

**Effect of tart cherry versus PPAR agonist pioglitazone on stroke-related phenotypes and inflammation**

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Epidemiology data show that anthocyanin intake reduces stroke mortality. Anthocyanins can activate PPAR isoforms, but PPAR agonist drugs can increase stroke risk. Tart cherries are a rich source of anthocyanins, so we compared the effect of tart cherry (1% w:w) and PPAR agonist drug pioglitazone (Actos®) in the stroke-prone spontaneously hypertensive rat. Over 5 months, we serially measured locomotion, balance, coordination, and systolic blood pressure. Compared to control, cherry intake affected morbidity but not mortality and reduced systolic blood pressure beyond Week 8. Tart cherry intake significantly improved balance (tapered beam, unassisted rearing) and coordination (ladder climb). Tart cherry reduced serum TNF- $\alpha$ , reduced brain NF- $\kappa$ B- and PPAR-associated mRNA, and reduced brain TNF- $\alpha$  expression. Compared to cherry, Actos worsened tapered beam and ladder climb performance and increased brain PPAR-related mRNA and brain TNF- $\alpha$ . In summary, intake of a physiologically-relevant amount of anthocyanins from tart cherry significantly reduced stroke-related phenotypes, was safer than Actos, and may be a good preclinical model to explore the stroke-protective effects of an anthocyanin-rich diet. Supported by private gift (to SF Bolling).