

Aceite de Coco Puro Extra Virgen y Triglicéridos de Cadena Media

Estudios sobre el Aceite de Coco Virgen (VCO)

An Open-Label Pilot Study to Assess the Efficacy and Safety of Virgin Coconut Oil in Reducing Visceral Adiposity.

Ming Liau, Yeong Yeh Lee et al. Kai International Scholarly Research Network. ISRN Pharmacology Volume 2011, Article ID 949686, 7 pagesdoi:10.5402/2011/949686

Abstract

Introduction. This is an open-label pilot study on four weeks of virgin coconut oil (VCO) to investigate its efficacy in weight reduction and its safety of use in 20 obese but healthy Malay volunteers. **Methodology.** Efficacy was assessed by measuring weight and associated anthropometric parameters and lipid profile one week before and one week after VCO intake. Safety was assessed by comparing organ function tests one week before and one week after intake of VCO. Paired t-test was used to analyse any differences in all the measurable variables. **Results.** Only waist circumference (WC) was significantly reduced with a mean reduction of 2.86 cm or 0.97% from initial measurement ($P = .02$). WC reduction was only seen in males ($P < .05$). There was no change in the lipid profile. There was a small reduction in creatinine and alanine transferase levels. **Conclusion. VCO is efficacious for WC reduction especially in males and it is safe for use in humans.**

Effects of dietary coconut oil on the biochemical and anthropometric profiles of women presenting abdominal obesity.

Assunção, Ferreira et al. Lipids. 2009 Jul;44(7):593-601. doi: 10.1007/s11745-009-3306-6. Epub 2009 May 13

Abstract

The effects of dietary supplementation with coconut oil on the biochemical and anthropometric profiles of women presenting waist circumferences (WC) >88 cm (abdominal obesity) were investigated. The randomised, double-blind, clinical trial involved 40 women aged 20-40 years. Groups received daily dietary supplements comprising 30 mL of either soy bean oil (group S; $n = 20$) or coconut oil (group C; $n = 20$) over a 12-week period, during which all subjects were instructed to follow a balanced hypocaloric diet and to walk for 50 min per day. Data were collected 1 week before (T1) and 1 week after (T2) dietary intervention. Energy intake and amount of carbohydrate ingested by both groups diminished over the trial, whereas the consumption of protein

and fibre increased and lipid ingestion remained unchanged. At T1 there were no differences in biochemical or anthropometric characteristics between the groups, whereas at T2 group C presented a higher level of HDL (48.7 +/- 2.4 vs. 45.00 +/- 5.6; P = 0.01) and a lower LDL:HDL ratio (2.41 +/- 0.8 vs. 3.1 +/- 0.8; P = 0.04). Reductions in BMI were observed in both groups at T2 (P < 0.05), but only group C exhibited a reduction in WC (P = 0.005). Group S presented an increase (P < 0.05) in total cholesterol, LDL and LDL:HDL ratio, whilst HDL diminished (P = 0.03). Such alterations were not observed in group C. **It appears that dietetic supplementation with coconut oil does not cause dyslipidemia and seems to promote a reduction in abdominal obesity.**

The effect of virgin coconut oil on weight and lipid profile among overweight, healthy individuals.

Pollisco, CC, Carlos-Raboca, J. Philippine Journal of Internal Medicine. 2008 Jan-Feb 46(1):35-44.

Abstract

From different researches, it was learned that virgin coconut oil (VCO) has the following chemical properties: **It is a saturated fat, chemically a medium chain fatty acid (MCFA), which is uniquely different from other fatty acids in that it has the lowest caloric value gram per gram but still provides the highest energy expenditure. Another special feature of MCFA, is that they circulate as fatty acids, not as triglyceride, therefore are not deposited in fat tissues. Furthermore, they raise the body's metabolic rate giving a thermogenic effect and like animal fats, induce satiety and make one stop eating, hence can lead to weight loss.**

Several human studies done from 1965 to 1994 suggested that lauric, myristic, and palmitic acids have cholesterol-raising action but of different potential levels. A meta analysis of 60 controlled trials by Mensink et. al. 2003 showed that lauric acid greatly increased total cholesterol, but much of its effect was on high density lipoprotein (HDL) cholesterol. Another randomized control trial done in India also showed that low density lipoprotein levels were lower and HDL levels were higher in the serum and tissues of patients given VCO for 45 days compared with those given ground nut and copra oil.

The general objective is to determine the effects of virgin coconut oil on weight, total cholesterol, triglyceride, LDL, HDL among overweight otherwise healthy individuals.

This is an open-label, randomized control trial, a pilot study on the effects of virgin coconut oil on weight, total cholesterol, triglyceride, LDL, HDL among overweight otherwise healthy individuals, with a computed sample size of 50.

Thirty one patients met the inclusion criteria. Sixteen subjects (52%) were randomized to oral intake of virgin coconut oil (n=16) while 15 subjects (48%) to diet and exercise only (control). Four dropped out, one from the VCO group and three from the control group.

At baseline, the two groups were comparable in terms of age ($p=.67$), sex ($p=.94$), height ($p=.59$), weight ($p=.77$), abdominal circumference ($p=.80$), and body mass index ($p=.08$).

Within-Groups Comparison: After 45 days of oral intake of virgin coconut oil, a statistically significant reduction in the mean weight was noted from baseline (64 kg to 59.9 kg, $p=.001$). This finding was also seen with the control group. (65.1 to 61.8 kg, $p=.002$). A statistically significant decrease in the serum HDL was noted in the control after the trial (56.9 mg/dL to 51.7 mg/dL, $p=.021$). A non-statistically significant reduction was seen in the VCO group (54.8 to 54.2, $p=.69$). No significant change was noted in terms of the total cholesterol, triglycerides and LDL.

Between-Groups Comparison: After 45 days, no observable statistical difference was noted in the mean weight between the VCO group and the control group (VCO=59.9 kg. Control=61.8 kg, $p=.43$). Likewise, total cholesterol (176.8 vs. 181.5 $p=.79$); triglycerides (66.5 vs. 65.9, $p=.91$), LDL (107 vs 113.4, $p=.61$), HDL (54.2 vs 51.7, $p=.65$) were not statistically different.

The demonstrated serum lipid-reducing effects in this trial are inconclusive. Although, total cholesterol, triglycerides and LDL showed a decreasing trend from baseline, the effect size was small and statistically insignificant. Large scale trials that rigorously control for variation in serum lipids among the healthy population are still warranted.

Beneficial effects of virgin coconut oil on lipid parameters and in vitro LDL oxidation. *Nevin KG, Rajamohan T. Clinical Biochemistry 37 (2004) 830– 835.*

Abstract

Objectives: The present study was conducted to investigate the effect of consumption of virgin coconut oil (VCO) on various lipid parameters in comparison with copra oil (CO). In addition, the preventive effect of polyphenol fraction (PF) from test oils on copper induced oxidation of LDL and carbonyl formation was also studied. Design and methods:

After 45 days of oil feeding to Sprague–Dawley rats, several lipid parameters and lipoprotein levels were determined. PF was isolated from the oils and its effect on in vitro LDL oxidation was assessed. Results: VCO obtained by wet process has a beneficial effect in lowering lipid components compared to CO. It reduced total cholesterol, triglycerides, phospholipids, LDL, and VLDL cholesterol levels and increased HDL cholesterol in serum and tissues. The PF of virgin coconut oil was also found to be capable of preventing in vitro LDL oxidation with reduced carbonyl formation.

Conclusion: The results demonstrated the potential beneficiary effect of virgin coconut oil in lowering lipid levels in serum and tissues and LDL oxidation by physiological oxidants. This property of VCO may be attributed to the biologically active polyphenol components present in the oil.

Estudios sobre los Ácidos Grasos de Cadena Media

The influence of a pre-exercise sports drink (PRX) on factors related to maximal aerobic performance.

Byars A, Keith S et al. Journal of the International Society of Sports Nutrition 2010, 7:12

Abstract

Background: Pre-exercise sports drinks (PRX) are commonly used as ergogenic aids in athletic competitions requiring aerobic power. However, in most cases, claims regarding their effectiveness have not been substantiated. In addition, the ingredients in PRX products must be deemed acceptable by the athletic governing bodies that regulate their use in training and competition. The purpose of this study was to examine the effects of a modified PRX formulation (known as EM-PACT™) from earlier investigations on factors related to maximal aerobic performance during a graded exercise test. The modification consisted of removing creatine to meet the compliance standards set forth by various athletic organizations that regulate the use of nutritional supplements. **Methods:** Twenty-nine male and female college students varying in levels of aerobic fitness participated in a randomized crossover administration of PRX (containing 14 g/serving of fructose, medium-chain triglycerides, and amino acids mixed with 8 oz. of water) and placebo (PL) 30 minutes prior to performing a treadmill test with approximately one week separation between the trials. VO₂max, maximal heart rate (HR), time to exhaustion (Time), and percentage estimated non-protein fat substrate utilization (FA) during two a priori submaximal stages of a graded exercise testing were evaluated. **Results:** The VO₂max mean value of the PRX trial was significantly greater than the PL trial (P < 0.01). The mean value for Time was also observed to be greater for the PRX trial compared to PL (P < 0.05). Additionally, percentage of FA during submaximal stages of the exercise test was greater for PRX trial in comparison to PL (P < 0.01). **Conclusions:** **The modified PRX formulation utilized in this investigation supports the findings of the previous investigation and its efficacy for enhancing indices of aerobic performance (specifically VO₂max, Time, & FA) during graded exercise testing.**

Medium-chain fatty acids: functional lipids for the prevention and treatment of the metabolic syndrome.

Nagao K, Yanagita T. Pharmacol Res. 2010 Mar;61(3):208-12. doi: 10.1016/j.phrs.2009.11.007. Epub 2009 Nov 30.

Abstract

Metabolic syndrome is a cluster of metabolic disorders, such as abdominal obesity, dyslipidemia, hypertension and impaired fasting glucose, that contribute to increased cardiovascular morbidity and mortality. Although the pathogenesis of metabolic syndrome is complicated and the precise mechanisms have not been elucidated, dietary lipids have been recognized as contributory factors in the development and the prevention of cardiovascular risk clustering. This review explores the physiological functions and molecular actions of medium-chain fatty acids (MCFAs) and medium-chain

triglycerides (MCTs) in the development of metabolic syndrome. **Experimental studies demonstrate that dietary MCFAs/MCTs suppress fat deposition through enhanced thermogenesis and fat oxidation in animal and human subjects. Additionally, several reports suggest that MCFAs/MCTs offer the therapeutic advantage of preserving insulin sensitivity in animal models and patients with type 2 diabetes.**

Decrease of food intake in rats after ingestion of medium-chain triacylglycerol.

Ooyama K, Kojima K et al. J Nutr Sci Vitaminol, 55, 423-427, 2009.

Abstract

Previous studies have demonstrated that fatty acid oxidation in the liver may affect food intake. This study examined the influence of preloading of medium-chain triacylglycerol (MCT) on food intake in comparison with long-chain triacylglycerol (LCT). Male rats were fasted for 18h and then administered LCT or MCT emulsion orally. Each group of rats was allowed to rest for 30 min, and then food intake during 1h was measured. Food intake in the MCT group was significantly lower than that in the LCT group. To examine the influence of hepatic oxidation, the MCT+MA group was injected intraperitoneally with mercaptoacetate (MA), an inhibitor of fatty acid oxidation, 2h before ingestion of MCT emulsion. Then, 30 min after ingestion of LCT or MCT emulsion, food intake was measured for 1h. Food intake in the MCT group was significantly lower than that in the LCT group, but there was no significant difference between the MCT+MA group and the LCT group. Food intake in the MCT+MA group was significantly higher than that in the MCT group. The hepatic ATP content after MCT ingestion was significantly higher than that after LCT ingestion, but there was no significant difference between the MCT+MA group and the LCT group. The hepatic ATP content after MCT+MA ingestion was significantly lower than that after MCT ingestion. **These results suggest that ingestion of medium-chain fatty acid (MCFA) increases the liver ATP content in fasted rats, consequently decreasing food intake.**

Combined intervention of medium-chain triacylglycerol diet and reduces body fat mass and enhances energy expenditure in rats.

Ooyama K, Wu J et al. J Nutr Sci Vitaminol (Tokyo). 2008 Apr; 54(2):136-41

Abstract

Previous studies indicated that a medium-chain triacylglycerol (MCT) diet could inhibit body fat accumulation. It is also well established that exercise can reduce fat mass. However, the effects of a combination of MCT diet and exercise on reduction of fat mass have not been studied. Here we examined whether MCT diet and exercise intervention exert cooperative effects on body composition. Rats were assigned to 4 groups: 1. LCT diet, control (LCT-C); 2. MCT diet, control (MCT-C); 3. LCT diet, exercise (LCT-E); 4. MCT diet, exercise (MCT-E). After the 6-wk intervention, visceral fat mass was measured by

CT scan and dissection, and energy expenditure was estimated for 24 h. The value of the visceral fat mass showed a significant correlation between CT scan and dissection ($r=0.995$, $p<0.001$). Visceral fat mass in the MCT-C group was lower than that in the LCT-C group. Furthermore, the fat-lowering effects were greater in the MCT-E group than that in either intervention alone. Thus significant effects of the MCT diet and exercise on the reduction of visceral fat mass were observed. Energy expenditure was significantly higher in the MCT-E group than in the other groups. **Our present findings suggest that combined intervention of MCT diet and exercise has an additive effect on reduction of visceral and subcutaneous fat accumulation, and that this effect may be partially related to increased energy expenditure.** However, future studies are necessary to define the relationship between energy expenditure and fat mass accumulation.

Physiological Effects of Medium-Chain Triglycerides: Potential Agents in the Prevention of Obesity.

Marie-Pierre St-Onge and Peter J. H. Jones. J. Nutr.132: 329–332, 2002.

Abstract

Medium chain fatty acids (MCFA) are readily oxidized in the liver. Animal and human studies have shown that the fast rate of oxidation of MCFA leads to greater energy expenditure (EE). Most animal studies have also demonstrated that the greater EE with MCFA relative to long-chain fatty acids (LCFA) results in less body weight gain and decreased size of fat depots after several months of consumption. Furthermore, both animal and human trials suggest a greater satiating effect of medium-chain triglycerides (MCT) compared with long-chain triglycerides (LCT). The aim of this review is to evaluate existing data describing the effects of MCT on EE and satiety and determine their potential efficacy as agents in the treatment of human obesity. Animal studies are summarized and human trials more systematically evaluated because the primary focus of this article is to examine the effects of MCT on human energy metabolism and satiety. Hormones including cholecystokinin, peptide YY, gastric inhibitory peptide, neurotensin and pancreatic polypeptide have been proposed to be involved in the mechanism by which MCT may induce satiety; however, the exact mechanisms have not been established. **From the literature reviewed, we conclude that MCT increase energy expenditure, may result in faster satiety and facilitate weight control when included in the diet as a replacement for fats containing LCT.**

Estudios comparativos sobre los Ácidos Grasos de Cadena Media y los Ácidos Grasos de Cadena Larga

Usefulness and controversial issues of middle-chain fatty acids consumption on lipid-protein metabolism and obesity.

S. G. Sáyago-Ayerdi. Nutr Hosp. 2008;23(3):191-202.

Abstract

Middle-chain fatty acids (MCFA) contain 6-12 carbon atoms and are digested, absorbed and metabolized differently than long-chain fatty acids (LCFA). This work reviews some of the potential and real utilities of MCFA and their role on health. For this reason, they are used in enteral and parenteral nutrition because of their good absorption, and in premature-feeding milk-based formulas in order to improve calcium absorption. MCFA have become particularly important because of their possible role in treating and preventing obesity. Since they are more water soluble, they are taken-up by chylomicrons, and it is believed that they do not directly participate in lipogenesis. **They are able to increase the thermogenic effect of foods, and its metabolism increases the production of ketonic agents with the subsequent anorexigenic effect.** However, high doses of MCFA are required to obtain significant effects on weight reduction. The effects on lipid-protein metabolism are controversial. So, although they seem to reduce the post-prandial triglyceridemic response, the results their effects are not uniform regarding triglyceridemia and cholesterolemia. In spite of this, more and more products are being designed incorporating MCFA to treat obesity and overweight, having been considered as “GRAS” (Generally Recommended as Safe”) components by the ADA. Further long-term studies are needed to warrant the usefulness of consumption of these compounds, particularly in the treatment and prevention of obesity.

Medium- versus long-chain triglycerides for 27 days increases fat oxidation and energy expenditure without resulting in changes in body composition in overweight women.

St-Onge MP, Bourque C. International Journal of Obesity (2003) 27, 95–102

Abstract

Objective: To determine the effects of long-term consumption of medium chain (MCT) versus long chain triglycerides (LCT) on energy expenditure (EE), substrate oxidation and body composition. **Hypothesis:** MCT consumption will not result in greater EE, substrate oxidation, and body weight loss compared with LCT consumption. **Research methods and procedures:** Seventeen healthy obese women participated in this randomized, crossover inpatient trial. Meals were prepared and consumed on site for two periods of 27 days. Diets containing 40% of energy as fat, with treatment fat comprising 75% of the

total fat, were designed to supply each subject with their individual weight-maintaining energy needs. The MCT diet contained 67% of treatment fat as MCT oil (49% octanoate, 50% decanoate) whereas the LCT diet contained exclusively beef tallow as treatment fat. Body composition was assessed by magnetic resonance imaging (MRI) on day 1 and 28 of each phase while energy expenditure was measured on day 2 and 27. **Results:** Changes in total and subcutaneous adipose tissue volumes following consumption of MCT and LCT were not different (70.610.38 l vs 70.540.48 l and 70.580.35 l vs 70.480.40 l, respectively). Average EE and fat oxidation were greater ($P < 0.05$) during MCT than LCT consumption (0.950.019 vs 0.900.024 kcal=min, respectively, for EE and 0.0800.0026 vs 0.0750.0022 g=min, respectively for fat oxidation). **Discussion: These results show that long-term consumption of MCT enhances EE and fat oxidation in obese women, when compared to LCT consumption. The difference in body composition change between MCT and LCT consumption, although not statistically different, was consistent with differences predicted by the shifts in EE. It can be concluded that substitution of MCT for LCT in a targeted energy balance diet may prevent long-term weight gain via increased EE.**

Comparison of diet-induced thermogenesis of foods containing medium-versus long-chain triacylglycerols.

Kasai M, Nosaka N et al. J Nutr Sci Vitaminol (Tokyo). 2002 Dec;48(6):536-40.

Abstract

The purpose of this study was to investigate the effect of 5-10 g of medium-chain triacylglycerols (MCT) on diet-induced thermogenesis in healthy humans. The study compared diet-induced thermogenesis after ingestion of test foods containing MCT and long-chain triacylglycerols (LCT), using a double-blind, crossover design. Eight male and eight female subjects participated in study 1 and study 2, respectively. In both studies, the LCT was a blend of rapeseed oil and soybean oil. In study 1, the liquid meals contained 10 g MCT (10M), a mixture of 5 g MCT and 5 g LCT (5M5L), and 10 g LCT (10L). In study 2, the subjects were given a meal (sandwich and clear soup) with the mayonnaise or margarine containing 5 g of MCT or LCT. Postprandial energy expenditure was measured by indirect calorimetry before and during the 6 h after ingestion of the test meals. Diet-induced thermogenesis was significantly greater after 5M5L and 10M ingestion as compared to 10L ingestion. Ingestion of the mayonnaise or margarine containing 5 g MCT caused significantly larger diet-induced thermogenesis as compared to that of LCT. **These results suggest that, in healthy humans, the intake of 5-10 g of MCT causes larger diet-induced thermogenesis than that of LCT, irrespective of the form of meal containing the MCT.**

Larger diet-induced thermogenesis and less body fat accumulation in rats fed medium-chain triacylglycerols than in those fed long-chain triacylglycerols.

Noguchi O, Takeuchi H et al. J Nutr Sci Vitaminol (Tokyo). 2002 Dec;48(6):524-9

Abstract

It has been previously shown that a diet containing medium-chain triacylglycerols (MCT) leads to less body fat accumulation as compared to a diet containing long-chain triacylglycerols (LCT). We investigated the involvement of diet-induced thermogenesis in the accumulation of body fat in rats fed a diet containing MCT. Twelve male Wistar rats were administered 1 g of MCT or LCT by gavage, and their oxygen consumption was measured for 6 h (experiment 1). Forty male Wistar rats were fed a diet containing 10% MCT or LCT for 6 wk, and their body composition was determined (experiment 2). In experiment 1, oxygen consumption increased to a greater extent after MCT administration than after LCT administration. Diet-induced thermogenesis was significantly (0.67 ± 0.14 kcal) larger after the administration of 1 g of MCT. In experiment 2, there were no differences in food intake or carcass protein content between the LCT group and MCT group. However, carcass fat and intra-abdominal fat content were significantly lower in rats fed MCT than in those fed LCT. We calculated that ingestion of 1 g of MCT decreased body fat by 0.94 ± 0.27 kcal relative to the ingestion of LCT. **These results suggest that the larger diet-induced thermogenesis observed in rats fed MCT, compared to that of those fed LCT, is one of the main factors involved in the suppression of body fat accumulation in rats fed MCT.**