

78 Muscle glycogen and lactate content and pork quality traits as affected by available dietary carbohydrate in pigs. G. Bee*, ¹Swiss Federal Research Station for Animal Production.

The aim of the study was to determine whether muscle glycogen content and pork quality traits could be modified by availability of carbohydrates in the diet. Biopsy samples of longissimus (LM) from 48 Swiss Large White pigs (25 gilts; 23 barrows) weighing 70 kg were collected, and the glycolytic potential ($GP = 2[(\text{glycogen} + \text{glucose} + \text{glucose-6-phosphate}) + \text{lactate}]$) was determined to vary from 111 to 187 $\mu\text{mol/g}$ wet weight. At 90 kg pigs were moved into individual pens and assigned (blocked by GP and sex) to be fed 2.8 kg of a diet either high (H) or low (L) in available carbohydrate up to 104 kg. Pigs were fasted over night (15 h) before slaughter. Glycogen and lactate content were determined in samples of LM (predominately glycolytic) collected 30 min and 24 h after stunning, and in samples of the dark part of the semitendinosus (ST, oxidative muscle) collected 24 h after stunning. Measurements of pH were carried out in the LM 30 min and 24 h after slaughter. Hunter L^* , a^* , b^* values and drip losses were assessed the day after dissection. Overall glycogen and lactate levels 24 h postmortem were higher in the LM compared to the ST (19.5 vs. 11.5 $\mu\text{mol/g}$; 95.4 vs. 74.8 $\mu\text{mol/g}$; $P < 0.05$). Diets did not affect pH, color, drip losses, or glycogen and lactate concentrations of the LM. The diets affected the glycogen content of the ST in gilts (H: 14.7 vs. L: 9.2 $\mu\text{mol/g}$) but not in barrows. Lactate concentrations in the ST were also higher in pigs fed the H diet (H: 76.3 vs. L: 73.4 $\mu\text{mol/g}$; $P = 0.03$). Compared to diet L, Hunter L^* values tended to be lower (H: 42.6 vs. L: 43.6; $P = 0.07$) in the ST of animals fed diet H, and b^* (H: 6.8 vs. L: 5.6; $P < 0.05$) and drip losses (H: 4.8 vs. L: 3.1%; $P \leq 0.05$) were higher in gilts but were unaffected in barrows. Hunter L^* , a^* , b^* and drip losses were positively correlated with glycogen (0.36; 0.34; 0.57; 0.59; $P < 0.05$) and lactate content (0.36; 0.28; 0.34; 0.27) in the ST, whereas the correlations were not significant in the LM. In conclusion, dietary treatment affected quality traits of the ST, but not of the LM muscle, and the effects were more pronounced in gilts than barrows.

Key Words: pigs, glycolytic potential, pork quality