In the growing pig, increasing feed efficiency is a way to reduce the production cost. The residual feed intake (RFI) is defined as the difference between the observed daily feed intake (DFI) and the theoretical DFI estimated from maintenance and production requirements (GILBERT et al., 2006). A divergent selection was conducted for 4 generations in Large White males recorded between 35 and 95 kg live weight in order to produce animals with under (RFI-, “efficient animals”) or over (RFI+, “luxurious animals”) consumption compared to standard requirements. At similar body weight (107.8 ± 8.0 kg), 14 females from each line were slaughtered. Animals from the RFI-line exhibited leaner carcasses with higher muscle content, lower backfat thickness and lower lipid content in the longissimus muscle (LM). Longissimus muscle fibres were classified as types I, IIA, IIBR (Red) and IIBW (White) as described in LARZUL et al. (1997). The higher muscle content of the RFI- pigs was associated with a hypertrophy of all fibre types and an increase in the percentage of type IIBW fibres in LM. However, the correlative responses of muscle typing and chemical composition to the selection on RFI were not associated with variations in the activities of lactate dehydrogenase (glycolytic metabolism) and citrate synthase (oxidative metabolism), only a slight decrease (P<0.05) in β-hydroxy-Acyl-CoA dehydrogenase (lipid β-oxidation) was observed in RFI- pigs. Glycogen content in LM was determined at the level of each myofibre using the periodic acid Schiff staining and computerized image analysis. Glycogen content was higher specifically in type IIBW fibres of RFI- animals (1.43 vs 1.09 %, P<0.001). In accordance with their higher glycogen level in the fast glycolytic fibres, the RFI- pigs showed a higher glycolytic potential (162 vs 138 µmol equivalent lactate g-1, P<0.01), a lower ultimate pH (5.42 vs 5.58, P<0.01), higher drip loss (2.1 vs 1.1 %, P<0.05), and meat lightness (L*, 54.1 vs 50.7, P<0.01). Altogether, this suggests an impaired meat quality of the RFI- compared with the RFI+ pigs.

**Keywords:** muscle, muscle fibre, meat quality, selection, residual feed intake, pig

**References**

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Corresponding author:
LOUIS LEFAUCHEUR
Institut National de la Recherche Agronomique (INRA)
UMR SENAH
35590 Saint-Gilles
France

email: louis.lefaucheur@rennes.inra.fr