Palm Oil Nutrition Update 2:
Modulation of human lipids and lipoproteins by dietary palm oil and palm olein: a review
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Abstract

Several human clinical trials have now evaluated palm oil's effects on blood lipids and lipoproteins. This concept is the result of the classical saturated fat-lipid hypothesis and its role in lipoprotein regulation.

Introduction

Dietary fats (and fatty acids) are known to modulate plasma lipids and lipoproteins. This concept resulted from the early observation that dietary cholesterol affected plasma cholesterol besides the fatty acids.

Resulting from these and other findings, there has been a tremendous effort to educate the consumer and the medical profession alike about the health effects of dietary fats and fatty acids. This concept is a result of the classical saturated fat-lipid hypothesis and its role in lipoprotein regulation.

Historical studies evaluating palm oil effects

One of earliest clinical trials evaluating palm oil was pioneered by Arhens et al. (12) who fed two test diets, one containing palm oil and the other a reference diet. They observed that palm oil caused an increase in cholesterol and triglyceride levels.

Anderson et al. (4) fed 12 volunteers diets containing 35% saturated fat contributed by two parts of coconut oil and one part of milk fat. They observed that the coconut oil diet resulted in significantly lower levels of total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) than the milk fat diet.

Mattson and Grundy (6) fed 20 male volunteers a liquid formula diet containing 40% of calories from fat. They observed that the high linoleic safflower oil diet resulted in significantly lower levels of TC and LDL-C than the liquid formula diets containing 40% of calories from high oleic sunflower oil and an olive oil control diet.

Bonanome and Grundy (8) evaluated the impact of palm oil, high oleic safflower oil and an olive oil control diet on cholesterol and lipoprotein levels in humans. They observed that palm oil had a neutral impact on cholesterol and lipoprotein levels.

Laine et al. (14) compared the effect of palm oil, corn oil, soybean oil and lightly hydrogenated coconut oil. They observed that the palm oil diet caused a significant increase in cholesterol levels.

These studies are often cited as examples of the cholesterol-raising properties of palm oil. However, some recent studies have suggested that the cholesterol-raising effect of palm oil may be less pronounced than previously thought.

Anderson et al. (13) who fed 11 patients liquid formula diets containing 40% of calories from fat. They observed that the liquid formula diets containing 40% of calories from high oleic sunflower oil resulted in significantly lower levels of TC and LDL-C than the liquid formula diets containing 40% of calories from low oleic sunflower oil and an olive oil control diet.

Mattson and Grundy (7) fed 11 patients liquid formula diets containing 40% of calories from fat. They observed that the liquid formula diets containing 40% of calories from high oleic sunflower oil resulted in significantly lower levels of TC and LDL-C than the liquid formula diets containing 40% of calories from low oleic sunflower oil and an olive oil control diet.

These studies are often cited as examples of the cholesterol-raising properties of palm oil. However, some recent studies have suggested that the cholesterol-raising effect of palm oil may be less pronounced than previously thought.

Conclusion

In conclusion, dietary fats (and fatty acids) are known to modulate plasma lipids and lipoproteins. This concept resulted from the early observation that dietary cholesterol affected plasma cholesterol besides the fatty acids. Resulting from these and other findings, there has been a tremendous effort to educate the consumer and the medical profession alike about the health effects of dietary fats and fatty acids. These studies are often cited as examples of the cholesterol-raising properties of palm oil. However, some recent studies have suggested that the cholesterol-raising effect of palm oil may be less pronounced than previously thought.

References

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Palm olein versus polyunsaturated oils


Palm oil (16:0-rich) versus other saturates

The human diet contains a mixture of different fats, and these studies compared the effects of 12:0+14:0 occurring naturally in coconut oil and palm olein feeding resulted in significant increases in TC and LDL-C compared with the palm olein feeding.

Palm oil versus hydrogenated fats (trans fatty acids)


Ng et al. (18) evaluated the effects of palm olein on serum lipids and lipoproteins in nonhypercholesterolemic individuals. Am J Clin Nutr 1991; 53: 1015S-1020S.

Palm olein versus the monounsaturated oils

Ng et al. (19) evaluated the effects of palm olein compared with olive oil on serum lipids and lipoproteins in nonhypercholesterolemic humans. Am J Clin Nutr 1991; 53: 1010S-1014S.

Palm olein (16:0-rich) versus polyunsaturated oils

These studies suggest that the cholesterolemic properties of palm oil and palm olein are dependent on the specific fatty acid composition, and therefore whole mixtures of different fatty acids present in foods containing saturated, monounsaturated, and polyunsaturated fatty acids may be required to improve serum cholesterol levels.

Conclusion

These studies suggest that the cholesterolemic properties of palm oil are different from those of other fats and oils, and therefore it is important to consider the specific fatty acid composition when evaluating the effects of these foods on serum lipids and lipoproteins.


