



Effect of muscle-fiber type on glycogenin-1 gene expression and its relationship with the glycolytic potential and pH of pork

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ABSTRACT. This study analyzed the effect of muscle-fiber type composition on glycogenin-1 (GYG) gene expression and its impact on pH. The longissimus dorsi (LD) muscle contains more type IIB fibers (75.10%) than does the psoas major (PM) muscle (41.58%), while the PM has more type I (3.65 vs 0.94%), type IIA (34.15 vs 10.63%), and type IIX (20.62 vs 13.33%) fibers. Compared with PM, glycolytic potential (GP), $pH_{45\text{ min}}$, and ΔpH from 45 min to 24 h post-mortem were all relatively higher in LD. Glycogen metabolites (lactate and GP) were negatively correlated with $pH_{24\text{ h}}$ and positively correlated with ΔpH . Expression of GYG was generally higher in LD. GYG expression was positively correlated with glycogen metabolite (lactate and GP) content and ΔpH , and was negatively correlated with $pH_{24\text{ h}}$. These data confirm that the muscle-fiber type and GP have significant effects on ultimate pH and pH decline, and suggest that expression of GYG in muscles is related to the metabolism of glycogen and may impact GP, ΔpH , and ultimate pH. High expression of GYG was associated with a high

glycogen content, large pH decline, and low ultimate pH in muscles post-mortem.

Key words: Pig; Glycogenin-1; Muscle-fiber type; Glycolytic potential; Myosin heavy chains