Slaughtering value of once-bred gilts vs. their littermates fattened according to common standards*

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Used were two groups of crossbred littermate gilts. Group A gilts (n = 34) were slaughtered after rearing their first litter, while group B (n = 39) were gilts fattened according to the procedure commonly used in pig production, and then slaughtered at about 106 kg body weight (BW). At slaughter, significantly older were gilts A than gilts B (371.03 vs. 179.64 days). BW at slaughter was 153.50 kg in group A and 106.77 kg in group B (P≤0.01). Lean content of carcass reached 53.36% in A and 54.77% in B gilts. Highly significant differences were found in backfat thickness over last rib (1.21 cm in A and 1.87 cm in B gilts), and over sacrum II (1.34 cm in A vs. 1.73 cm in B gilts). Significant differences for mean from five backfat measurements were identified between the groups: 2.01 cm in A vs. 2.36 cm in B group. Comparative analysis showed higher weight of ham (13.88 vs. 9.45 kg), and slightly lower meat content of ham (68.13% vs. 70.79%), respectively, in A and B gilts (P<0.01). The results obtained showed that first farrowing gilts did not differ in slaughter traits from standard gilt fatteners. Their certain carcass indicators seem to be even higher.

**KEY WORDS:** carcass / fattener gilts / once-bred gilts / gilts / slaughter value

The efficiency of pig production constitutes the most important element ensuring constant production development and quality progress. It should, therefore, encompass an appropriate income earned by the producer and comply with all applicable requirements and expectations of the meat buyer, i.e. the ultimate consumer. One of the methods for increasing pig production efficiency and lowering related costs may

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be to slaughter the gilts after they have reared the first litter. In this way, it is possible to obtain slaughter material and piglets for breeding at the same time. The production of this particular type of slaughter material, although not new [Alexandrowicz et al. 1954, Kotarbińska and Kielanowski 1973, Brooks and Smith 1977, Mac Pherson et al. 1977], nowadays calls for modern solutions. These concern mainly the process of obtaining the early maturing gilts distinguished by high slaughter value and prime quality of meat. The high slaughter value of first farrowing gilts comprises of high meat and low fat content of carcass [Kapelańska et al. 2002, Daszkiewicz et al. 2005, Kapelański et al. 2005, 2007]. The purpose of the present investigation was to compare the indicators of slaughter value in gilts after they have reared the first litter with the gilts fattened as per standard procedures.

Material and methods

Under conditions typical for a Polish pedigree pig breeding farm, 73 F₁ Polish Landrace × Polish Large White crossbred littermate gilts were taken from twenty litters and divided into two groups (A and B). Group A were gilts slaughtered after their first farrowing, while group B were their littermates undergoing regular (traditional) fattening process.

Gilts A were fed a standard diet, according to Polish standards and recommendations for this particular group of animals [Feeding Standards for Pigs 1993]. From day 142 of life and for a period of 21 days, special diet was applied, i.e. a diet enriched with maize starch and 60g of glucose, designed by Brand et al. [1998]. The diet was given in two meals, 2.5 kg / meal. From day 150 of life, the gilts of group A were allowed twice a day a direct 20 min contact with an adult boar to stimulate their sexual maturation. Moreover, the gilts remained under strict scrutiny (observed twice a day – at 11 am and 7 pm) with regard to oestrus occurrence, the intensity of which was measured according to the scale developed by Karalus et al. [1990]. In due time upon identifying the first oestrus, a double natural mating took place. The gilts suckled their new-born litters until day 28 and subsequently, no sooner however than 10 days from weaning, the gilts were transported to the Meat Processing Plant in Bydgoszcz, and slaughtered.

The fattening of B gilts started at the age of approximately three months and a BW of 30 kg, and was completed upon reaching a BW of about 106 kg. Ten gilt fatteners were kept together in one pen (1.2 m² for gilt) and fed the wet feed from troughs [Feeding Standards for Pigs 1993].

To assess the slaughter value and carcass quality of gilts of both groups the warm dressing percentage, carcass length and backfat thickness were established. Additionally, the loin eye area was measured by means of computer-aided image analysis – LUCIA, and the lean content of carcass estimated with the ULTRA FOM-100 stationary device. The tissue composition of ham was also determined by dissecting. Cutting of the carcasses was done in accordance with applicable meat
industry procedures [Polish Standard 1986]. Results were processed statistically. Significance of differences between the two groups was estimated with the Duncan test and t-test, aided by the STATISTICA 8 PL [2008] computer software.

**Results and discussion**

Important slaughter performance indicators are presented in Table 1. The studied groups of animals differed in terms of age and BW at slaughter. The first farrowing gilts (group A) were significantly older than those coming from traditional fattening (371.03 days and 179.64 days, respectively). At the same time, A animals showed a higher slaughter BW than animals B (153.50 kg vs. 106.77 kg; P≤0.01) and higher carcass weight (123.10 kg vs. 85.07 kg; P≤0.01). Slightly lower values were reported by Kapelańska et al. [2000] and Kapelański et al. [2004].

The relatively high warm dressing percentage (80.15 % for group A and 79.65% for group B) is worth pointing out, as it has been preliminarily estimated that the influence of reproduction organs on the first farrowing gilts’ body weight might have caused a considerable decrease in dressing percentage. This particular possibility was indicated by Fandrejewski and Raj [1997], who showed that first farrowing as well as multiparous sows, compared to controls fattened up to the same body weight, reached lower dressing percentage. Similar values in terms of trait in question were reported by Kapelańska et al. 2002, Kapelański and Grajewska 2005 and Kapelański et al. 2007. It has furthermore been stated (Tab. 1) that considerably heavier and longer carcasses of the first farrowing gilts (97.57 cm; P≤0.01) were characterized by good muscling and lower fat content, as compared to the carcasses of gilts fattened according to standard procedure (84.23 cm; P≤0.01).

The carcass tissue composition changes as the animals grow older [Chwalibog et al. 1997]. Daily protein deposition in pigs is beginning to fall with the animal reaching
a higher age, at which the period of fat deposition begins to dominate [Kotarbińska 1969]. This is most typical in fatteners with a longer fattening period and a high body weight upon slaughter [Larzul et al. 1997, Beattie et al. 1999]. In the case of gilts slaughtered after they have farrowed, the crucial factor which may affect the features of their carcasses related to muscling and fattness, may be the number of piglets born and suckled by the sow, as it is strictly related to energy expenditure for milk production during lactation. The amount of energy and nutrients necessary to suckle the piglets usually exceeds the amount that sows can obtain from the feed, and therefore a loss in body weight, mainly fat, takes place [Bocian et al. 2007]. In the course of this study, the muscling of both groups was on a similar level, amounting from 54.77% (group B) to 53.36% (group A) – Table 1.

The most lean-muscled carcass cuts remain to be seen as particularly valuable elements. These are: ham, loin, shoulder and neck. In the present study, a tissue composition analysis has been carried out with regard to the ham (Tab. 2). Mean weight of ham in A gilts was over 4 kg higher than of ham obtained from standard fatteners (P≤0.01). However, the meat content of ham turned out to be slightly higher in the gilts fattened by standard procedure (group B) – 70.79% vs. 68.13%; (P≤0.01). This result relates to the higher fattness of ham in case of older animals (first farrowing gilts). The intermuscular fat and external fat weights were both highly significantly higher in group A (0.47 kg and 2.16 kg, respectively), than in group B (0.18 kg and 1.39 kg, respectively). These results indicate the hams’ high value in terms of canned and quality meat products production and highly acclaimed flavour properties, owing to appropriate weight and good muscling.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>First farrowing gilts</td>
</tr>
<tr>
<td>Weight of ham (kg)</td>
<td>13.88±2.25</td>
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<tr>
<td>Meat of ham (kg) (%)</td>
<td>68.13±3.74</td>
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<tr>
<td>Skin (kg) (%)</td>
<td>5.41±0.93</td>
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<tr>
<td>External fat (kg) (%)</td>
<td>15.38±3.59</td>
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<tr>
<td>Intermuscular fat (kg)</td>
<td>0.47±0.10</td>
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<tr>
<td>Bone (kg) (%)</td>
<td>7.71±1.85</td>
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\(^{a}P \leq 0.01.\)
Table 3 presents the results of linear measurements of backfat. Highly significant differences were found in two points: on the back and over the second sacral vertebra. In both cases the thinner backfat occurred in the first farrowing gilts’ carcasses (1.21 cm and 1.34 cm, respectively) as compared to the standard fattened gilts (1.87 cm and 1.73 cm, respectively). Furthermore, mean backfat thickness from the five measurements was significantly lower in A than in B gilts (2.01 vs. 2.36 cm). Comparable results from a study on gilts upon their first farrowing were reported by Kapelański et al. [2004, 2007].

### Table 3. Linear measurements of backfat along the carcass side over the backbone

<table>
<thead>
<tr>
<th>Trait</th>
<th>Group</th>
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<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>First farrowing gilts</td>
<td>Standard fattened gilts</td>
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<tr>
<td>Backfat thickness (cm)</td>
<td></td>
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<tr>
<td>over shoulder</td>
<td>3.25±0.94</td>
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<tr>
<td>on the back over the last rib</td>
<td>1.21A±0.80</td>
</tr>
<tr>
<td>on sacrum I</td>
<td>2.17±0.85</td>
</tr>
<tr>
<td>on sacrum II</td>
<td>1.34A±0.58</td>
</tr>
<tr>
<td>on sacrum III</td>
<td>2.05±0.72</td>
</tr>
<tr>
<td>Mean backfat thickness (cm)</td>
<td>2.01a±0.68</td>
</tr>
</tbody>
</table>

\( \text{A}^{b}P \leq 0.01; \quad \text{a}^{b}P \leq 0.05. \)

Based on the results presented here it may be stated that the first farrowing gilts did not differ in terms of slaughter value from those fattened according to standard fattening procedures. In case of some parameters, the former have even produced better results. The meat content of carcass was considerably high and similar in both groups. In terms of the weight of the ham and the thickness of backfat, the first farrowing gilts’ carcasses were distinguished by more advantageous values.

**REFERENCES**

Wojciech Kapelański, Milena Biegniewska

Slaughter value of once-bred gilts

Wartość rzeźna loszek po odchowaniu pierwszego miotu i loszek tuczonych standardowo

S t r e s z c z e n i e

Badaniami objęto 73 loszki mieszânce F\textsubscript{1} ras polskiej białej zwisłouchej i wielkiej białej polskiej, które podzielono na dwie grupy (A i B). Grupę A stanowiły 34 loszki poddane ubojowi po odchowaniu pierwszego miotu („jednorazówki”), natomiast grupę B – 39 loszek tuczonych standardowo i ubijanych przy masie ciała około 106 kg. Loszki obu grup pochodziły z tych samych miotów i były siostrami. Celem przeprowadzonych badań było porównanie loszek grupy A z grupą B pod względem wartości rzeźnej. W dniu uboju badane grupy zwierząt różniły się średnim wiekiem i masą ciała. Istotnie starsze były loszki A („jednorazówki”), których wiek był dwukrotnie większy niż loszek pochodzących z tuczu tradycyjnego (odpowiednio 371,03 dni i 179,64 dni; P≤0,01). Jednocześnie zwierzęta grupy A cechowała wyższa masa ciała przed ubojem (153,50 kg grupa A oraz 106,77 kg grupa B; P≤0,01). Mięsność obu grup kształtowała się na zbliżonym poziomie – od 54,77\% (grupa B) do 53,36\% (grupa A). Wykazano wysoce istotne różnice w zakresie grubości słoniny grzbietowej mierzonej na grzbiecie i na wysokości II kręgu krzyżowego. W obu przypadkach cieńszą słoniną cechowały się tusze loszek grupy A (odpowiednio 1,21 i 1,34 cm) wobec loszek z tuczu standardowego (1,87 i 1,73 cm). Dysekcja szczegółowa szynki właściwej wykazała wyższą masę tego wyrębu, ale nieco niższy udział w nim mięsa w przypadku jednorazówek (13,88 wobec 9,46 kg i 68,13 wobec 70,79\%; P≤0,01). Na podstawie uzyskanych wyników można twierdzić, że loszki jednorazówki nie odbiegaly pod względem cech rzeźnych od loszek tuczonych tradycyjnie, a w przypadku niektórych parametrów nawet je przewyższały.