

Consensus Workshop on Nutrition:
Budapest 9-11 July 2003

Nutrition Controversies: Example
The Debate on Fat

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Chronic Non-communicable Diseases (NCD's)

- Lasting, rapid increase
- 60% of mortality (worldwide: basis 55.7 million cases)
- 43% of consequences of all diseases
- around 50% of NCD's are cardiovascular diseases and >25% cancer
- Obesity and Diabetes alarming trends:
 - high incidence
 - younger age groups are increasingly affected

Energy and Fat Intake in Human Nutrition

- **Energy intake over the last 40 years remains high (around 20% to 30% over recommendations)**
- **Energy expenditure decreasing (life style)**
- **Fat intake >30 cal%**
- **Saturated fatty acids >10 cal%**

Obesity in Austria

BMI > 30 kg/m²

Regional Basis

(Microsensus 1999)

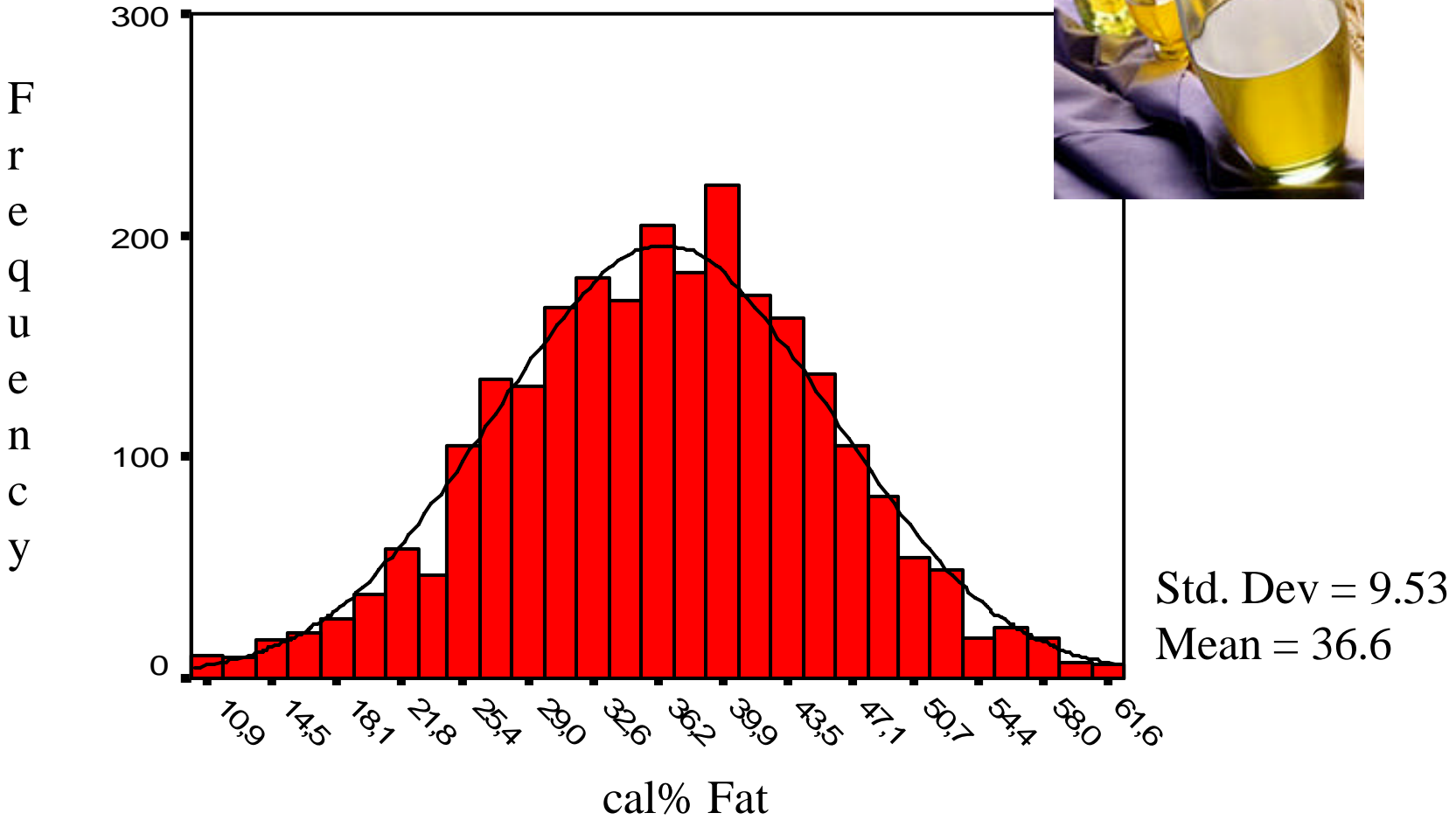
Burgenland	13.1%
Niederösterreich	10.4%
Steiermark	10.2%
Wien	8.5%
Vorarlberg	7.8%
Tirol	6.8%
Salzburg	6.2%

Nutritional Factors and CVD Risk

category	high risk
convincing	palmitic acid trans fatty acid obesity sodium; alcohol
probable	cholesterol β -carotin-supplement coffee unfiltered
possible	lauric acid malnutrition of the foetus

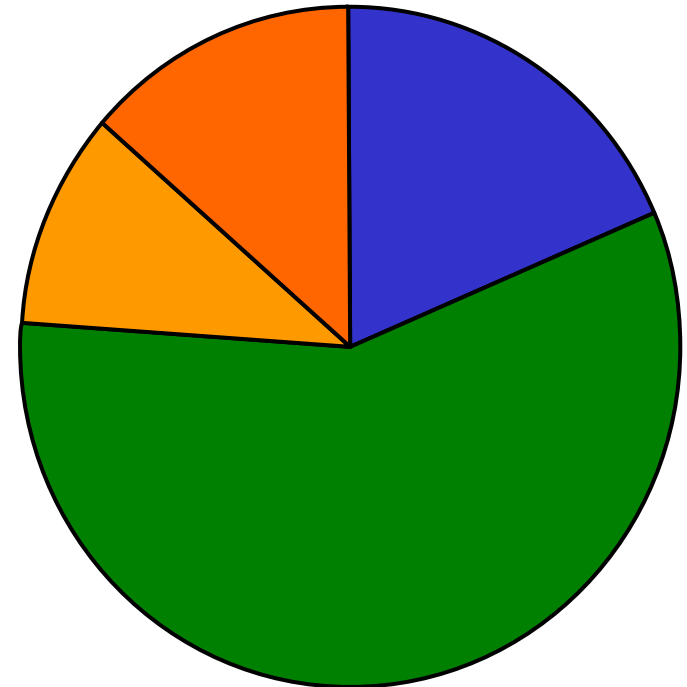
no evidence: CHO, Fe, Ca, Mg, vitamin C

Distribution of Fat Intake (cal%) of Adults N=2585

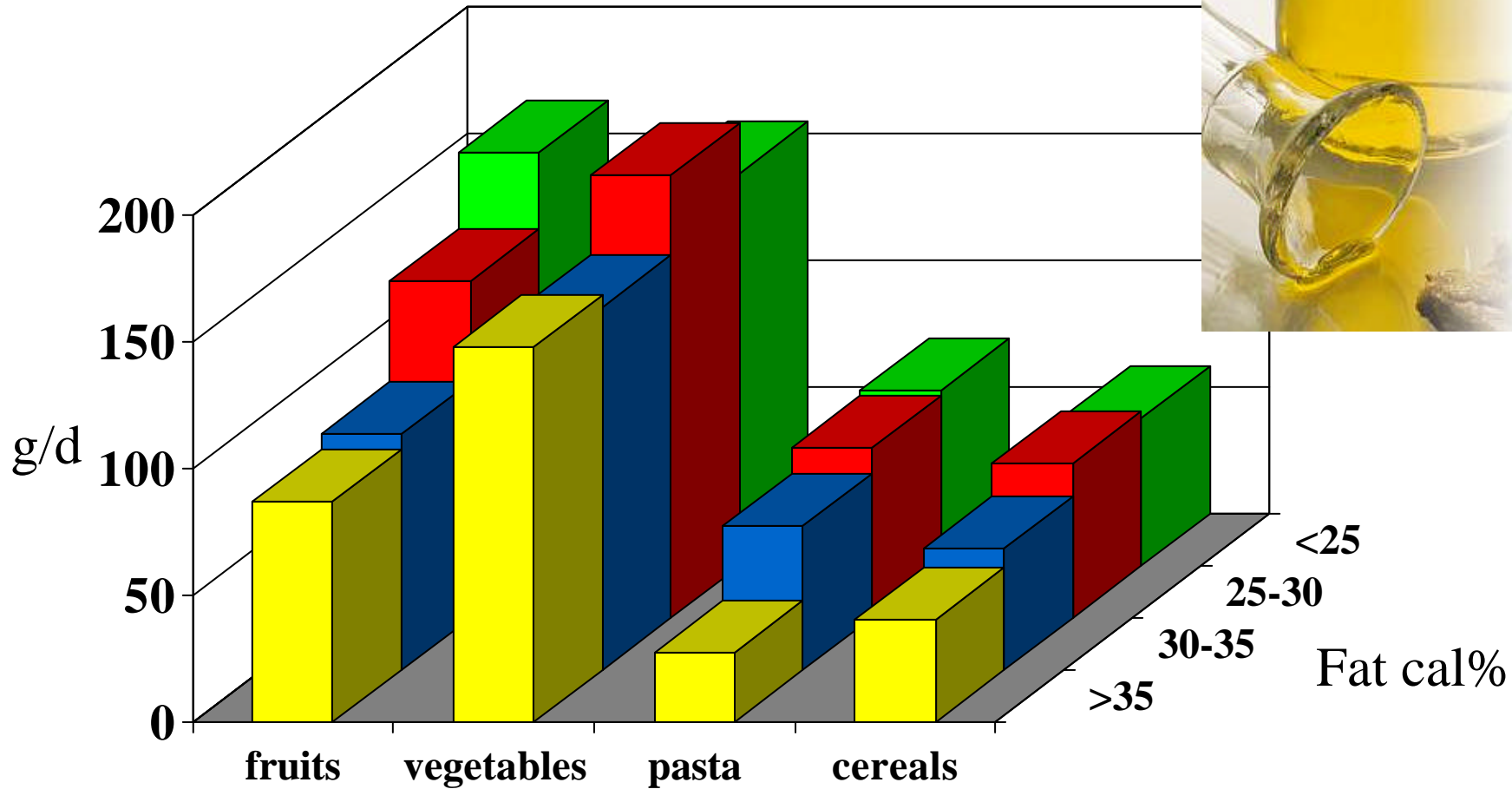


Fat Calories of Total Energy Intake in Adults Ranges from <25 to >45 cal%

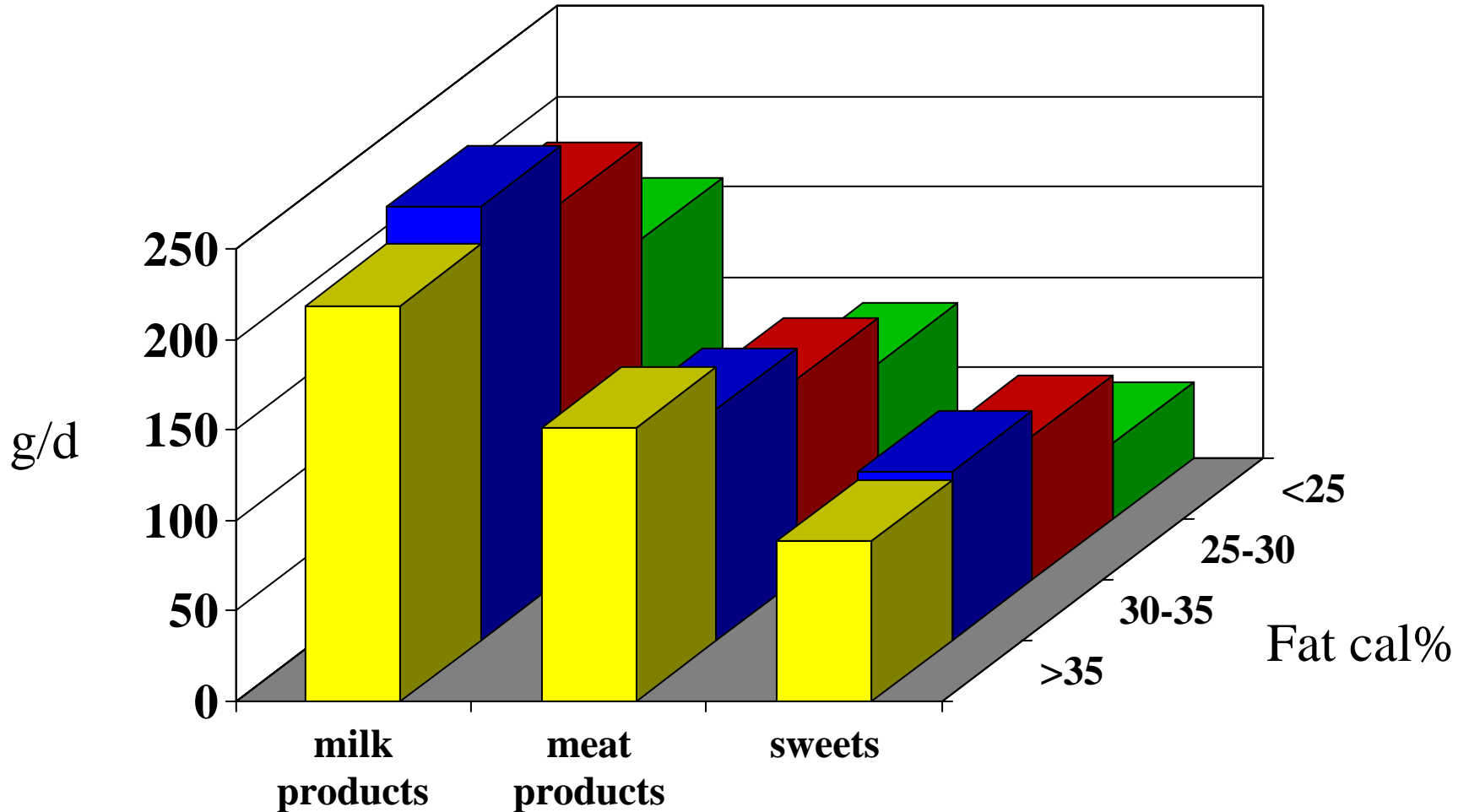
cal%	N=2585	%
<25	270	10.5
25 to 29.9	351	13.5
30 to 34.9	460	18.0
35 to 44.9	1032	39.5
>45	472	18.5



Correlation between Food Consumption and Fat Intake



Correlation between Food Consumption and Fat Intake



Food Consumption of Austrian Children (7-9 y.)

Recommended and Actual, 7-d-Weight-Record N=326

Recommended amounts

% of Recommended

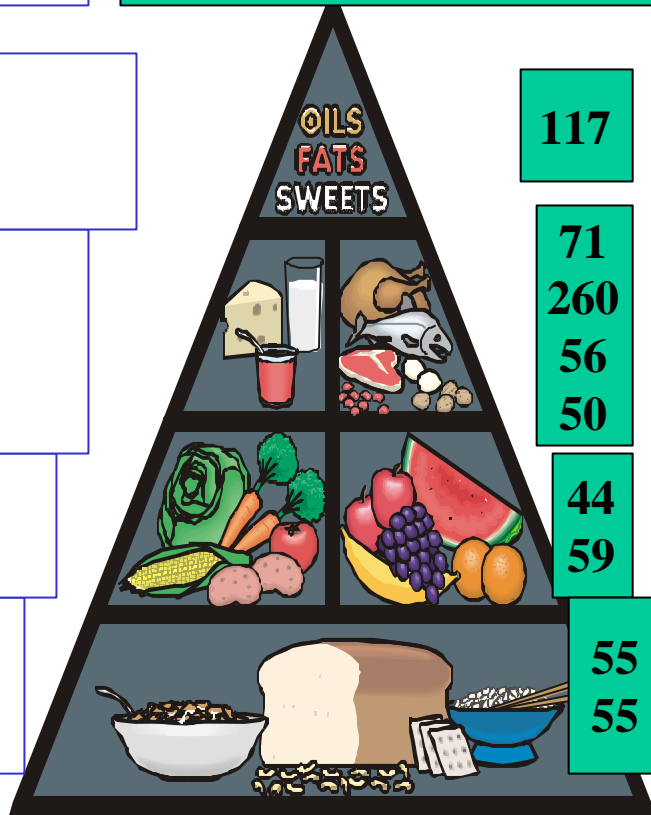
Results

< 60 g/d sweets, cakes etc.

400 g/d milk and products
 50 g/d meat, sausage
 150 g/week fish
 2 pieces/week eggs

220 g/d vegetables
 220 g/d fruits

200 g/d bread, cornflakes
 150 g/d potatoes, pasta,
 rice, cereals



117

70 g/d

71
 260
 56
 50

283 g/d
 130 g/d
 84 g/week
 ~ 1 pieces/week

44
 59

96 g/d
 130 g/d

55
 55

110 g/d
 82 g/d

88

789 ml/d

900 ml/d drinks

Food Consumption of Austrian Adults

Recommended and Actual, 24-h-Recall, N=2580

Recommended amounts

% of Recommended

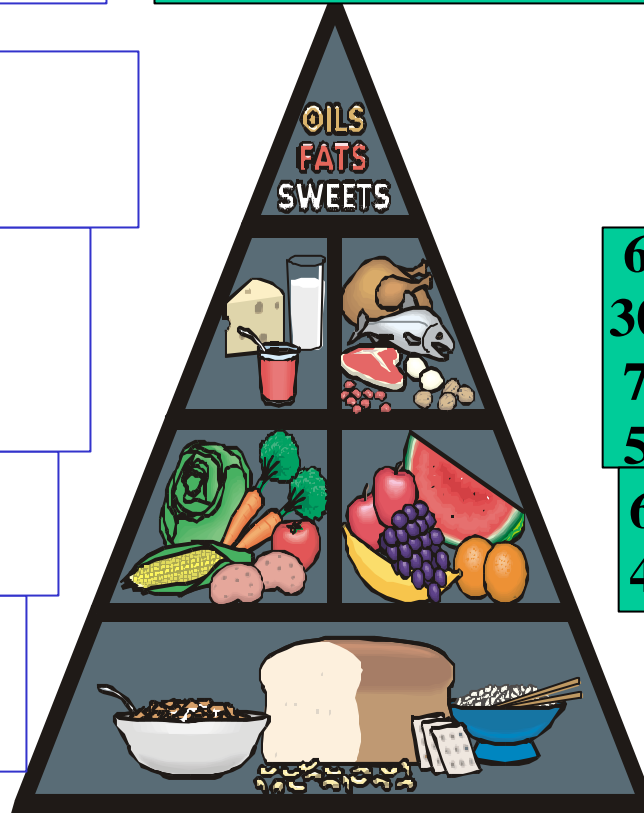
Results

moderate consumption

340 g/d milk and products
 43-86 g/d meat, sausage
 150 g/week fish
 3 pieces/week eggs

~350 g/d vegetables
 250-300 g/d fruit

250-300 g/d bread
 220-300 g/d rice, pasta,
 potatoes, cereals



81 g/d

63

213 g/d

300

130 g/d

79

118 g/week

58

~ 1.75 pcs./week

68

240 g/d

48

119 g/d

49

120 g/d

68

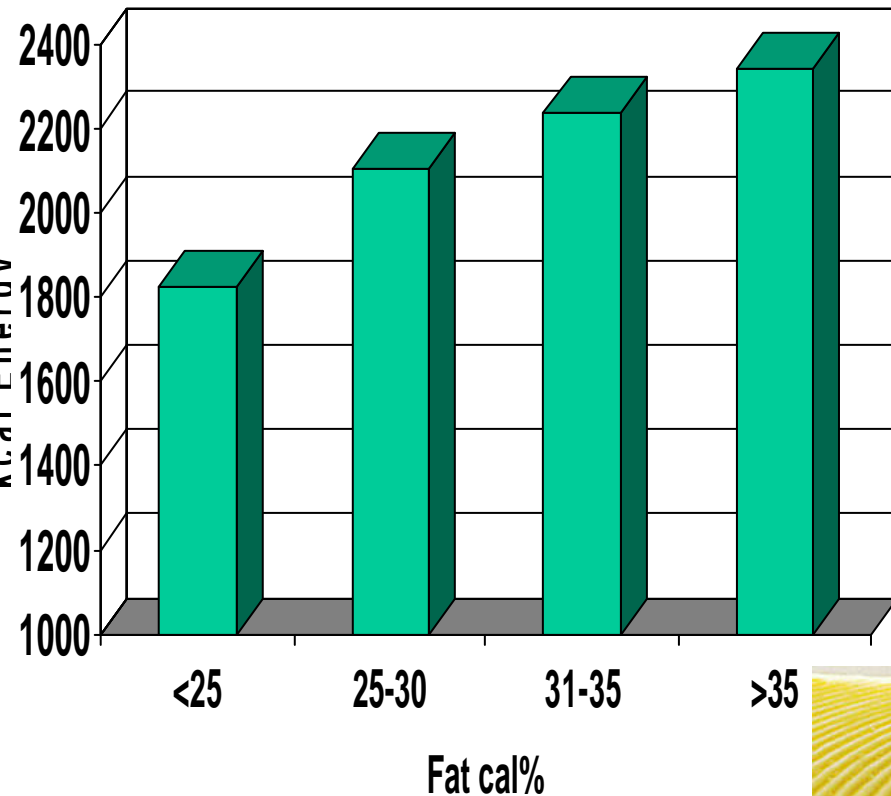
149 g/d

88

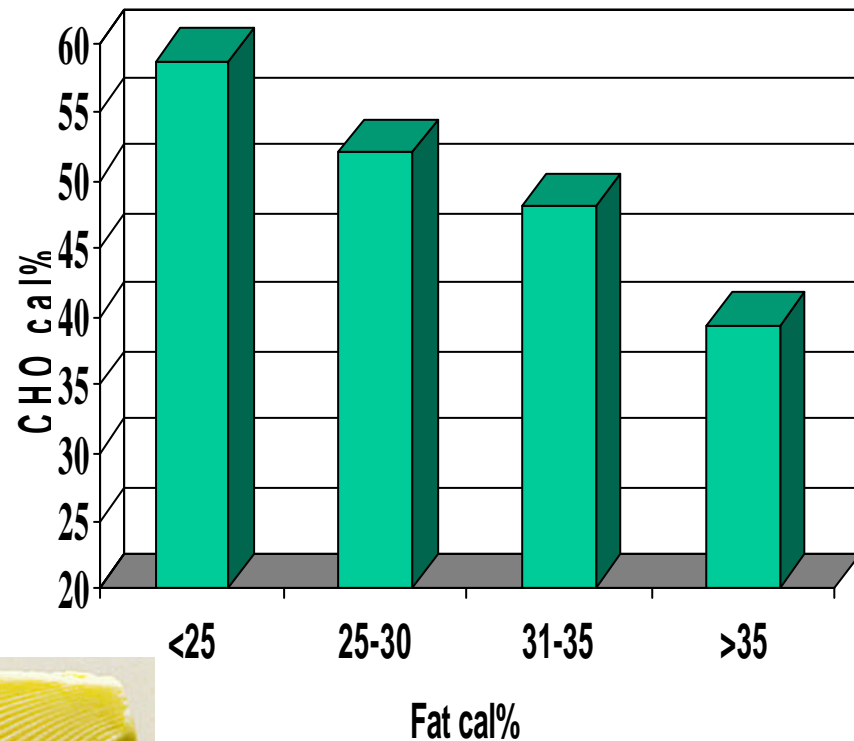
1314 ml/d

1500 ml/d drinks

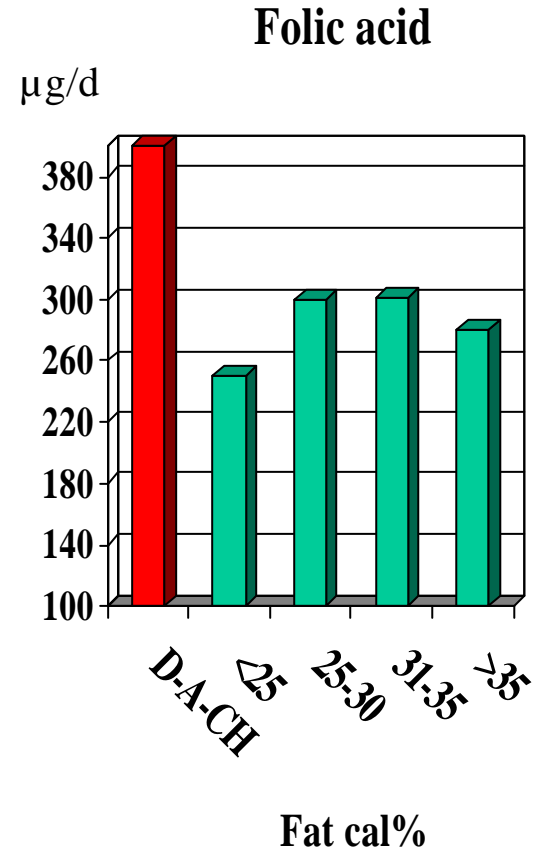
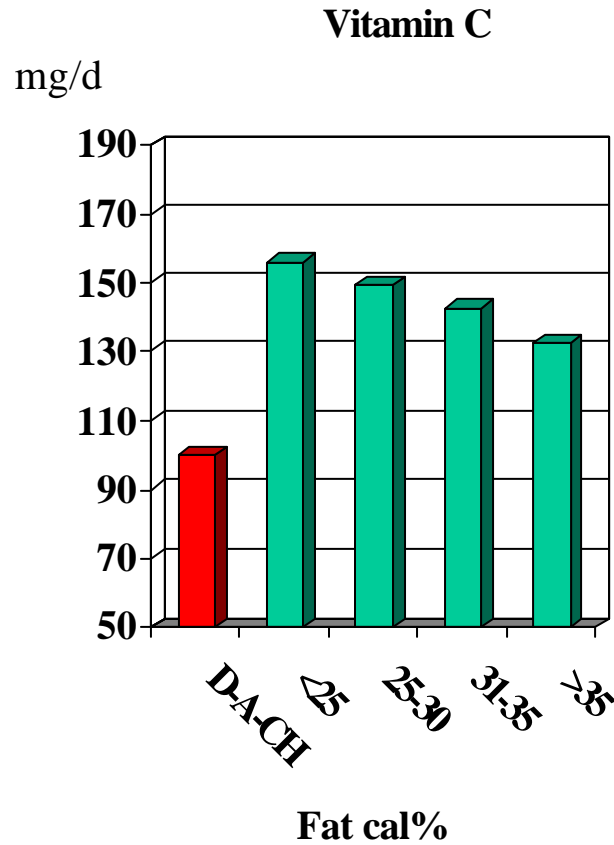
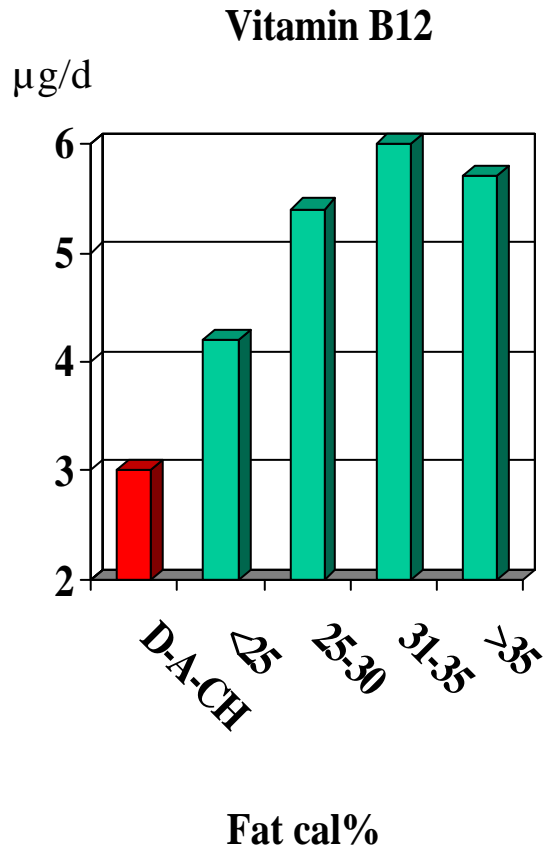
Close Correlation between Fat and Energy Intake



Inverse Correlation between Fat and Carbohydrate Intake

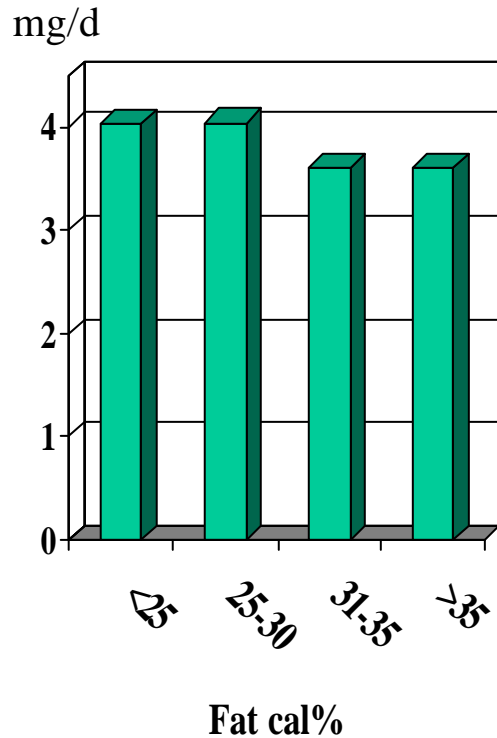


Correlation between Fat and Vitamin Intake

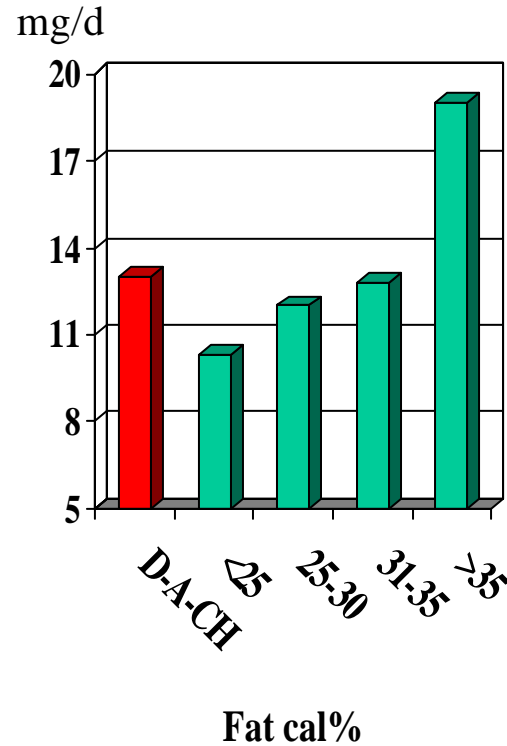


Correlation between Fat and Vitamin Intake

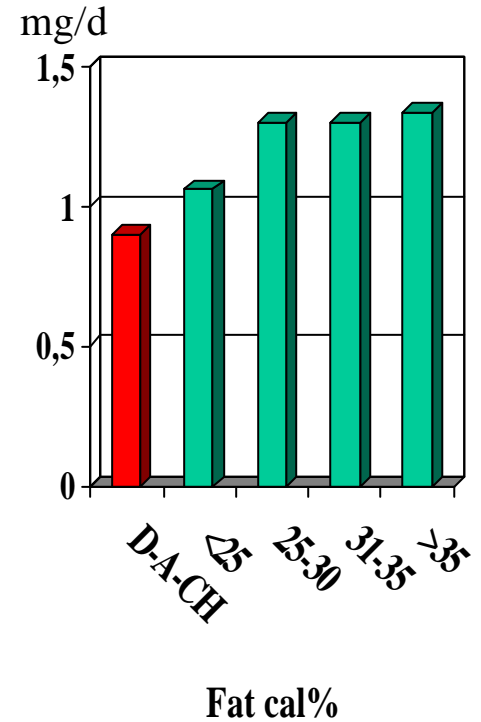
β -Carotin



Vitamin E

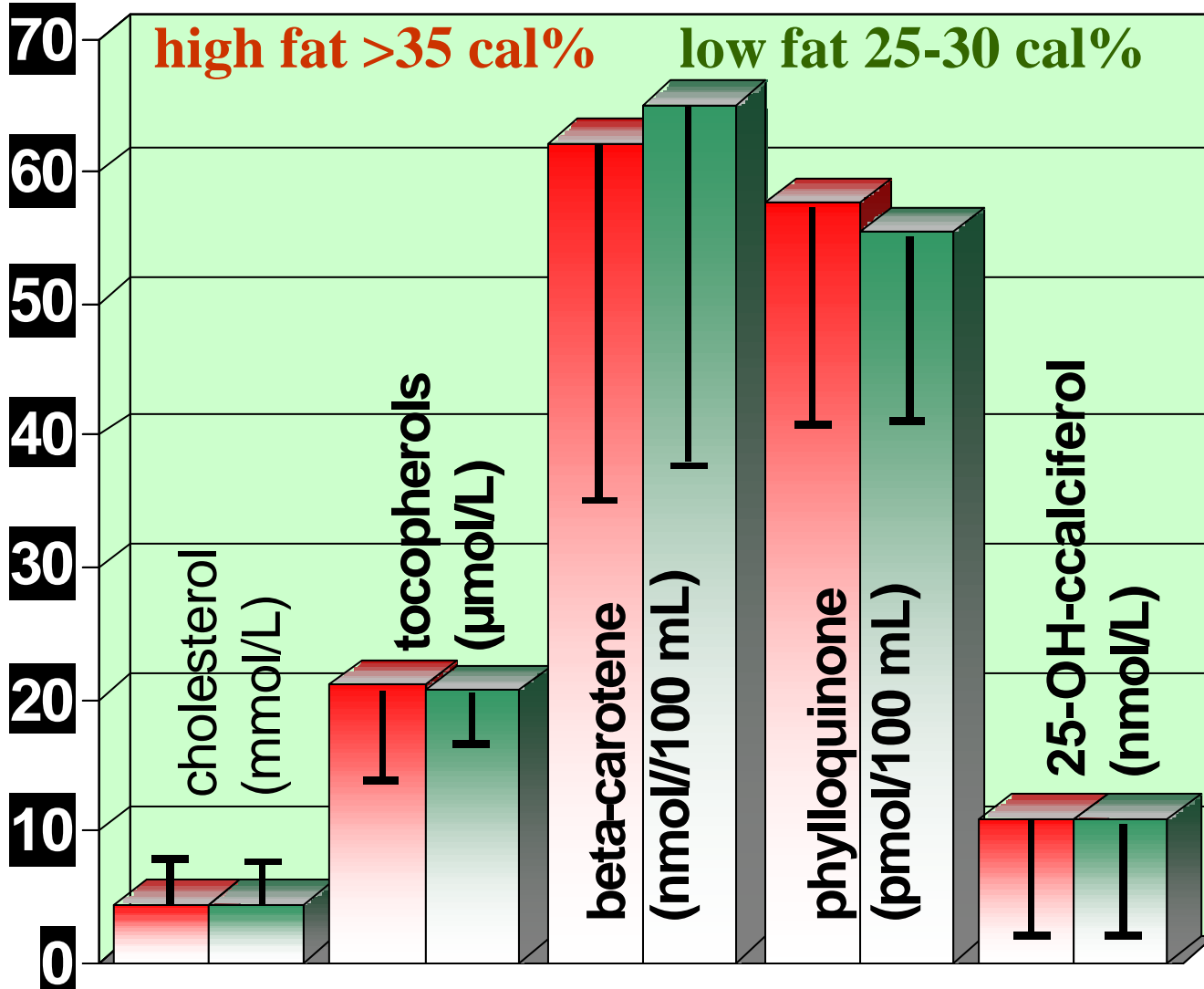


Vitamin A



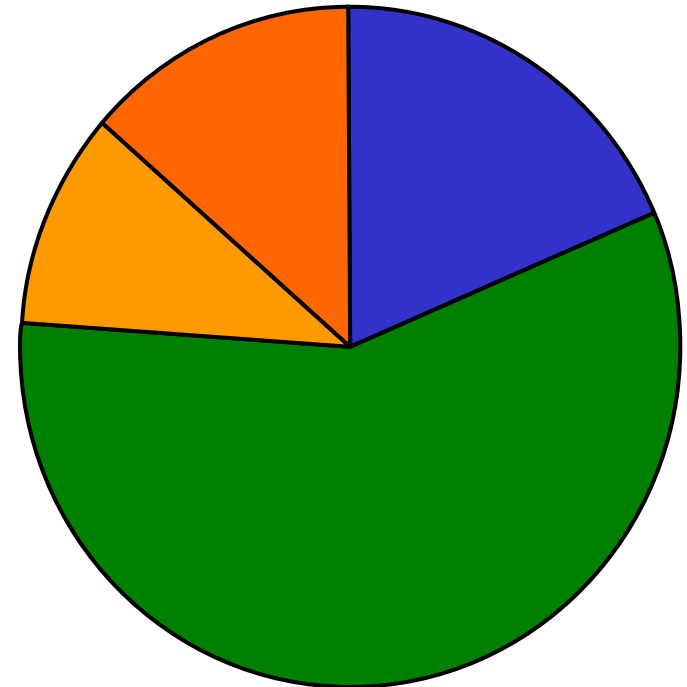
Reduction of

Fat Intake from >35 cal% to 25-30 cal% Does Not Affect Status of Fat Soluble Vitamins and Total Cholesterol
(N=1400 Children 7-18 y.)



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Example Fat 65 cal%

1 ham pie

cream coffee

chicken soup

150 g baked oyster mushrooms

50 g mayonnaise

200 g fried potatoes

200 ml whey

150 g calve sausage

1 slice bread



Example Fat 45 cal%

sweet white bread

1 slice of brown bread

10 g butter

30 g hard cheese

coffee with milk 3.6%

250 ml fruit juice (diluted
1:1)

1000 ml apple juice

200 g beef cooked

fried potatoes

lettuce

carrots, celery

1 bar of chocolate

500 ml fruit juice

sweet white bread

250 ml coffee with 50 ml
milk

2 pieces of rye
bread

20 g butter

50 g bacon

50 g hard cheese

5 pickles

330 ml Red Bull



Example Fat 30 cal%



80 g rye bread with
sunflower seeds

5 g margarine

15 g honey

125 ml 0,5 % UHT milk

40 g wholemeal
cornflakes

green tea

125 g fruit yoghurt 1.5%

125 g yoghurt drink

1/2 wholemeal roll

500 ml mineral water

500 ml mineral water

160 g rye bread with
low-fat cream cheese

40 g low fat cheese

40 g fresh paprika

1 apple

50 g chocolate rice
waffle

1 fruit candy

salad with sheep
cheese, big cub
(lettuce, olives,
tomatoes, paprika,
cucumber, sheep
cheese)

80 g rye bread

250 ml mineral water

250 ml mineral water

3 pieces chocolate
biscuits



The Higher the Amount of Fat, the Lower the Variety of Food Components

Food groups Fat cal. category	No. of Items consumed when			
	65	45	30	30*
Vegetables	2	4	4	6
Fruits	-	-	2	1
Cereals and products	2	2	3	3
Milk and products	1	2	3	6
Meat/Sausage	2	2	1	-
Beverages	3	4	4	3
Sweets	-	1	2	4
Fat spreads/Saucer	1	1	2	1
Items	11	16	21	24

* ovo-lacto vegetarian

Overweight and Fat Intake

Obesity reviews 2002

Fat is a major but not the only factor leading to overweight

10 cal% fat reduction

**weight loss of 3-4 kg in normal weight and
5-6 kg in obese individuals per
year**

Exercise and fat reduction are crucial to

- Body weight reduction and**
- Reduction of risk of diabetes II**

Fat Intake and Changes in Body Weight

	cal% Fat	kg BW	comments
Boyar et al, 1988 n=19 women 6 months intervention	34 → 21%	-5.1	
Buzzard et al, 1990 n=29 women 3 months parallel ad libitum	38 → 23% 39 → 35%	-2.8 -1.3	reduction of fat and energy
Bloemberg et al, 1991 n=80 men 6 months parallel ad libitum	39 → 34% 38 → 37%	-0.94 +0.06	
Boyd et al, 1990 n=206 women 1 year parallel ad libitum	37 → 21% 37 → 35%	-1.0 0	reduction of fat and energy
Leibel et al, 1992 n= 26 w and m 15-56 d intervention	0 , 40 or 70%	no sign. changes	isoenergetic diet

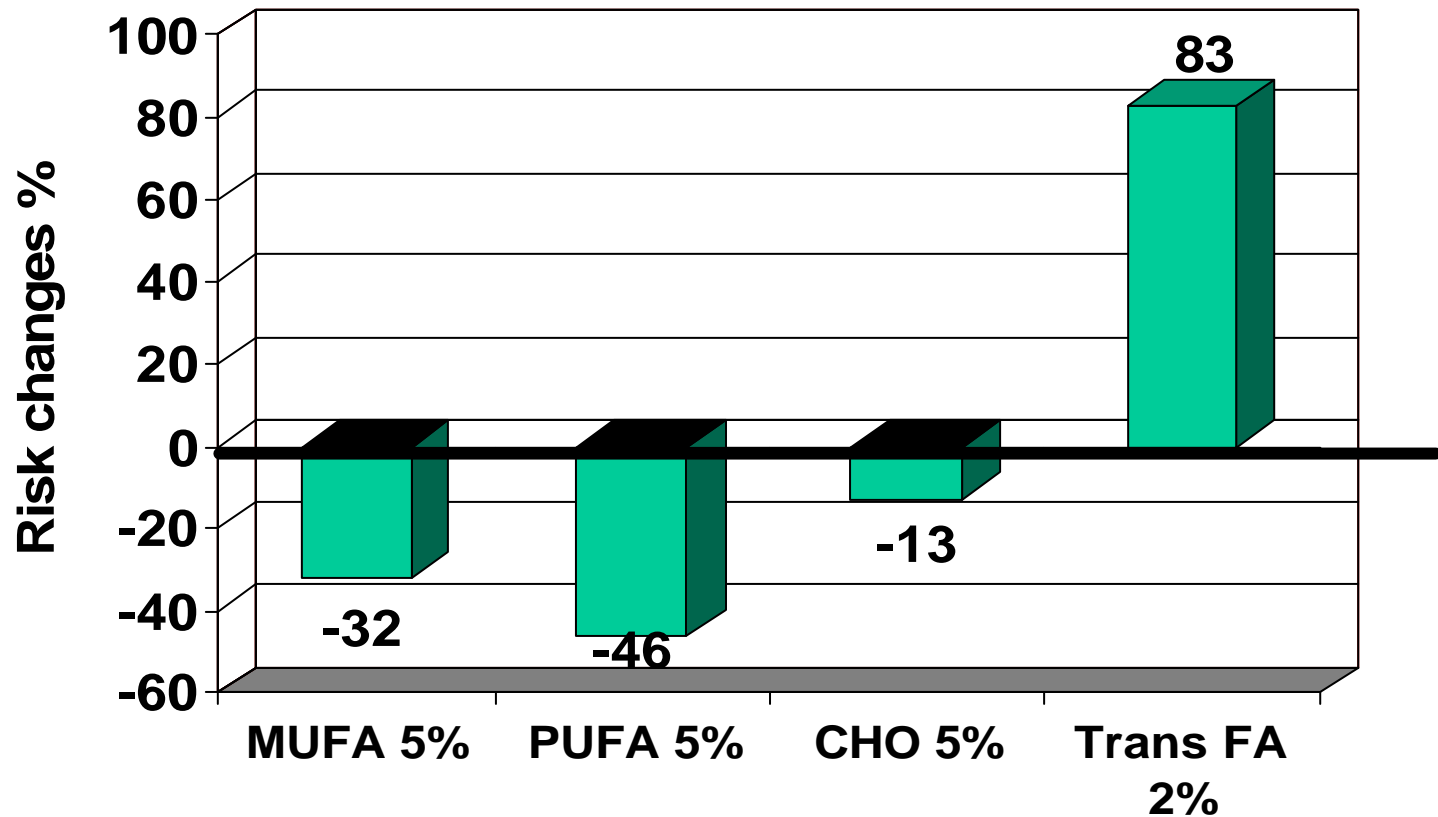
Fat Reduced Diets and Body Weight

**Advantages of fat reduction at >4 cal%
(replacement by CHO):**

- **less energy intake**
- **modest weight loss**
- **weight loss is persistent**

Cardiovascular Risk when Saturated Fatty Acids Were Replaced by Other Food Components

[Hu et al.; NEJM, 1997]



Food Based Guidelines for the Prevention of Obesity

- **Less food and beverages rich in fat and sugar**
- **Avoid big portions of energy dense food**
- **Increase consumption of vegetables, fruits and whole flour products**



Fat is a major but not the only factor leading to overweight

Less fat and food rich in fat 

↓ **Energy intake**

↓ **Bodyfat**

↓ **Body weight**

Improved blood lipids, better health status

Conclusion:

Fat intake ↓ 30 cal%

↑ **PUFAs have no additional positive effects**