



Quantitative changes in mitochondrial DNA copy number in various tissues of pigs during growth

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ABSTRACT. Mitochondrial DNA (mtDNA) content is dependent on the energy requirements of tissues. To date, no comprehensive study has been conducted to examine mtDNA copy number variations in pigs. In the current study, quantitative polymerase chain reaction was performed to quantify the mtDNA copy number in 15 pig tissue types at 5 growth stages from embryo to adult. Observable differences in mtDNA content were detected in the tissues, including a 6-fold greater mtDNA content in the heart compared with the lung of 180-day-old samples. mtDNA content in the heart, longissimus dorsi muscle, psoas major muscle, kidney, brain, ovary, and subcutaneous adipose increased with growth. Expression of the replicative mitochondrial helicase (*TWINKLE*), which regulates mtDNA turnover, was significantly associated with changes in mtDNA copy numbers across tissues during growth ($r = 0.33$, $P = 0.01$). We demonstrated that the

expression levels of mitochondrial genes were positively correlated with mtDNA copy number.

Key words: Growth stages; Mitochondrial DNA copy number; Gene expression; Pig