

14. Effect of litter size and birth weight on growth performance, carcass characteristics, and meat quality in pigs (Einfluss der Wurfgrösse und des Geburtsgewichtes auf Wachstumsleistung, Schlachtkörper- und Fleischqualität beim Schwein). J. Bérard*, M. Kreuzer and G. Bee – Posieux/Zürich

Introduction: There is some evidence that within litter low birth weight pigs not only grow slower and have fatter carcasses but also meat quality traits like drip loss or shear force are impaired compared to their high birth weight siblings (1,2). Because the variability of the body weight (**BW**) at birth is greater in large compared to small litters, the aim of the present study was to test the hypothesis that effects of birth weight on growth performance, carcass and meat quality are different when pigs originate from small or large litters.

Material and Methods: The 60 Swiss Large White barrows used in this study originated from 20 litters with either less than 10 (**S**) or more than 14 (**L**) piglets born per litter. Within the 10 S- and 10 L-litters, three piglets were selected per litter at birth: the lightest (**L-BW**), the heaviest (**H-BW**), and the one with a birth weight nearest to the average birth weight of the litter (**M-BW**). At weaning the barrows were individually penned and they had free access to a standard starter (9 – 27 kg BW), growing (27 – 63 kg BW), and finishing diet until slaughter (63 – 105 kg BW). The BW and total feed intake was determined each week. At slaughter, the weights of the hot carcass, heart, liver, and kidney were assessed. The carcass was dissected according to the Swiss Pig Performance Testing Station procedure (MLP, Sempach, Switzerland) 24 h post-mortem. The colour (L^*, a^*, b^* -values) and the drip loss for 48 h was measured in the longissimus muscle (**LM**) and in the light and dark portion of the semitendinosus muscle (**ST**).

Results: Birth weights of L- as compared to S-litters were lower in L-BW (1.2 vs. 1.6 kg) and M-BW barrows (1.6 vs. 1.9 kg) and similar in H-BW barrows (1.9 vs. 2.0 kg) (litter size \times birth weight interaction; $P < 0.01$). The L-BW barrows grew slower (0.81 vs. 0.90 kg; $P < 0.01$), ingested less feed (2.30 vs. 2.42 kg; $P = 0.03$), and were still less efficient (2.84 vs. 2.71 kg feed/kg gain; $P < 0.01$) than H-BW- and M-BW barrows, regardless whether they originated from S- or L-litters. The carcass yield was higher (81 vs. 82%; $P < 0.01$), the liver (1.58 vs. 1.74 kg), and kidney (0.31 vs. 0.34 kg) were lighter ($P \leq 0.01$) in L-BW- compared to H-BW barrows in the S- and L-litters. Regardless of the BW, barrows from L-litters had higher ($P = 0.02$) percentages of shoulder than barrows from S-litters (12.4 vs. 12.1%). Drip loss percentage determined in the muscles was neither affected by litter size nor by birth weight. The LM of L-BW was less red (a^* value: 6.1 vs. 6.9; $P = 0.02$) than the LM of H-BW barrows. Yellowness of the light portion of the ST was lower (b^* value: 3.4 vs. 3.8; $P = 0.03$) in barrows originating from L- than from H-litters.

Conclusions: The present results confirm the marked effect of birth weight on growth performance. However, the hypothesised impact on carcass characteristics and meat quality traits could not be demonstrated. Although the litter size affected average birth weight of the L-BW- and M-BW barrows, its impact on growth performance, carcass and meat quality was minor.

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