily gain increases, the relative muscularity of pigs decreases. The lean meat percentage is tightly related to backfat thickness and loin lean area. By the data of foreign authors (Citek et al., 2006), in hybrids with daily gain more than 1050 g, lean meat content in carcass is lower by 2% (P<0.01) and percentage of backfat is higher by 1.6 % (P<0.05) when compared to hybrids with daily gain till 850 g. By the data of Stupka et al. (2006), when the daily gain for the hybrids grown in Czech Republic was increased from 750 g to 1050 g and more, the percentage of muscularity in carcass decreased by 3.5 % (P<0.001). Similar tendency in crossbred pigs was indicated in own research too. Lean meat content of all investigated combinations of crossbreeds that had daily gain 951 g and more was lower by 1.7–4.1 % (P<0.05–0.001, except hybrids of Lithuanian White x Landrace).

In the Pig Testing Station of the National Research Institute for Animal Production of Poland (Żak et al., 2008), it was determined that purebred pigs with the lowest daily gain (till 799g) tended to deposit less fat than the other groups (800-950 g and more than 950 g). Besides, the Polish Landrace gilts are more susceptible to the effect of growth rate on fat tissue content in carcass than are gilts of Polish Large White breed. In our investigation of purebred pigs, the biggest and statistically significant influence of fattening intensity on the changes of meatiness traits also was found in Landraces. When the daily gain increased from 750 to 851 g and more, leanness

and loin lean area in Landrace pigs was lower by, respectively, 4.0 % (P<0.001) and 2.6 cm² (P<0.05), and backfat thickness was higher by 2.6 mm (P<0.01). The effect of growth rate on above mentioned meatiness traits in other purebred pigs was lesser.

According to Kapelanski et al. (2000), Pierzchala et al. (2003), when pigs are selected by rapidity of their growth only, the muscularity of carcass decreases, and when pigs are intensively selected by leanness, their daily gain decreases. However, it is necessary to select pigs by both these indicators though they are hardly combined together. Therefore in all categories of farms (concrete environmental conditions) it is purposeful to search optimal growing rapidity that do not significantly change the percentage of muscularity, that should be the criterion used to settle accounts with breeders for the pigs sold for meat (Pork-carcasses EUROP, 1994). Thus, in view of increasing demand for leanness and profitable pork the researches on the intensity of meatiness and fattening performance gain greater importance. In this country, for the first time the optimal limits of daily gain (from 30 to approx. 95 kg weight) that do not have essential negative influence on lean meat percentage, backfat thickness and loin lean area in purebreds Lithuanian white, Large White, Yorkshire, Landrace, Pietrain, Duroc and their hybrids kept in standard conditions – in stables of control fattening of the State Pig Breeding Station – were determined.

Conclusions

1. Leanness of Lithuanian White, Large White, Yorkshire and Landrace breed pigs that had daily gain 851 g and more was lower by 2.2–4.0 % (P<0.05–0.001) and backfat thickness at the last rib was higher by 1.2–2.6 mm when compared to pigs with daily gain till 750 g. Reliable thickening of backfat was found not only in Yorkshires and Landraces, but in Durocs as well (P<0.05–0.01).

2. Lean meat content of all investigated combinations of crossbreeds that had daily gain 951 g and more was lower by 1.7–4.1 % (P<0.05–0.001, except LWxL) and backfat thickness at the last rib was higher by 2.4–5.0 mm (P<0.05–0.001) when compared to hybrids with daily gain till 750 g.

3. Intensity of fattening did not have crucial influence on the loin lean area for the most purebred and crossbred pigs.

4. According to the investigation data, in appropriate conditions of housing and complete feeding the optimal limits of daily gain (from 30 to approx. 95 kg weight) that do not have crucial negative influence on meatiness traits are the following:

4.1. The daily gain for purebred Lithuanian White, Large White, Yorkshire and Landrace pigs amounts to 751–850 g. Growing purebred Durocs and Pietrains for fattening purposes is not recommended. They could be used in crossbreeding combinations as a paternal form.

4.2. The daily gain for hybrids of Lithuanian White and Landrace (LWxL), Yorkshire and Landrace (YxL), Yorkshire and Pietrain (YxP), Landrace and Duroc (LxD), Yorkshire, Pietrain and Duroc (YxPxL) is 851–950 g and for crossbreds of Large White and Landrace (La.WxL), Large White and Pietrain (La.WxP), Landrace, Pietrain and Duroc (LxPxL) it is 751–850 g.

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