

## **Fish oil feeding increases gut contractility in spontaneous hypertensive rat (SHR) model**

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**Background** - In a previous study we observed an apparent depression in prostanoid-induced contractility of the gut in the SHR compared to the normotensive (WKY) rat.

**Objective** - To determine if diets containing n-3 polyunsaturated fatty acids (PUFA) can overcome the defect in prostanoid-induced contractility in the SHR ileum.

**Design** - Twelve week old SHR were fed diets for 12 weeks containing 5% fat as saturated fat, canola oil, or fish oil and compared with WKY control. Contractility of isolated ileal and colonic tissue was determined in an organ bath system in response to muscarinic and eicosanoid stimulators of gut isometric contraction.

**Outcomes** - As previously demonstrated, there was a significantly depressed response in the SHR ileum to PGE<sub>2</sub> and PGF<sub>2α</sub> compared to the WKY. Compared to the other diets, only fish oil supplementation resulted in a significant increase in maximal ileal contraction in response to acetylcholine and prostaglandins that was positively correlated with an increase in long chain (LC) n-3 PUFA (eicosapentaenoic [EPA] and docosahexaenoic acid [DHA]) in gut tissue. However, the canola diet rich in n-3 18:3 (alpha linoleic acid [ALA]) did not result in an increase in tissue LC n-3 PUFA or changes in contractility.

**Conclusions** - Fish oil supplementation resulted in an increase of gut tissue LC n-3 PUFA content, increased ileal contractility and reversal of the depressed gut contractility response to prostanoids in SHR. Since prostaglandins are involved in homeostasis of gut integrity and contractility, these findings may be applicable to bowel health in regard to normal and disease states.