An extreme systemic inflammatory response may be observed in dogs that experience severe accidental trauma, such as being struck by a car. The inflammatory response may be so extreme that it complicates treatment and causes multiple organ failure. There are few currently available methods to counter an extreme systemic inflammatory response. Oral omega-3 fatty acid administration has been reported to have anti-inflammatory effects in veterinary medicine; however, information on the effects of intravenous fatty acid administration is lacking. The aim of this project was to determine if systemic inflammatory mediators released in response to relatively consistent surgical trauma (ovariohysterectomy) could be modulated by intravenous fish oil infusion, high in omega-3 fatty acids. The purpose in making this determination was to evaluate whether dogs having ovariohysterectomy would be good subjects in which to study methods that control inflammation, such as infusion of fish oil emulsion. This study was a prospective randomized clinical trial. Fish oil, soybean oil, or saline was given intravenously to dogs immediately following ovariohysterectomy, and postoperative plasma concentration of inflammatory mediators was compared among groups. After fish oil infusion, plasma omega-3 fatty acid concentration markedly increased, but the increase was not long-lasting. Inflammatory mediator production was increased by the surgery, but it was not suppressed by fish oil infusion. Using inflammatory mediator production as a marker of systemic inflammation, fish oil emulsion infused at the dose and duration studied did not appear to attenuate the systemic inflammatory response.