

Palmitic Acid in the American Diet

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Since 1985, a relentless 'war of words' has been waged in the media, essentially in the United States, between the producers of tropical tree oils on the one hand, and US-based oil seed growers' and oil seed crushers' trade associations on the other.

Using the transparent guise of 'health concerns', these associations have joined with such consumer pressure groups as the Centre for Science in the Public Interest (CSPI), to try to prevent the import of palm, palm kernel and coconut oils. The producers of tropical oils' have been placed in the situation of fighting a continuous rearguard action, of responding to misinformation from a variety of sources and directions.

The most recent change in direction of the attack came in June and July 1988, when palmitic acid was named as *the* saturated fatty acid to avoid. The sustained attack had earlier been on the general level of saturated fatty acids in the US diet, but now the main opponents of dietary saturated fatty acids began to publish data which specifically questioned the effect of palmitic acid upon serum cholesterol levels.

This can be viewed as yet another anti-palm oil move, related to previous attempts by American oilseed producing interests to have *all* oils whose composition included more than 25% palmitic acid classified as of 'non-vegetable origin', irrespective of the actual source. Without doubt, the apparently arbitrary upper limit of 25% was well chosen, since it would allow cottonseed oil to continue enjoying the accolade of 'Vegetable Oil'.

How valid is the assertion by the US research fraternity regarding palmitic acid?

Consideration of statistics from the USA on oils and fats, is instructive and allows us to assess palmitic acid consumption in the diet of Mr and Mrs America in its proper context. *Table 1* shows the consumption of edible oils and fats in the USA during 1984 – 1987, while in *Table 2* the figures for consumption of 'tropical oils' are repeated and totalled. *Table 3* shows the palmitic acid loading in the US diet, derived from edible oils and fats. It is instructive to determine the proportion of this which is attributable to tropical oils, as in done in *Table 4*.

TABLE 1. CONSUMPTION OF EDIBLE OILS AND FATS IN THE USA ('000 tonnes)

Oil or Fat Type	1987	1986	1985	1984
Soyabean	4950.2	4621.1	4552.2	4497.7
Cottonseed	271.6	260.4	319.6	257.1
Peanut	86.8	32.6	51.8	47.2
Sunflowerseed	71.0	75.9	81.5	67.6
Canola	88.7	55.3	16.2	5.2
Corn	422.8	436.0	441.3	341.8
Palm	185.6	288.0	185.4	152.6
Palm kernel	188.2	127.0	136.4	96.0
Coconut	447.3	463.6	392.5	380.8
Lard	338.7	356.8	375.4	384.2
Fish	26.8	26.5	22.0	25.3
Butter	427.2	447.6	474.1	474.2
Tallow	1921.2	2046.9	2103.8	2041.0
Total	9426.1	9237.7	9152.2	8770.7

TABLE 2. CONSUMPTION OF TROPICAL OILS IN THE USA ('000 tonnes)

Oil Type	1987	1986	1985	1984
Palm	185.6	288.0	185.4	152.6
Palm kernel	188.2	127.0	136.4	96.0
Coconut	447.3	463.6	392.5	380.8
Total	821.1	878.6	714.3	629.4

TABLE 3. PALMITIC ACID LOADING FROM THE EDIBLE OILS AND FATS CONTENT OF THE US DIET ('000 tonnes)

Oil or Fat Type	1987	1986	1985	1984
Soyabean	544.5	508.3	500.7	494.7
Cottonseed	65.2	62.5	76.7	66.0
Peanut	10.4	3.9	6.2	5.7
Sunflowerseed	5.0	5.3	5.7	4.7
Canola	3.5	2.2	0.6	0.2
Corn	50.7	52.3	53.0	41.0
Palm	83.5	129.6	83.4	68.7
Palm kernel	15.1	10.2	10.9	7.7
Coconut	40.3	41.7	35.3	34.3
Lard	84.7	89.2	93.9	96.1
Butter	111.1	116.4	123.3	123.3
Beef Tallow	499.5	532.2	523.6	530.7
Total	1513.5	1553.9	1512.7	1473.1

TABLE 4. IMPORTED PALMITIC ACID IN THE US DIET ('000 tonnes)

Oil Type	1987	1986	1985	1984
Palm	83.5	129.6	83.4	68.7
Palm kernel	15.1	10.2	10.9	7.7
Coconut	40.3	41.7	35.3	34.3
Total from tropical oils	138.9	181.5	129.6	110.7
Total from all sources	1513.5	1553.9	1512.7	1473.1
Contribution of tropical oils as % of total	9.2	11.7	8.6	7.5

There is thus no question that the palmitic acid loading, attributable to the ingestion of 'tropical oils', is at a low level, relative to that coming from the indigenous oils and fats in the US diet.

Table 5 also indicates that the tropical oils are by no means the only source of palmitic acid in the US diet, although it does confirm that palm oil has the highest level in its glycerides. The table also serves to illustrate the reason for the apparently arbitrary selection of 25% as the cut-off for the definition of 'vegetable oil'.

From the statistics presented, the following conclusions may be drawn:

- In the period 1984 to 1987, the consumption of edible oil in the USA increased from 8.77 million tonnes to 9.43 million tonnes, a rise of 7.53 per cent.
- In the same period, the palmitic acid loading in the US diet attributable to dietary oils and fats increased from 1.47 million tonnes to 1.51 million tonnes, a rise of 2.72 per cent.

TABLE 5. MEAN PALMITIC ACID CONTENT OF COMMON OILS & FATS IN THE US DIET.

Oil Type	% C16:0	Per Capita Consumption (kg) C16:0 in 1987
Soyabean	11	2.232
Cottonseed	24	0.267
Peanut	12	0.043
Sunflowerseed	7	0.020
Canola	4	0.014
Corn	12	0.208
Palm	45	0.342
Palm kernel	8	0.062
Coconut	9	0.165
Lard	25	0.347
Butter	26	0.465
Beef Tallow	26	2.047
		6.202

1987 per capita consumption of Palmitic Acid = 6.202 kg
 * This table is derived from Table 3. Population in 1987 = 224 x 10⁶

- The dietary palmitic acid loading in the US diet, due to the use of tropical oils increased from 0.11 million tonnes to 0.14 million tonnes, a rise of 27.27 per cent.
- Tropical palmitic acid rose from 7.5% of the total in 1984 to 9.2% of the total in 1987.

- From 1986 to 1987, the reduction in dietary palmitic acid of 46 100 tonnes, due to the reduced consumption of palm oil, was more than matched by increases from the following sources:

Soyabean oil	36 200 tonnes
Cottonseed oil	2 700 tonnes
Peanut oil	6 500 tonnes
Canola oil	1 100 tonnes

Total new palmitate: 46 500 tonnes.

- The increase of tropical palmitic acid is from a small base.
- From 1986 to 1987, there was an undeniable drop in the overall palmitic acid loading, won mainly from a drop in the amount of tallow used.
- In the period 1984 to 1987, the US population increased by 3.08% from 236.7 to 244 million. By virtue of

this rise in the number of new mouths to be fed, the per capita consumption of palmitic acid from dietary oils and fats actually fell in the same period, from 6.22 to 6.20 kilogrammes.

From available statistics, it would appear that, although a reduced consumption of palm oil led to a decrease in 'tropical palmitic acid', increased use of 'local oils' more than made up for that fall.

In the media, no mention is ever made of the fact that locally-produced oils and fats contain palmitic acid which is only ever associated with imported 'tropical oils'. Only the palmitic acid contribution from *visible*, imported, fat consumption is usually considered, with no mention being made of alternative sources of palmitic acid in the US food supply, *i.e.* locally-produced oils and fats or indeed other foodstuffs.

By implication therefore, the US public are being led to believe that 'locally produced palmitic acid is better than the imported kind'. This has, of course, no basis in fact, but that is no bar to the self-proclaimed guardians of 'dietary rectitude'.

EDITOR'S NOTE

Recently in a study conducted on three species of monkeys, it was found that a 3-fold increase in palmitic acid content of the diet, had no effect on increasing the plasma cholesterol levels of the animals. The lack of a hypercholesterolemic effect of palmitic acid in the palm oil-enriched diet, contrasted sharply with the cholesterol raising effects of myristic and lauric acids found in a coconut oil-enriched diet. (K.C. Hayes, Brandeis University, Massachusetts, personal communication).

SOURCES

The data presented and used in this paper are, except in the case of Table 5, drawn from the *Oil World Annual, 1988*.

The data for Table 5, are drawn from *Recent Advances in the Chemistry of Oils & Fats*, edited by R J Hamilton and A Bhati, Elsevier Applied Science, London 1987.