

## THE EFFECTS OF DIETARY DIACYLGLYCEROLS ON POSTPRANDIAL LIPEMIA COMPARED TO TRIACYLGLYCEROLS IN COLLEGE AGED MALES AND FEMALES.

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**Purpose:** The purpose of this study was to examine the difference in postprandial triglyceride response of subjects to triacylglycerols [canola oil] compared to diacylglycerols [Enova oil] to determine if consumption of diacylglycerols produces a lower postprandial triglyceride response. **Background:** Postprandial lipemia is an increase in duration and magnitude of triglycerides in the blood. An elevated postprandial response to lipids is associated with an increased risk of cardiovascular disease and metabolic syndrome, and metabolic syndrome independently increases the risk of cardiovascular disease and type 2 diabetes. The greater the magnitude of lipemia, the greater the risk. In a double-blind study on male subjects, consumption of 10-44g (about 2 tsp to 3 tbsp) of diacylglycerol oil compared to triacylglycerol oil resulted in a decreased serum TG response. The most significant difference in postprandial response was seen with the ingestion of 20g of diacylglycerol oil compared to triacylglycerol oil where the increase in TG was ~50% less with diacylglycerol consumption than with triacylglycerols. The postprandial peak in triglycerides occurred at 4 hours post consumption with both the diacylglycerol and triacylglycerol oil<sup>1</sup>. **Methods:** This study included 21 college students with an average age of 20-21 years old enrolled in the Nutritional Biochemistry class in the fall of 2005. The study was a double-blind cross over design approved by the Institutional Review Board of the College of St. Benedict/St. John's University on August 23, 2005. Subjects consumed approximately 180g cake with 20g of canola oil on one occasion and 20g of Enova oil on the other. Initial fasting triglycerides were determined and then at 2, 3, and 4 hours post consumption. **Results:** Average fasting triglycerides with canola oil were 69mg/dL and for Enova oil 80mg/dL. At the average peak response serum triglycerides were ~1.9% lower with Enova oil compared to canola oil consumption. **Conclusion:** There was no statistically significant difference in postprandial response between the oils. In a college aged population with individuals with low fasting triglyceride values, there seems to be no benefit on postprandial triglycerides to consume an oil composed primarily of diacylglycerols compared to one of triacylglycerols as seen by both oils causing peak triglycerides at 2 hours and almost identical slopes of the curves from fasting to 2 hours postprandial as well as no statistically significant difference in postprandial response.

<sup>1</sup>Taguchi, H., Watanabe, H., Onizawa, K., Nagao, T., Gotoh, N., Yasukawa, T., Tsuschima, R., Shimasaki, H., Itakura, H. Double-Blind Controlled Study on the Effects of Dietary Diacylglycerol on Postprandial Serum and Chylomicron Triacylglycerol Responses in Healthy Humans. (2000). *Journal of the American College of Nutrition*, 19,789-796. Retrieved February 12, 2005 from <http://www.jacn.org/cgi/reprint/19/6/789>.

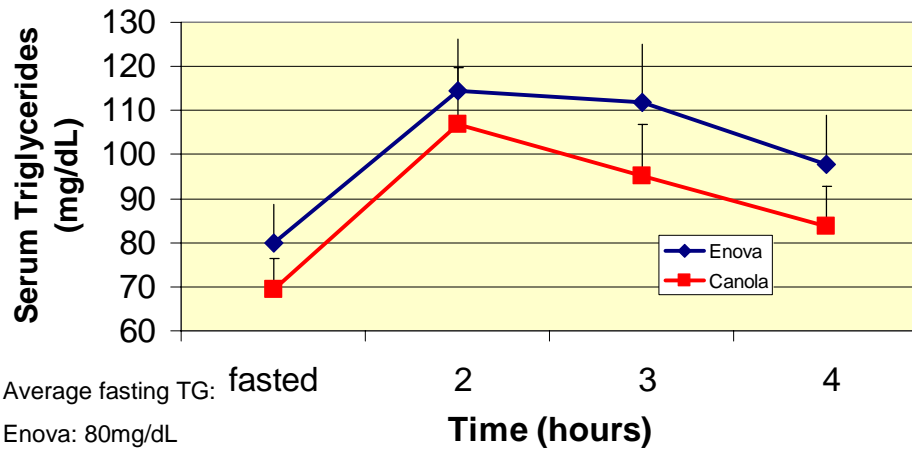
## Enova vs. Canola

	Enova	Canola
Source	Soybean and Canola Oils	Derivative of rapeseed plant but nutritionally and structurally different than rapeseed
% DAG	80%	2.9%
% TAG	20%	97.1%
Cost per ounce	\$0.26	\$0.04
Calories per Tbsp	120	120
Energy value	9.3kcal/kg	9.46kcal/kg

## Fat Profile of Enova vs. Canola

	Enova	Canola
Total Fat per Tbsp	14g	14g
Saturated Fat per Tbsp	0.5g	1g
Polyunsaturated Fat per Tbsp	8g	4g
Monounsaturated Fat per Tbsp	5g	9g
Trans Fat	0g	0g
Cholesterol	0mg	0mg

### Average Change in Serum Triglyceride Level with Consumption of 20g of Canola vs. Enova Oil



Average fasting TG: fasted

Enova: 80mg/dL

Canola: 69mg/dL