

# Corn farmer in Iowa, USA



**Energy prices remain high bio-fuels will compete with food for land and water across the globe.**



**Egypt**



**Government subsidized bread near the Great Pyramid at Giza.**



# Philippines



**Even record harvests haven't been able to support the nation's 90 million people, forcing it to become the leading rice importer.**



# Philippines



**Marilyn and her family of seven spend roughly 70 % of the family's income just paying for food.**





**A woman sweeps a harvested rice field, gleaning leftover grains to feed her family.**



**Ethiopia**



**Afari mother sorghum porridge lacks nutrients needed to feed her malnourished son**





**WFP basket wheat or rice; lentils, chickpeas; vegetable oil (vit A & D); sugar; and I salt**



# The Observer

## UN says eat less meat to curb global warming

- Climate expert urges radical diet shift
- Industry unfairly targeted – farmers

by Juliette Jowit  
Environment Editor

PEOPLE SHOULD have one meat-free day a week if they want to make a personal and effective sacrifice that would help tackle climate change, the world's leading authority on global warming has told *The Observer*.

Dr Rajendra Pachauri, chair of the United Nations Intergovernmental Panel on Climate Change, which last year earned a joint share of the Nobel Peace Prize, said that people should then go on to reduce their meat consumption even further.

**INSIDE**  
Is our taste for Sunday roast killing the planet? Special report, 18-19

His comments are the most controversial advice yet provided by the panel on how individuals can help tackle global warming.

Pachauri, who was re-elected the panel's chairman for a second six-year term last week, said diet change was important because of the huge greenhouse gas emissions and other environmental problems – including habitat destruction – associated with rearing cattle and other animals. It was

relatively easy to change eating habits compared to changing means of transport, he said.

The UN's Food and Agriculture Organisation has estimated that meat production accounts for nearly a fifth of global greenhouse gas emissions. These are generated during the production of animal feeds, for example, while ruminants, particularly cows, emit methane, which is 23 times more dangerous as a global warming agent than carbon dioxide. The agency has also warned that meat consumption is set to double by the middle of the century.

'In terms of immediacy of action and the feasibility of bringing about reductions in a short period of time, it clearly is the most attractive opportunity,' said Pachauri. 'Give up meat for one day [a week] initially, and decrease it from there,' said the Indian economist, who is a vegetarian.

However, he also stressed other changes in lifestyle would help to combat climate change. 'That's what I want to emphasise: we really have to bring about reductions in every sector of the economy.'

Pachauri can expect some vociferous responses from the food industry to his advice, though last night he was given unexpected support by *Masterchef* presenter and restaurateur John Torode, who is about to publish a new book,

CONTINUED ON PAGE 18

## Murray's New York thriller



Scotland's Andy Murray celebrates taking the second set during his US Open semi-final match against Rafael Nadal. Torrential rain stopped play for the day in the third set, with Nadal leading three games to two (Sport, pages 2-3; full coverage guardian.co.uk)

## Vicious union attack deepens Labour rift

by Toby Helm  
Whitehall Editor

LABOUR'S CIVIL war reaches new heights today as the leader of Britain's biggest union launches a venomous personal attack on Foreign Secretary David Miliband.

In an outspoken interview with *The Observer* on the eve of the Trades Union Congress, Derek Simpson, joint general secretary of Unite, the union with the biggest group of Labour MPs at Westminster, accused Miliband, in a stream of swearwords, of being 'smug' and 'arrogant'. In terms that caused fury on the

**INSIDE**  
Labour's open warfare, 8-9  
Observer Comment, 30  
Andrew Rawnsley, 31

right of the party, he also said Labour would take the country back to the 'failings of Blairism' and be a worse choice as Prime Minister than the Tory leader David Cameron. 'We might as well elect Cameron; he might be better off with Cameron,' he said. 'He [Miliband] is in the wrong direction. Why should we go in the wrong direction?'

CONTINUED





The USA meat industry produces more than 60 million tons of waste annually—five tons for every U.S. citizen and 130 times the volume of human waste.



Meat production is a major factor in deforestation, and grazing now occupies 70 percent of previously forested land in the Amazon region.



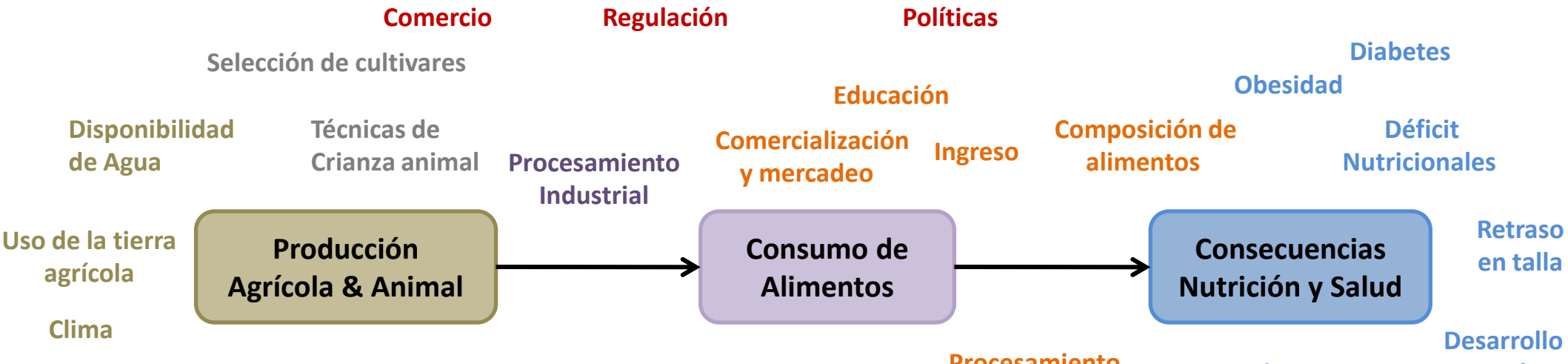




Baby suffering from kidney stones receives medical treatment at a hospital Lanzhou, Gansu province

A baby suffering from kidney stones receives medical treatment at a hospital in Lanzhou, Gansu province, September 11, 2008. A health scare in China involving babies developing kidney stones after drinking possibly fake milk formula has spread across the country, state media said on Thursday. One baby had died from kidney stones in northwest Gansu province, Xinhua quoted health officials as saying, but it was not clear if there was any link to milk powder in that case





# Nueva Disciplina: Agri-Salud

- Sal/Sodio
- Densidad de Energía
- Azúcar y Carbohidratos refinados
- Grasas parcialmente hidrogenadas

Mejoramiento Nutricional : Selección genética y Bio-fortificación	Legislación de fortificación o enriquecimiento obligatorio	Etiquetado Nutricional legislación regulatoria de comercialización y consumo
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# Population growth is a key driver for long-term outlook on global food, agriculture and nutrition



Annual increments (billions)



# Desafíos que nos trae el futuro ?



- Para el año 2050 necesitamos producir alimentos para nutrir a los 9 billones habitantes de la tierra
- Aumentan los Malnutridos por deficit y exceso en el mundo
- Los sistemas alimentarios globales proveen dietas poco saludables
- Sistemas alimentarios contribuyen a generar Zoonosis con un impacto sobre la salud y la economia.
- Los sistemas alimentarios actuales son en gran medida poco o no-sustentables desde el punto de vista agricola y ambiental.



# Sistemas alimentarios desconectados y desacoplados



- La agricultura, la salud y la nutrición han estado separadas a nivel nacional e internacional.
- Aislamiento académico de la salud y la agricultura en la formación profesional y en la investigación.
- Falta visión compartida que promueva conceptos, métodos y herramientas comunes para medir el valor de la agricultura y alimentación para la salud.
- Falta percepción de que la investigación integrada de la agricultura, la nutrición y la salud agricultura es sinérgica.



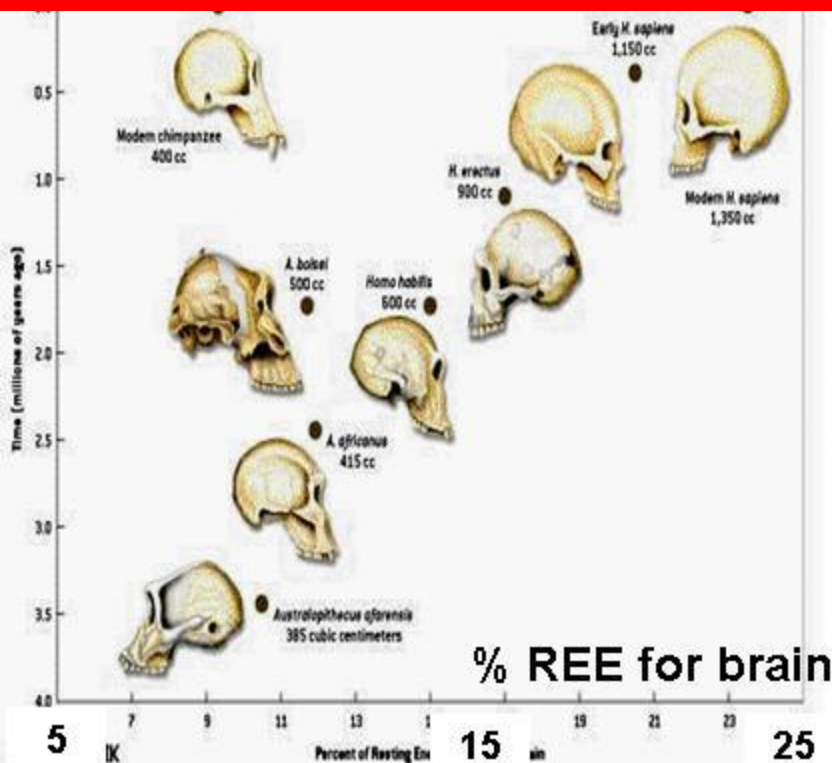
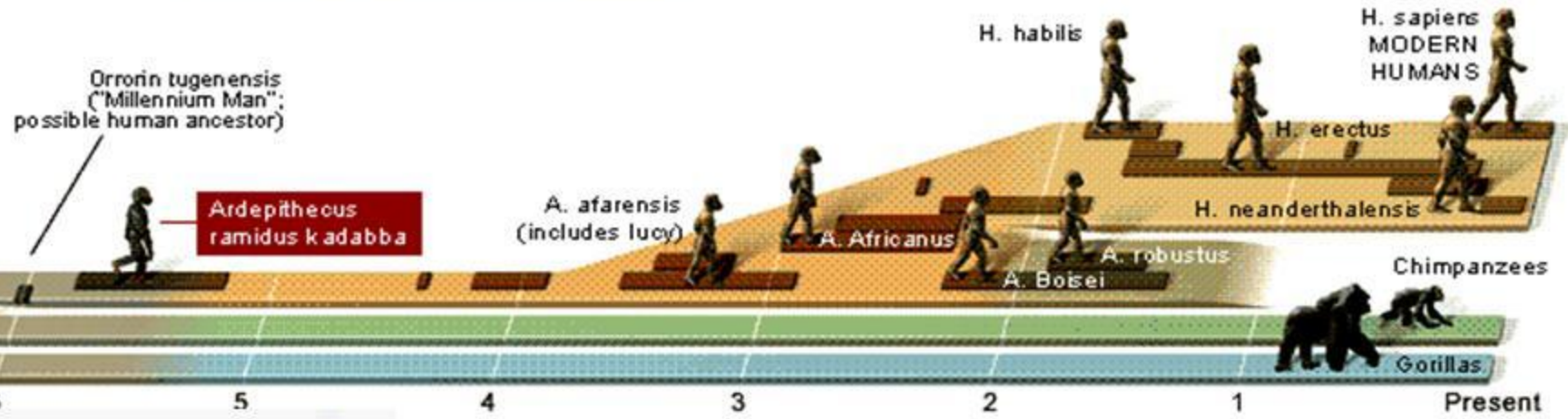
# El Desafío de la integración: la iniciativa Agri-Salud

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“visión unificadora, enfoque y metodología compartida para entender de mejor forma la relación entre la producción de alimentos la salud de la población, y los factores que determinan el progreso integrado de ambas”.

# Co-evolved with our food supply to secure survival, high quality diet provides fuel for progressively larger brain

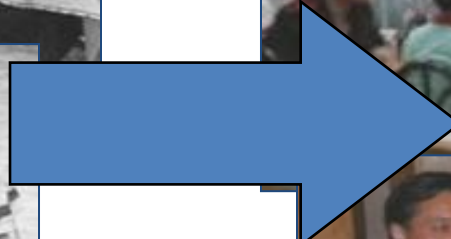
LAST COMMON ANCESTOR  
It should have a mosaic of features reminiscent of both apes and humans- but that's true of several species already found, so identification might be tough



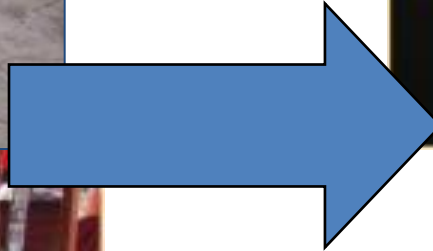
- CEREAL GRAINS**
- DAIRY FOODS**
- ETHANOL**
- VEGETABLE OILS**
- REFINED SUGARS**
- SALTED FOODS**
- FATTY MEATS**



# From Traditional to Modern Meals

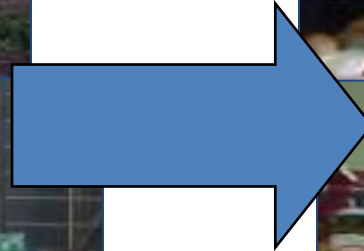


# From Traditional to Modern Snacking





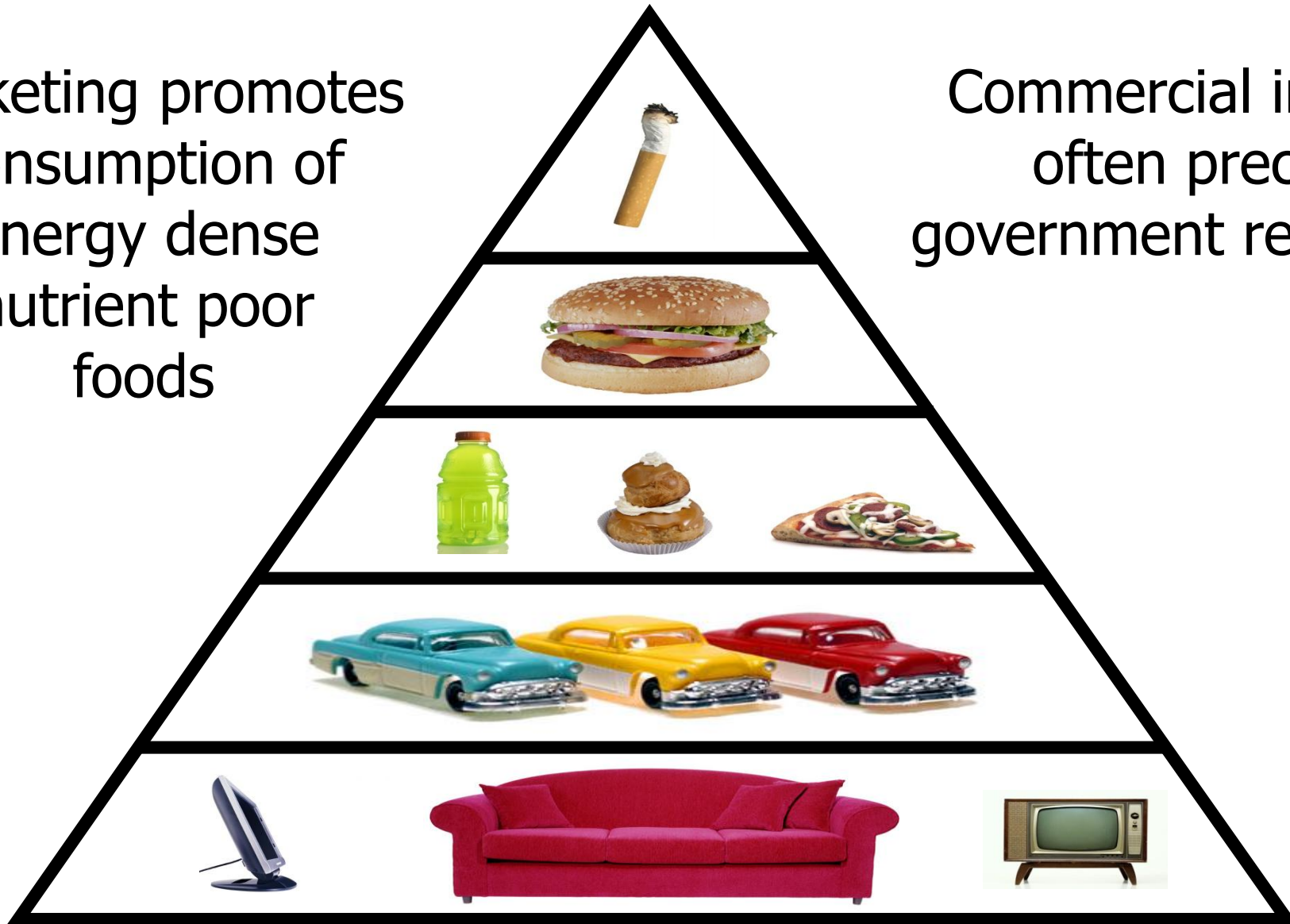
# From Traditional to Modern..... Marketing of Food



# Globalization of Unhealthy Consumption

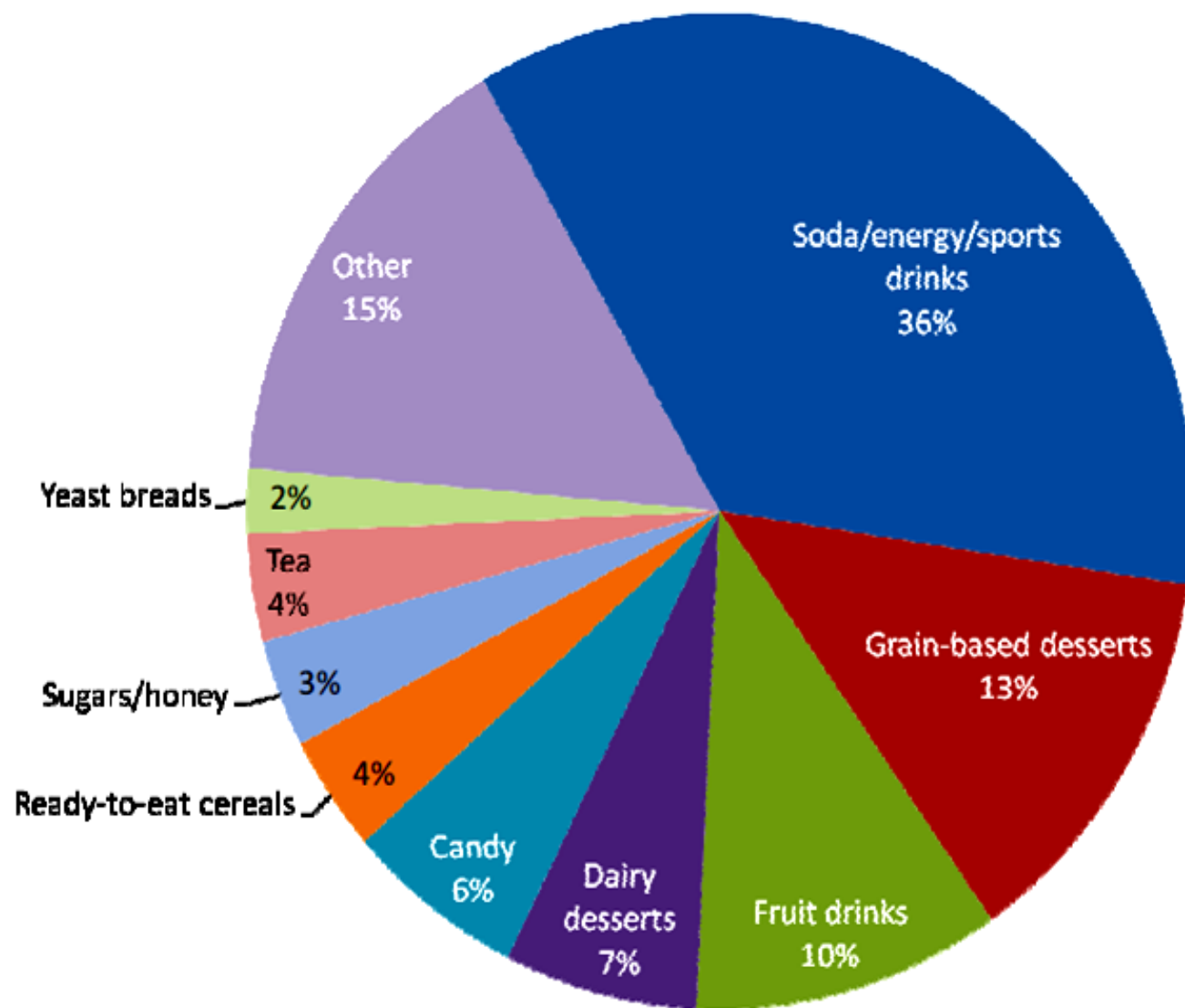
Marketing promotes  
consumption of  
energy dense  
nutrient poor  
foods

Commercial interests  
often preclude  
government regulations





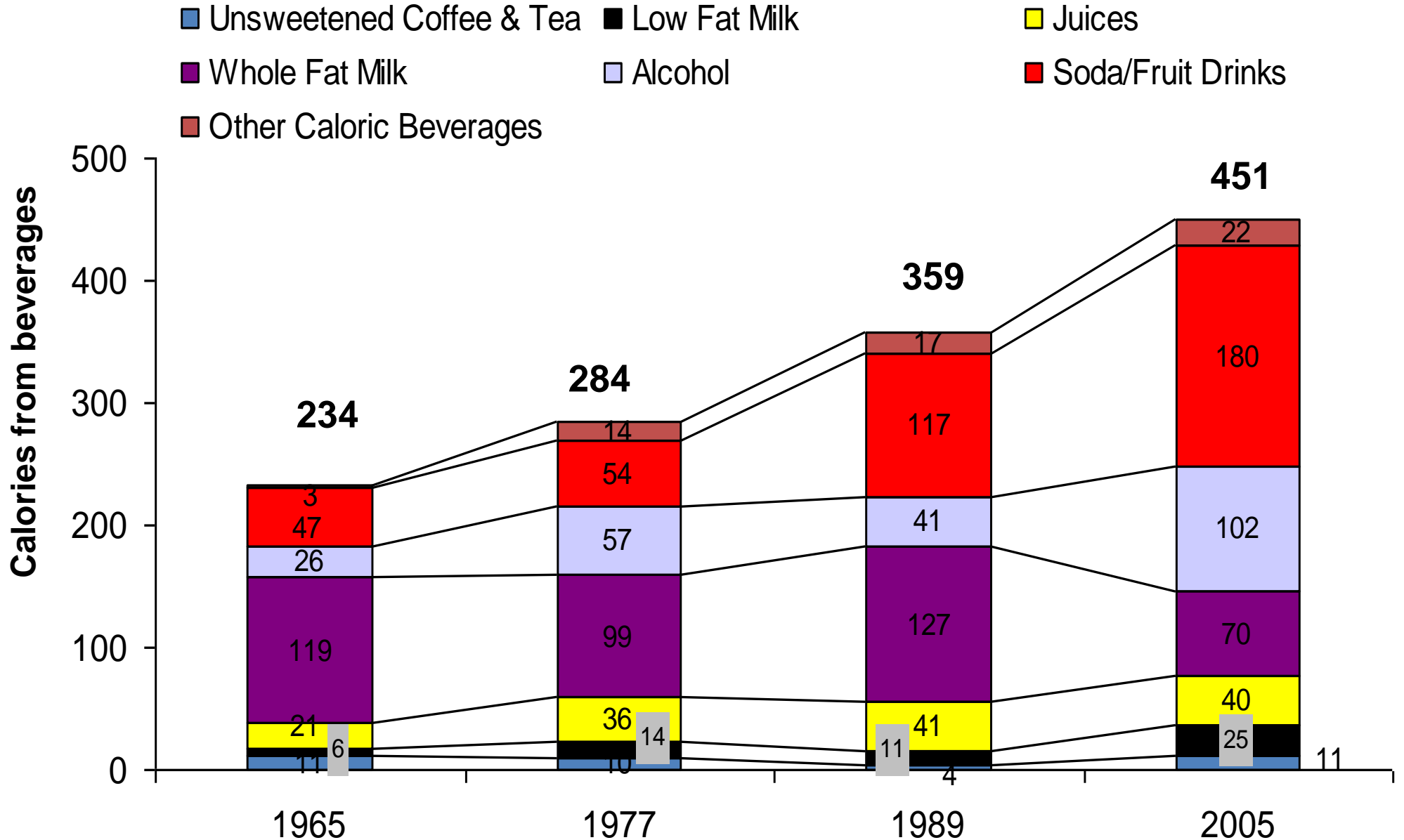
# Sources Of Added Sugars (tsp), US Population



*The "Other" category includes many specific foods that each contribute less than 2% of added sugars.*

Data source: NHANES 2003-04

# Change in Energy (kcal) from Beverages Between 1965-05





# Short History for Caloric Beverages: Might the Absence of Compensation Relate to This Historical Evolution?

- Earliest possible date
- Definite date

Mammals Evolve – 200,000 BCE  
Pre-Homo Saptens

Water, Breast Milk

2,000,000 BCE  
Homo Sapiens

200,000 BCE - 10,000 BCE  
Origin of Humans

100,000 BCE

Modern Beverage Era  
10,000 BCE - present

Wine, Beer, Juice  
(8000 BCE)

Milk (9000 BCE)

Wine (5400 BCE)

Beer (4000 BCE)

2000 BCE

52 Gal Soda/American  
(2004)

46 Gal Coffee/American  
(1946)

Juice Concentrates  
(1945)

45 Gal Milk/American  
(1945)

Coca Cola (1886)

Pasteurization (1860-64)

Carbonation (1760-70)

Liquor  
(1700-1800)

Lemonade  
(1500-1600)

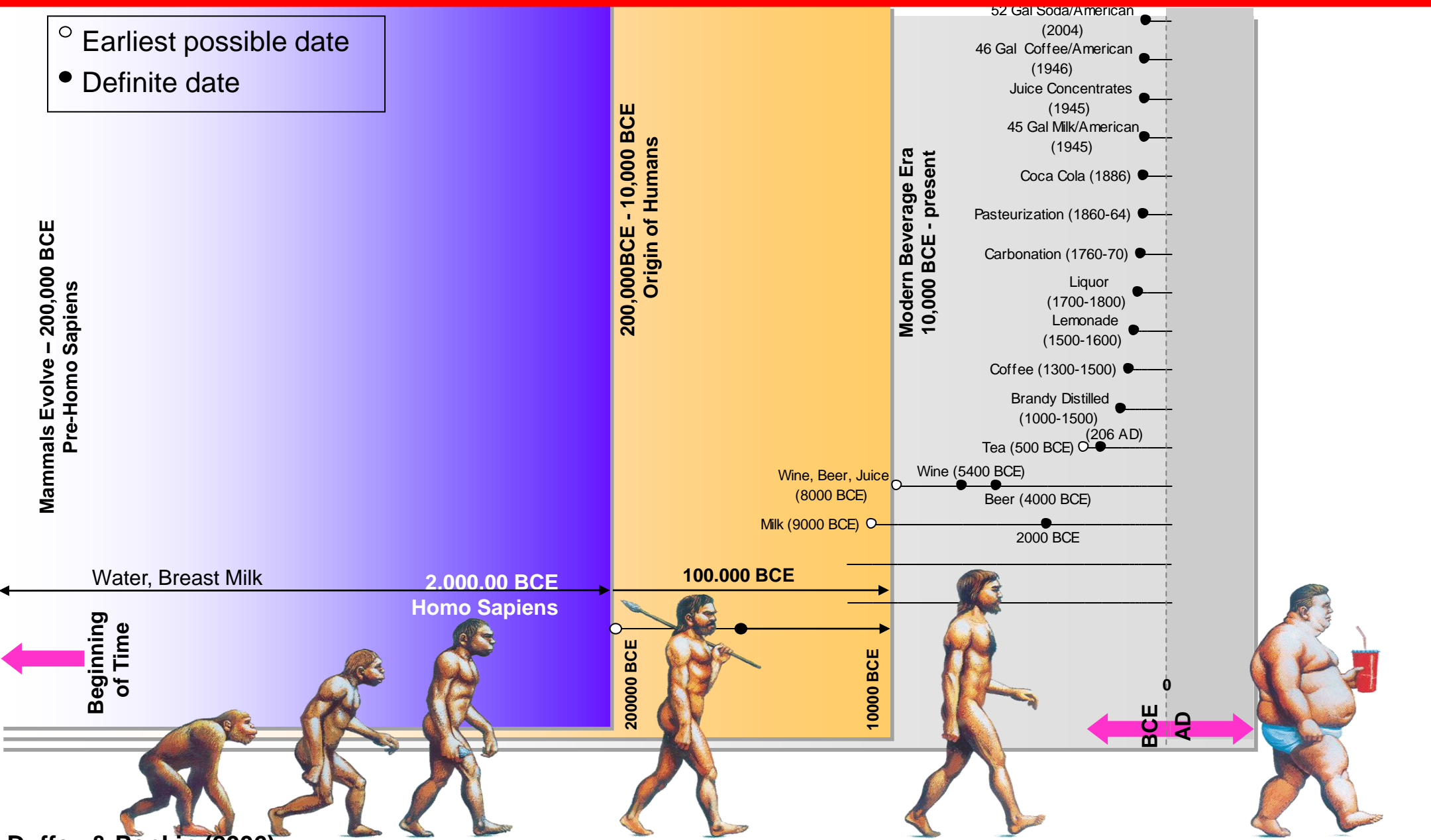
Coffee (1300-1500)

Brandy Distilled  
(1000-1500)

Tea (500 BCE) ○ ● (206 AD)

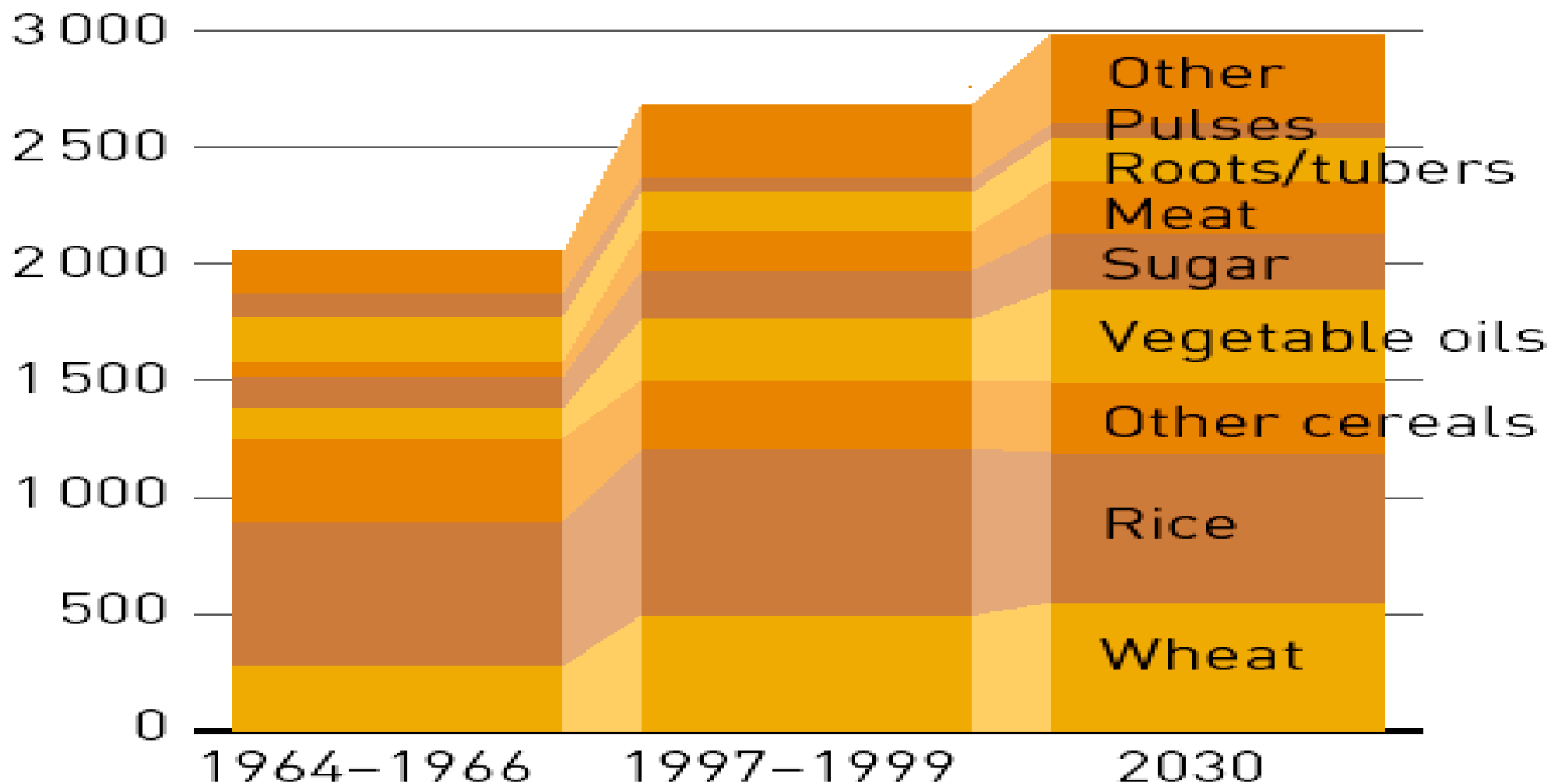
Beginning  
of Time

BCE  
AD



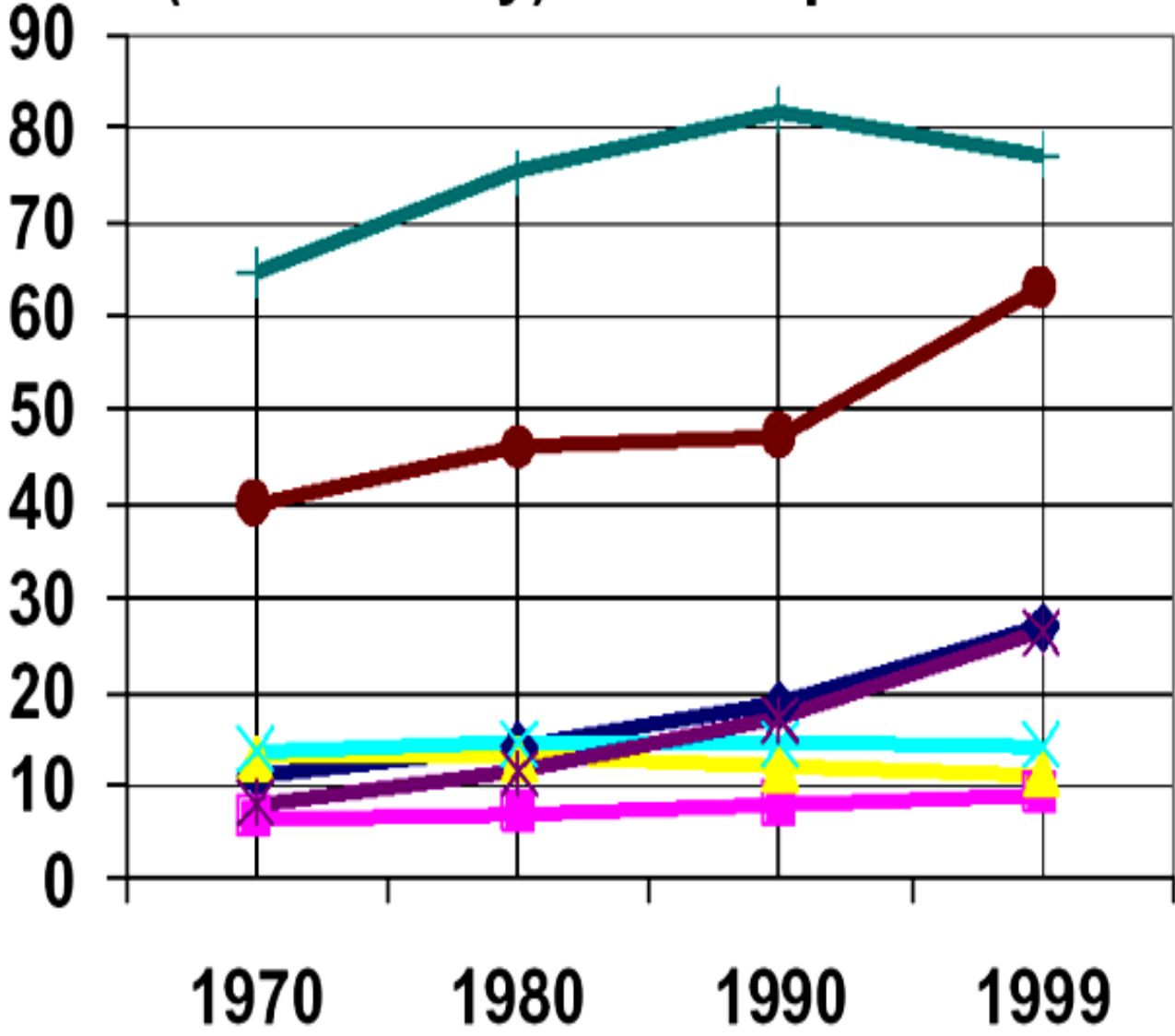
# Changing diets in developing countries, 1964–1966 to 2030

Kcal/capita/day

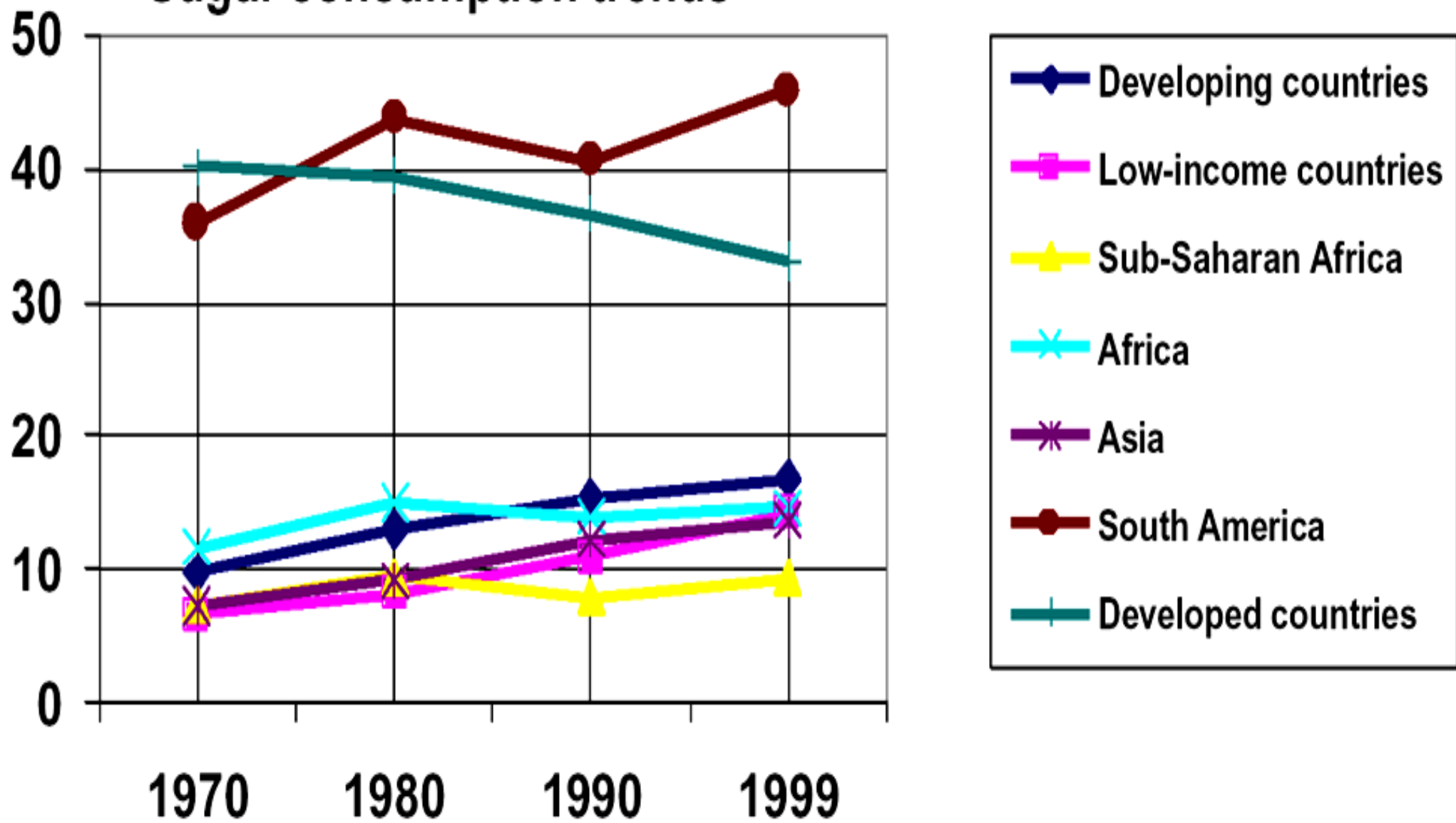




# Meat (incl. Poultry) consumption trends

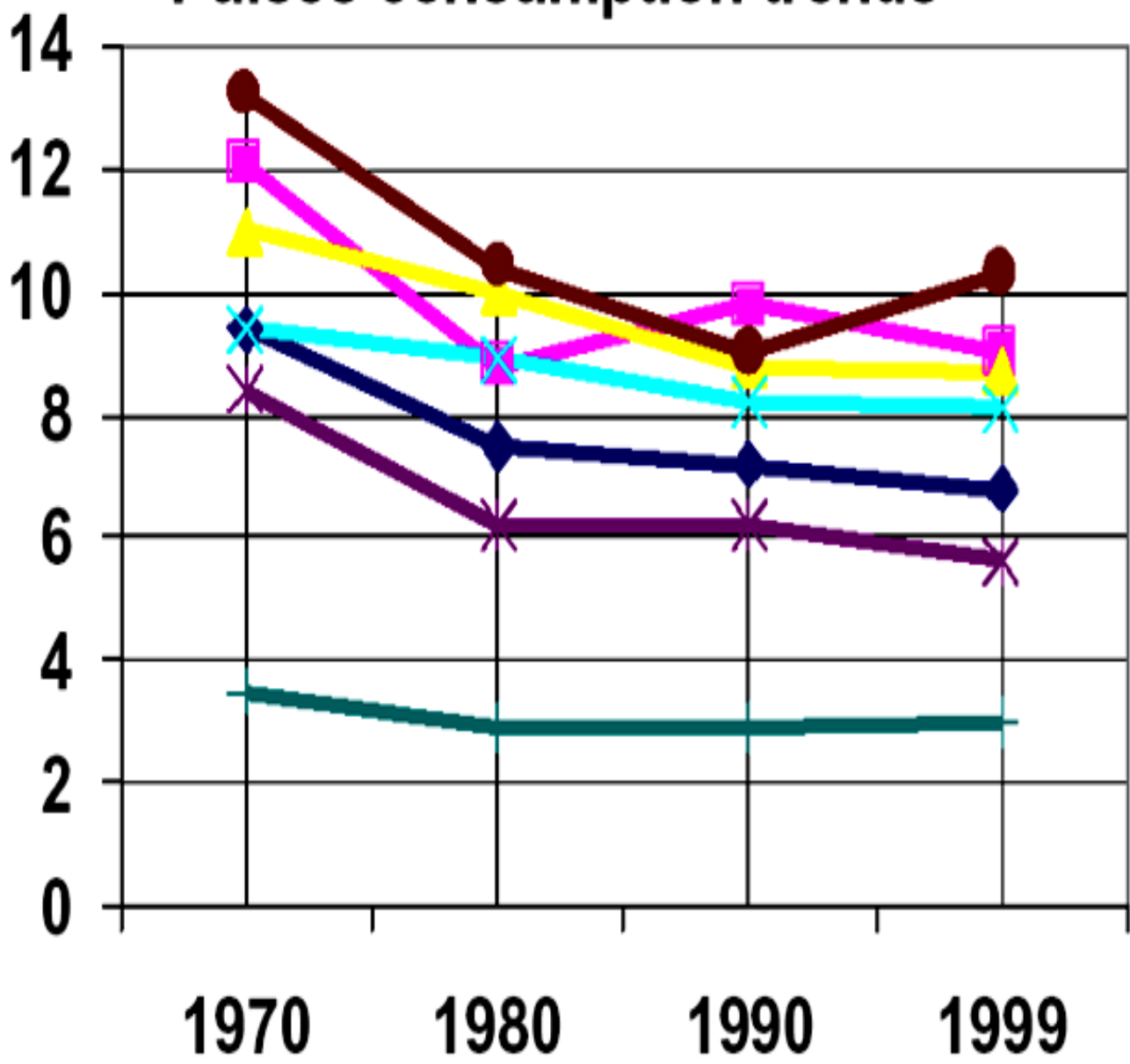


# Sugar consumption trends

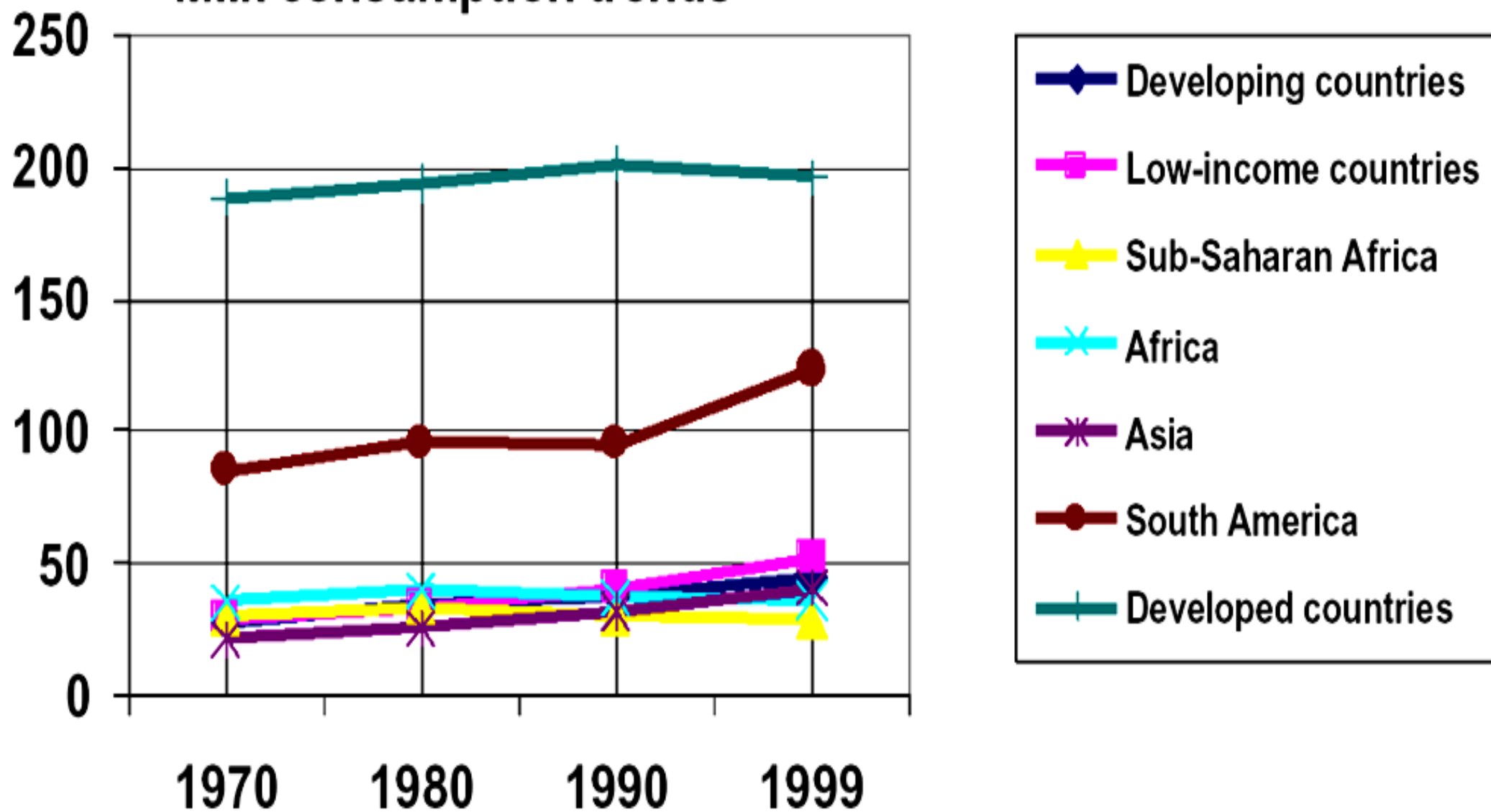




# Pulses consumption trends

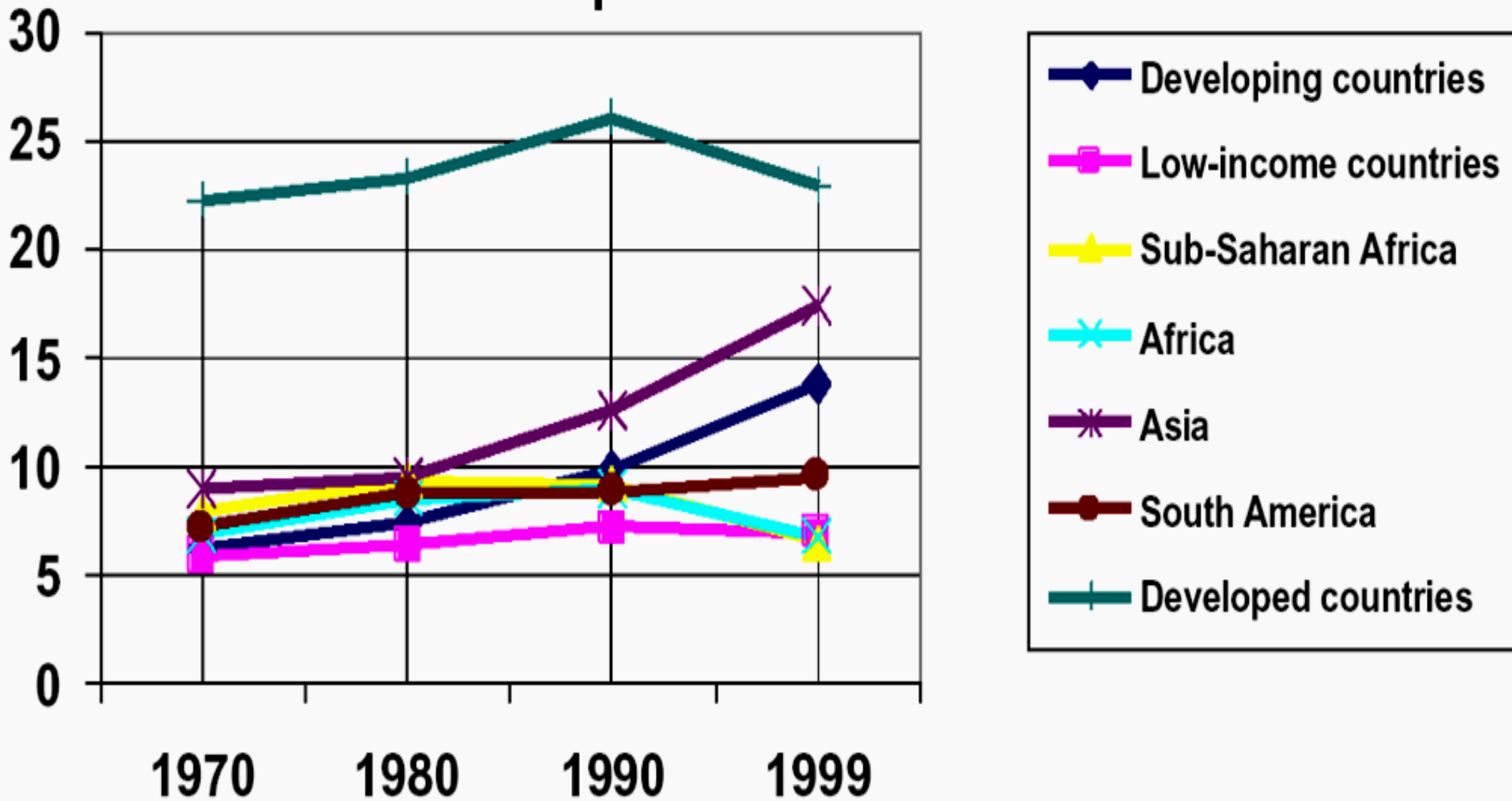


## Milk consumption trends





## Fish & Seafood consumption trends



Germany: The Melander family of Bargteheide  
Food expenditure for one week US \$500





**Ecuador: The Ayme family of Tingo**  
**Food expenditure for one week US \$31.55**



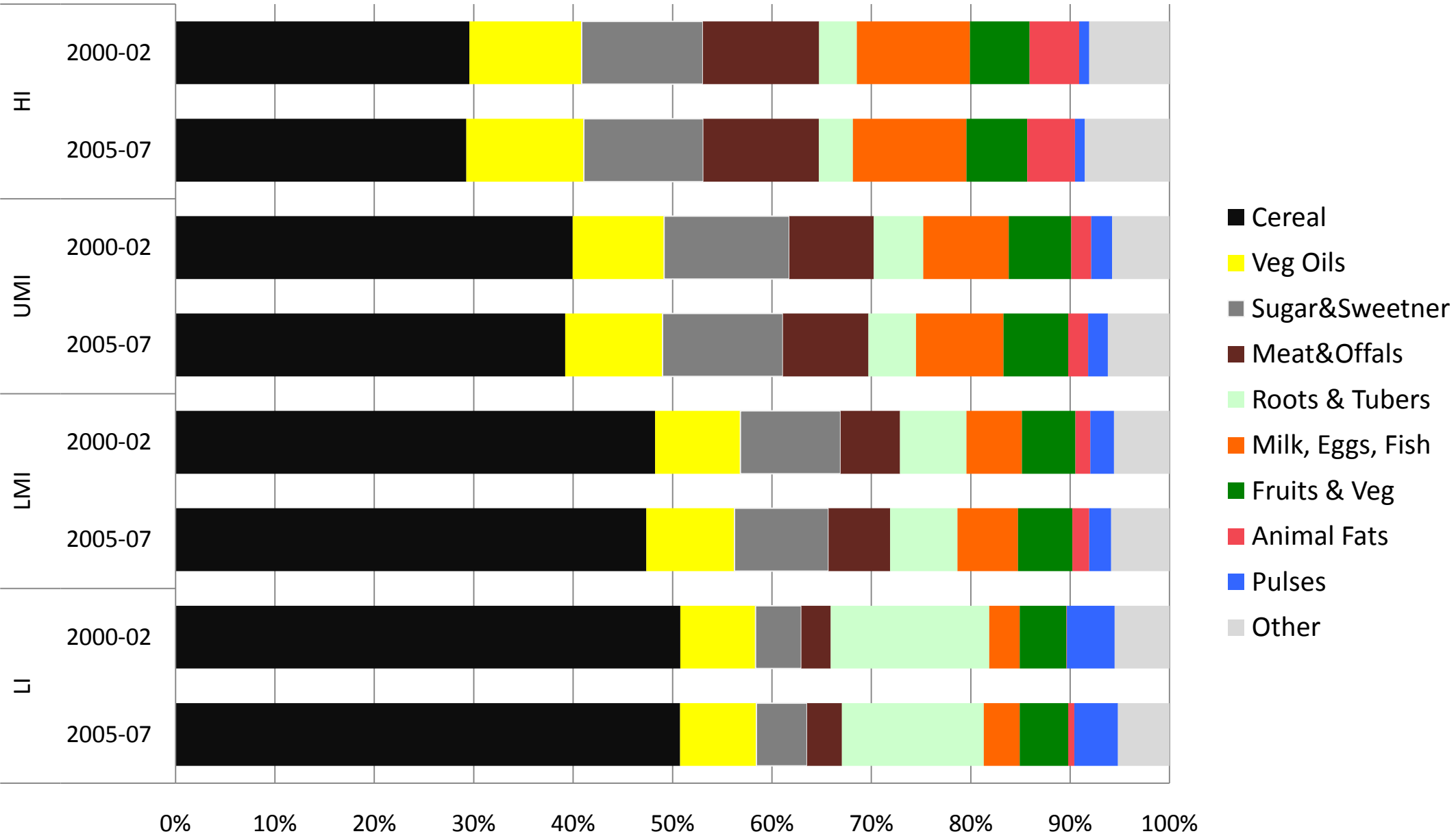


**Chad: The Aboubakar family of Breidjing Camp**  
**Food expenditure for one week US \$1.23**

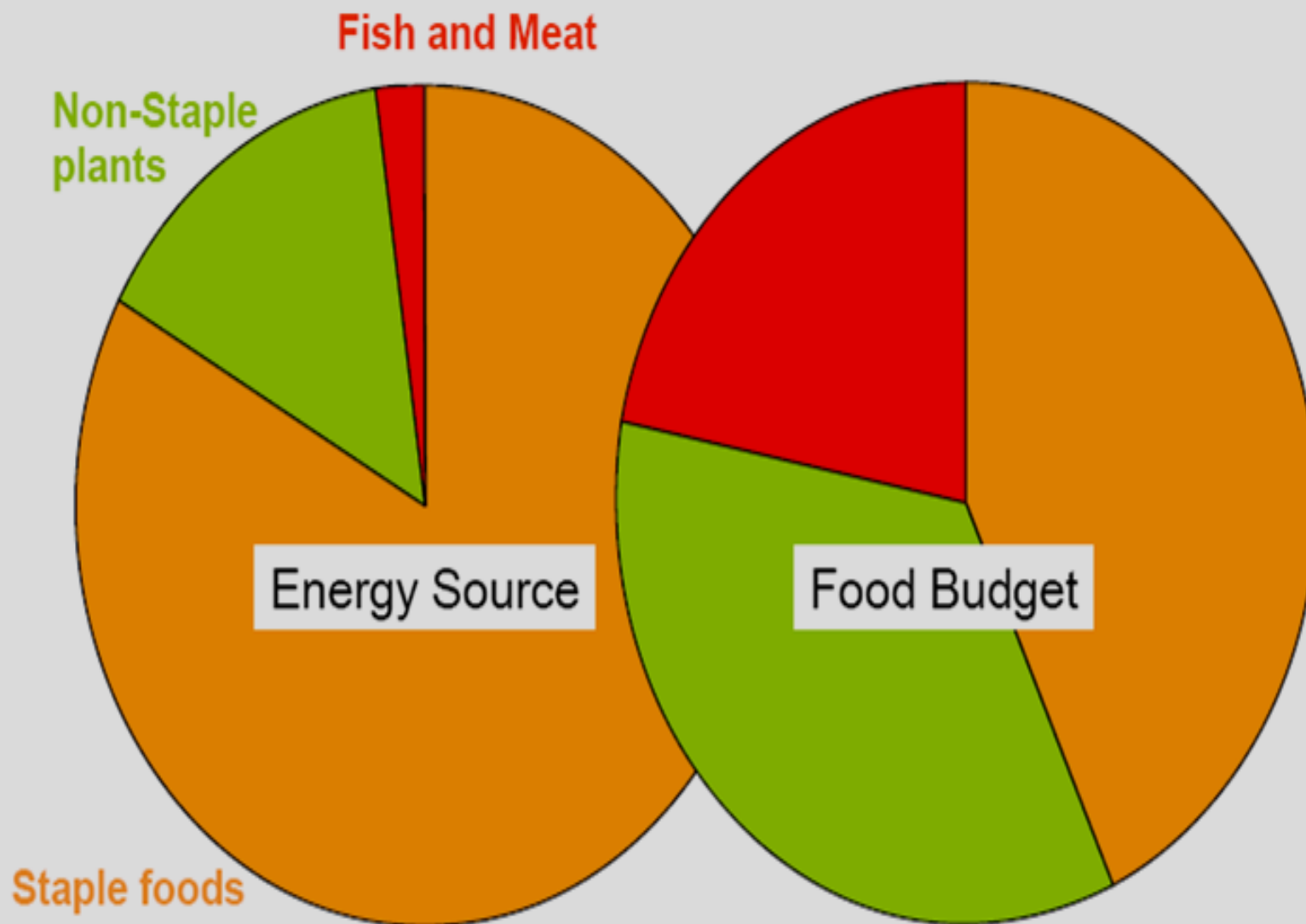




# Dietary Consumption in Energy Consumption Relative to Income

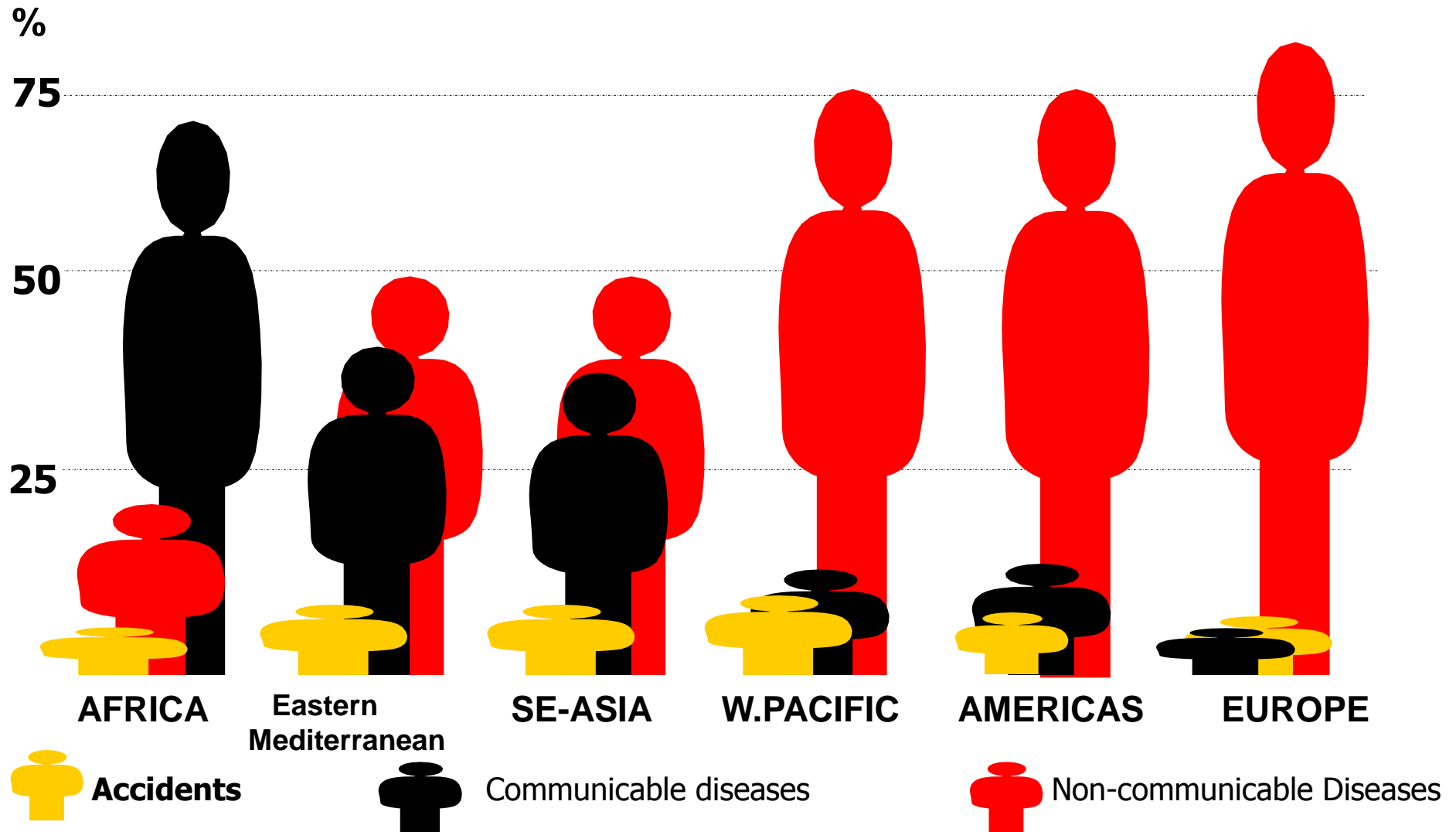


# Share of Energy Source & Food Budget in Rural Bangladesh





# Deaths by Regions of the World



# **Todas las formas de la Malnutrición**

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## ***Fetal / Infantil / Niños / Adolescentes***

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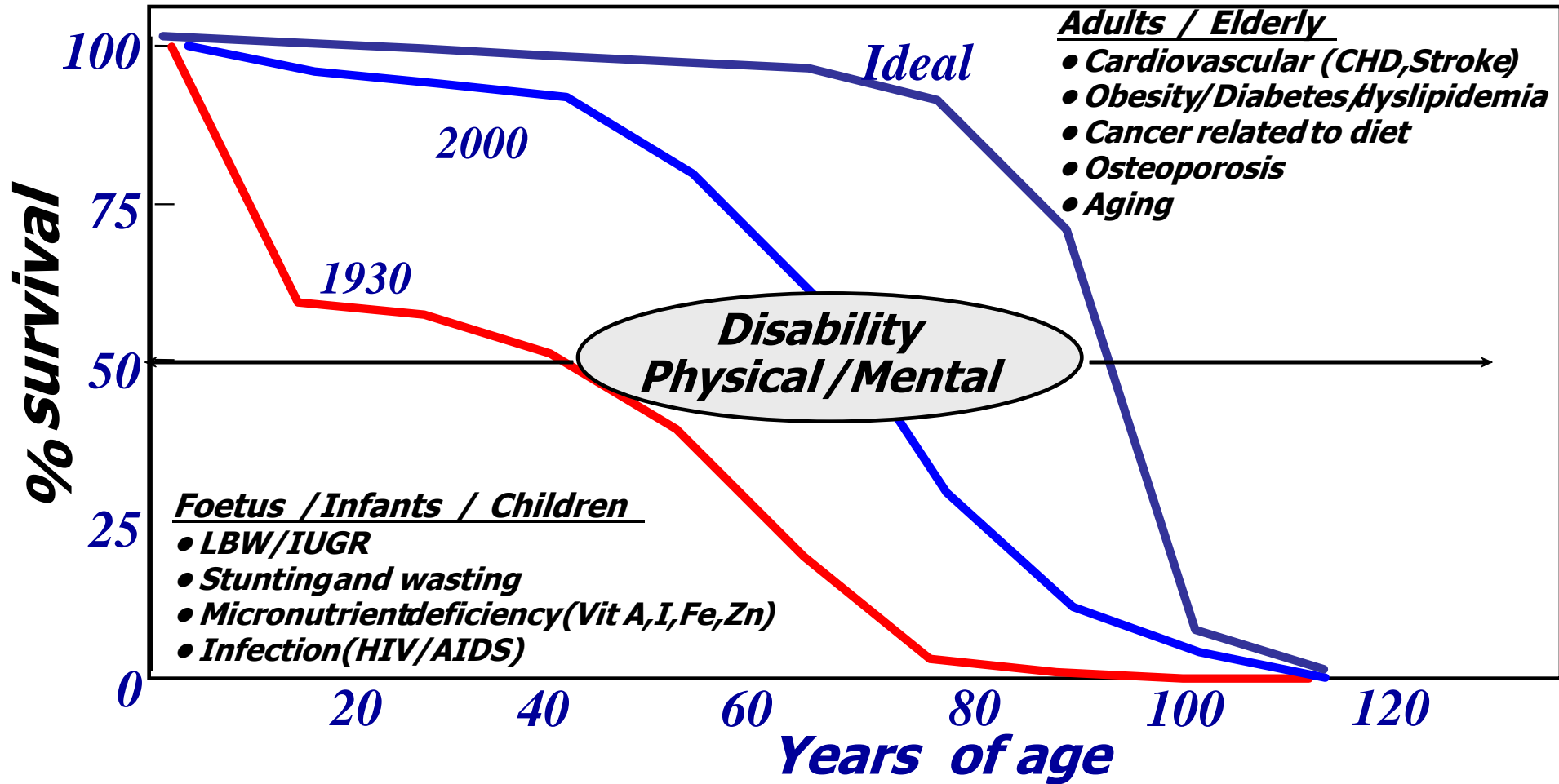
- Bajo Peso/RCIU
- Talla Baja y Desnutrición severa
- Deficit de micronutrientes (VitA,I,Fe,Zn,Fol)
- Infeccion (HIV/SIDA)

## ***Adultos / Personas Mayores***

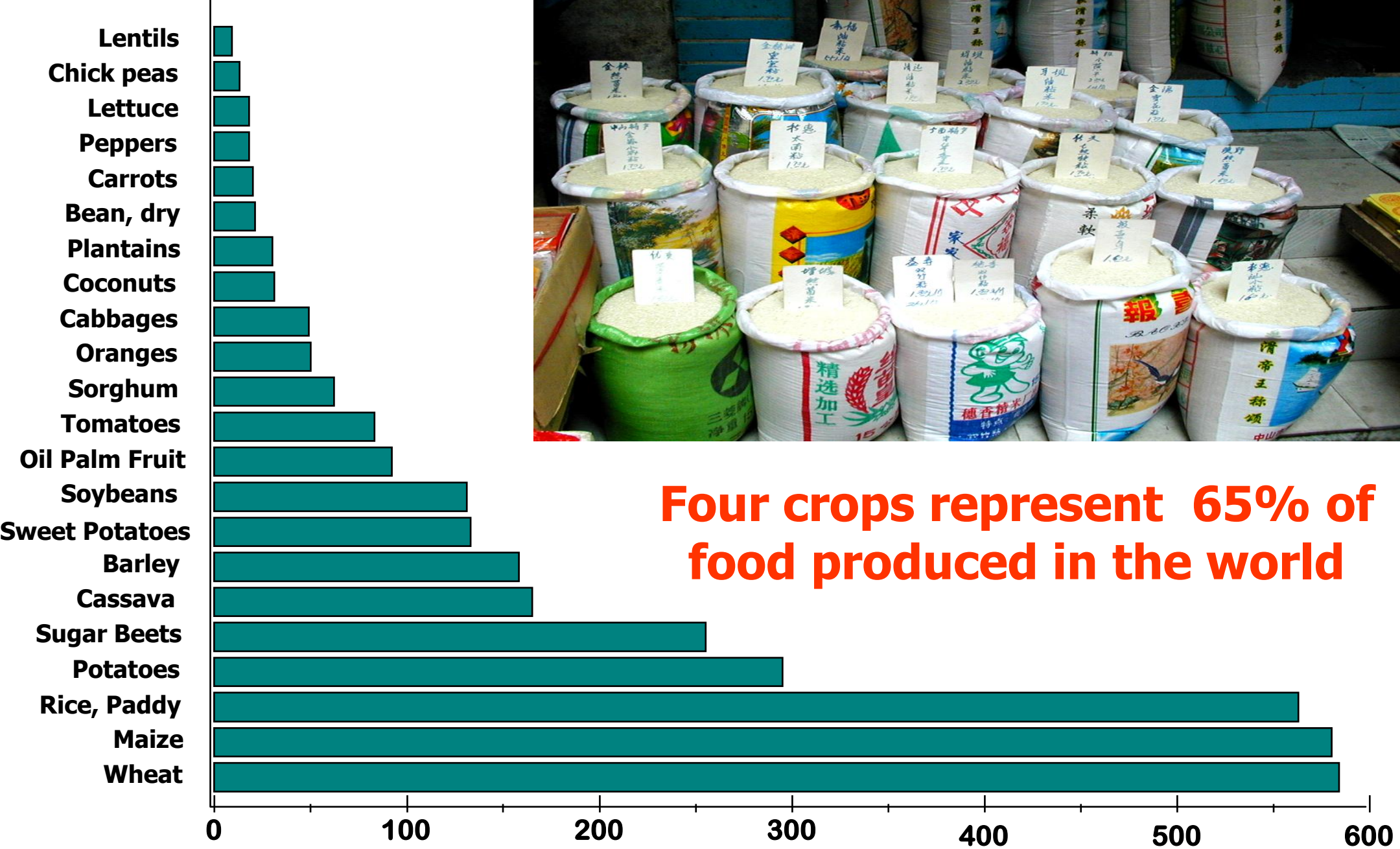
- Enf Cardiovascular
- Obesidad /Diabetes/ Dislipidemia
- Cancer relacionado con dieta y inactividad
- Osteoporosis, Caries
- Perdida funcional (vit D, B12, AGE n-3)



# ***Nutrition defines in great part how many will survive infancy & how they will live and die***



***Nutrition-Infection interactions determine in great part, how we grow physically and develop mentally,  
Nutrition-Physical activity interactions define how we will age and die.***



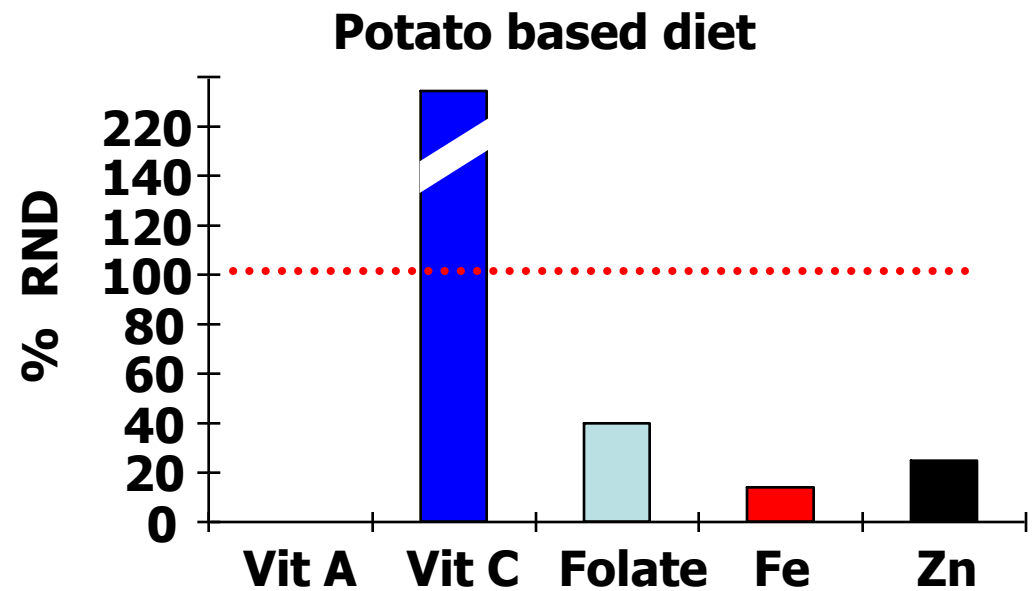
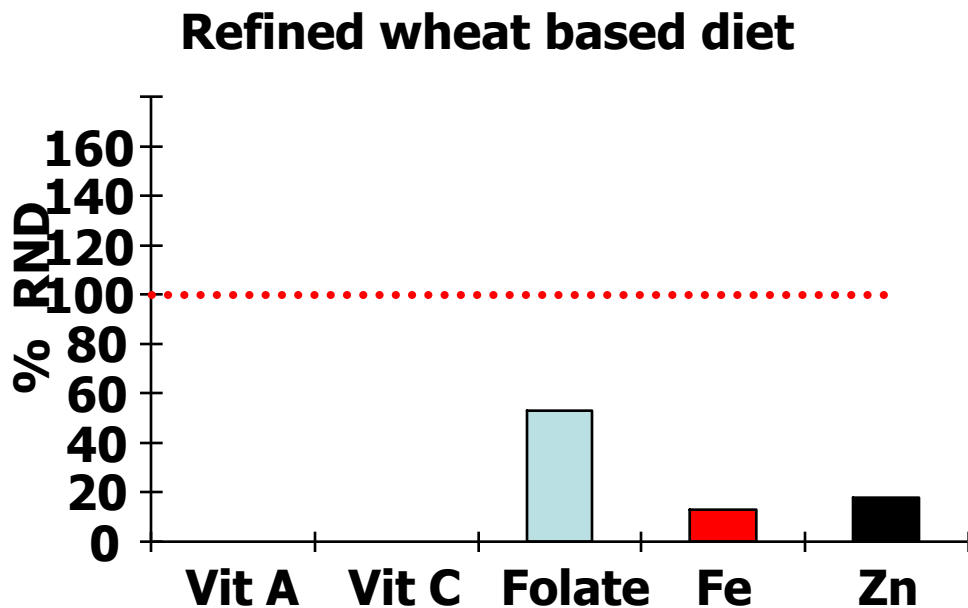
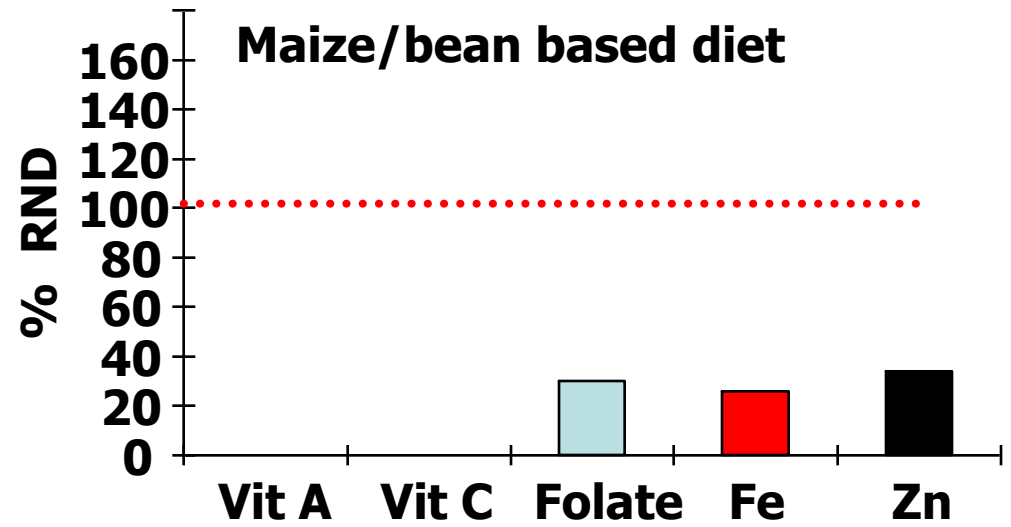
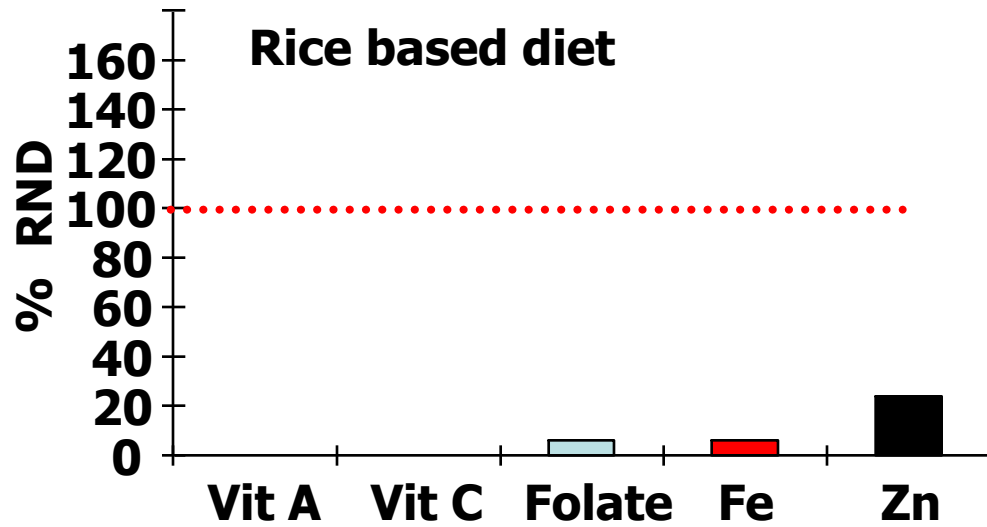
**Four crops represent 65% of food produced in the world**

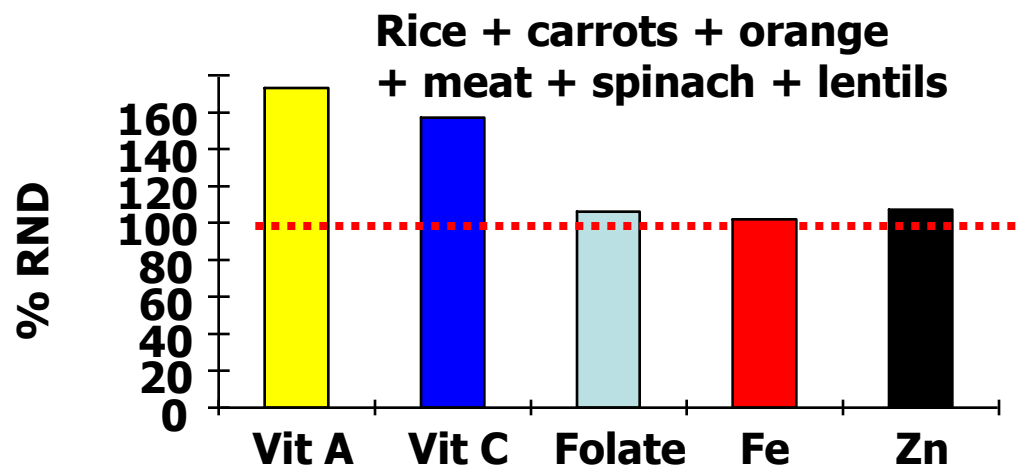
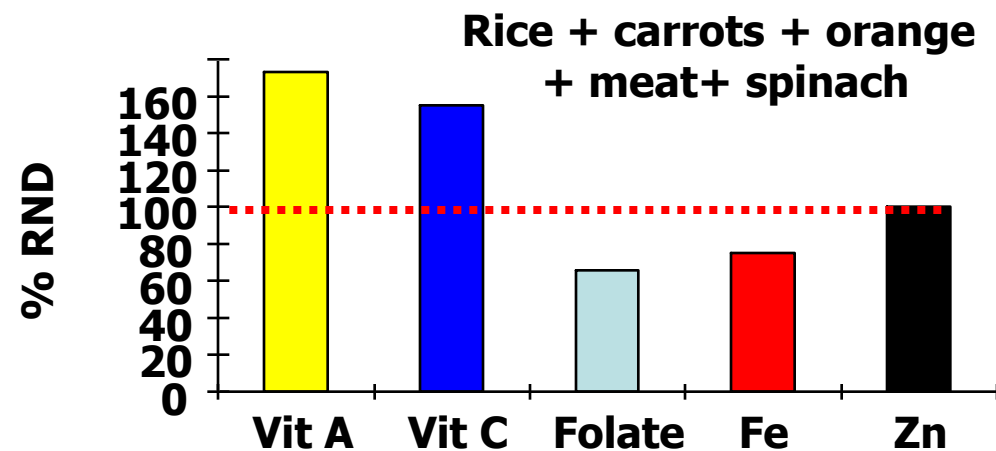
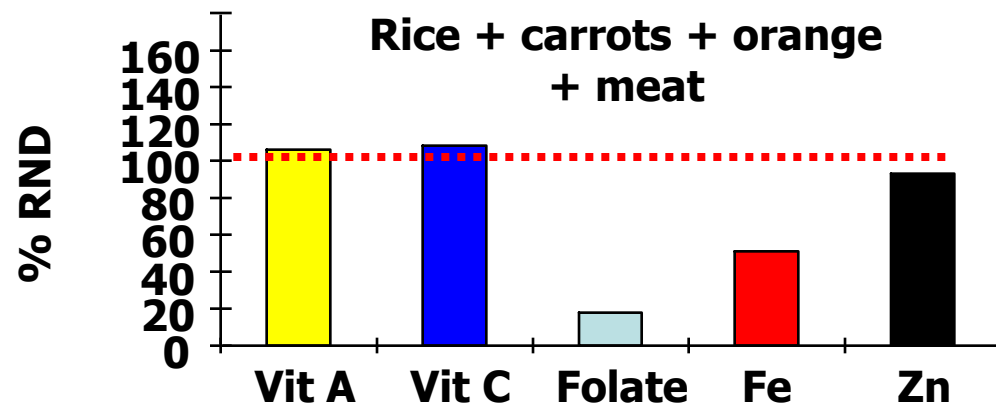
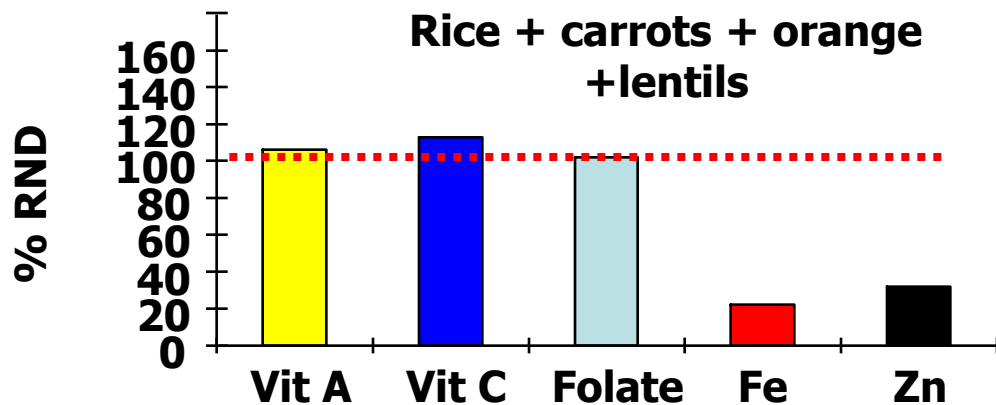
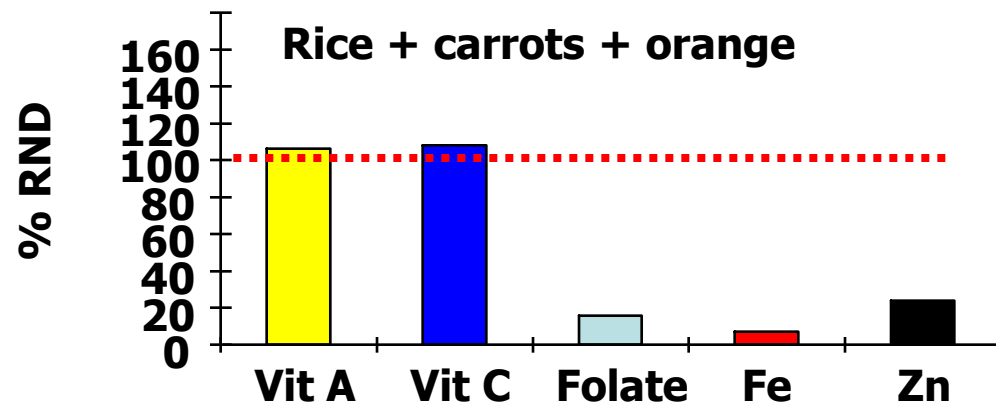
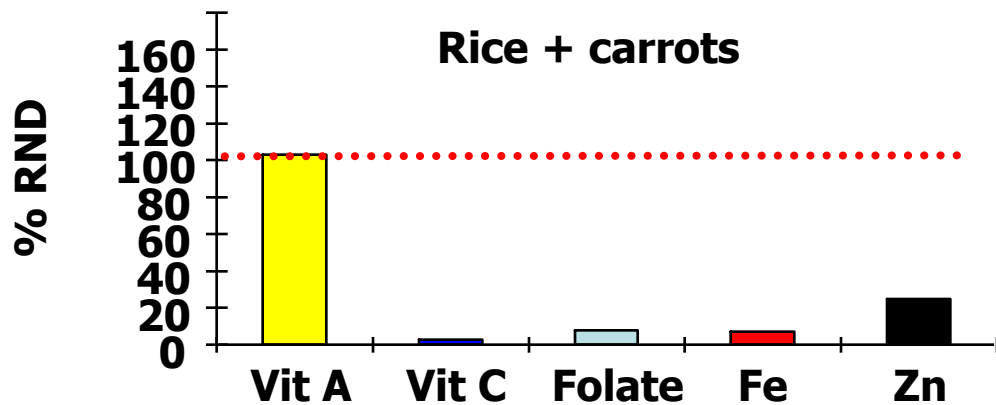
Mann, C. (1997)

**100,000 metric tons**



# Dietary diversity & healthy diets









SCIENCE COUNCIL

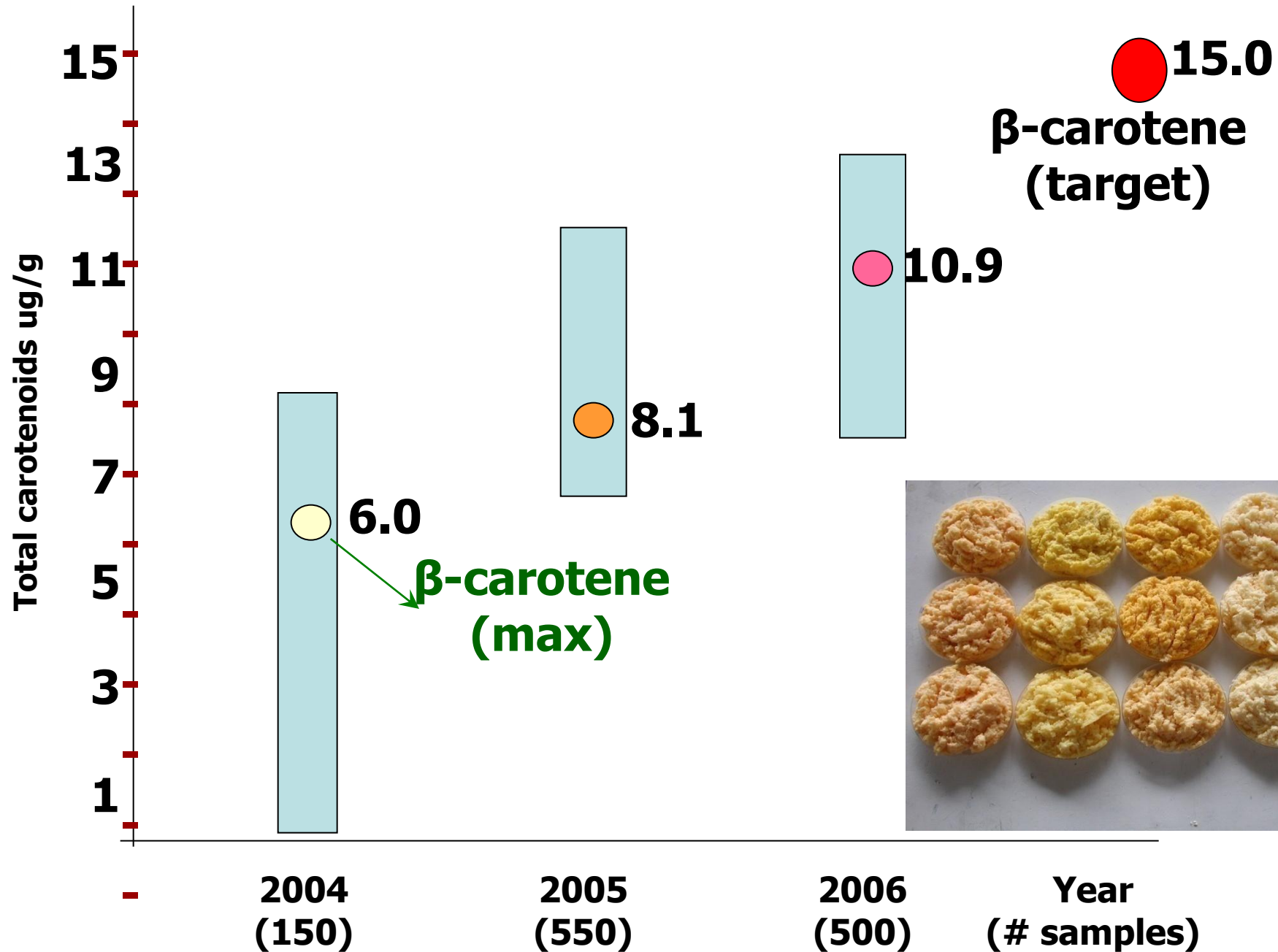
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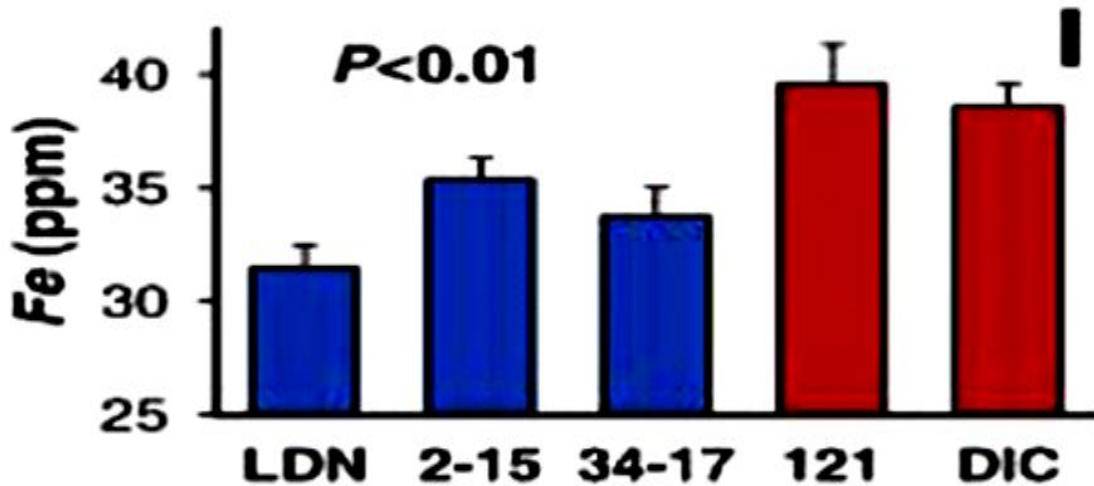
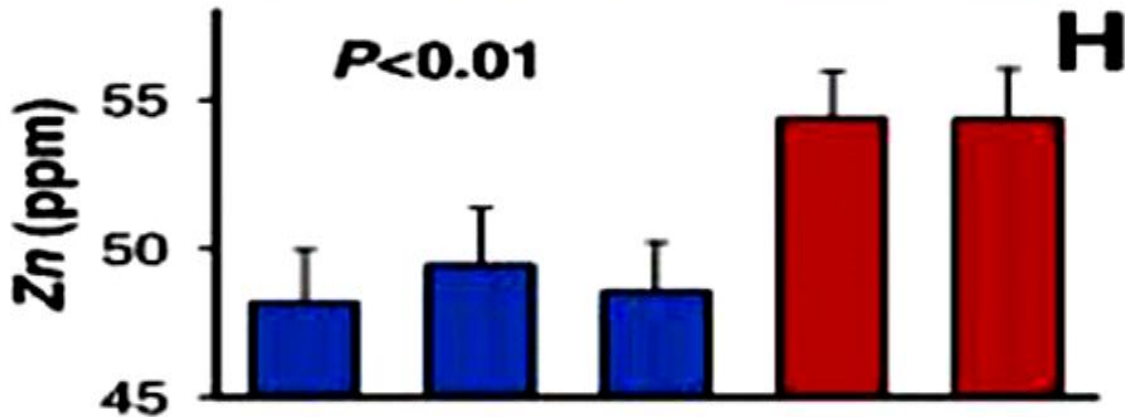
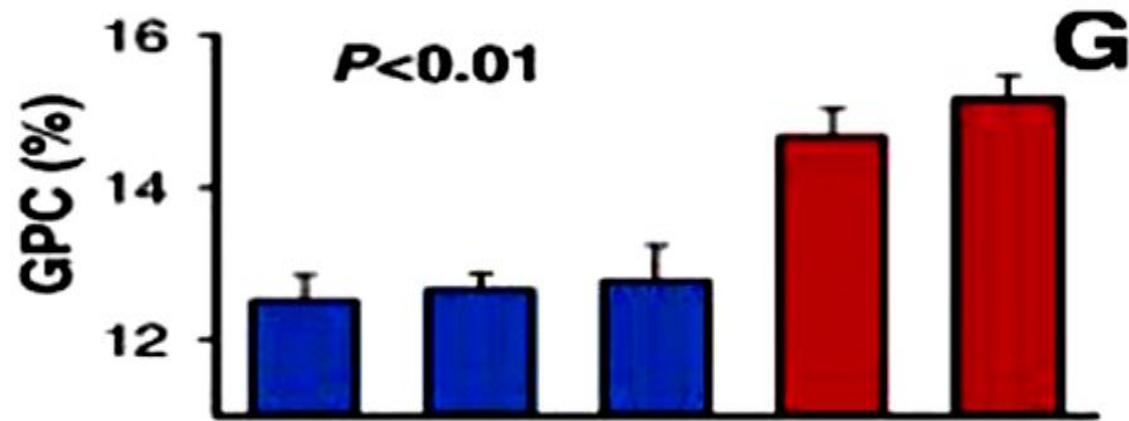
CGIAR

Report of the  
First External Review  
of the HarvestPlus  
Challenge Program

Review Panel: Ricardo Uauy (Chair)  
Markus Palenberg  
Abdul Hamid Zakri

# Total carotenoids in segregated population





*Use of natural allelic diversity... gene was lost in domestication.... bringing it back to wheat varieties increases GPC protein by 10-15%. Zn and Fe by 30-50 %*

*This gene is already deployed in 3 commercial varieties in CA and WA and is being used in CIMMYT crosses*



- **The quality of the diet has been recognized for many years to play a key role as a determinant of health and wellbeing of human populations.**
- **The solution of hunger and malnutrition is not achieved by providing only food energy in sufficient amounts, it should also be of adequate quality (micronutrient supply).**
- **Traditional, plant based low energy, nutrient rich diets are being replaced in developing & transitional countries by energy-dense (high fat-ref CHO) nutrient/fibre poor diets.**

## ***Goal 1: Eradicate extreme poverty and hunger.***

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Malnutrition erodes human capital through irreversible and intergenerational effects on cognitive and physical development.

## ***Goal 2: Achieve universal primary education.***

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Undernutrition reduces the chances that a child will go to school, stay in school, and perform well.

## ***Goal 3: Promote gender equality & empower women.***

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Inadequate access to food, health, and care resources by women and young girls may result in malnutrition.

Undernourished girls are more likely to drop out of school.

## ***Goal 4: Reduce child mortality.***

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Hunger and undernutrition are the underlying causes of roughly one third of the 10 million yearly preventable child deaths

## ***Goal 5: Improve maternal health.***

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Maternal stunting, anemia and a lack of iodine pose serious health problems which are associated with risk factors for maternal mortality.

## ***Goal 6: Combat HIV/AIDS, malaria, and other diseases.***

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Undernutrition compromises antiretroviral therapy, increases the risk of HIV transmission, and hasten the onset of symptomatic AIDS and premature death; undernutrition increases risk of death from malaria.



# •What would comprise an appropriate multi-sectoral response to the crisis?

Our CEO's choice, from The New York Times



# ***Strengthen Supply of Healthy Choices:***

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- **Optimize chain from farmer to consumer.**

Improvements in technology to produce and preserve food, less steps in commerce of fruits and vegetables.

- **Re-allocation of subsidies to agricultural and industrial food production.** Eliminate gradually subsidies to sugar, alcohol and animal food products. Provide incentives to consumption of healthy foods ( vegetables and fruits).

- **Trade regulations favoring consumption of healthy foods.** Prevent dumping of excess fat and sugar in developing countries.

- **Governments must practice what they preach:** School lunch programs, institutional feeding (hospitals, others) should set standards promoting healthy choices

# ***Strengthen Demand for Healthy Foods:***

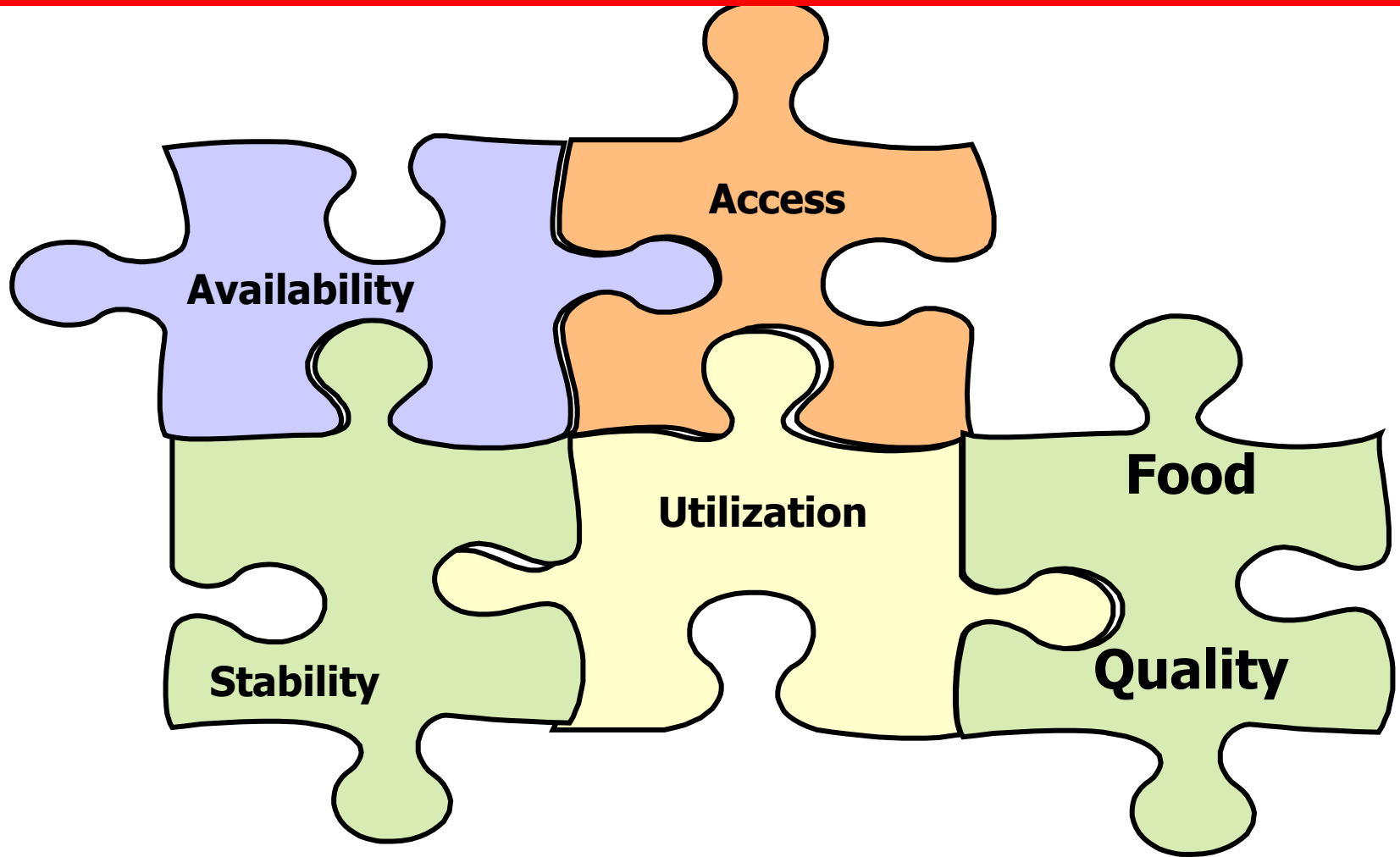
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- **Change relative price of foods:** Increase those that are less desirable and decrease price of healthy foods. i.e. low fat milk, subsidize fruits and vegetables
- **Facilitate the selection and consumption of healthy foods for lowest price:** Consumer cooperatives, “Best buy” nutrient dense energy dilute foods for lowest price.
- **Provide information to consumer at place of food sale** (Supermarket). Implement dietary guidelines, simple format leaflets. Nutritional Info Booth independent of commercial interests.

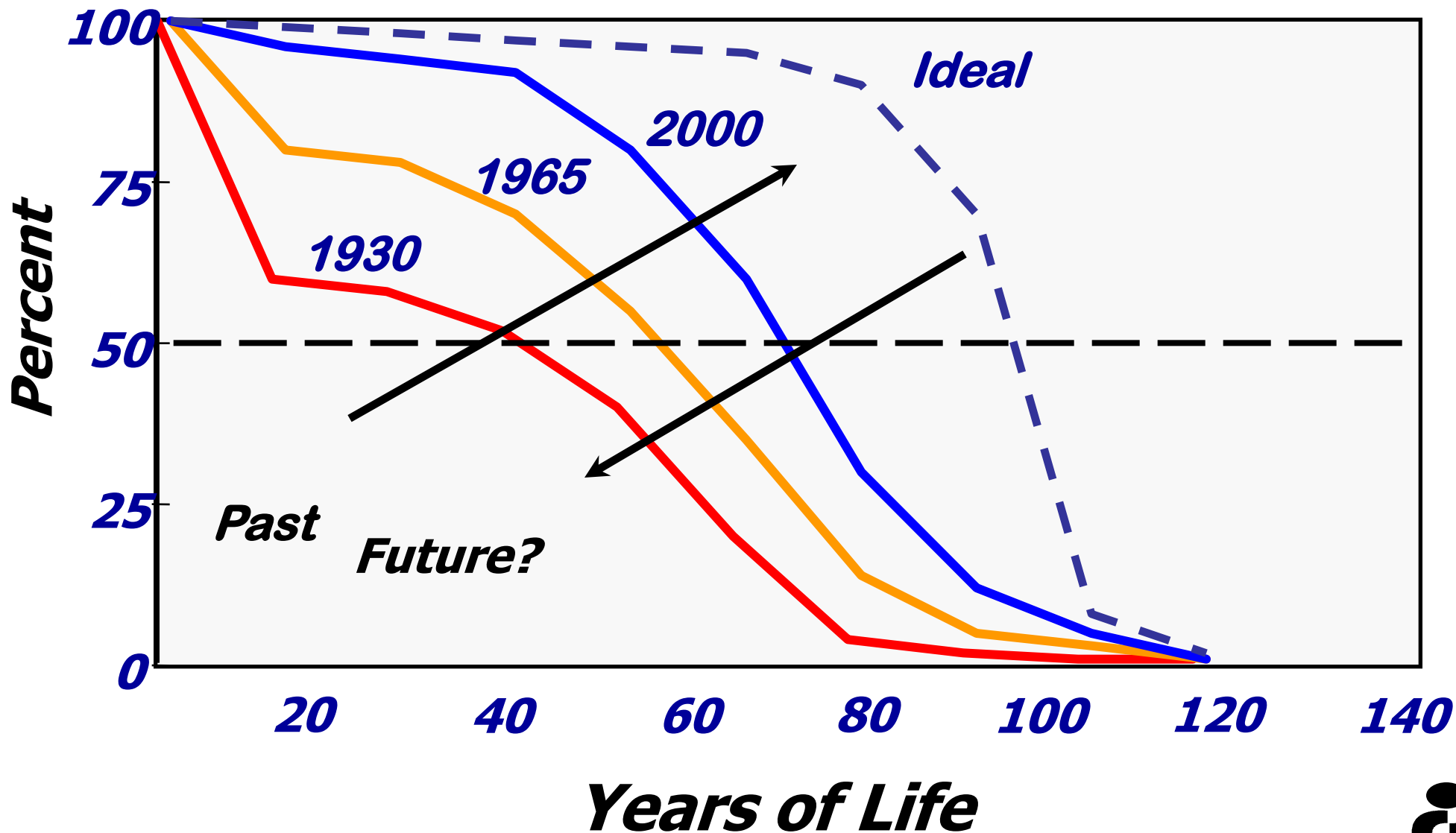


# Dimensions of food-nutrition-health security

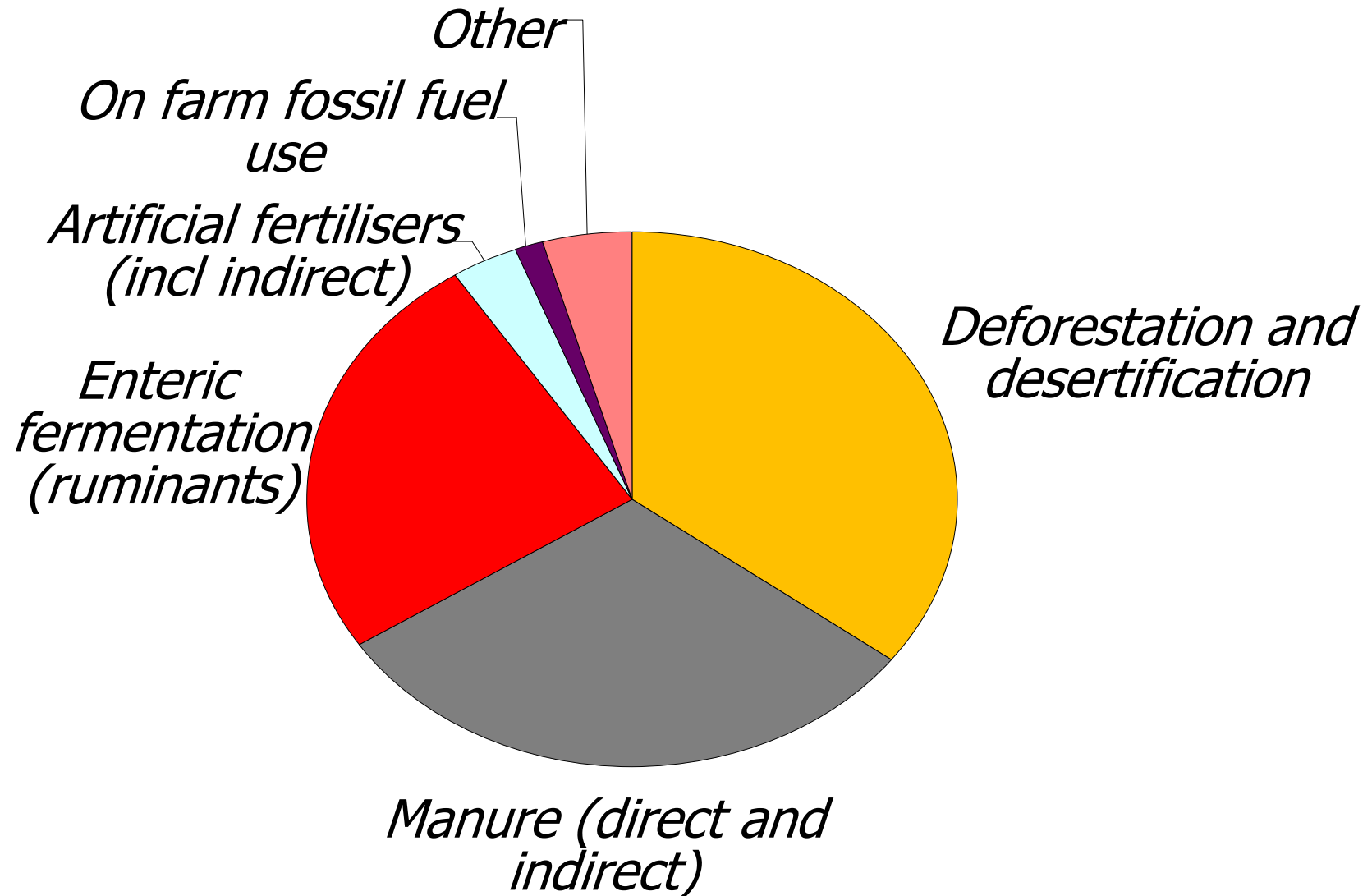
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# Changes in Life Expectancy

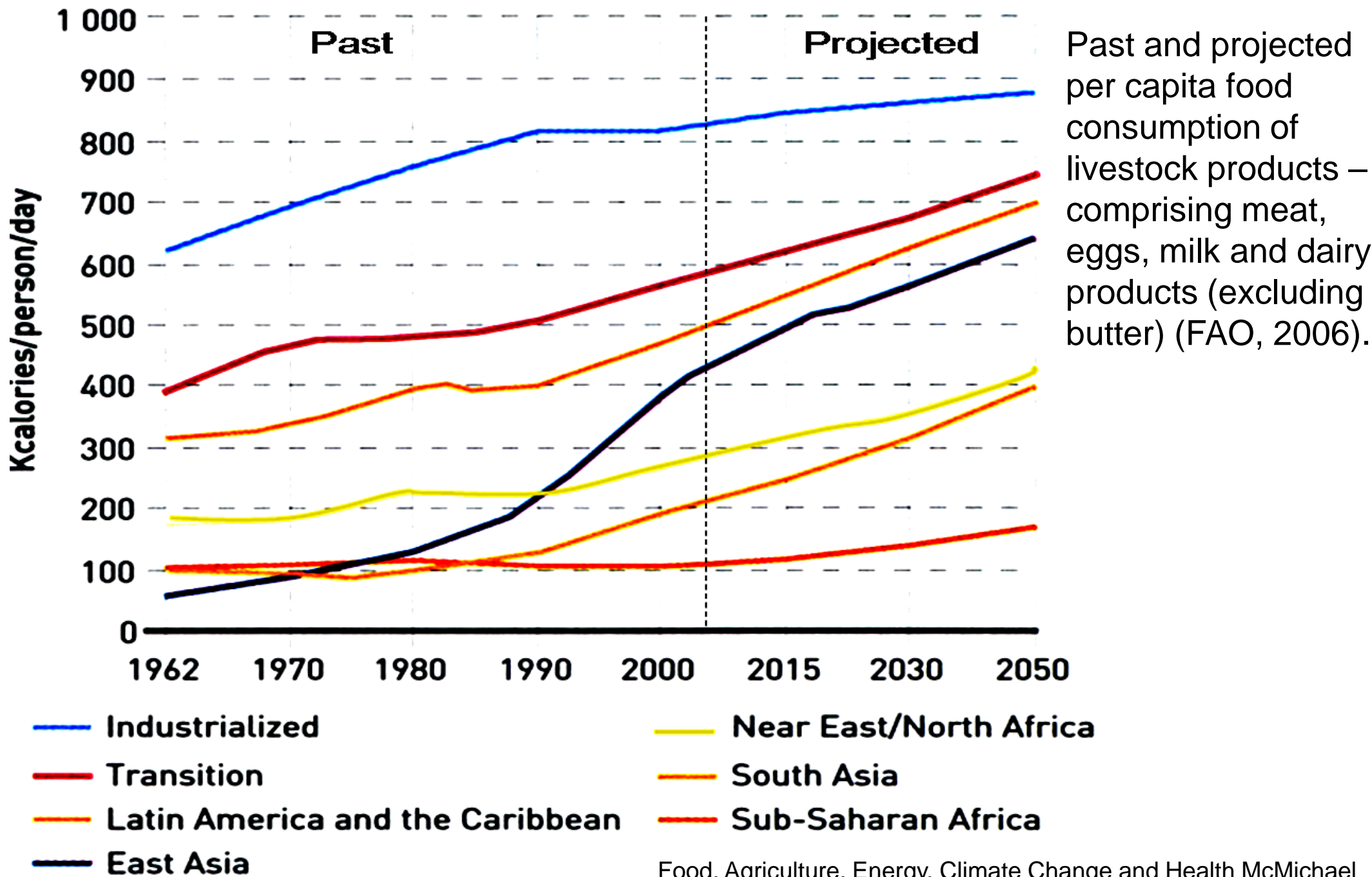


# Sources of green house gas emissions from livestock production\*



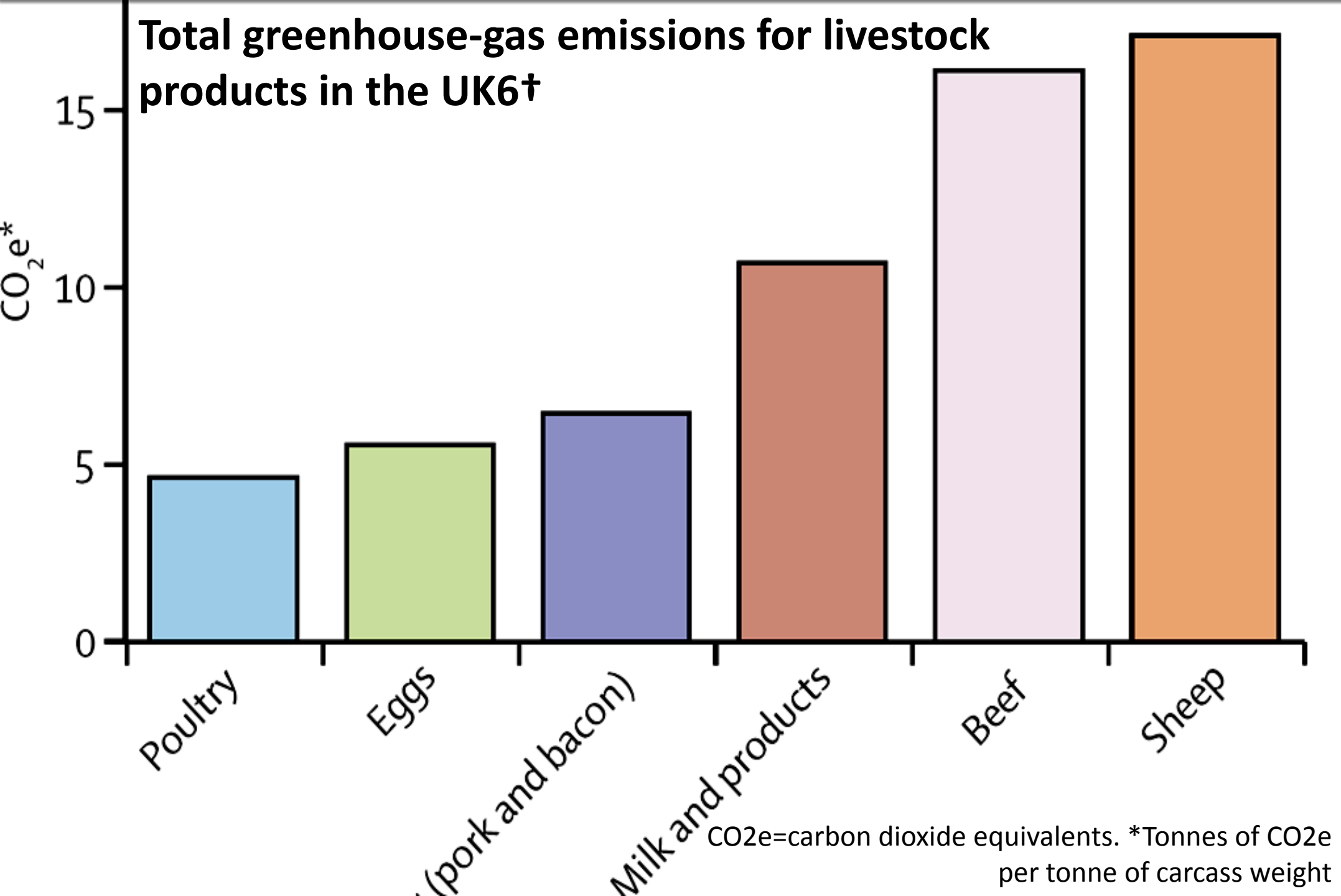
\* including feed production and associated land use and land use changes





Past and projected per capita food consumption of livestock products – comprising meat, eggs, milk and dairy products (excluding butter) (FAO, 2006).

# Total greenhouse-gas emissions for livestock products in the UK6†



# Model of food production is unsustainable & unhealthy

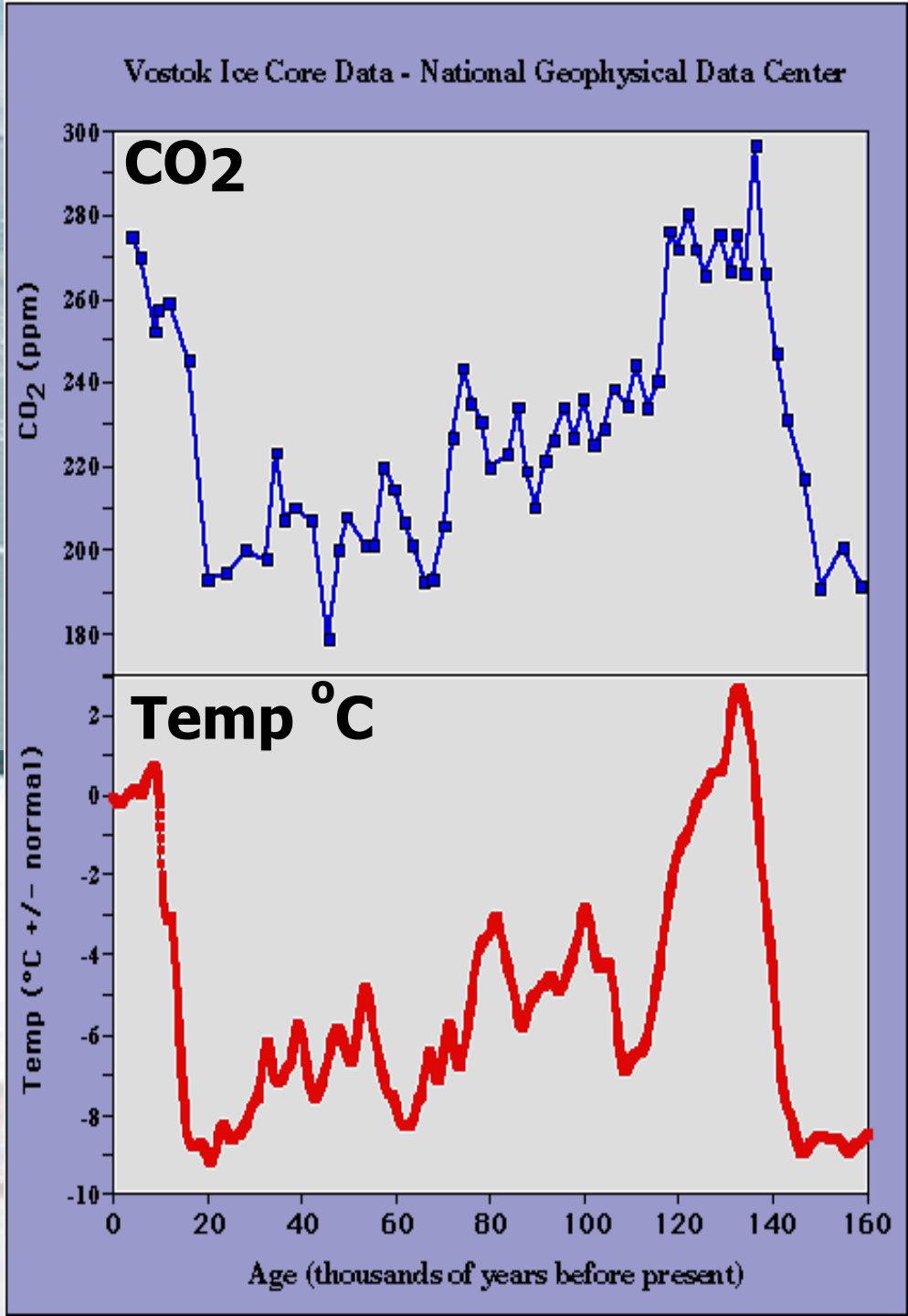
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- People that can be fed in a year per hectare ranges from 22 for potatoes to 19 for rice down to 1-2 people for beef & lamb.
- The low conversion ratio from feed to meat is of concern since cereal grain food produced is diverted to livestock production. Animals displace the poor in purchasing power.
- Land and water requirements for meat production is a major concern with the increasing demand for animal products leading to intensive (factory-type) livestock production.
- New food safety (microbiologic & chemical) and environmental concerns are created by intensive food production systems



**Food/Agriculture sector GHG emissions account for around 22% of global total emissions – similar to industry’s contribution and greater than that of transport.**

**Livestock production (including transport of livestock and feed) accounts for nearly 80% of the sector’s emissions**



# ***The five key actions are as follows:***

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- 1. Switching to a diet with lower environmental and social impacts (eg. by eating fewer meat and dairy products).***
  - 2. Wasting less food in the home.***
  - 3. Avoid fish from unsustainable stocks; promote fish farming.***
  - 4. Switching to more seasonal and local food.***
  - 5. Increasing consumption of organic or certified / assured food and drink (including FairTrade).***
- 

***Broadly speaking, eating fewer meat and dairy products and consuming more plant foods in their place is probably the single most helpful behavioural shift one can make.***

# Nueva Disciplina: Agri-Salud

## Miembros Grupo Agri-Salu

- **Jeff Waage (LIDC)**
- **Katharina Stärk (RVC)**
- **Jonathan Rushton (RVC)**
- **Andrew Dorward (SOAS)**
- **Harry West (SOAS)**
- **Karen Lock (LSHTM)**
- **Alan Dangour (LSHTM)**
- **Ricardo Uauy (LSHTM/INTA)**





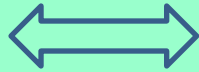
# Conclusiones

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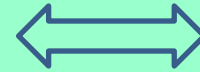
- Existe una demanda creciente por un enfoque integrado de los temas de agricultura, nutrición y salud.
- La respuesta a esta demanda requiere realizar una mirada holística de los problemas y una evolución hacia una mayor integración interdisciplinaria
- Se requiere generar estructuras y espacios compartidos y formación de grupos multi/interdisciplinarios para responder a los desafíos de AGRISALUD
- Debemos ser capaces de imaginar nuevos enfoques, invertir en los mas jóvenes, acelerar el paso para alcanzar metas mas ambiciosas

# AGRI-SALUD: Conceptos Fundamentales

Establece un  
**Nuevo Paradigma  
AGRISALUD**



Mejora la  
comprensión de  
**TEMAS GLOBALES  
COMPLEJOS**

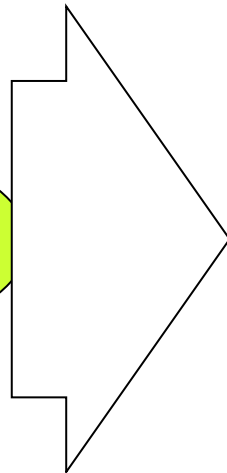


Entregándonos  
**HERRAMIENTAS** para  
Afrontar problemas tales como:

**AGRICULTURA**

Visión Unificadora,  
Enfoque/Metodologías  
**COMPARTIDAS**

**SALUD**



Desarrollo Humano  
y Reducción de  
La Pobreza

Cambio Climático  
Mitigación y  
Adaptación

Globalización,  
Migraciones  
y Comercio

- Falta integración entre producción de **alimentos, la nutrición y salud**
- Romper el ciclo vicioso de la **Pobreza y Malnutrición**
- 'Doble carga' de enfermedad **Malnutrición en todas sus formas**

- Efecto de la ganadería en las emisión de **gases INVERNADERO**, y la sustentabilidad de la agricultura
- Manejo de recurso **agua para la agricultura & el saneamiento**

- Riesgos para la Salud y el Ingreso relacionados con los cambios en los sistemas alimentarios globales & supermercados y venta masiva
- Amenaza de afecciones Zoonoticas y contaminación de los alimentos

# Los tres componentes clave

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- **“Perspectiva/Mirada amplia” – base teórica y principios generales**  
Concebir una **DIETA para un PLANETA MAS SALUDABLE**
- Construir y evaluar nuevas mediciones para describir las **consecuencias de la innovación agrícola en la nutrición y salud .**
- **Establecer un programa de investigación novedoso en Agri-Salud** nuevas herramientas incluyendo **estudios experimentales** grupo consultivo, revisión por pares capaces de imaginar programa de conferencias y talleres