

Reunión de Expertos sobre: Nutrición, Desarrollo Humano y Pobreza
PAHO - Washington, 14-15 de Octubre 2002

Salud, nutrición y pobreza: Desafíos de política pública

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- ✓ Nutrition transition: concept and stages (where are the developed and the developing countries?)
- ✓ Worldwide trends in food availability and the predicted impact on the nutritional and health status of the population.
- ✓ Obesity, national wealth and individual SES.

THE NUTRITION TRANSITION PROCESS

**CHANGES IN
THE
ECONOMY**



**CHANGES IN
THE
PHYSICAL
AND THE
SOCIO-
CULTURAL
ENVIRONME
NT**



**CHANGES IN
DIETARY
PATTERNS
AND
ENERGY
AND
NUTRIENT
REQUIREME
NTS**



**CHANGES IN
MAGNITUDE
AND
DISTRIBUTION
OF NUTRITION
-RELATED
DISEASES
AND RISK
FACTORS**

STAGES OF THE NUTRITION TRANSITION

ECONOMY	DIETARY PATTERN	ENERGY AND NUTRIENT EXPENDITURE	NUTRITIONAL STATUS
Hunther-gatherer	Fruits, seeds, roots, wild animals	Very high	Fair for all
Primitive agriculture	One cereal-based diets	Very high	Famine and spread undernutrition
More developed agriculture	Cereals, some vegetables, fruits and animal products	High	Maternal and child undernutrition mainly among the poor
Industrial, mass consumption	Declining plant foods, increasing animal products, oil, sugar, salt and processed foods	Low	Obesity, diabetes, CVD, cancer, etc first among the rich, then shifting rapidly toward the poor
Post-industrial (!)	Cereals, pulses, nuts, F&V, lean meat, skimmed milk	Moderate	Optimum for all

NUTRITION TRANSITION

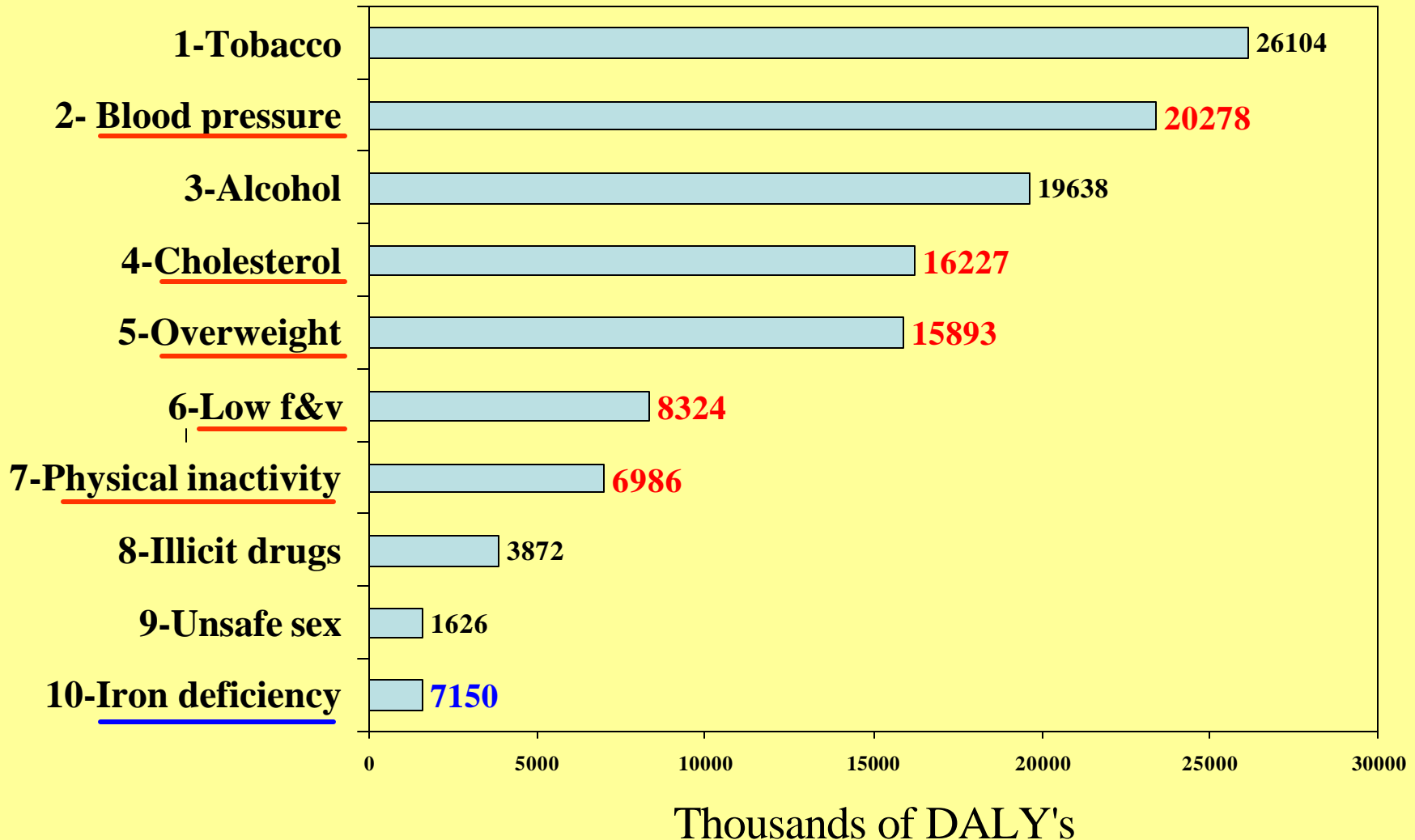
Where we are?

Developed countries

Developing countries

Burden of disease due to risk factors (2000)

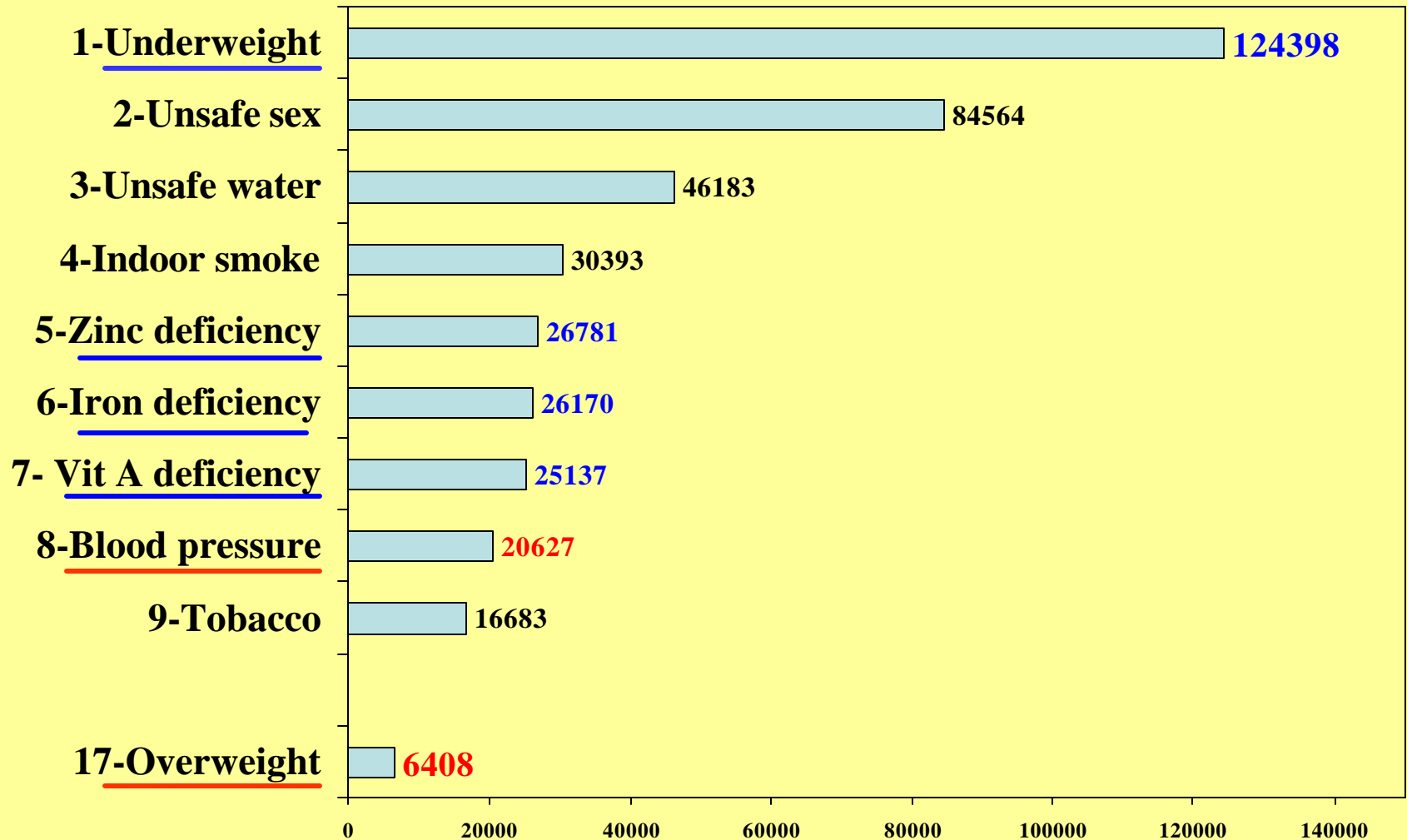
Developed countries (pop: 1.4 billion)



Source: WHO 2002

Burden of disease due to risk factors (2000)

Half poorest developing countries (pop: 2.3 billion)

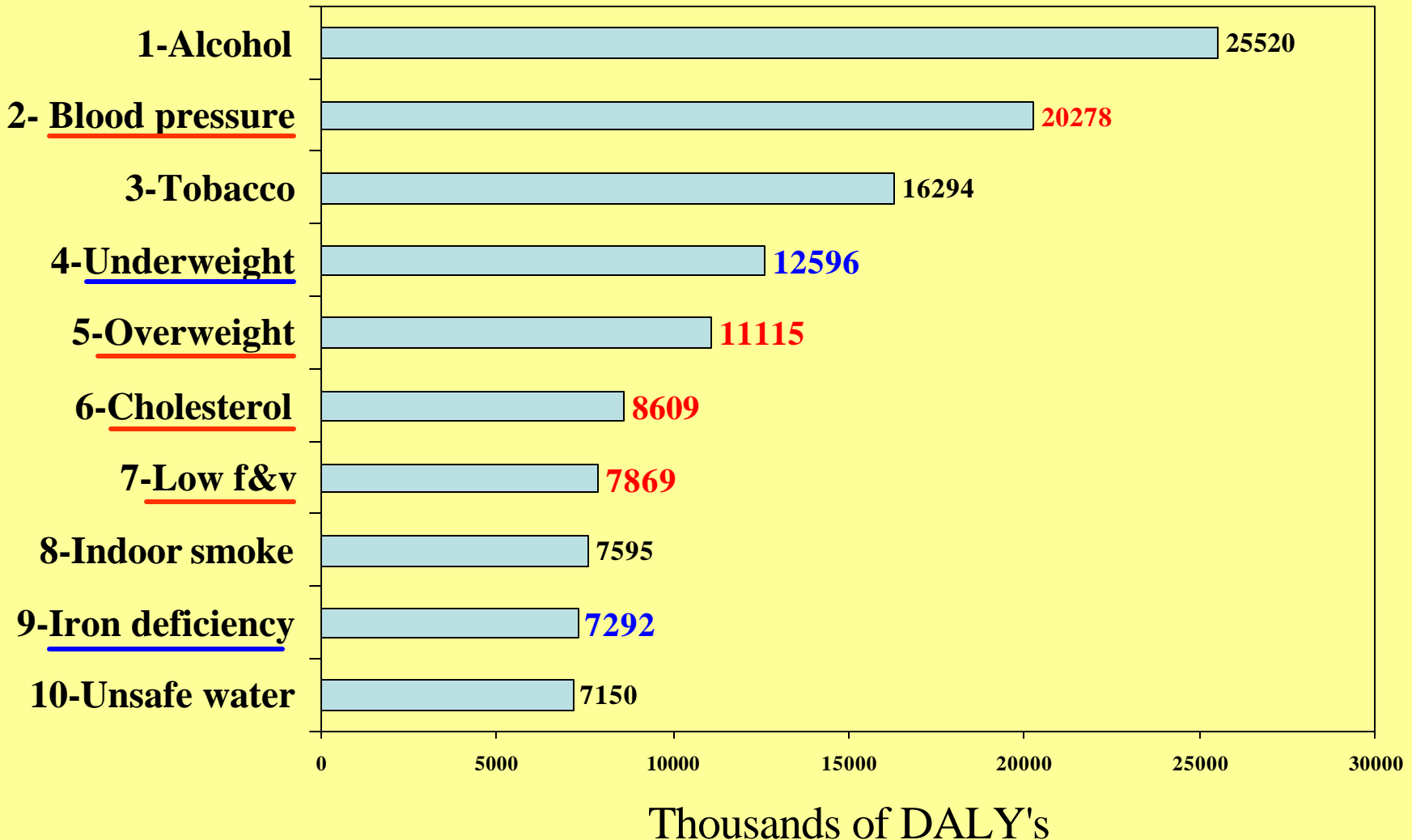


Source: WHO 2002

Thousands of DALY's

Burden of disease due to risk factors (2000)

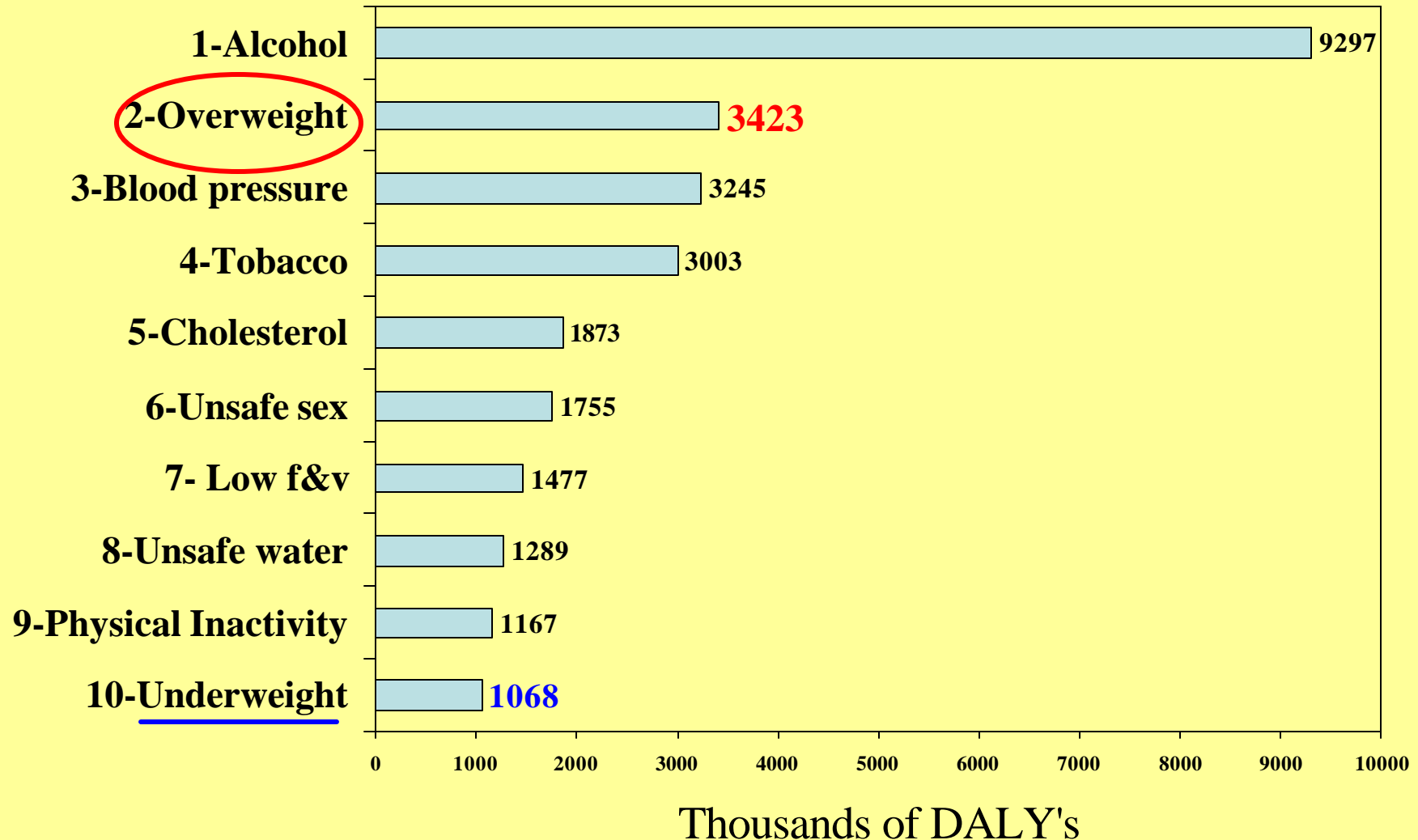
Half richest developing countries (pop: 2.4 billion)



Source: WHO 2002

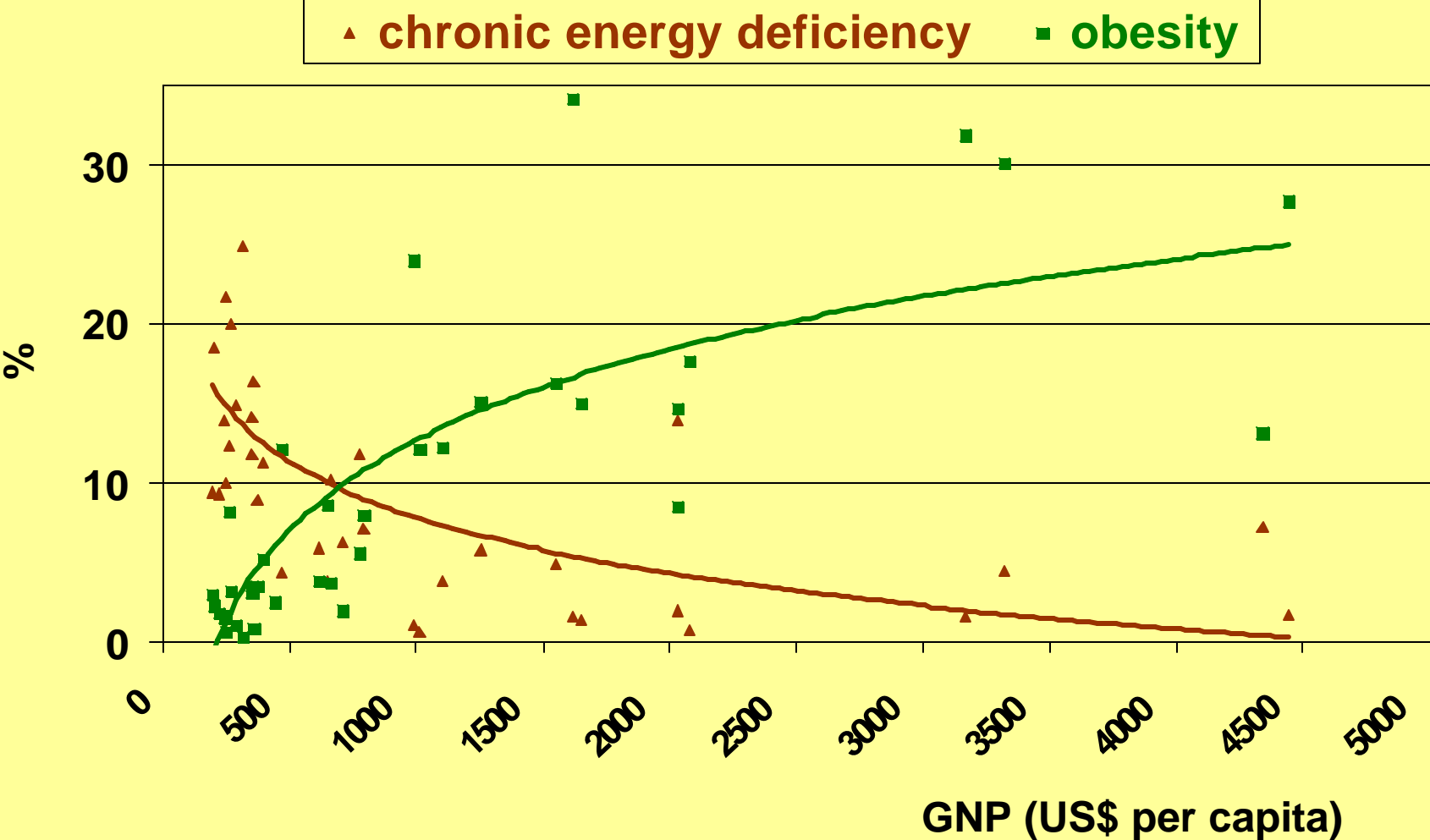
Burden of disease due to risk factors (2000)

Most Latinamerican countries (Brazil, Mexico, Argentina ...)



Source: WHO 2002

National prevalence (%) of women's chronic energy deficiency (BMI < 18.5) and obesity (BMI >= 30) in 37 developing countries

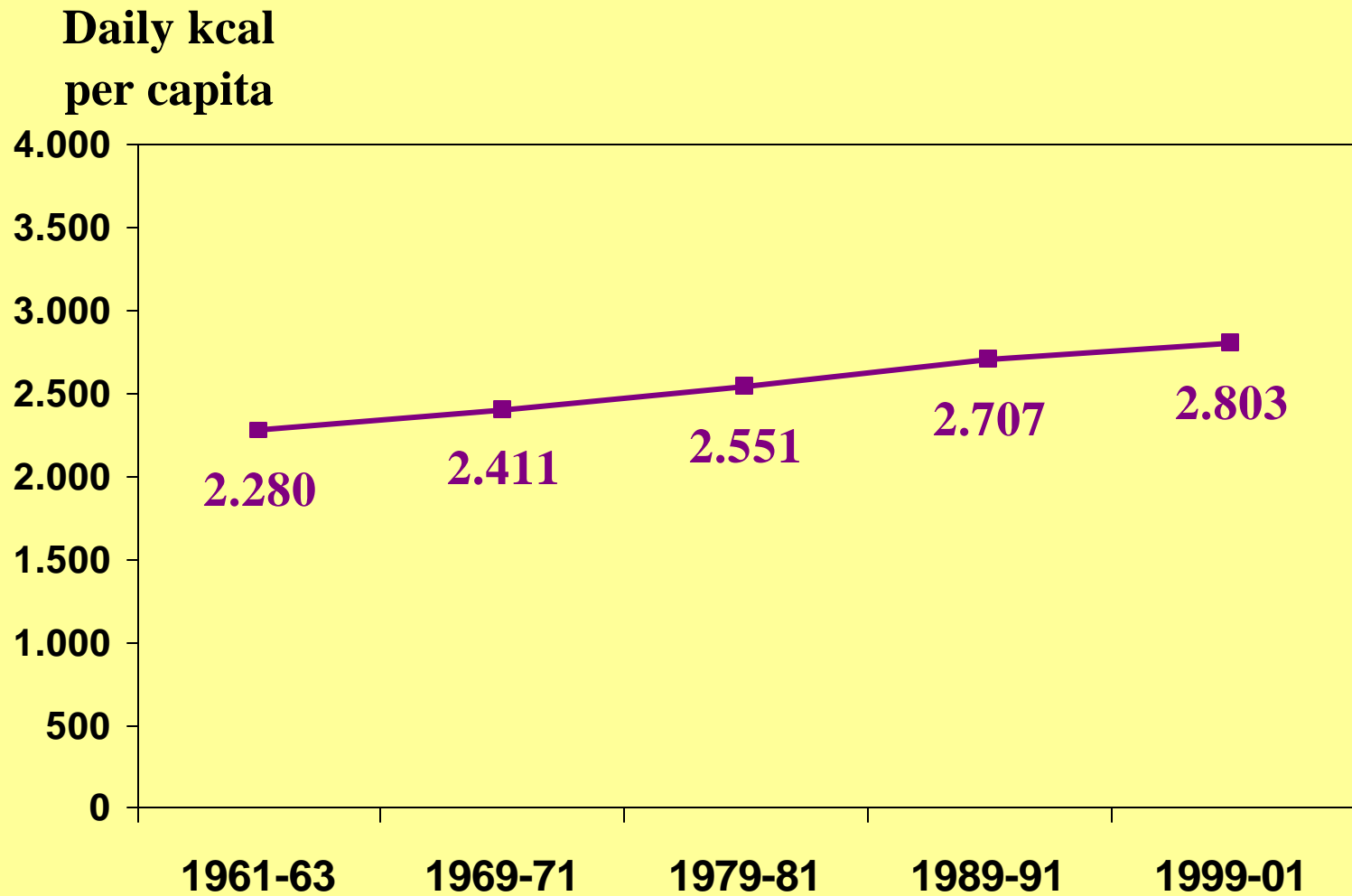


Source: Monteiro et al (in preparation) 2004

WORLDWIDE TRENDS IN FOOD AVAILABILITY

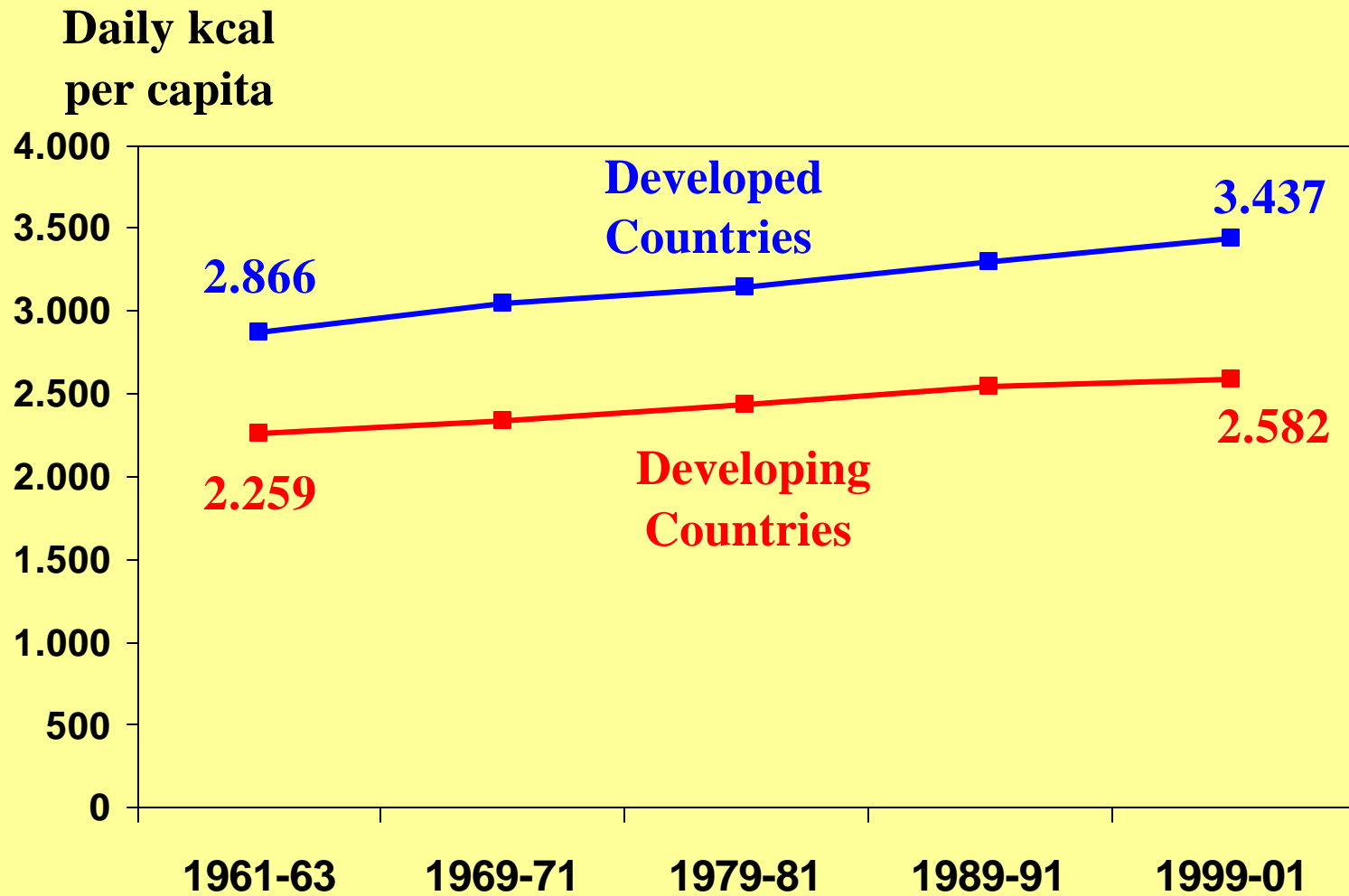
Source: FAO Food Balance Sheets

Global trends in food availability: 1961-2001



Source: Food Balance Sheets from FAOSTAT

Global trends in food availability: 1961-2001



*TRENDS IN THE RELATIVE
AVAILABILITY OF FOOD
GROUPS*

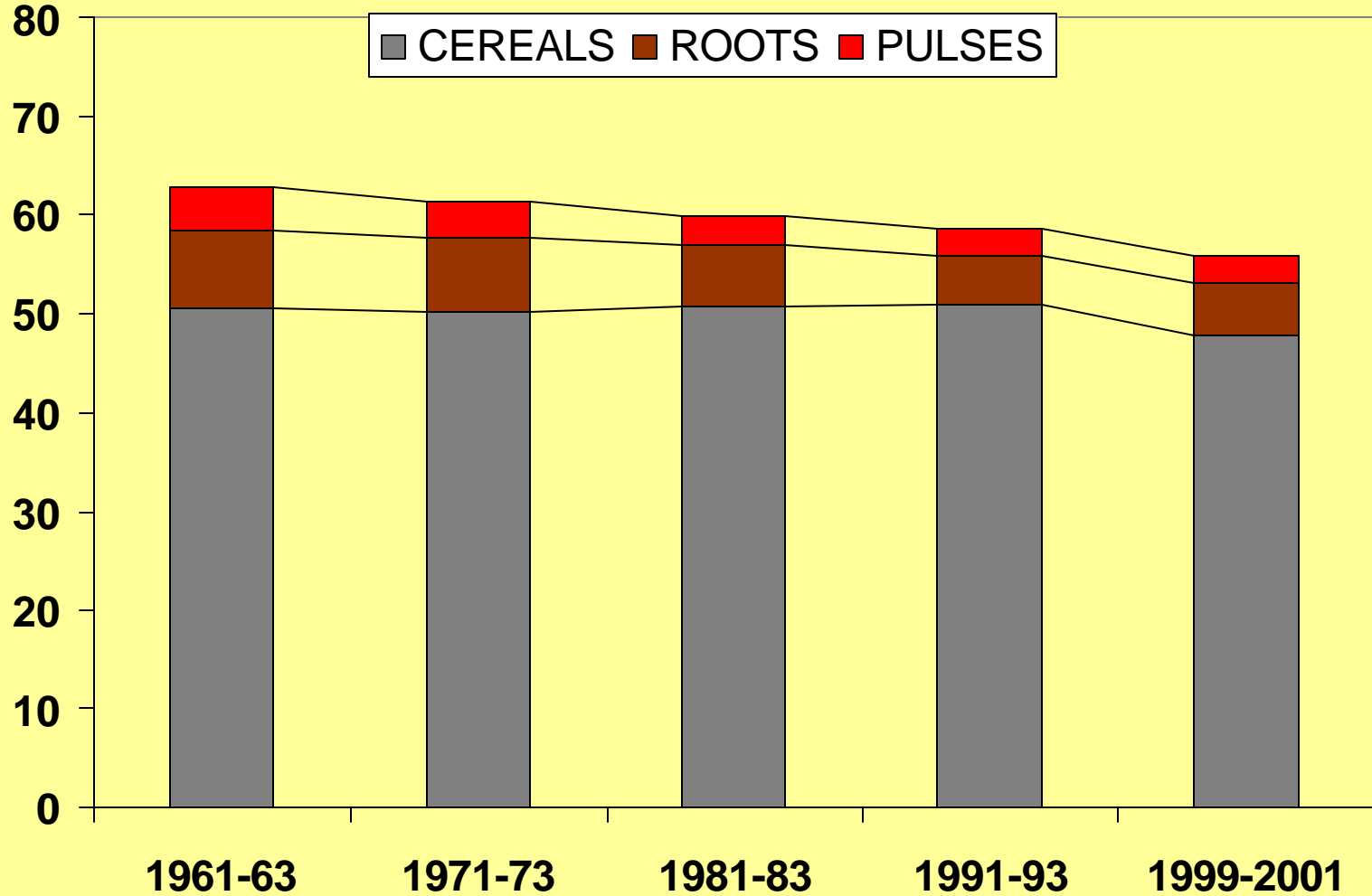
Source: FAO Food Balance Sheets

All countries

Changes in the share of the main food groups

STAPLE FOODS

% OF TOTAL
KCAL

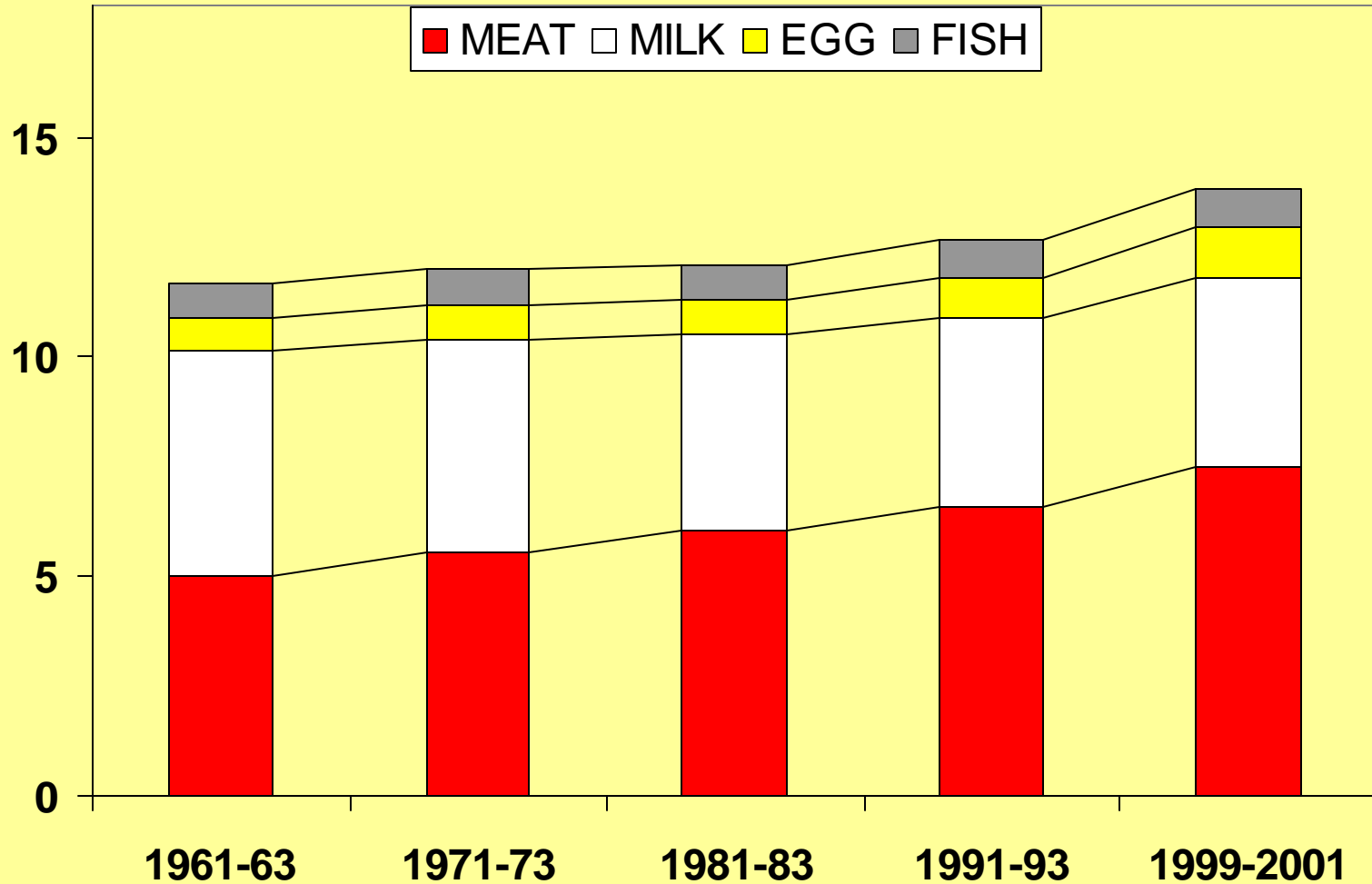


Source: Food Balance Sheets from FAOSTAT

Changes in the share of the main food groups

ANIMAL PRODUCTS

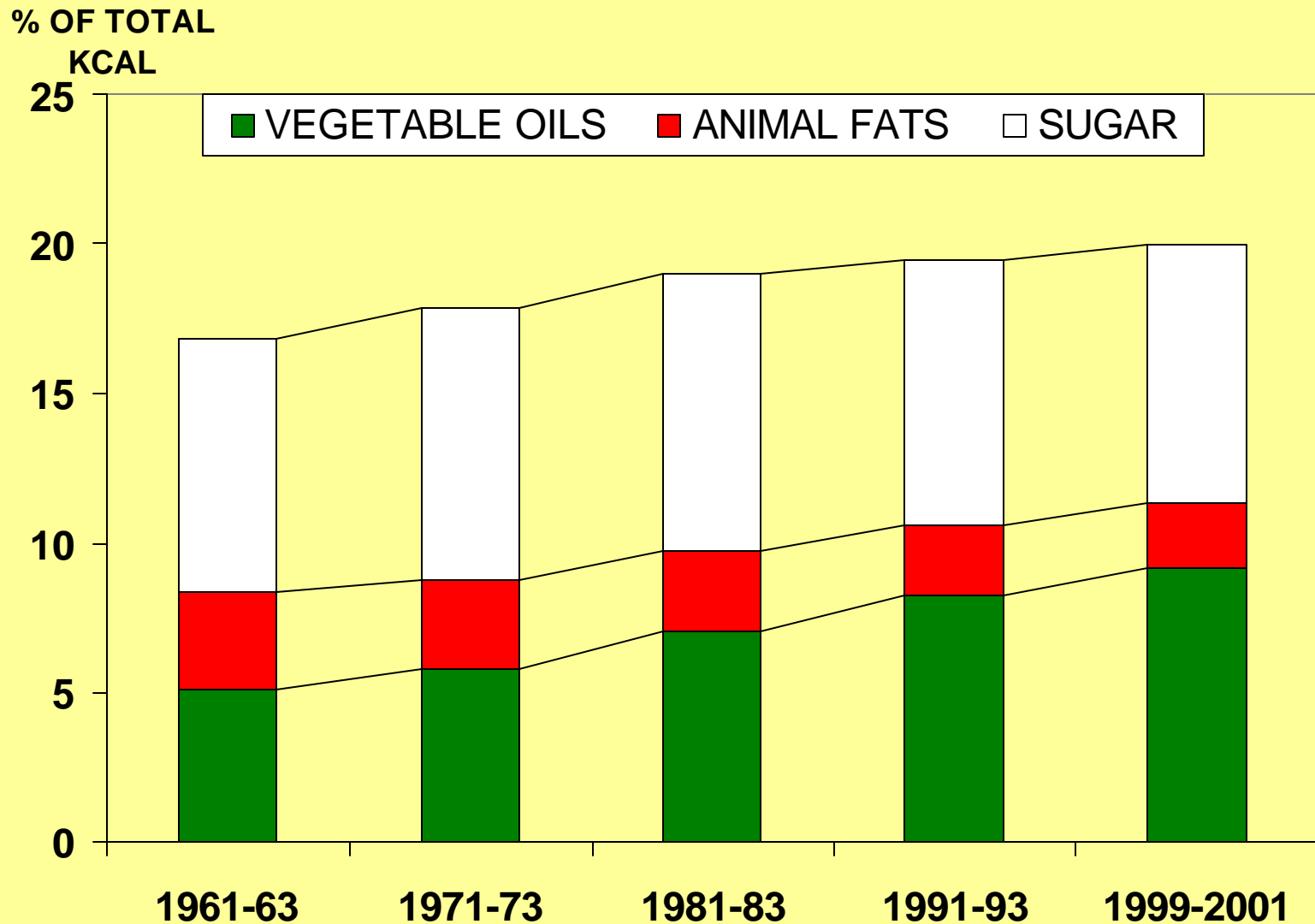
% OF TOTAL
KCAL



Source: Food Balance Sheets from FAOSTAT

Changes in the share of the main food groups

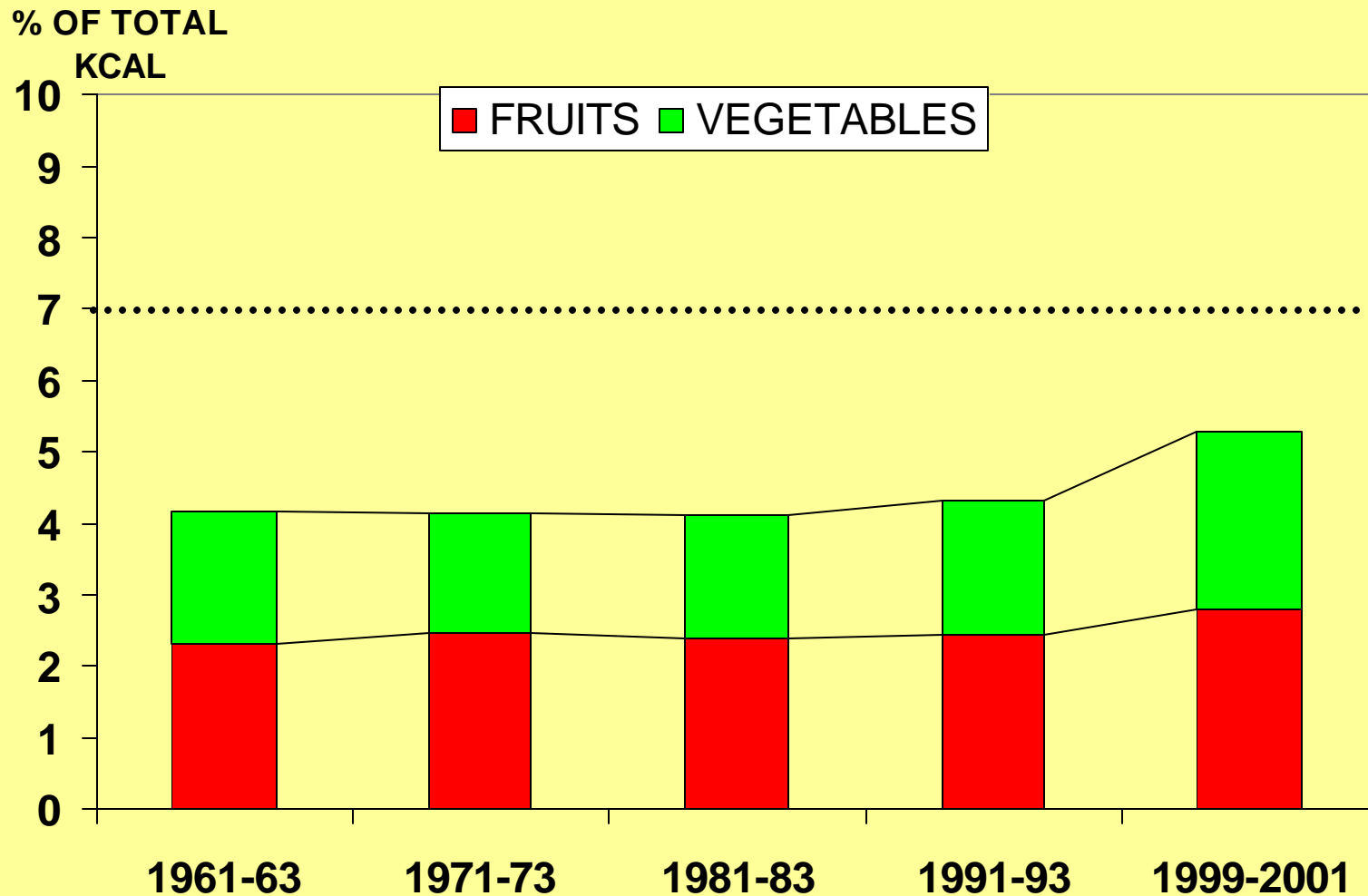
FATS AND SUGAR/SWEETENERS



Source: Food Balance Sheets from FAOSTAT

Changes in the share of the main food groups

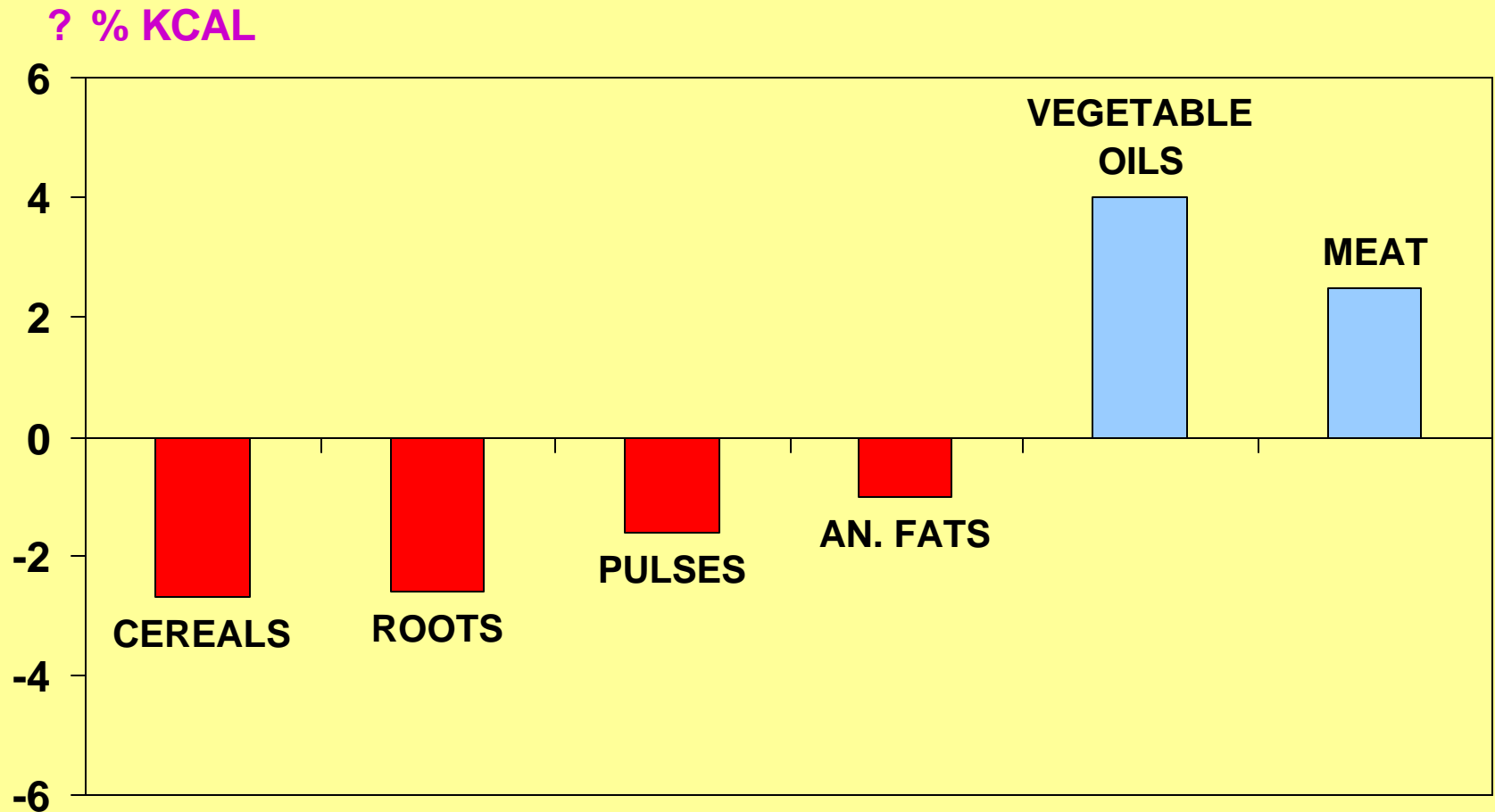
FRUITS AND VEGETABLES



Source: Food Balance Sheets from FAOSTAT

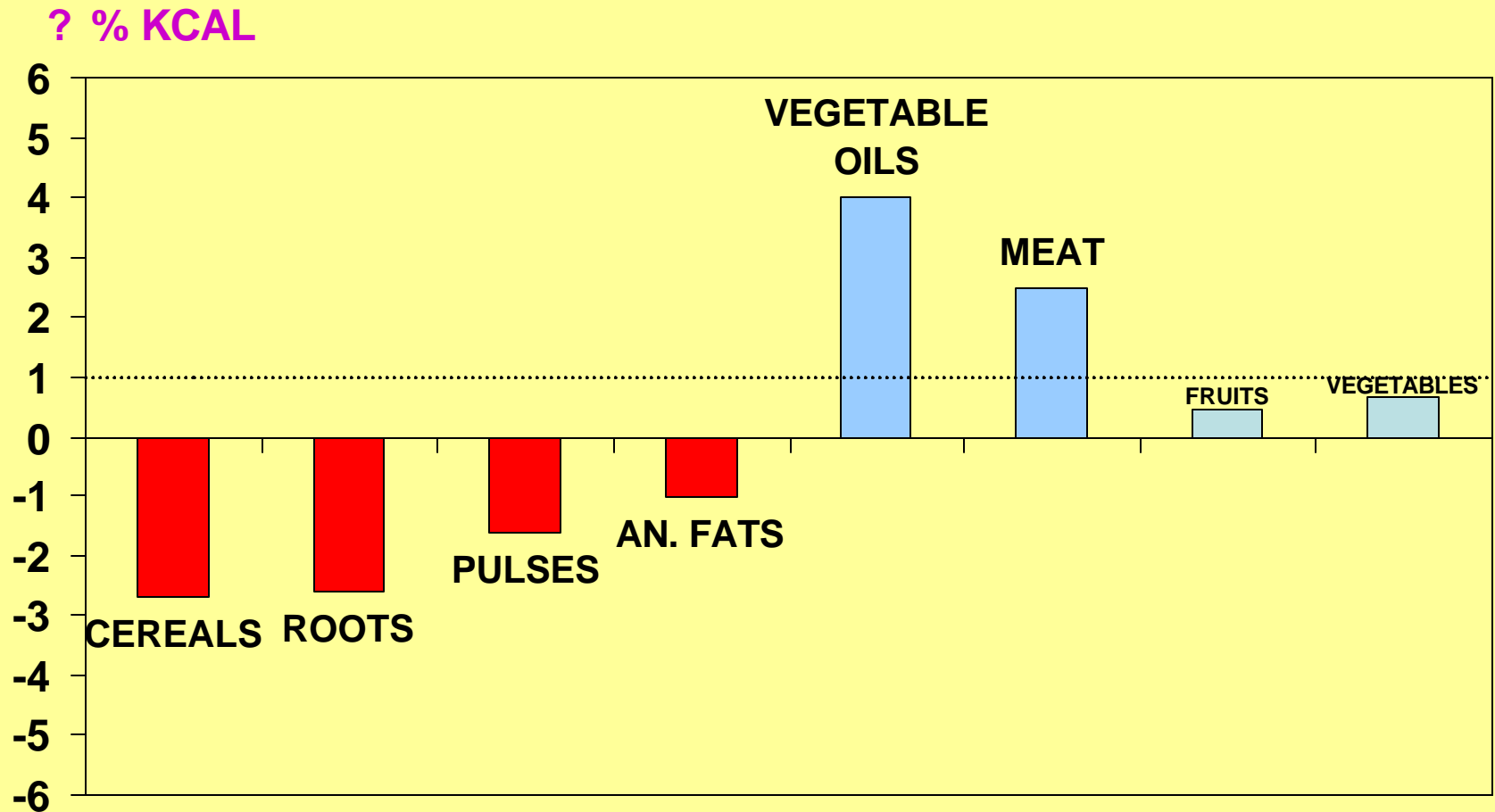
*Food groups with at least 1%
change in the share of total kcal
from 1961 to 2001*

Changes in the share of the main food groups from 1961 to 2001



Source: Food Balance Sheets from FAOSTAT

Changes in the share of the main food groups from 1961 to 2001



Source: Food Balance Sheets from FAOSTAT

Developed

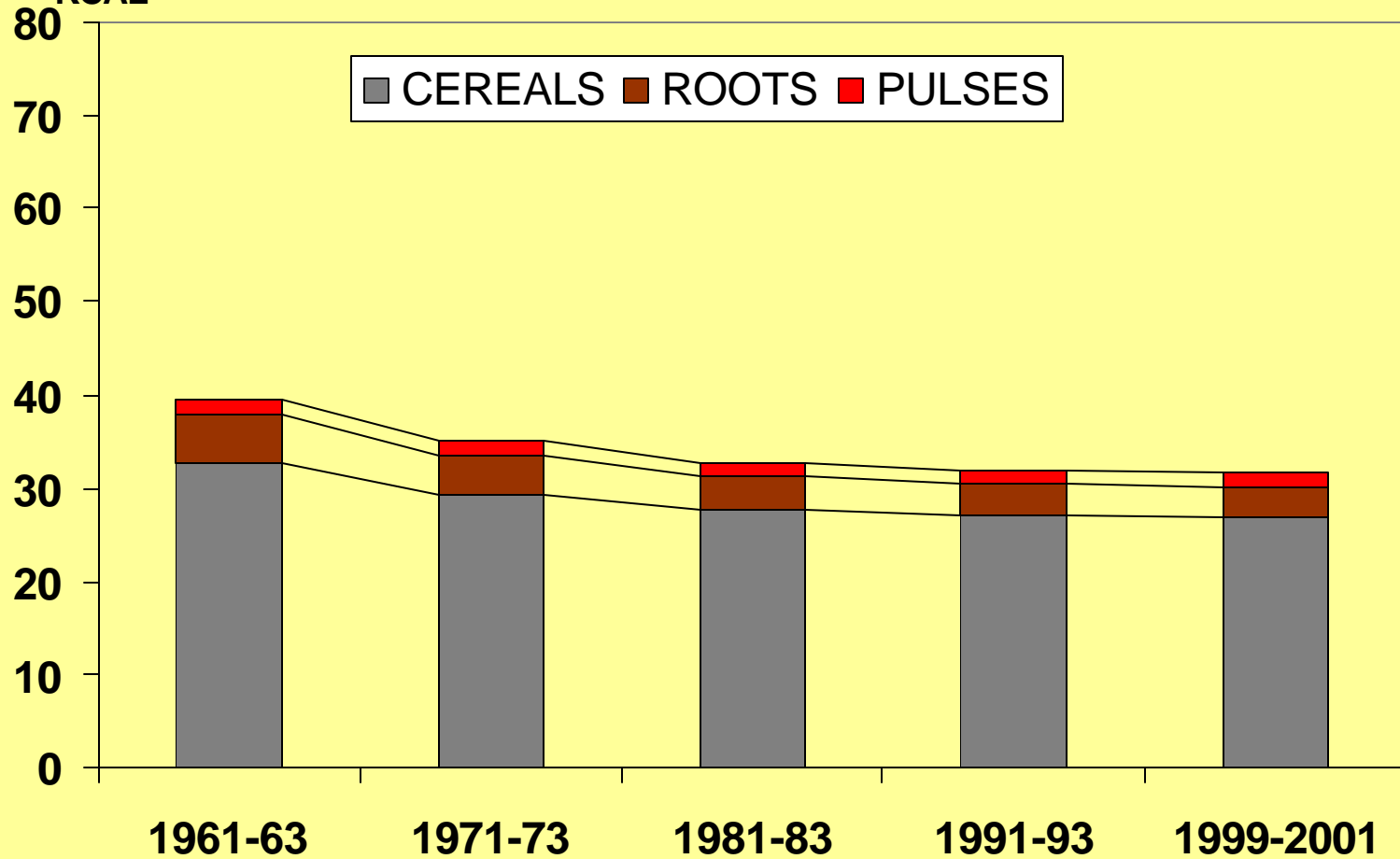
X

Developing Countries

STAPLE FOODS

DEVELOPED COUNTRIES

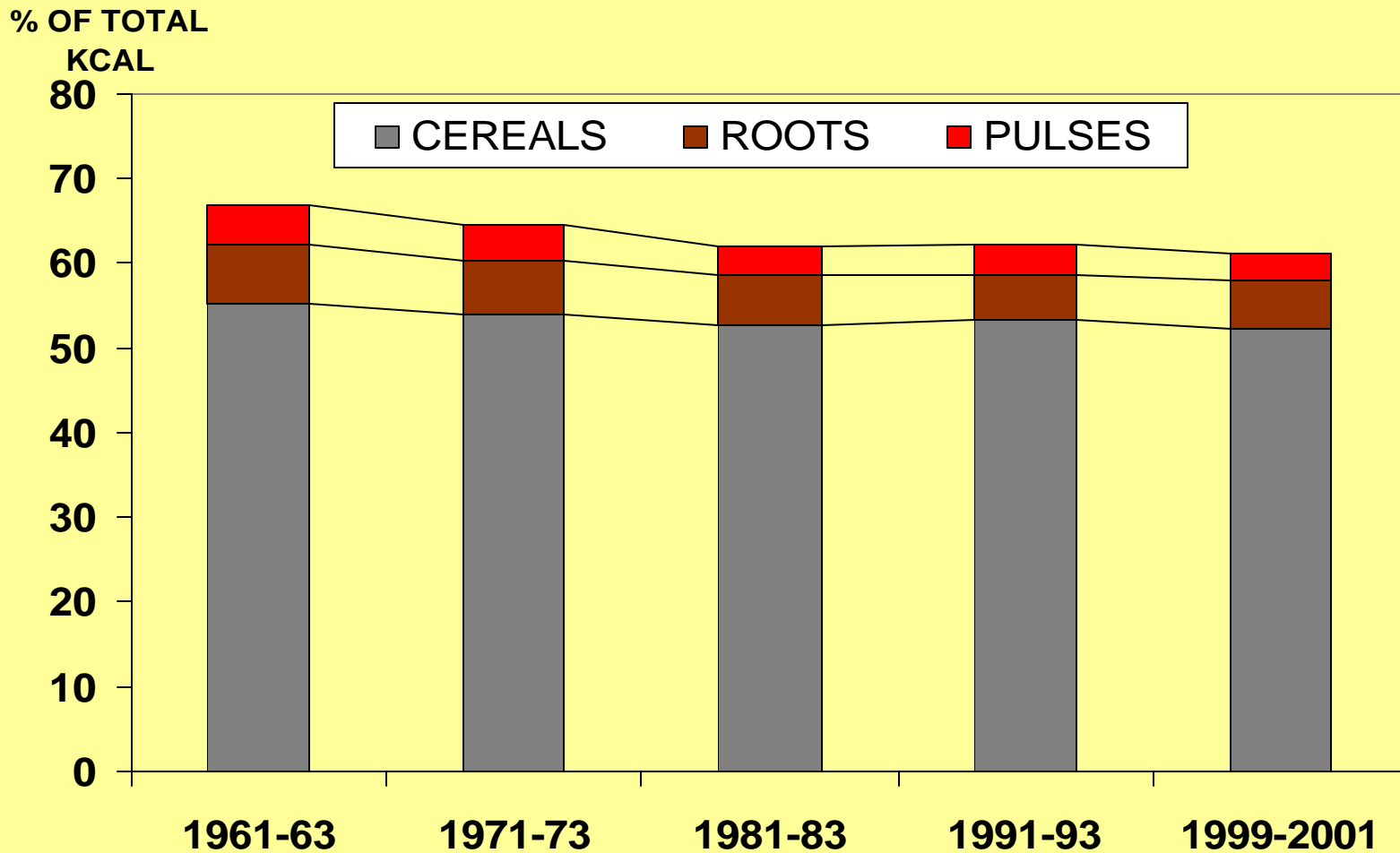
% OF TOTAL
KCAL



Source: Food Balance Sheets from FAOSTAT

STAPLE FOODS

DEVELOPING COUNTRIES

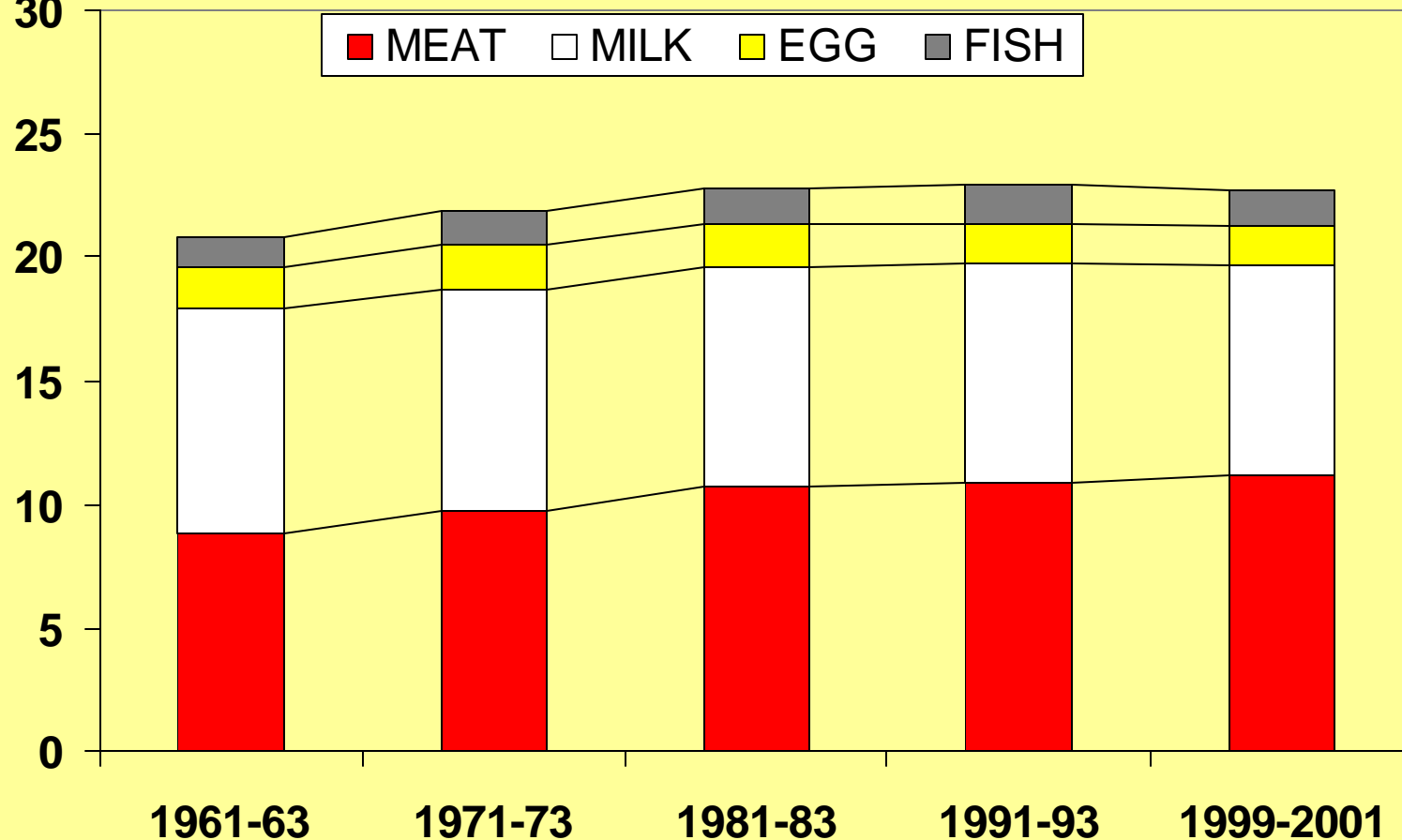


Source: Food Balance Sheets from FAOSTAT

ANIMAL PRODUCTS

DEVELOPED COUNTRIES

% OF TOTAL
KCAL

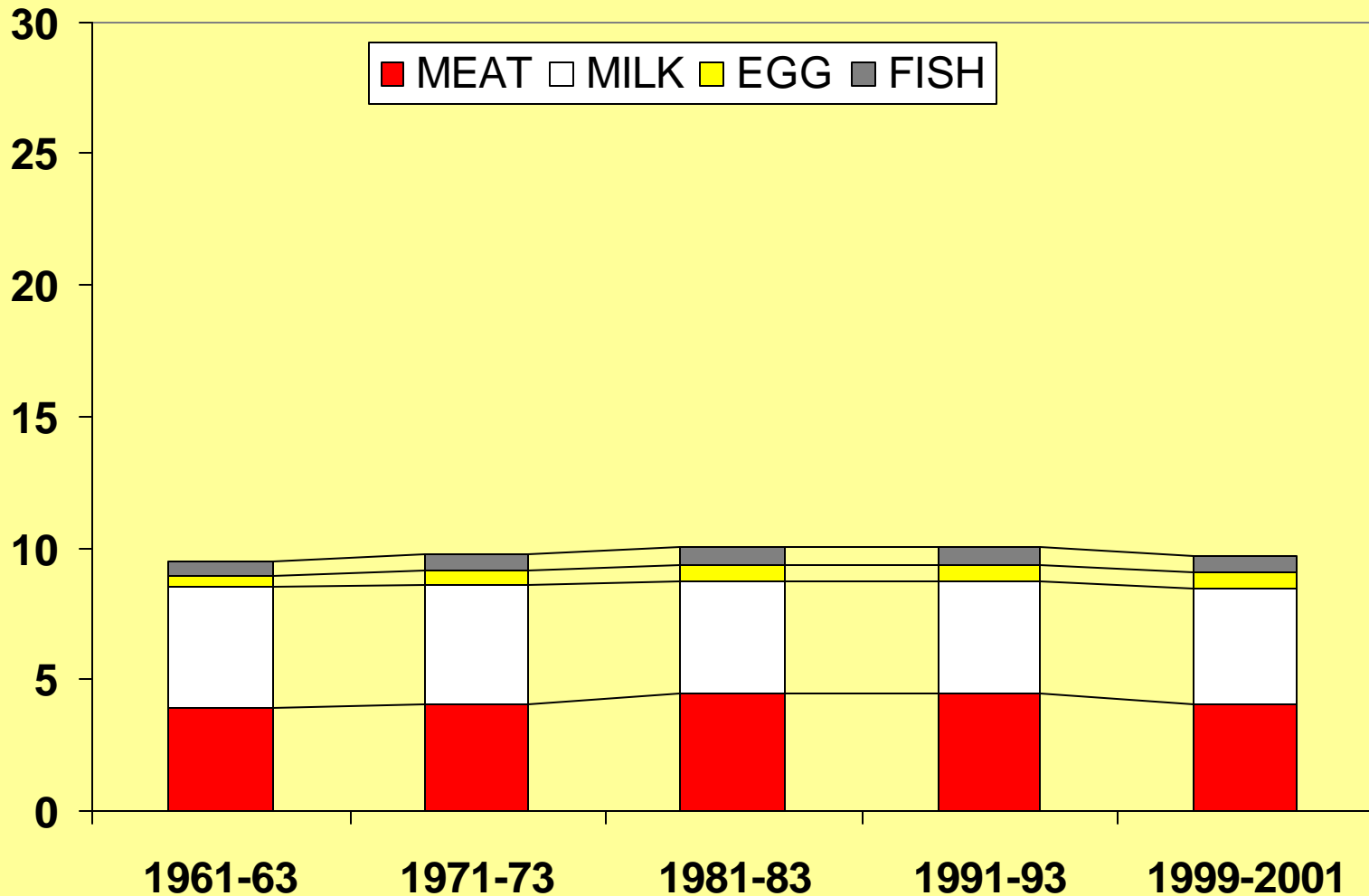


Source: Food Balance Sheets from FAOSTAT

ANIMAL PRODUCTS

DEVELOPING COUNTRIES

% OF TOTAL
KCAL

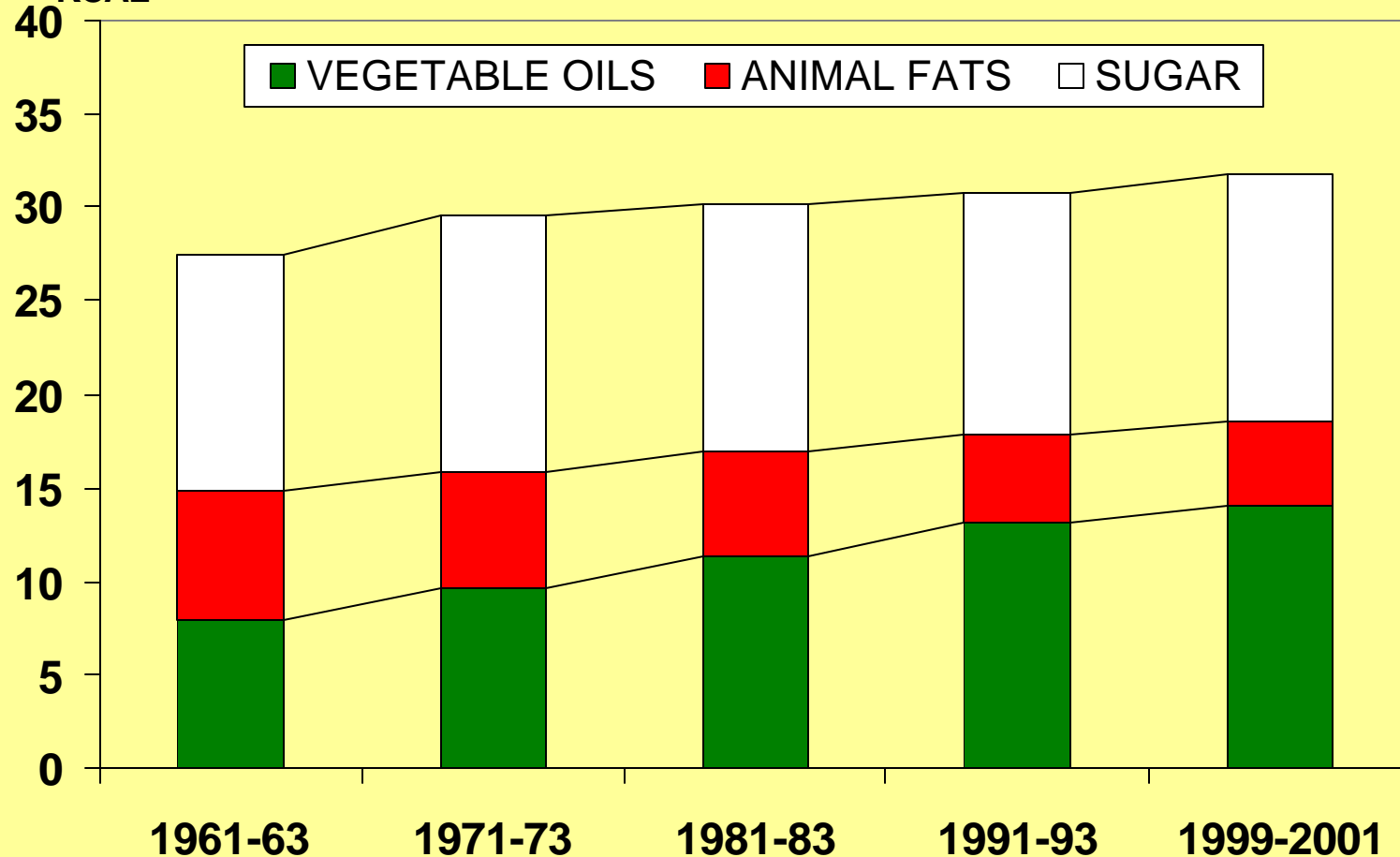


Source: Food Balance Sheets from FAOSTAT

FATS AND SUGAR

DEVELOPED COUNTRIES

% OF TOTAL
KCAL

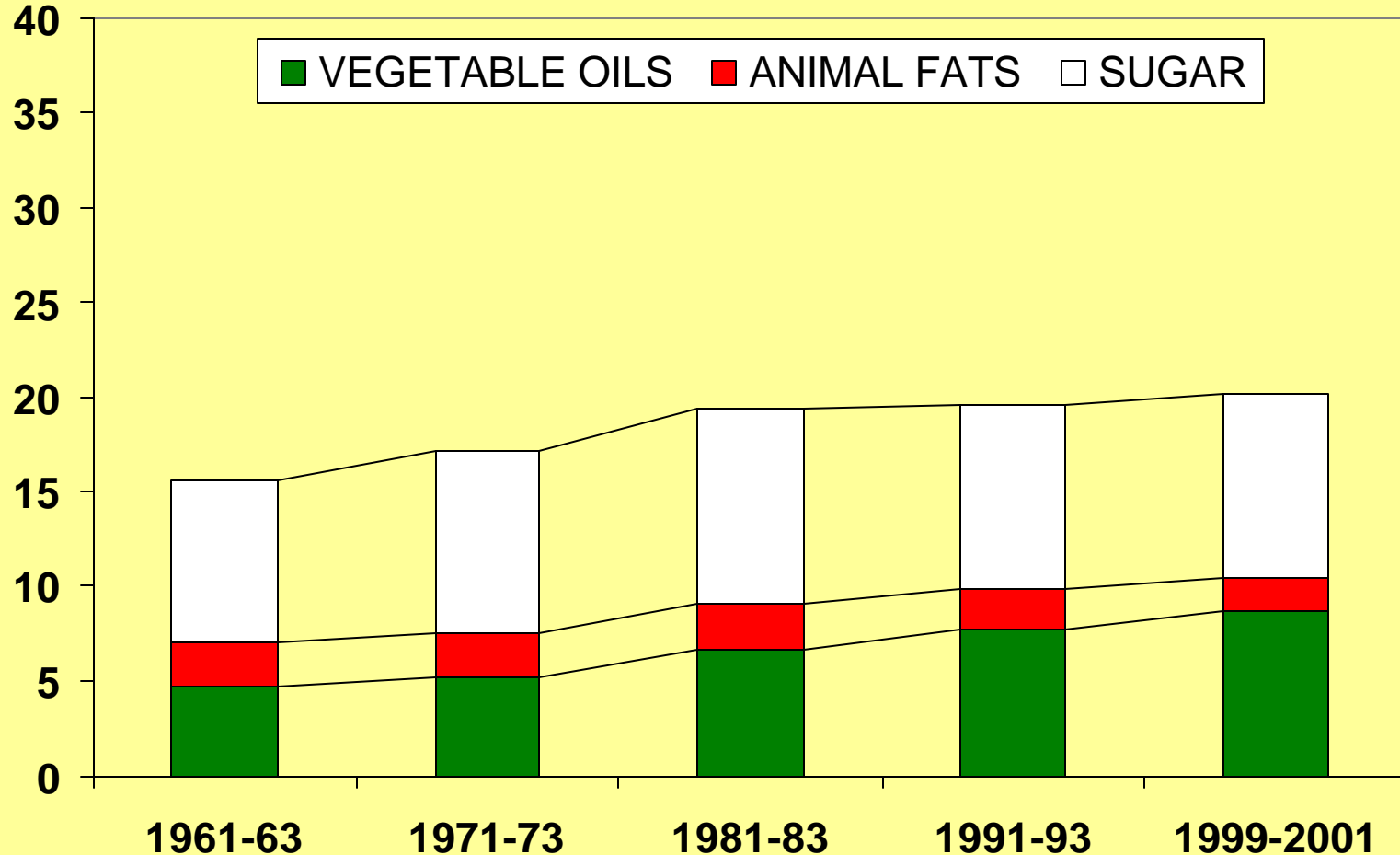


Source: Food Balance Sheets from FAOSTAT

FATS AND SUGAR

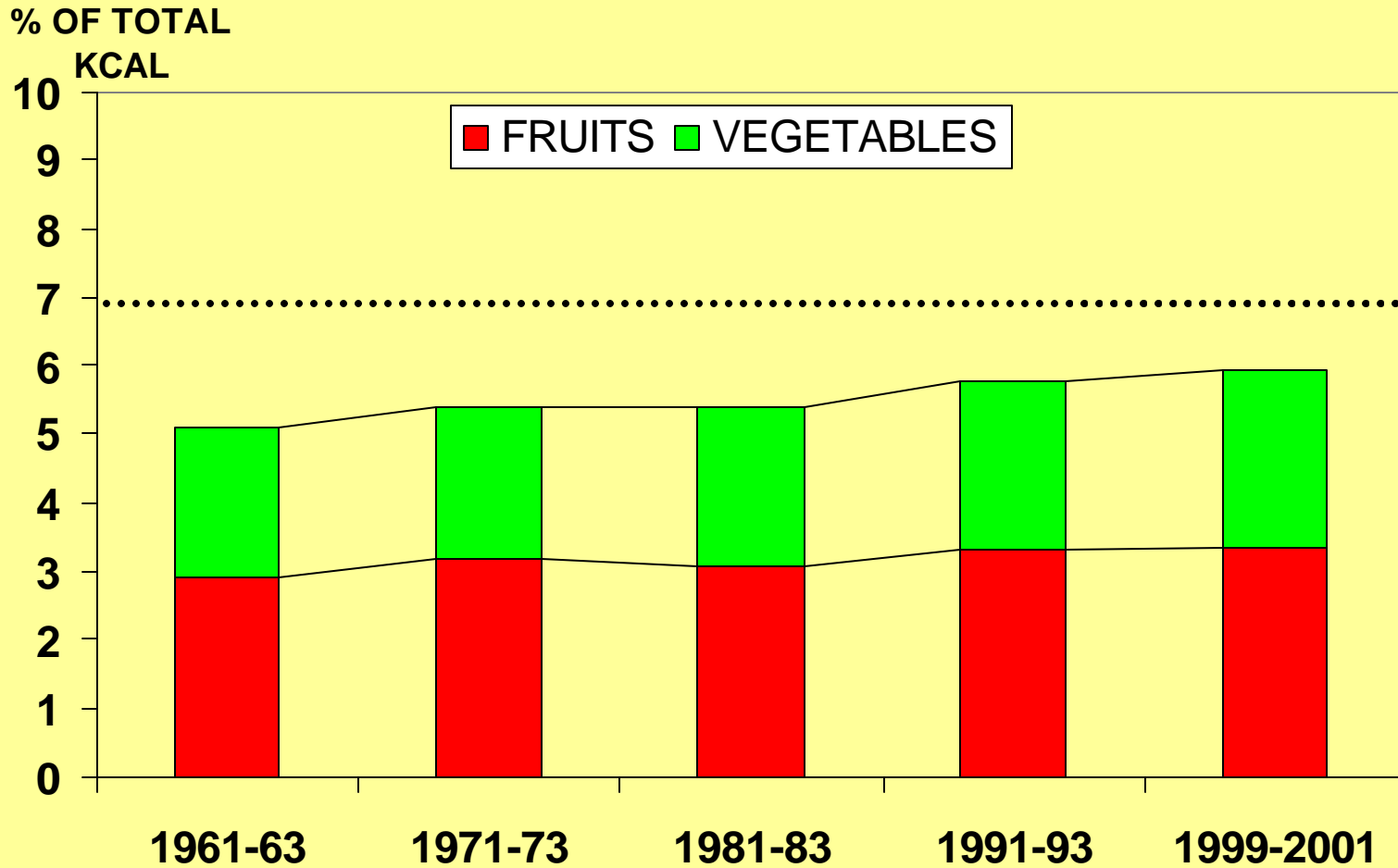
DEVELOPING COUNTRIES

% OF TOTAL
KCAL



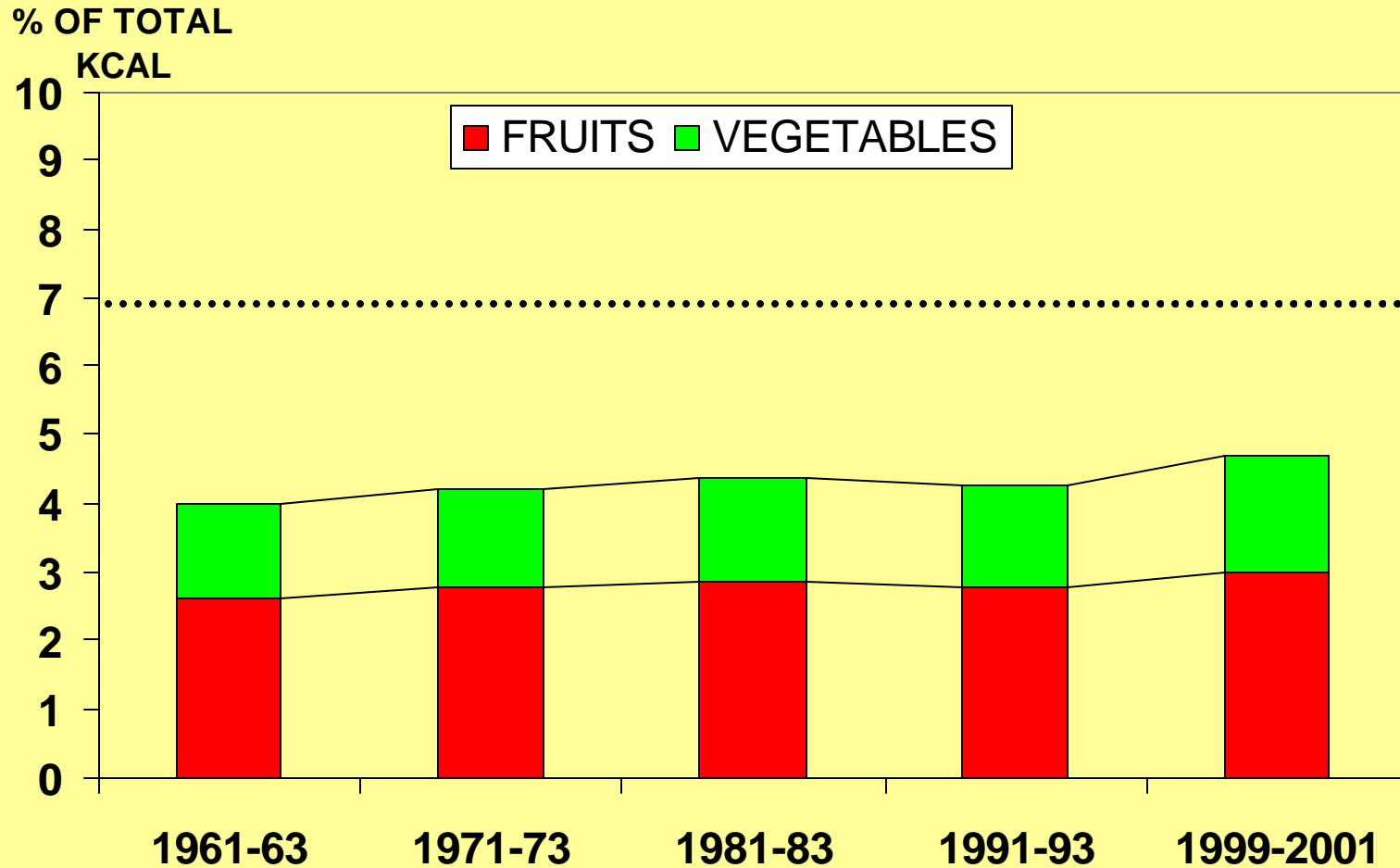
Source: Food Balance Sheets from FAOSTAT

FRUITS AND VEGETABLES DEVELOPED COUNTRIES



Source: Food Balance Sheets from FAOSTAT

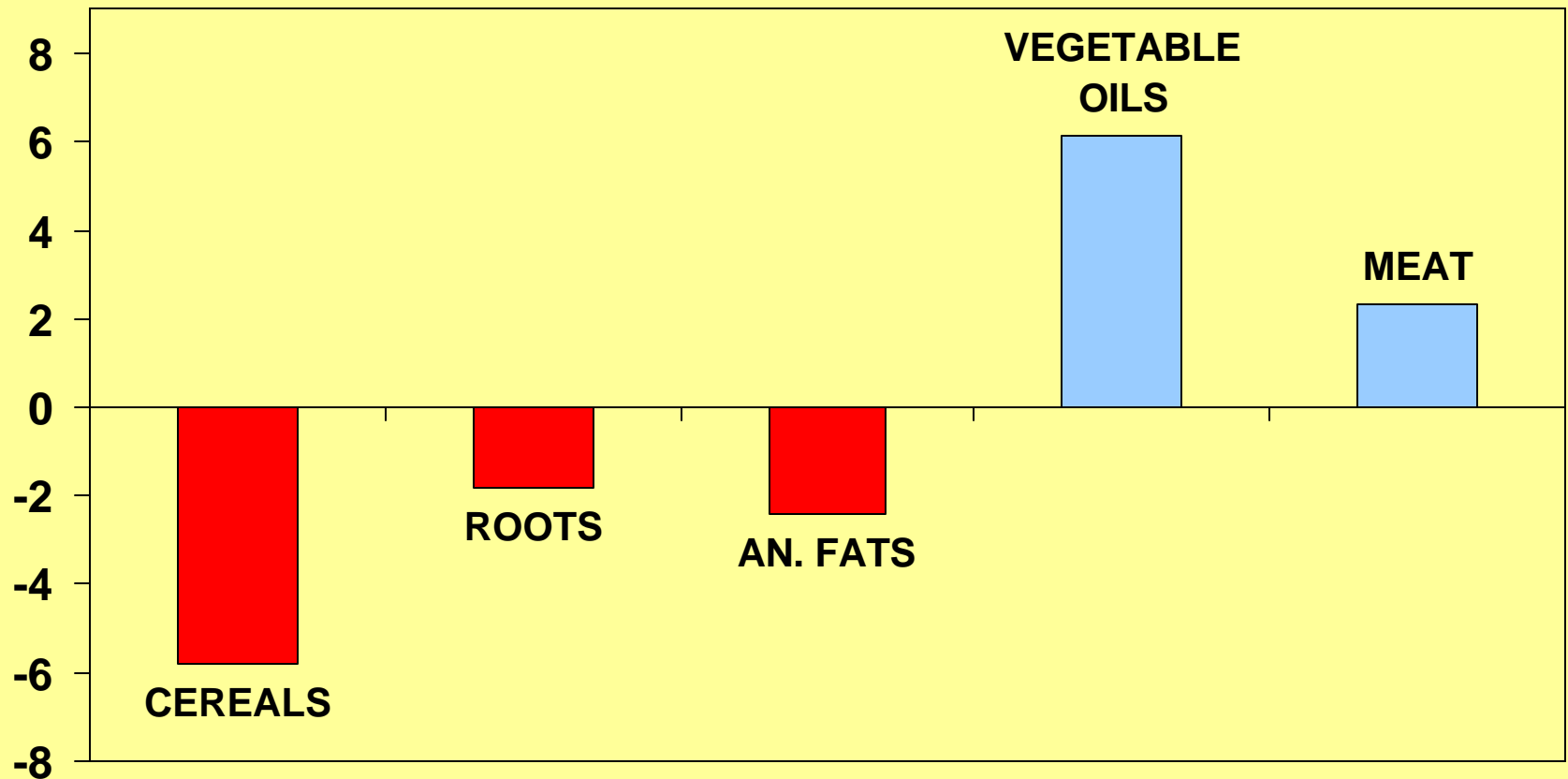
FRUITS AND VEGETABLES DEVELOPING COUNTRIES



Source: Food Balance Sheets from FAOSTAT

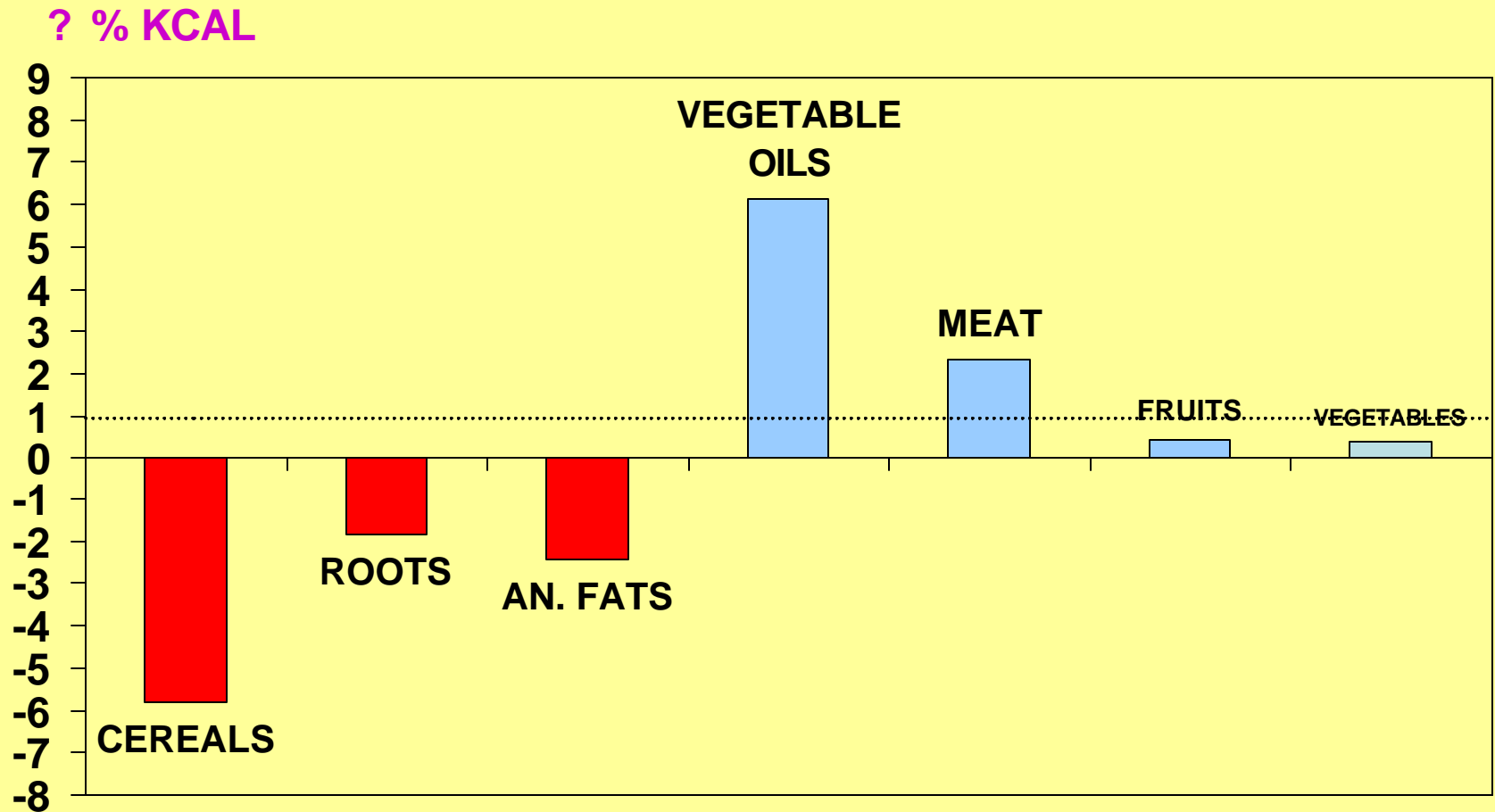
CHANGES FROM 1961 TO 2001 DEVELOPED COUNTRIES

? % KCAL



Source: Food Balance Sheets from FAOSTAT

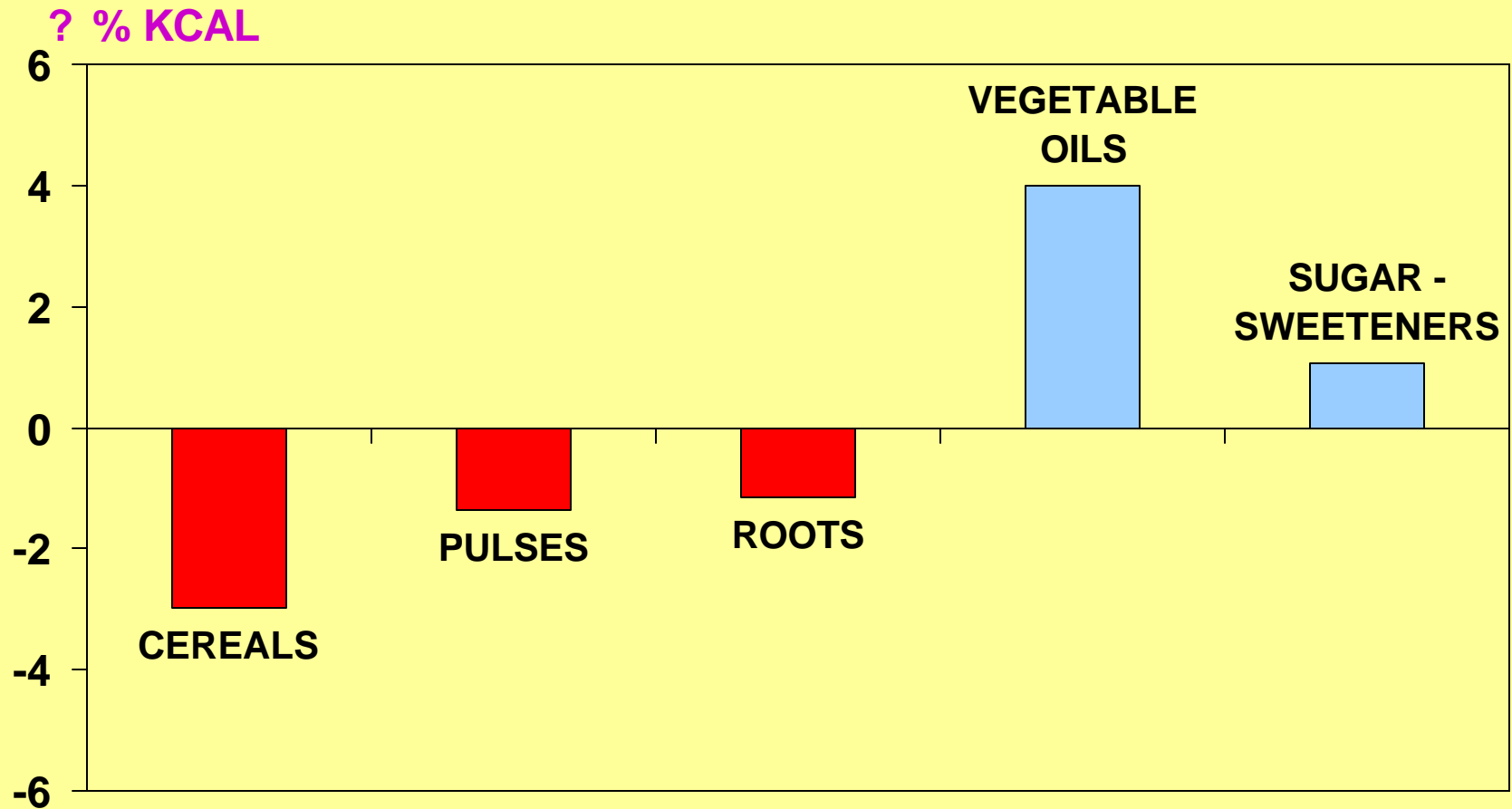
CHANGES FROM 1961 TO 2001 DEVELOPED COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

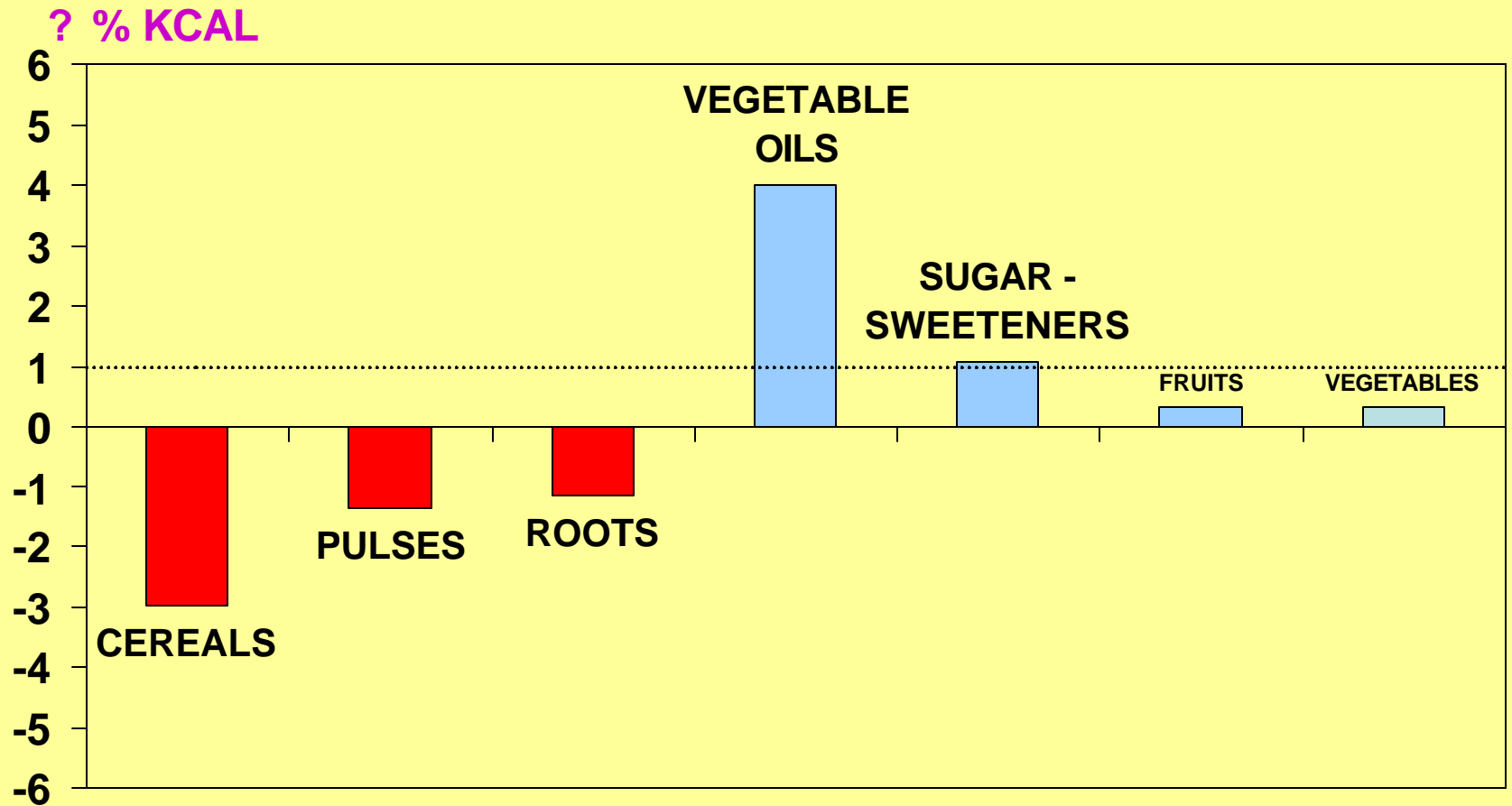
DEVELOPING COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

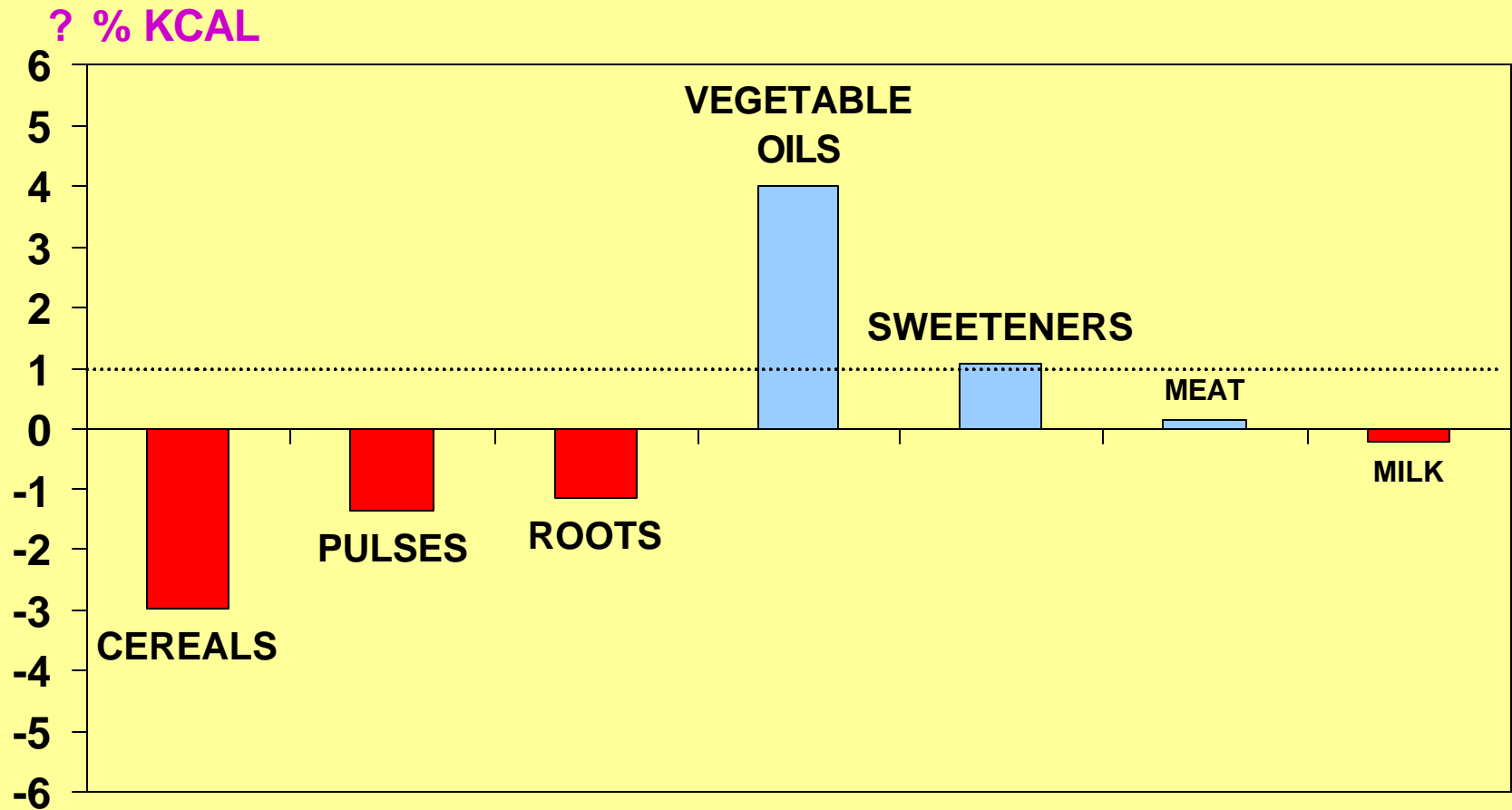
DEVELOPING COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

DEVELOPING COUNTRIES



Source: Food Balance Sheets from FAOSTAT

Developing Countries

Low income

(GNP \leq US\$ 765 per capita)

X

Lower-middle income

(GNP US\$ 766-3035 per capita)

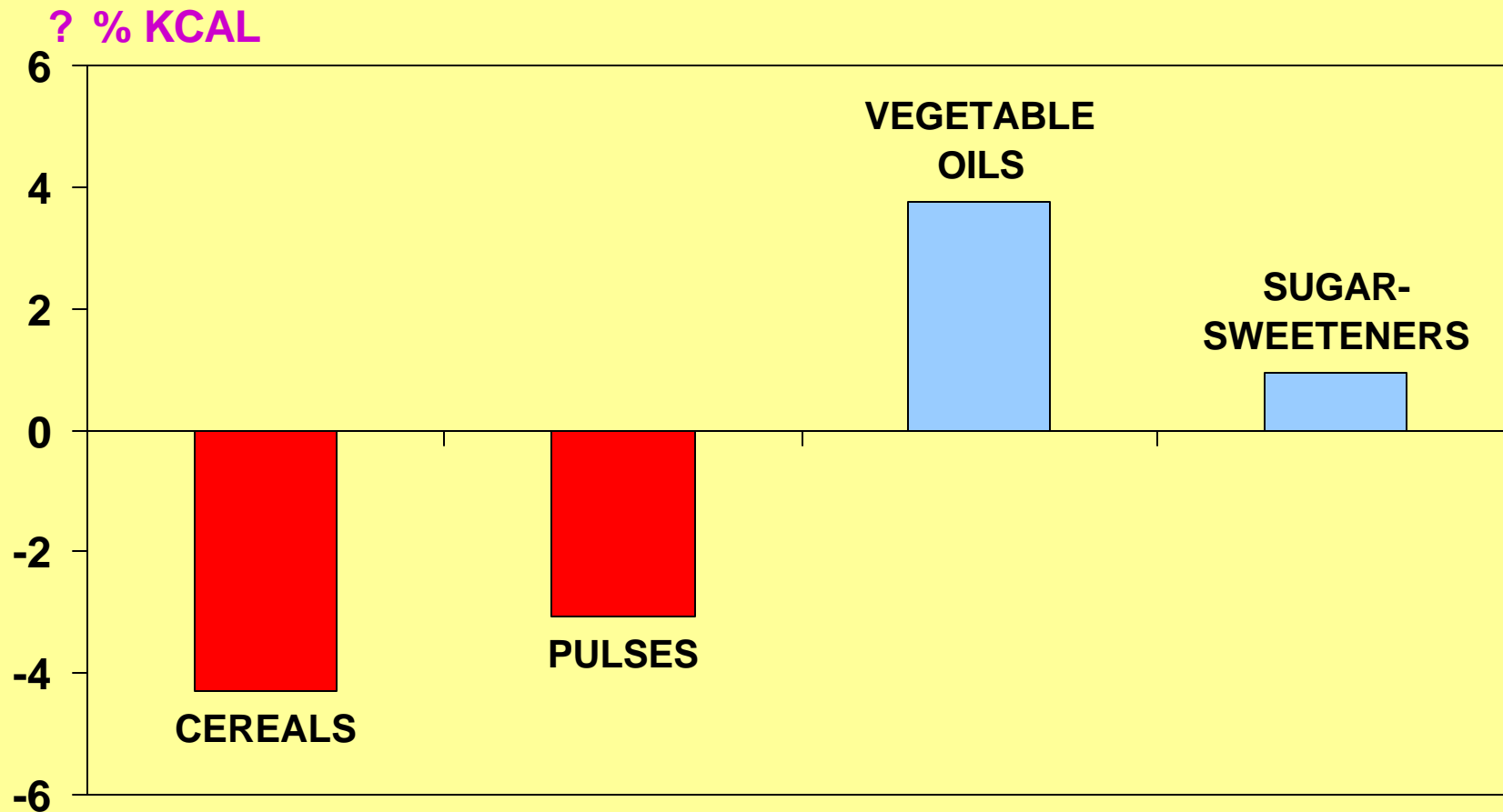
X

Upper-middle income

(GNP US\$ 3036- 9385)

CHANGES FROM 1961 TO 2001

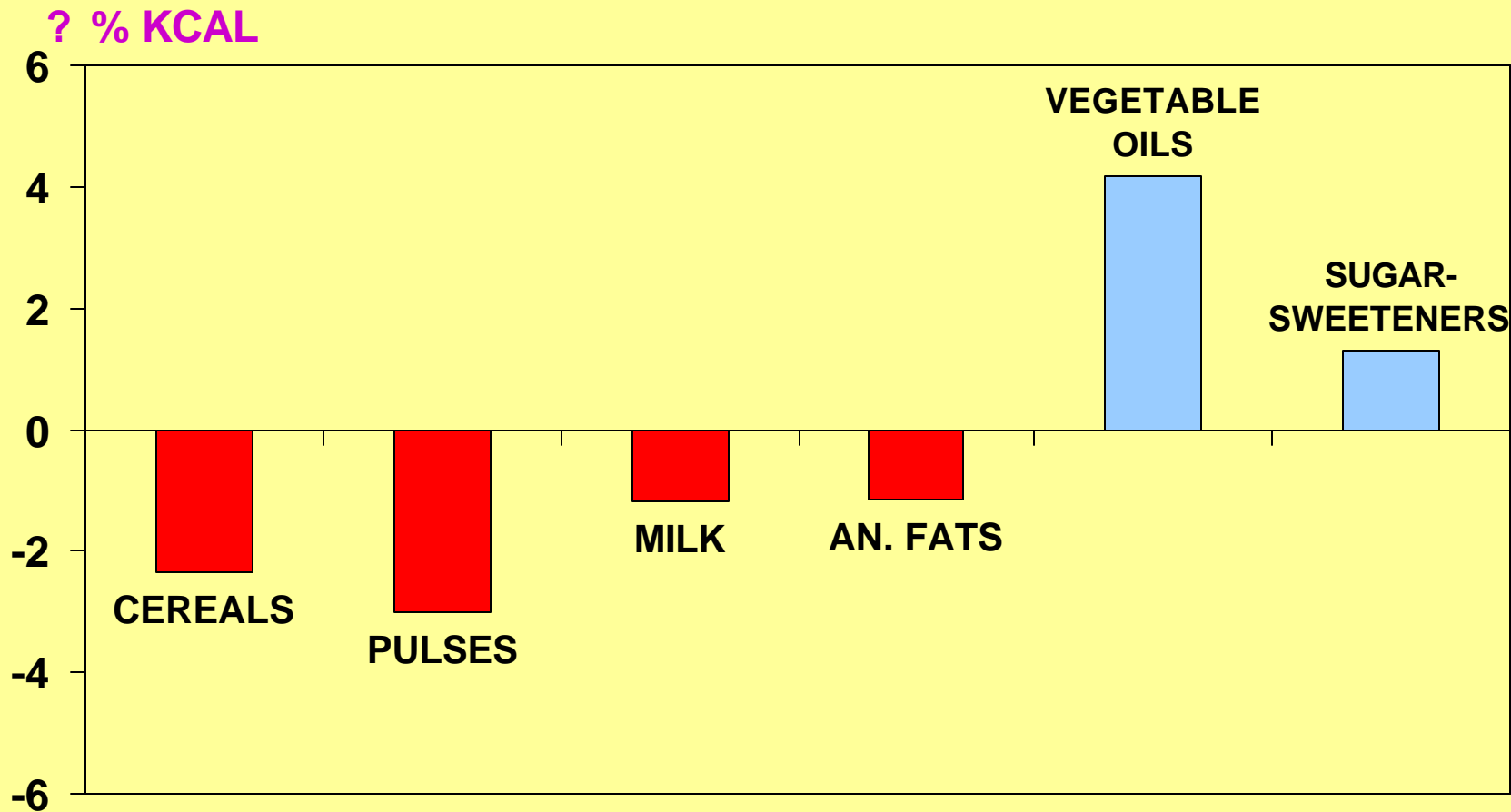
LOW INCOME COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

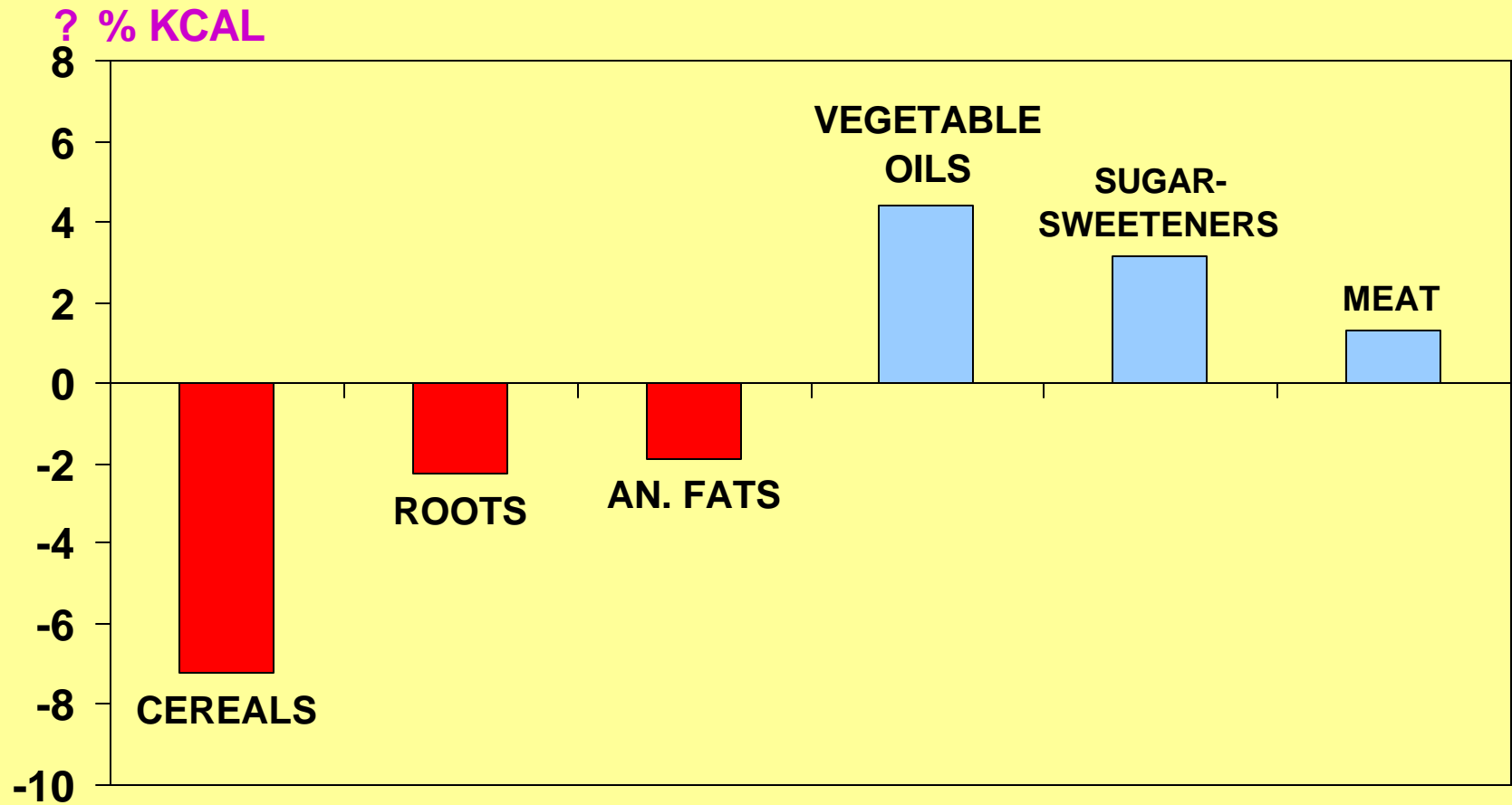
LOWER-MIDDLE INCOME COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

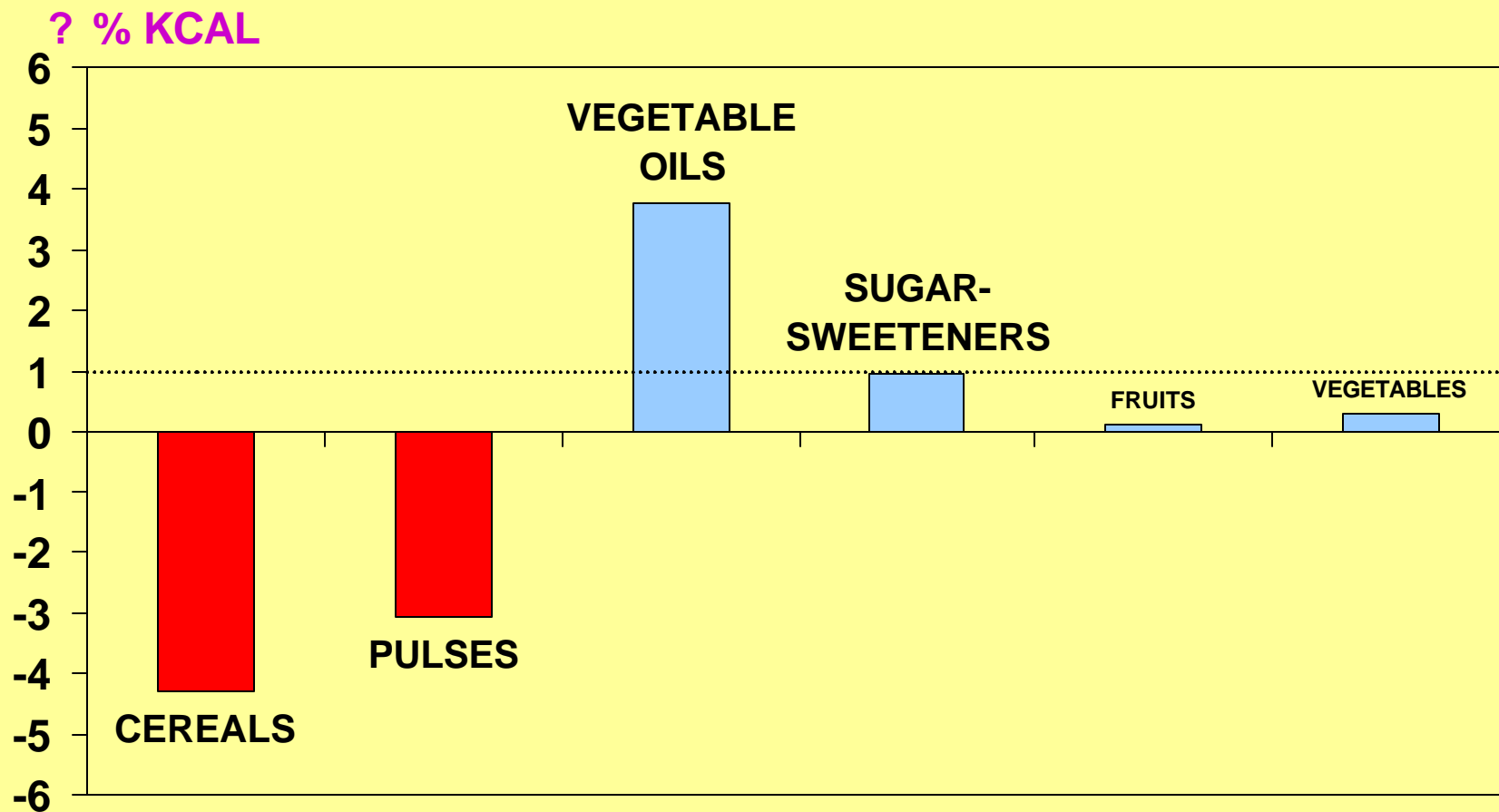
UPPER-MIDDLE INCOME COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

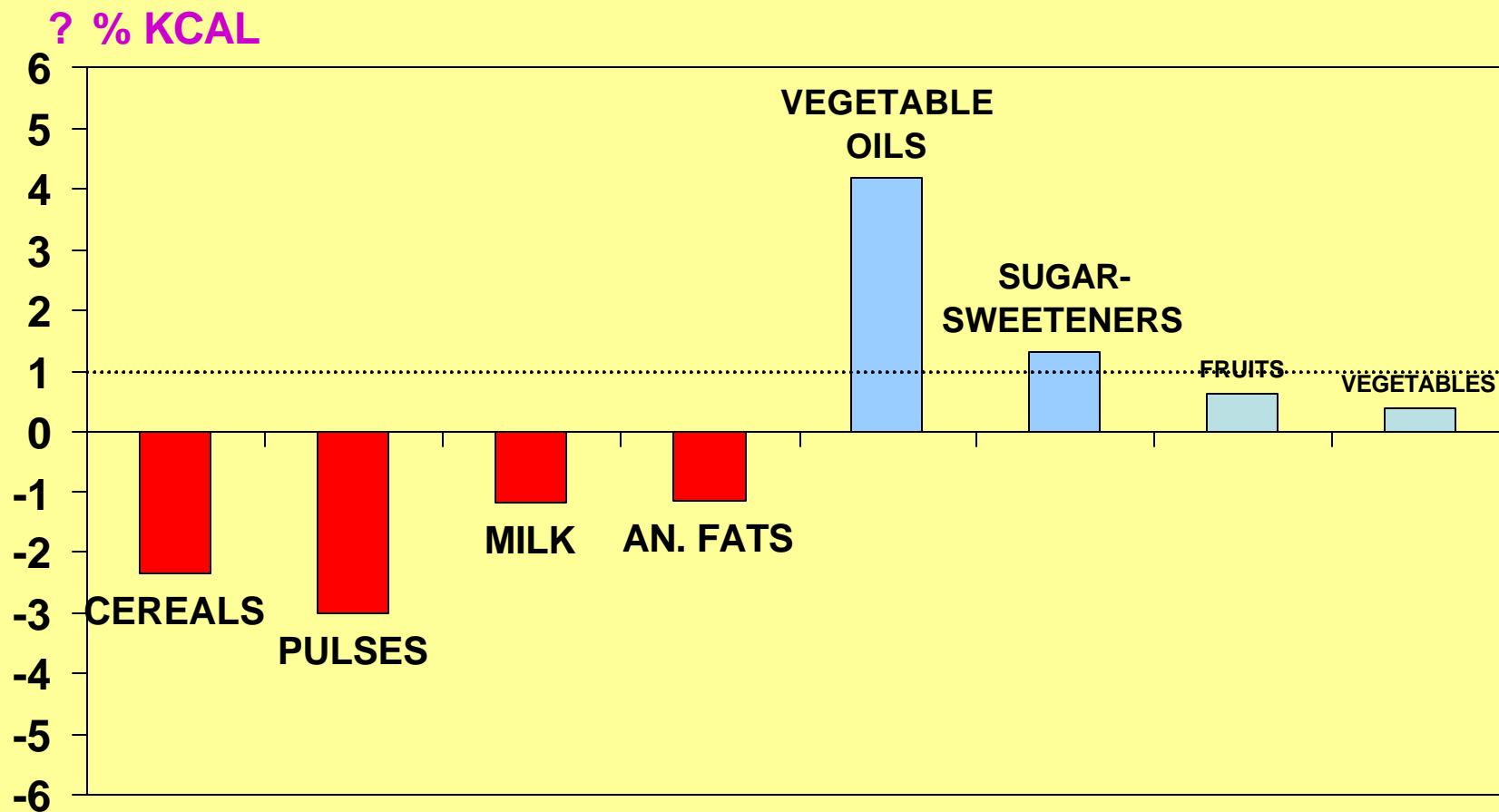
LOW INCOME COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

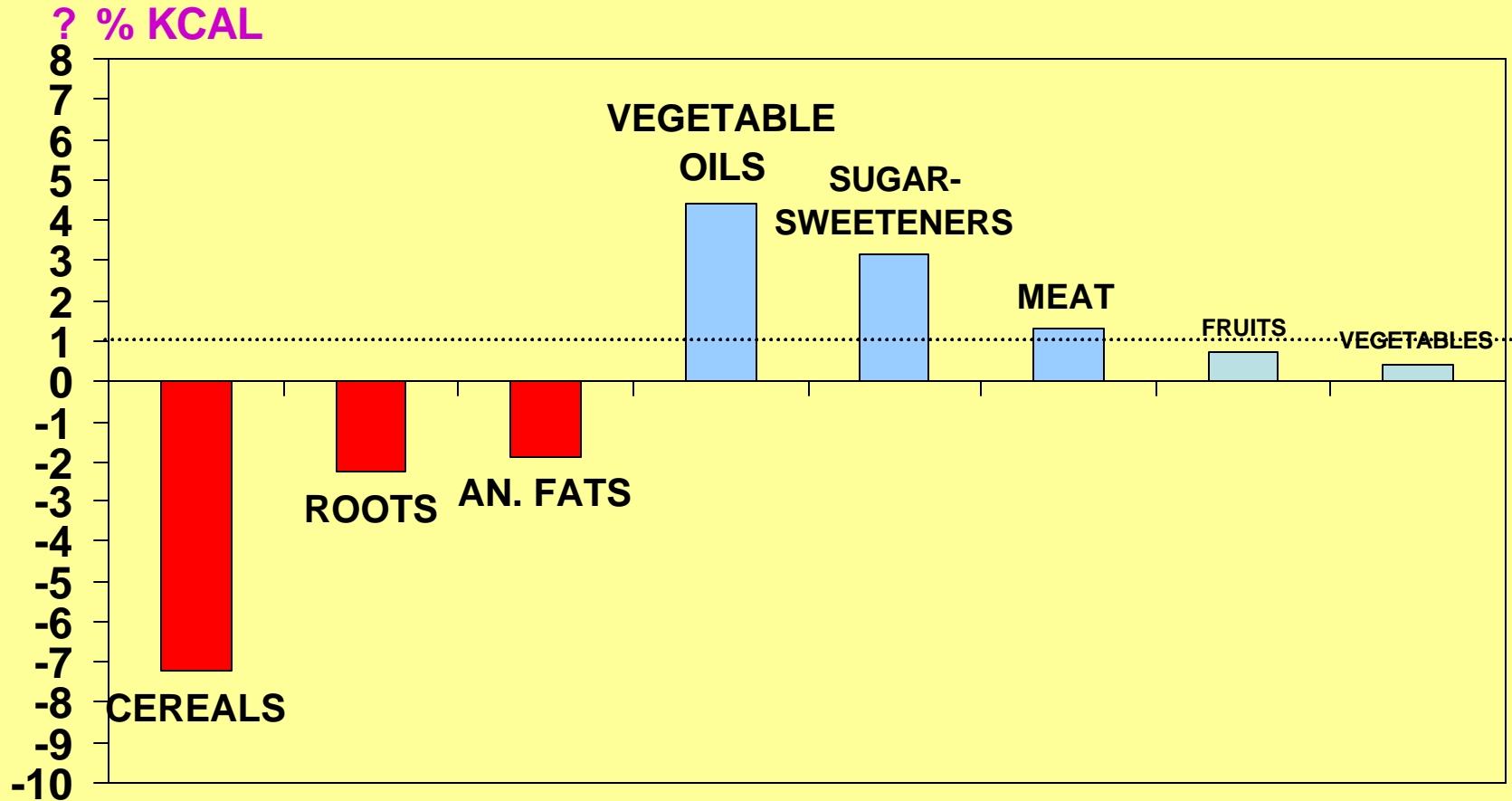
LOWER-MIDDLE INCOME COUNTRIES



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

UPPER-MIDDLE INCOME COUNTRIES

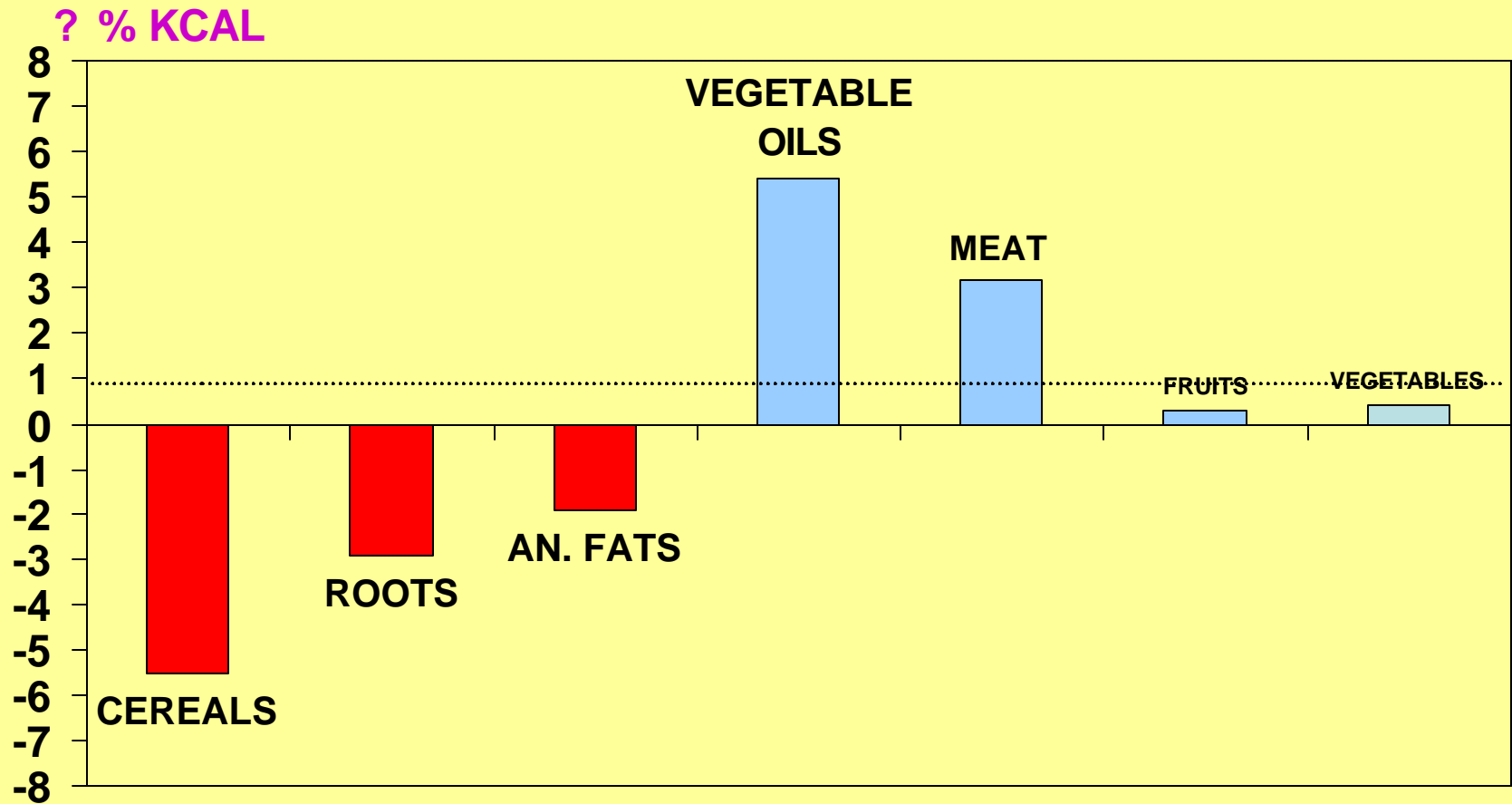


Source: Food Balance Sheets from FAOSTAT

***Changes in selected countries
and regions***

CHANGES FROM 1961 TO 2001

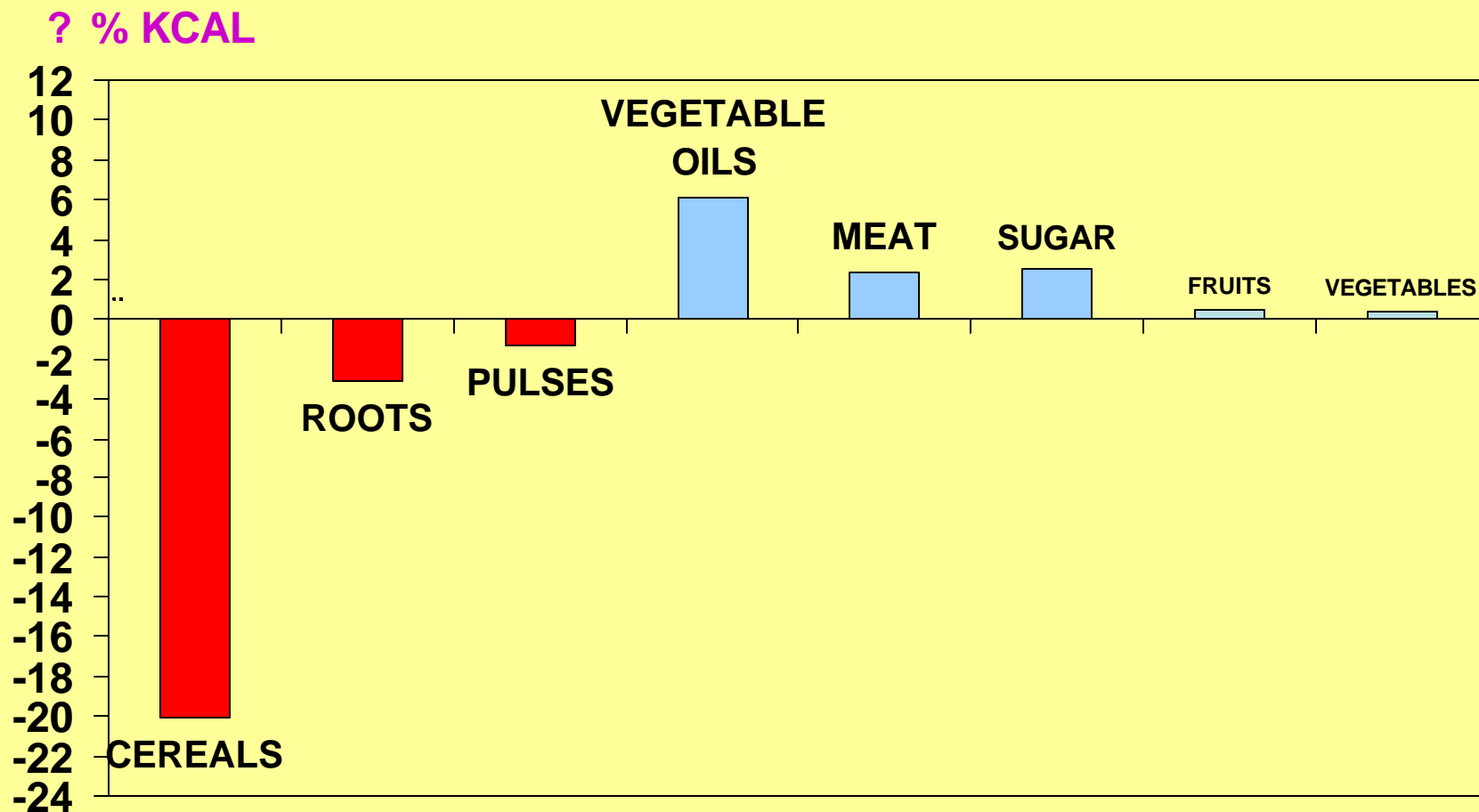
EUROPE



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

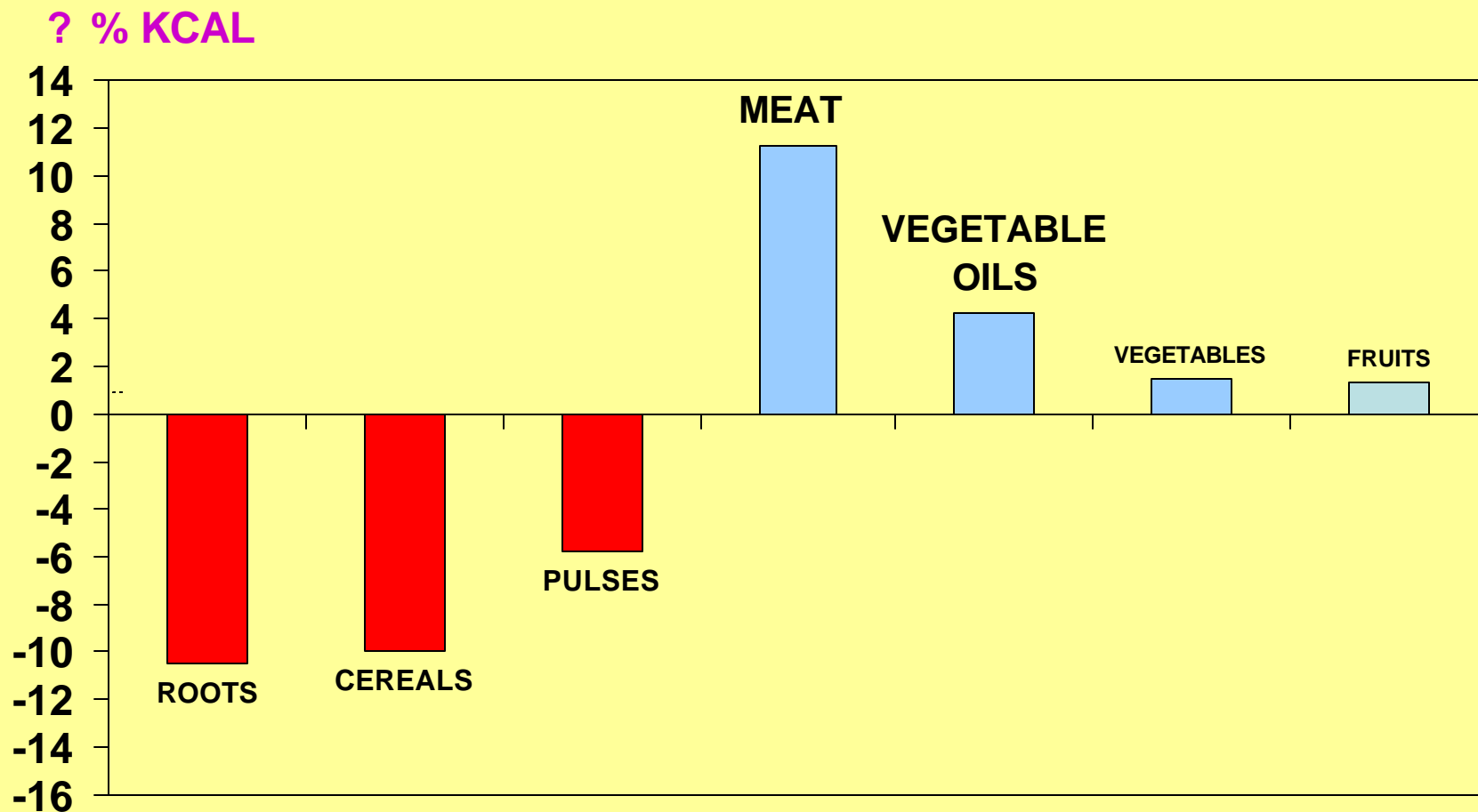
JAPAN



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

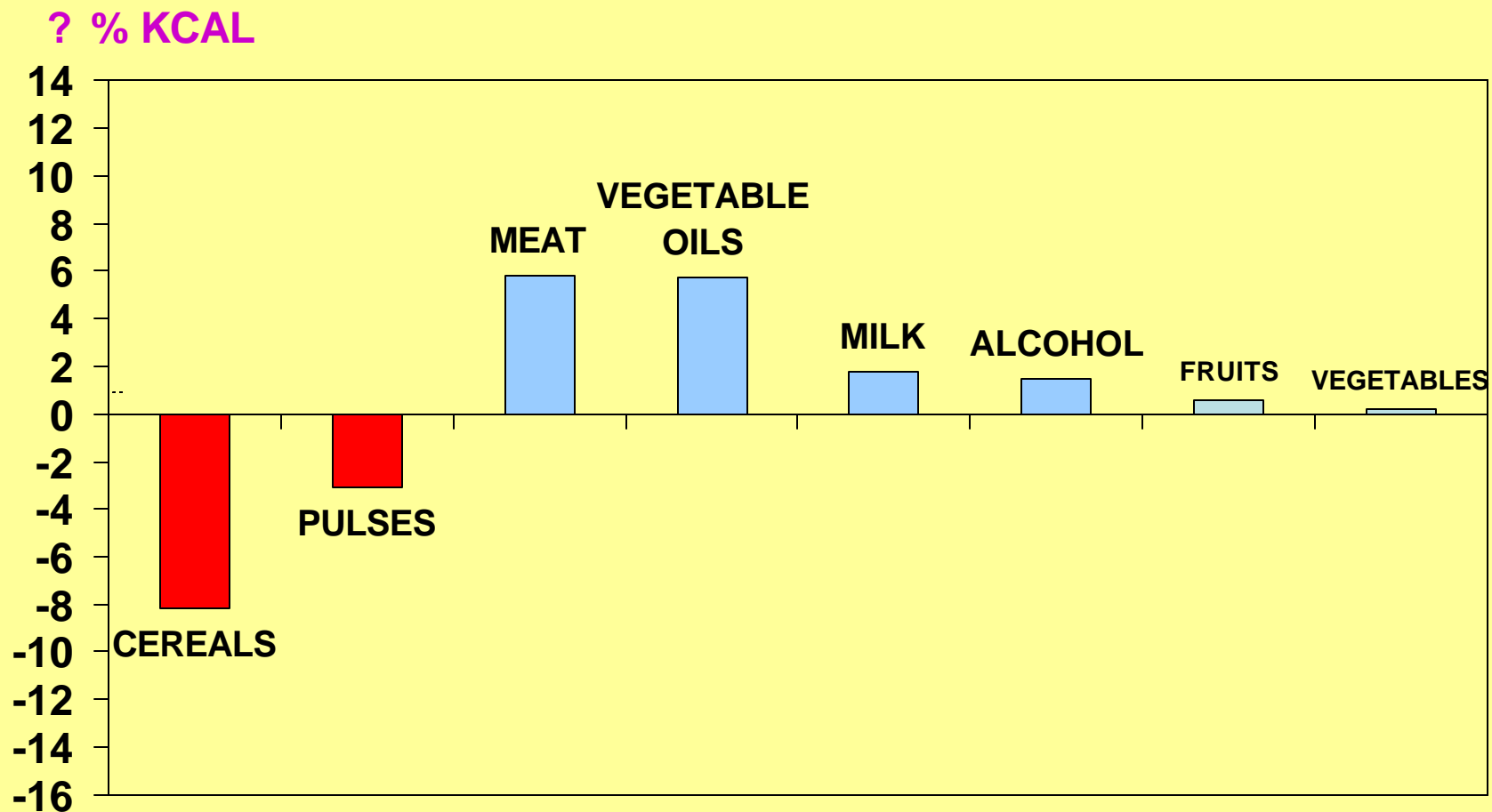
CHINA



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

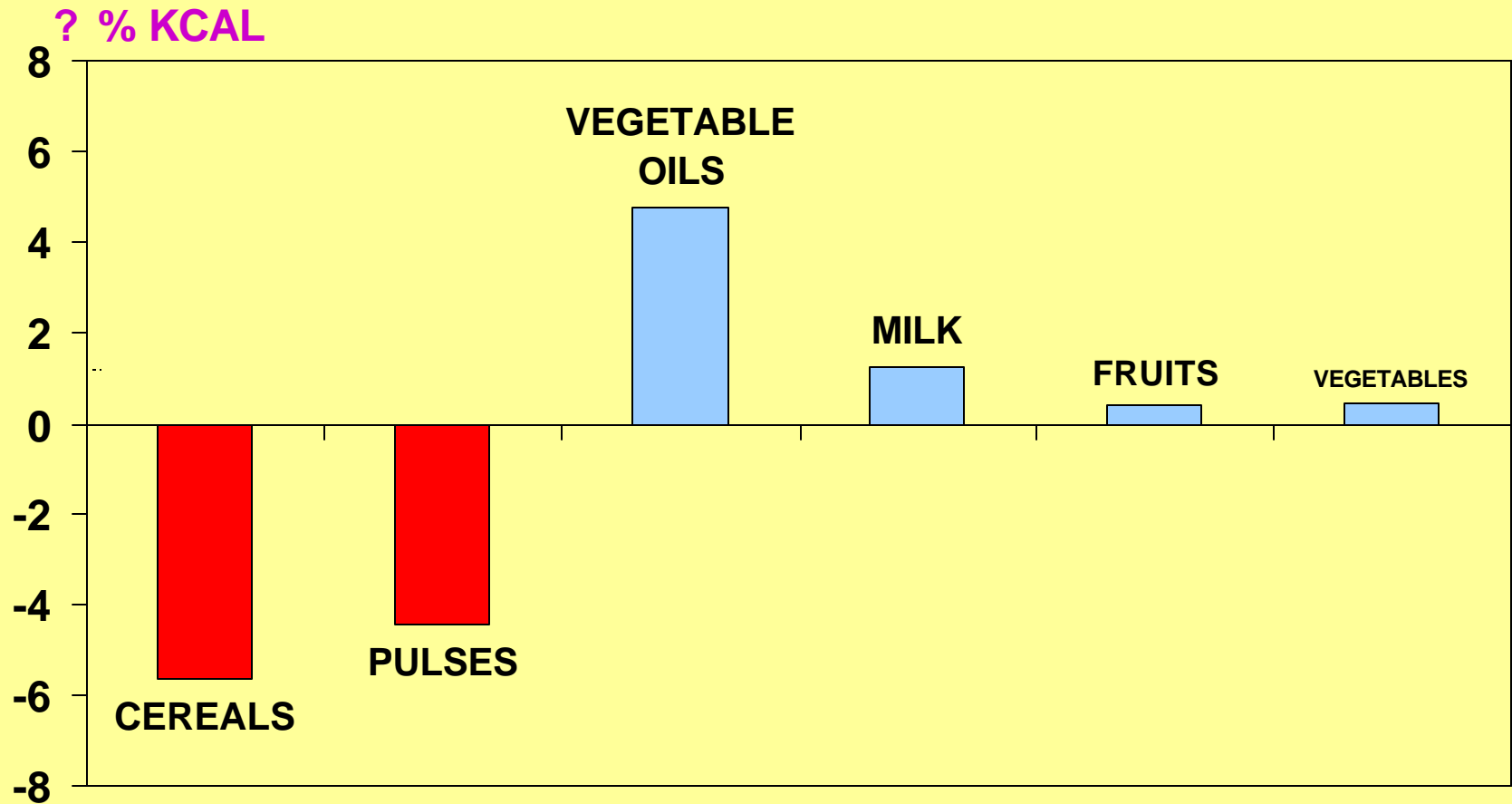
BRAZIL



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

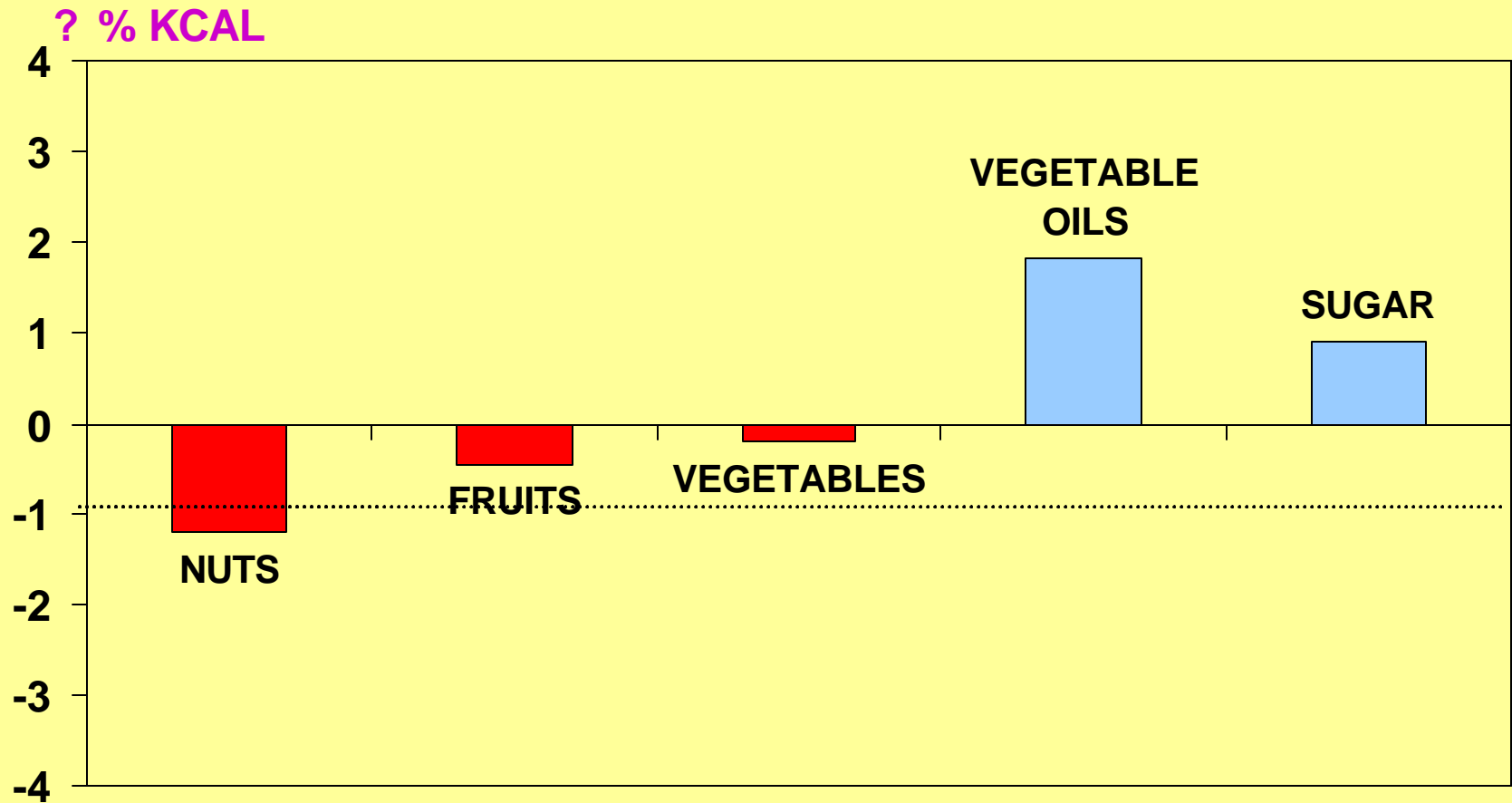
SOUTH ASIA



Source: Food Balance Sheets from FAOSTAT

CHANGES FROM 1961 TO 2001

SUB-SAHARA AFRICA



Source: Food Balance Sheets from FAOSTAT

Conclusions

- In the last 4 decades the relative availability of staple foods (cereals, pulses, and starchy roots) decreased almost everywhere.
- Staple foods were essentially replaced:
 - by **vegetable oils and sugar** in low and lower-middle income countries;
 - by **vegetable oils, sugar, and meat** in upper-middle income countries,
 - by **vegetable oils and meat** in higher income countries
- The relative availability of F&V was only slightly increased in most countries and it is still well below the recommendations in both the developed and the developing countries.

- Impact of food availability changes on nutritional parameters of the diet

Likely impact:

- Increased total **fat content** and decreased total carbohydrate content everywhere
- Increased **energy density** everywhere
- Decreased **fibre content** everywhere
- Decreased protein content in less developed countries

Possible impact (need individual evaluation):

- Increase in **saturated fats**
- Decrease in some **vitamins and minerals**
- Increase in the **glycaemic index**
- Decrease in bioactive compounds (flavonoids, etc)

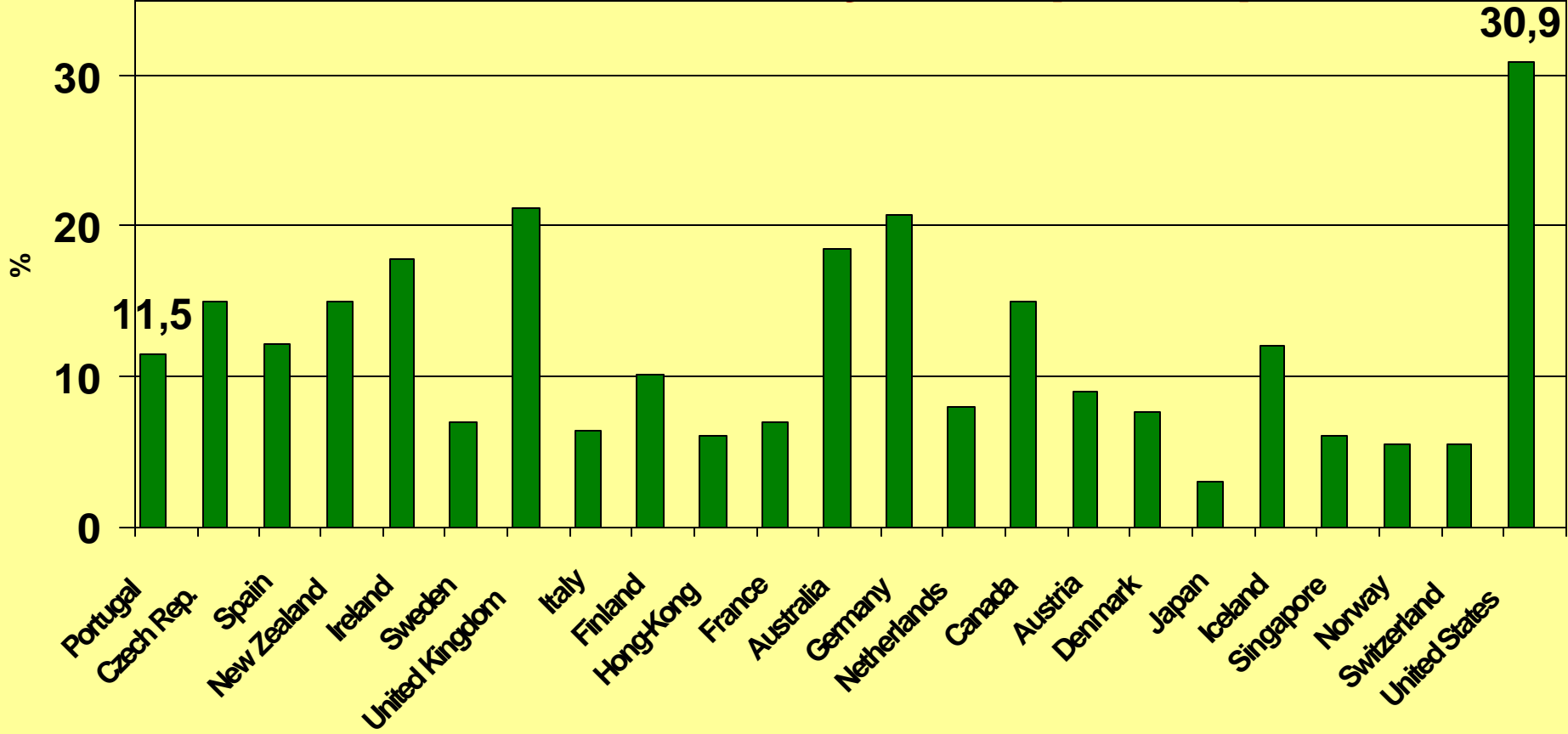
- Food availability changes in the last 4 decades are therefore consistent with the deterioration of human diets particularly in what concerns the incidence of obesity, CVD, diabetes, certain types of cancer and other nutrition-related NCDs.
- A higher replacement of staple foods by F&V, instead meat, fats and sugar, would have avoided most of this deterioration
- A future increase in the availability (and consumption) of F&V, particularly if replacing meat, fats and sugar, has the potential to revert the deterioration seen in the past.

*Obesity, national wealth and
individual SES.*

*GNP and obesity in
high-income countries*

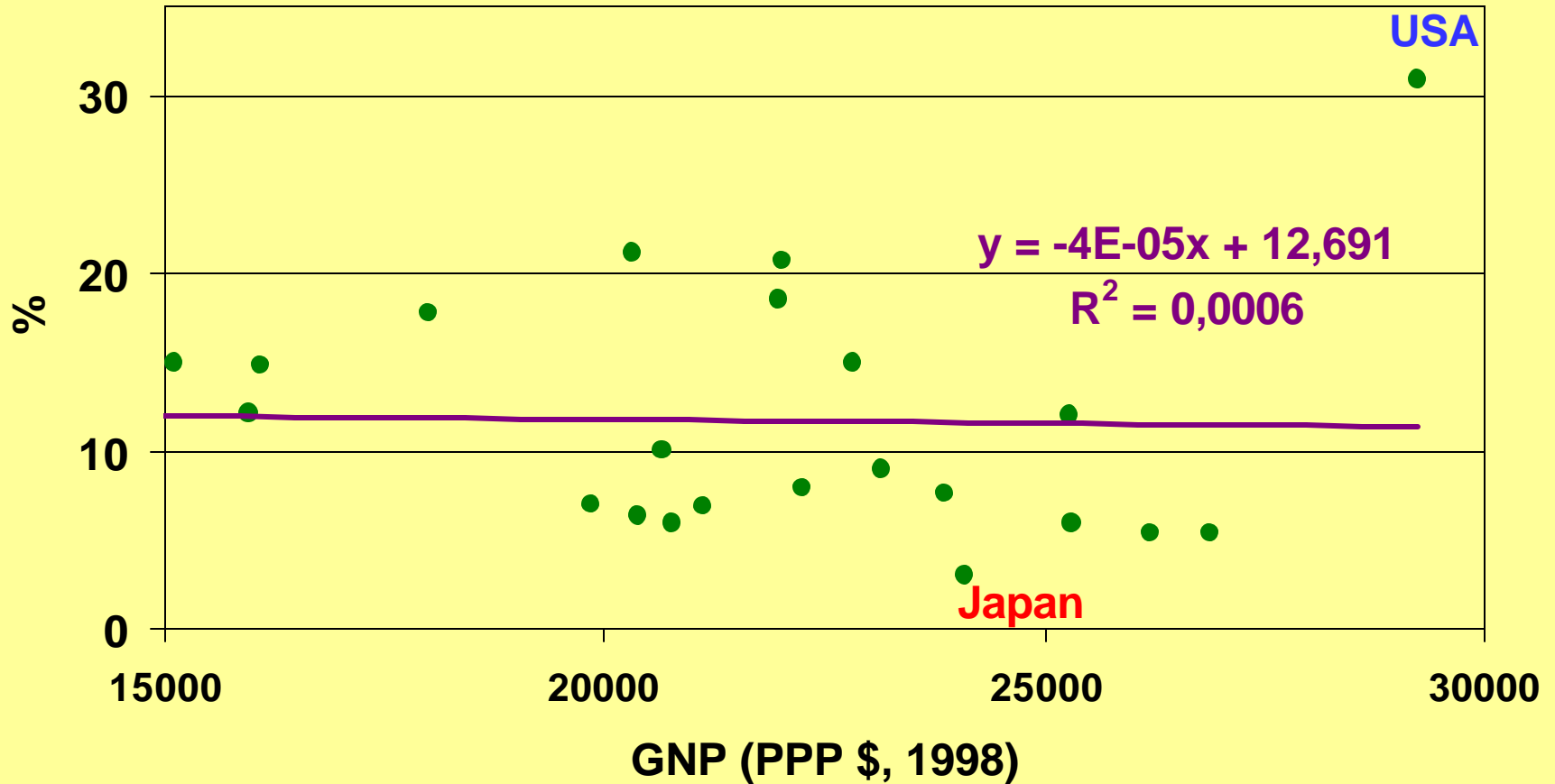
Prevalence of obesity among adults in high-income countries (1991-2000)

Countries ordered by GNP per capita

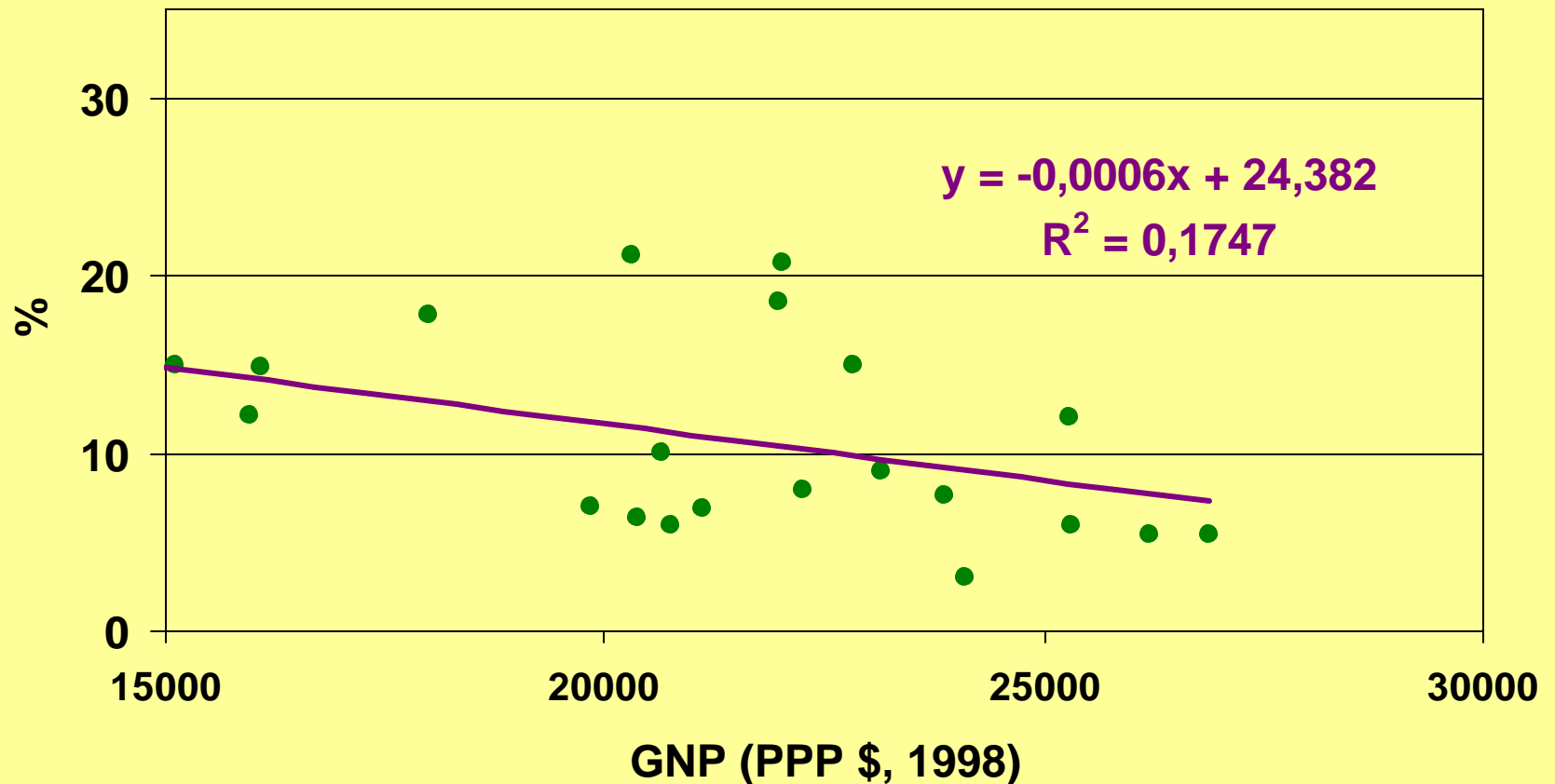


Sources: The WHO Global Data Base on BMI, OECD Health Statistics and the World Bank

Obesity and GNP per capita in 23 high-income countries



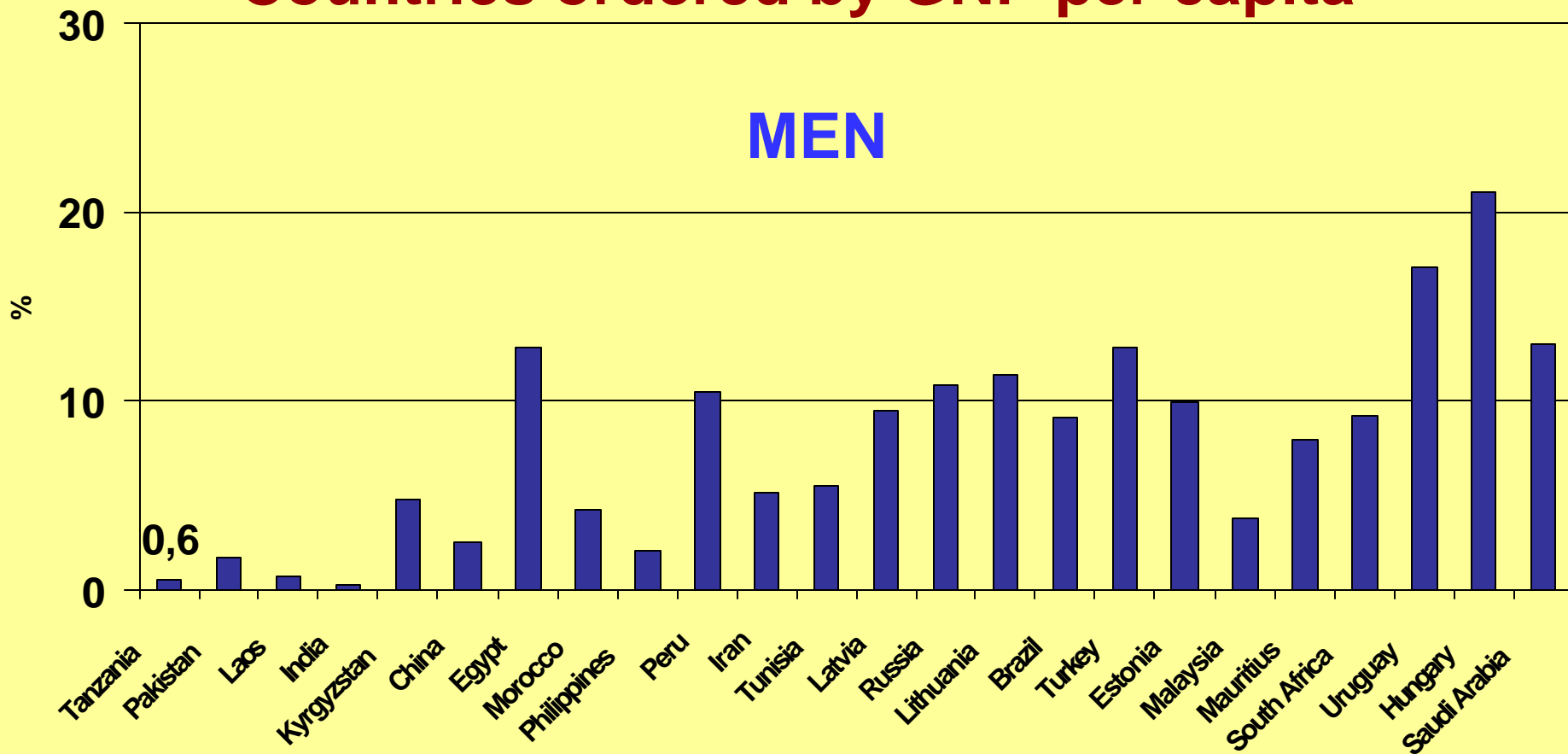
Obesity and GNP per capita in high-income countries (without USA)



*GNP and obesity in
low- and middle-income
countries*

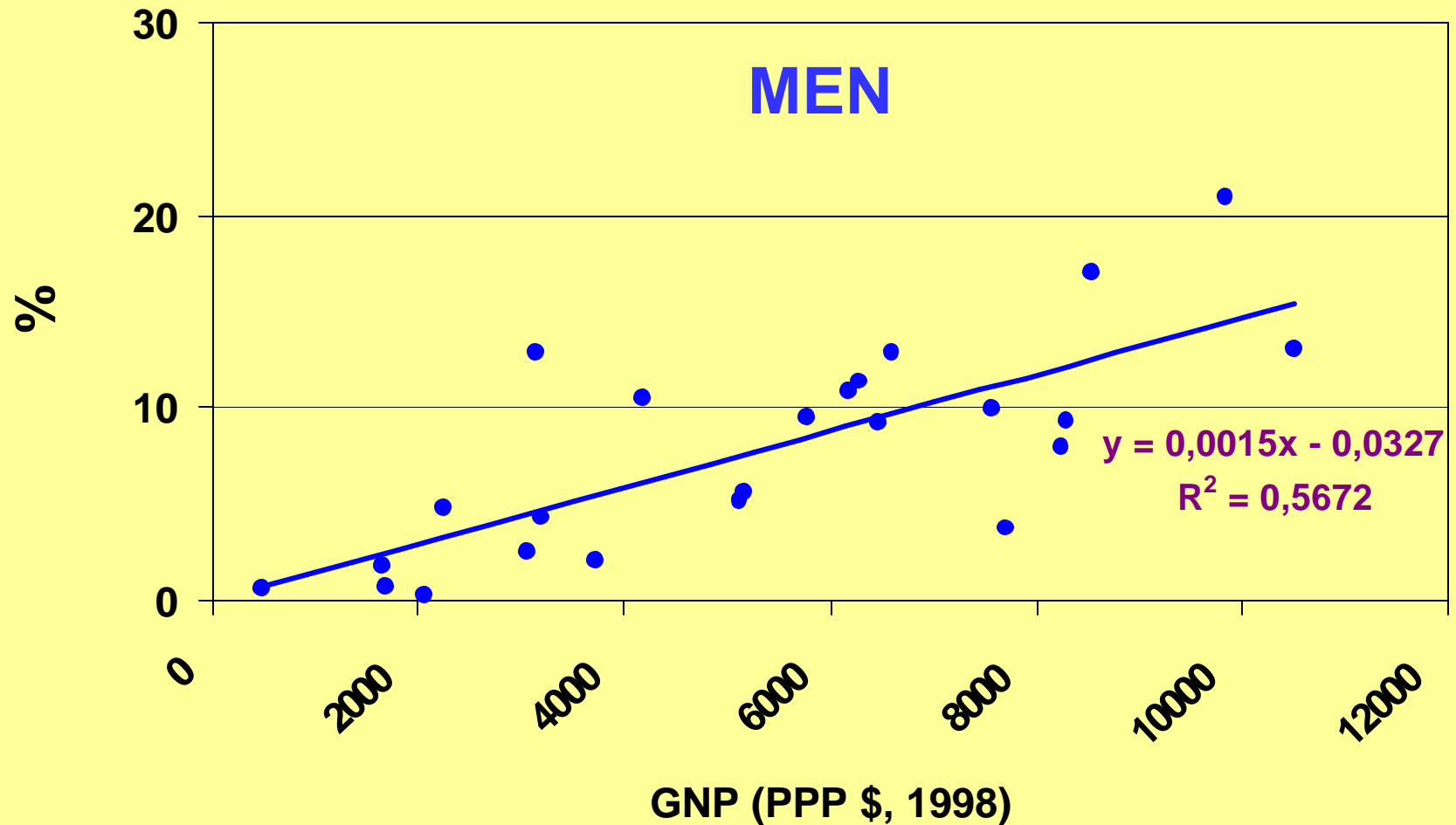
Prevalence of obesity among adults in low and middle-income countries (1989-2003)

Countries ordered by GNP per capita



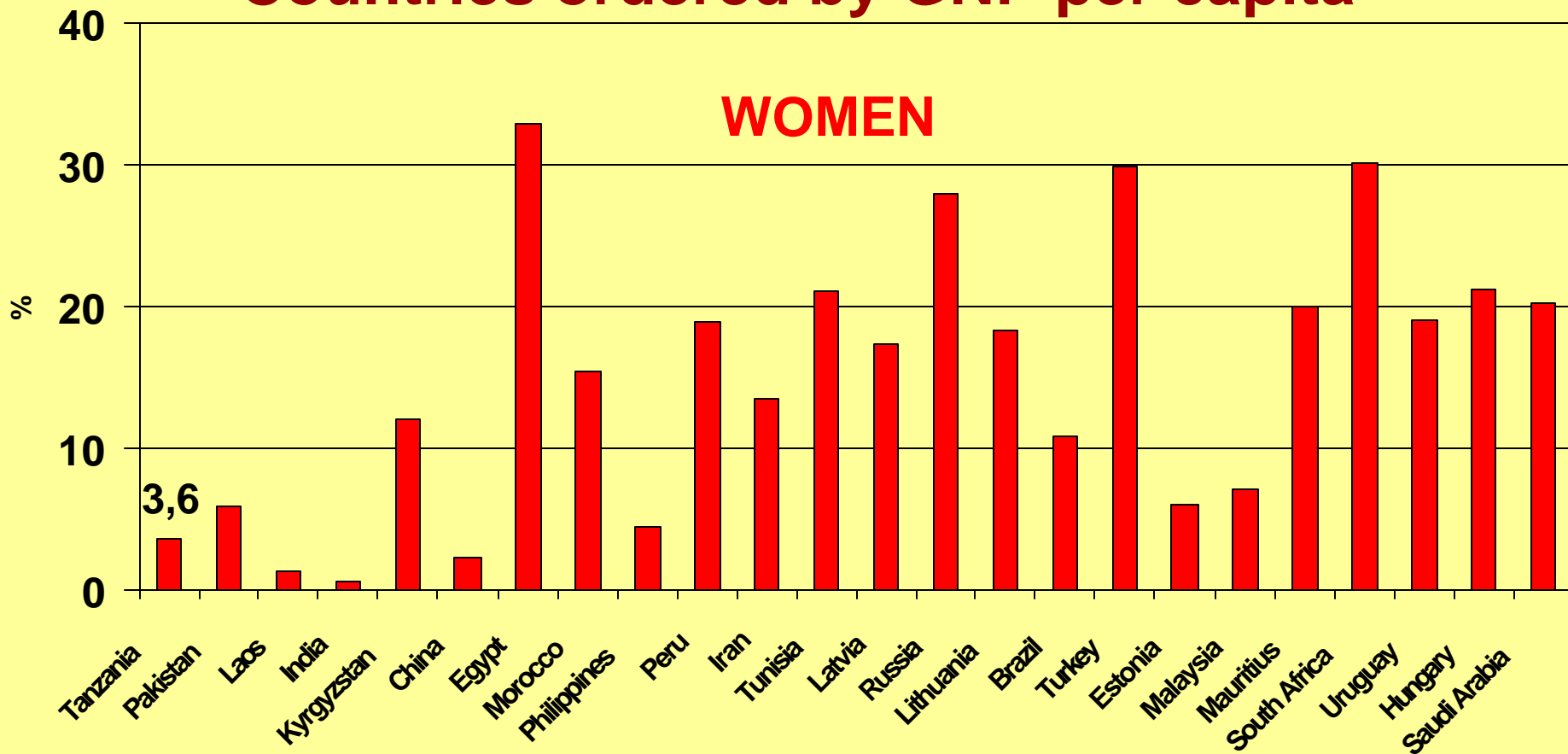
Sources: The WHO Global Data Base on BMI, National surveys and the World Bank

Obesity and GNP per capita in 24 developing countries



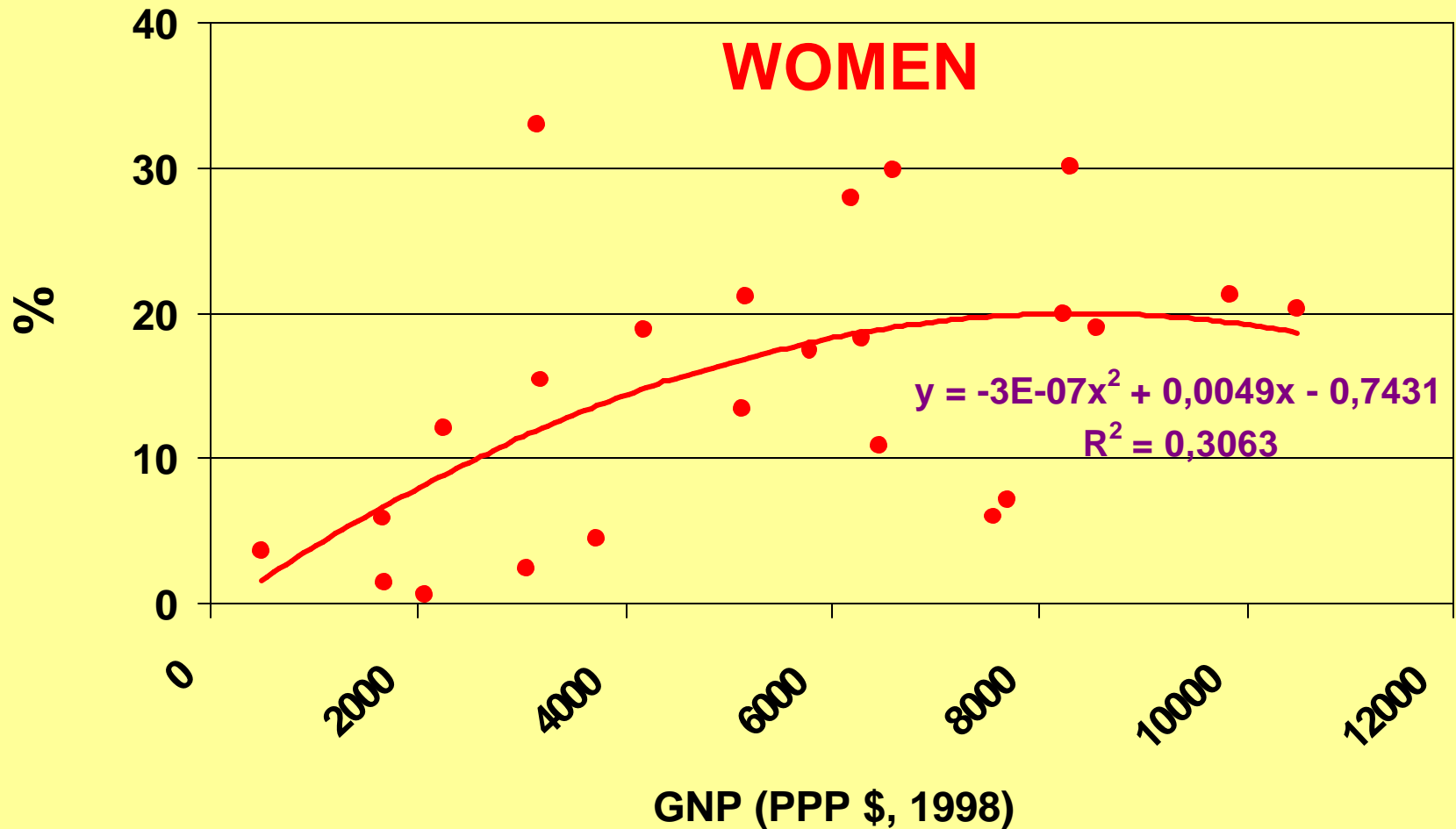
Prevalence of obesity among adults in low and middle-income countries (1989-2003)

Countries ordered by GNP per capita



Sources: The WHO Global Data Base on BMI, National surveys and the World Bank

Obesity and GNP per capita in 24 developing countries



*Relationship between individual
SES and the risk of obesity*

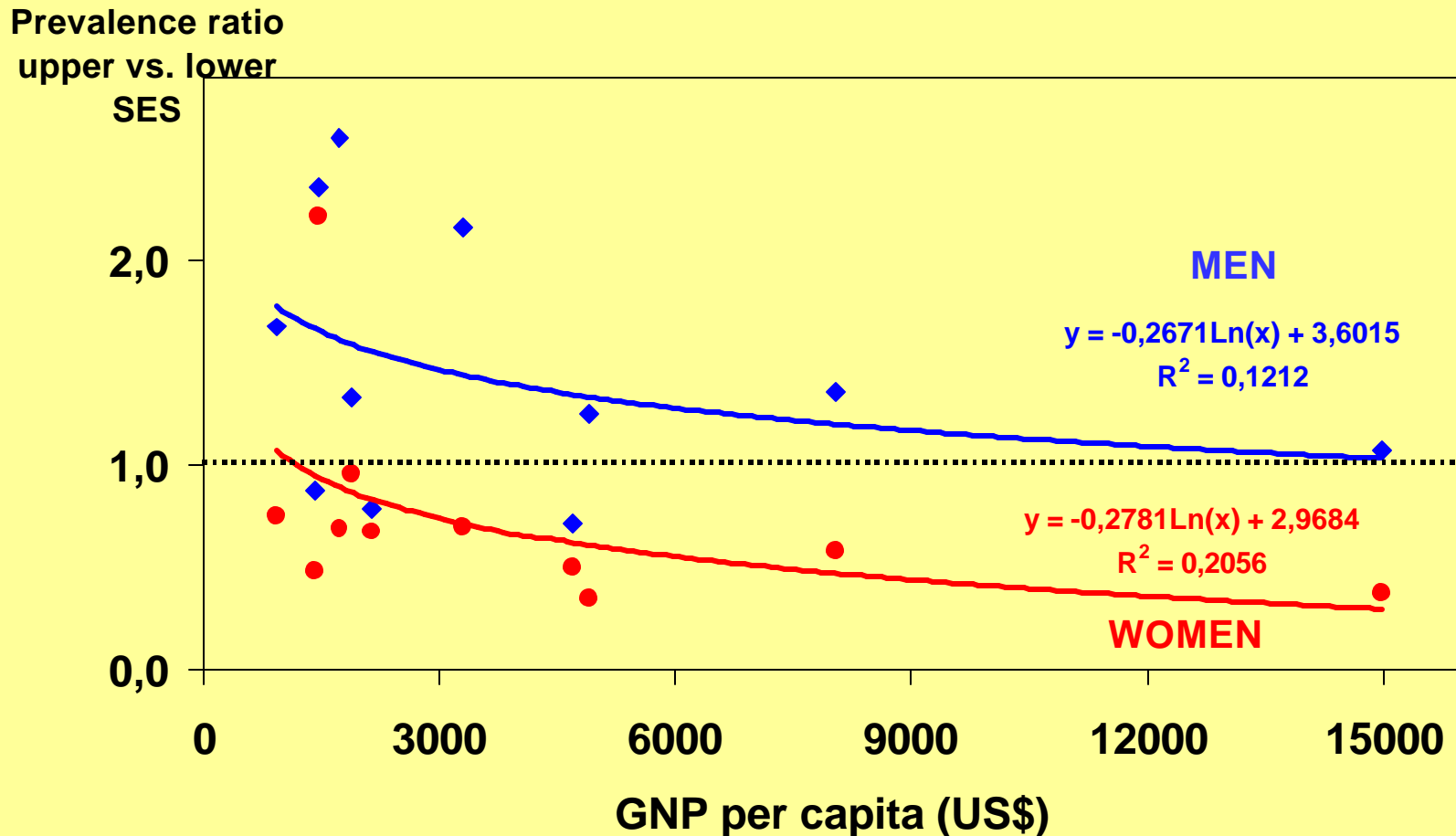
According to a review article still often quoted in the international literature (Sobal and Stunkard, 1989), obesity in the developing world would be essentially a disease of the rich!

*13 studies on SES and obesity
conducted in national or sub-
national samples of adult
populations (men and women) from
developing countries and published
from 1989 to 2003*

(Monteiro et al. 2004, WHO Bulletin (in press))

RELATIVE RISK OF OBESITY AMONG THE UPPER SOCIAL CLASS

Lower- and upper-middle income societies (1990-2001)

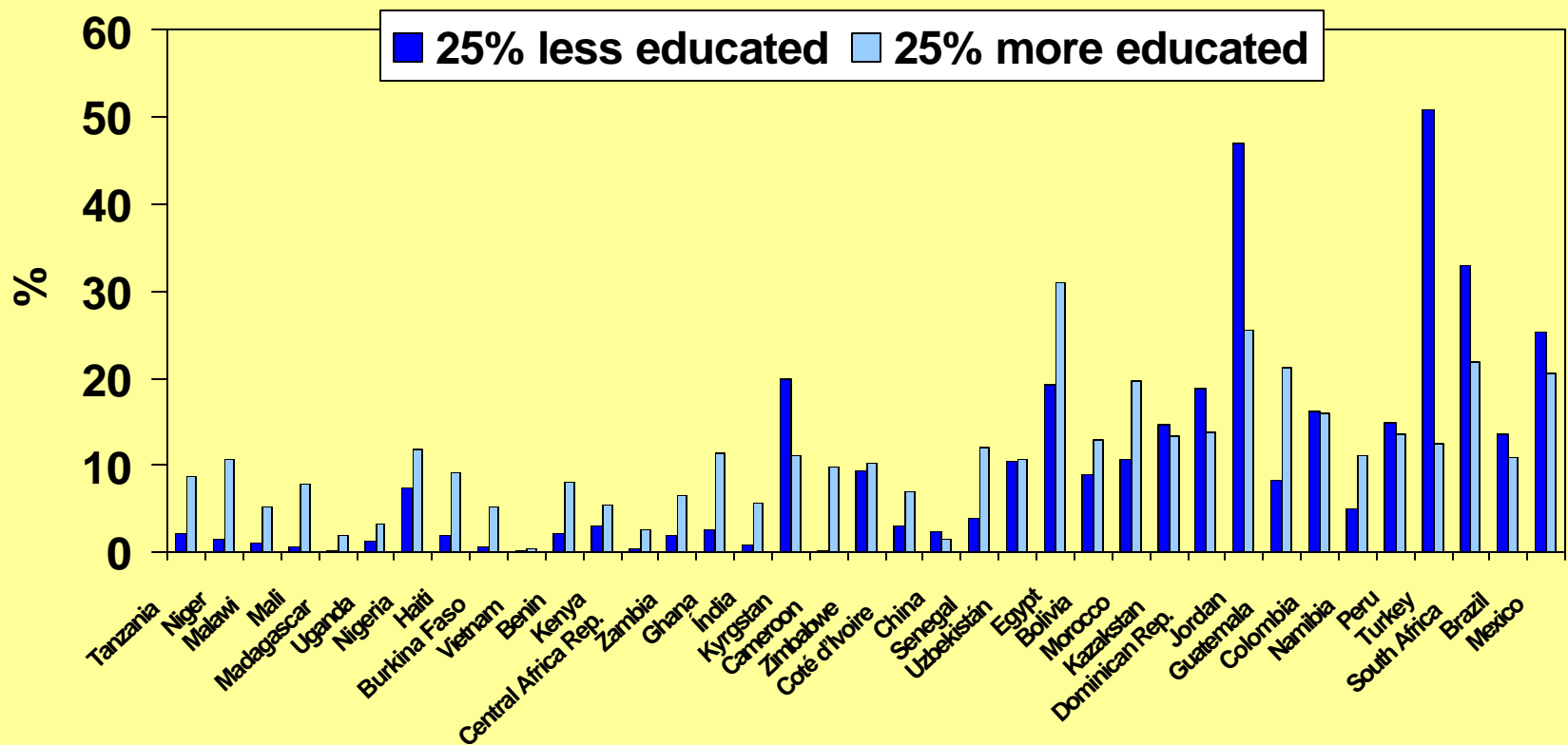


Source: Monteiro et al. 2004 (in press)

*Economic development and SES as
joint predictors of obesity: a study
on 148,579 women from 37
developing countries*

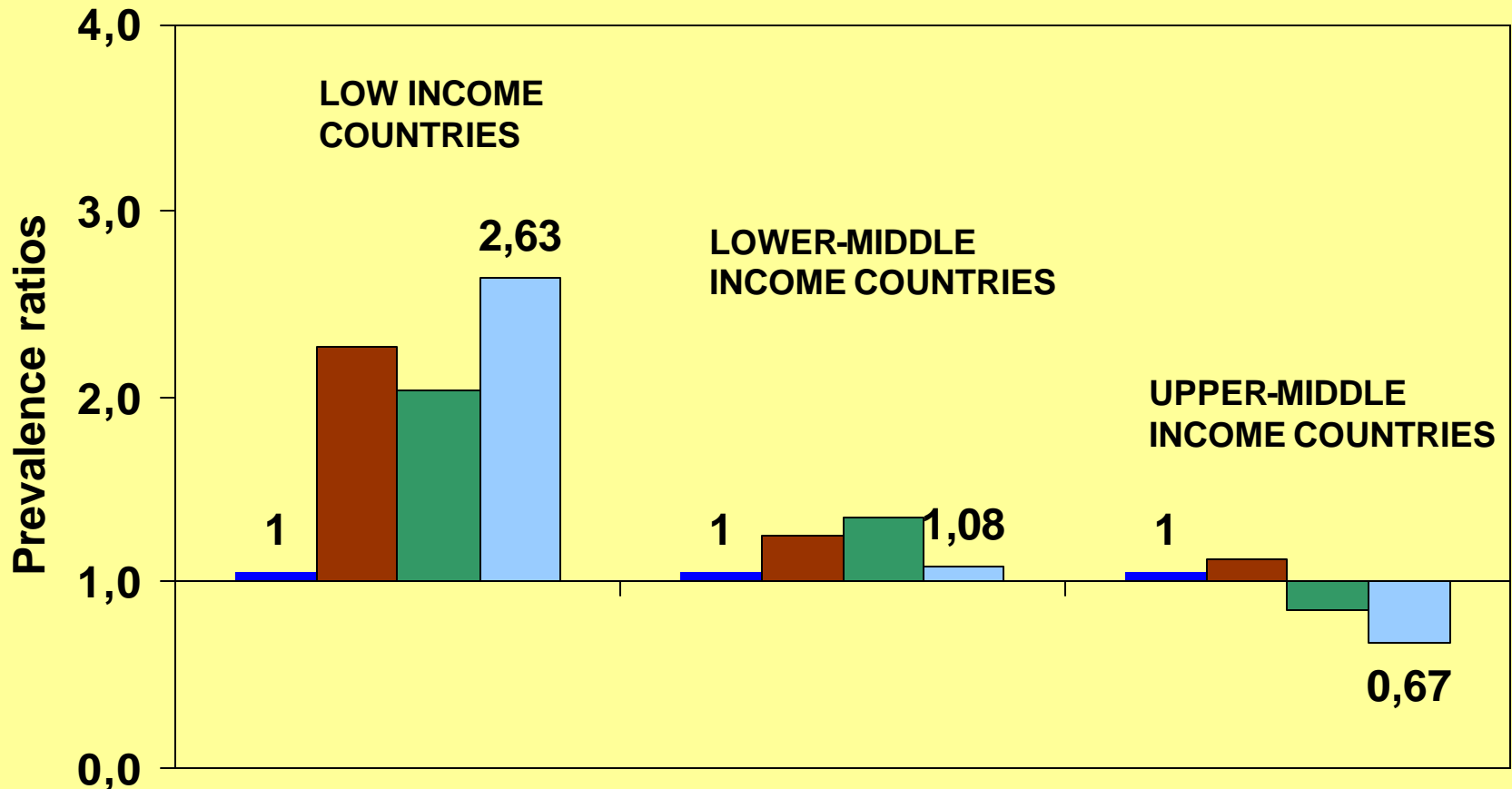
*Monteiro et al. - Obesity and health inequities in the
developing world IJO 2004*

Obesity in women 20-49 y by SES in 37 developing countries ordered by GNP per capita (1992-00)



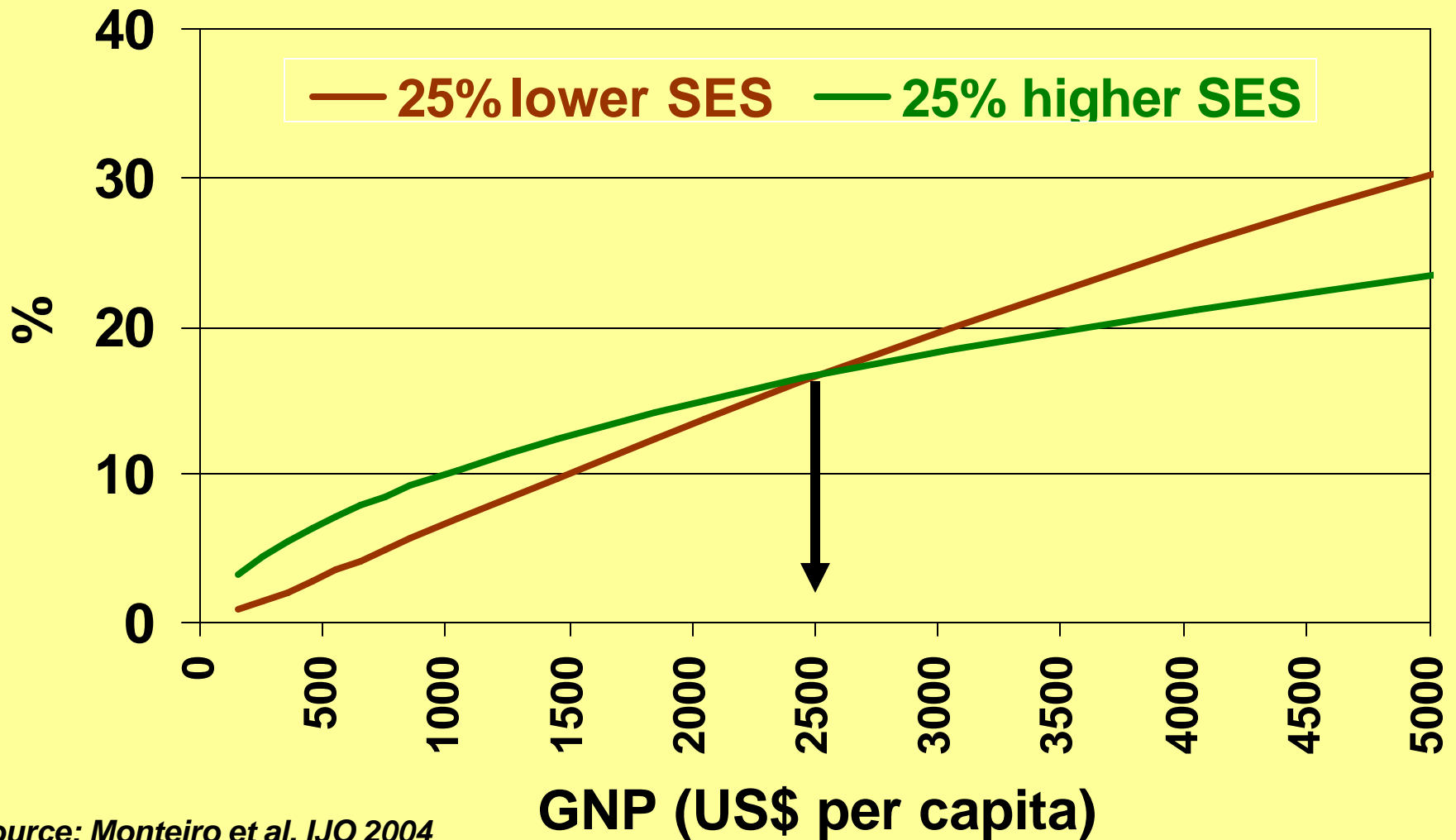
Prevalence ratios for women's obesity by quartiles of years of schooling

■ Q1 ■ Q2 ■ Q3 ■ Q4



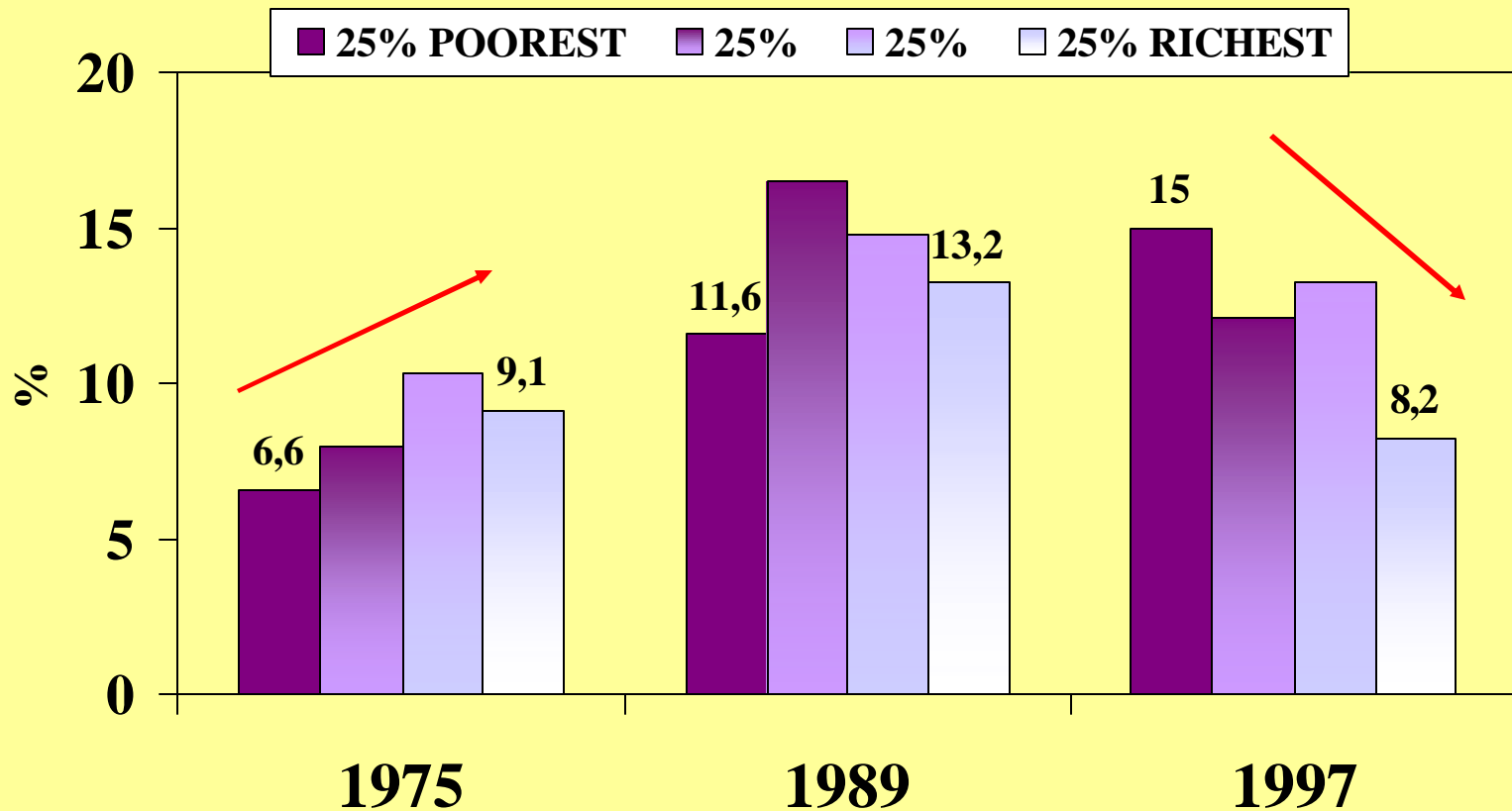
Modeling the probability of obesity as a function of individual SES, the country's GNP per capita (log) and an interaction term between SES and GNP

Predicted prevalence (%) of women's obesity in extreme SES at different country's GNP



*The shifting of obesity toward
the poorest women in the
Southeast of Brazil*

THE SHIFTING OF OBESITY TOWARD THE POOREST WOMEN IN SOUTHEAST BRASIL



Source: Monteiro, Conde and Popkin 2002 - Pub Health Nut 5(1A): 105-112

Public policies can re-direct the nutrition transition. Countries are not condemned to “follow” the historical evolution!

