



PROTEINS: the often neglected nutrient in development

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OUTLINE of PRESENTATION

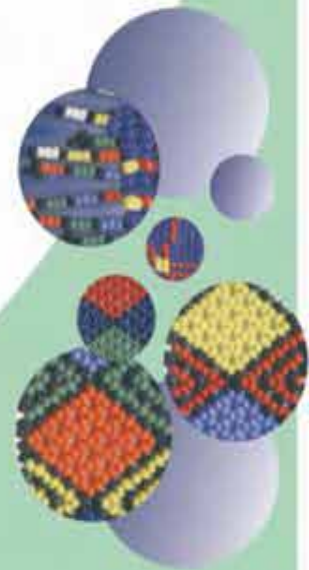
- The role of protein in the human diet
- Reasons for neglect
- Consequences
- Conclusions and recommendations



HUMAN DIET

- Energy
- Carbohydrates
- Fats
- Protein

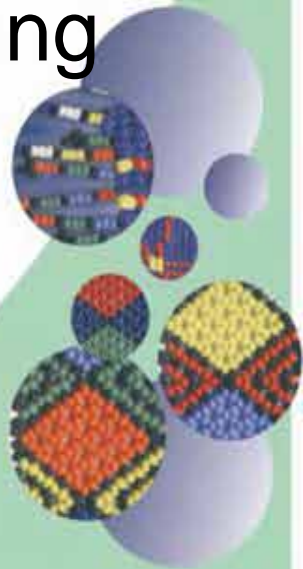
- Vitamins
- Minerals



WHAT is PROTEIN?

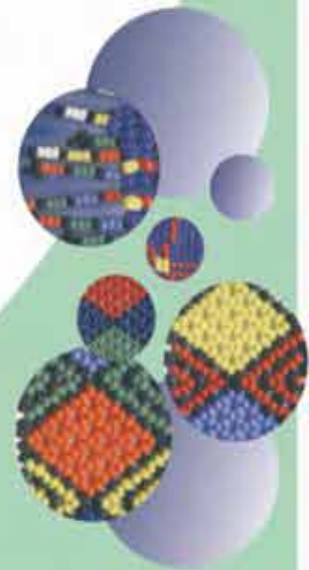
- A vital structural and working substance in **all** cells in the human body
- “Of prime importance” – Greek meaning

(Mahan & Escott-Stump, 2004; Whitney & Rolfes, 2008)



STRUCTURE OF PROTEIN

- Amino acids (20)
= building blocks of proteins
- Essential (9)
= body cannot synthesize
must be provided by diet/foods
- Non-essential (11)
= body can synthesize from essential amino acids



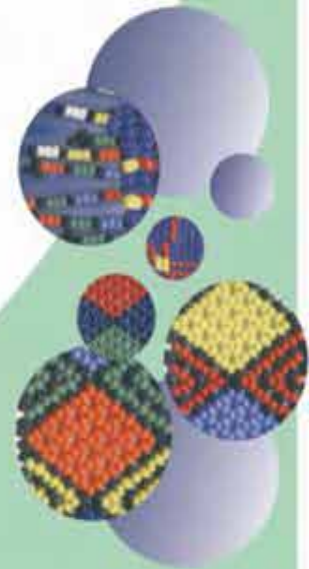
PROTEIN QUALITY

Complete Protein

Contains the essential amino acids in the right proportions to promote growth and maintenance of the body

- Animal sources are complete proteins
 - Eggs (gold standard)
 - Milk, cheese
 - Meat, fish poultry
 - Only plant food = soy beans

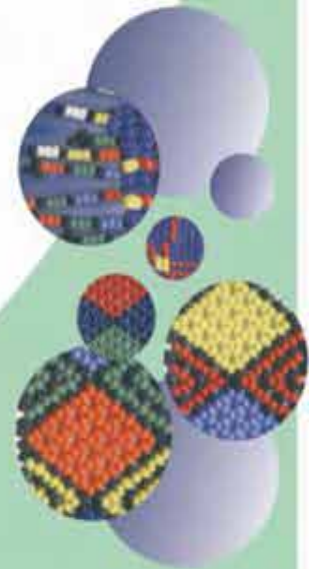
(Mahan & Escott-Stump, 2004; Whitney & Rolfes, 2008)



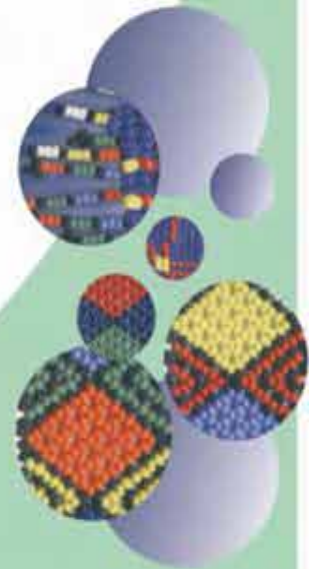
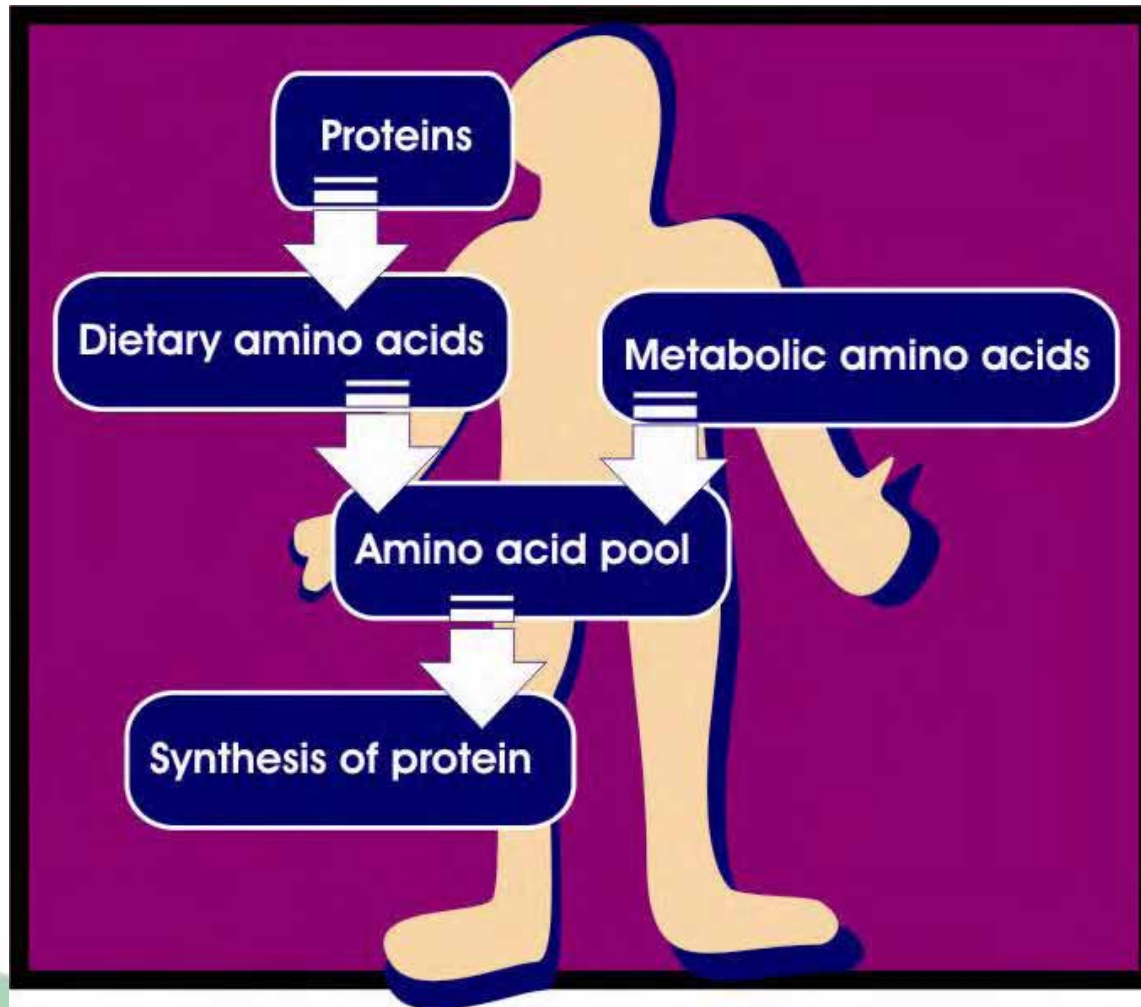
INCOMPLETE PROTEINS

- Foods that are missing or low in one or more of the essential amino acids.
- Plant sources are incomplete proteins
 - Legumes: beans, peas, lentils
 - Cereals: rice, wheat, oats

(Mahan & Escott-Stump, 2004; Whitney & Rolfes, 2008)



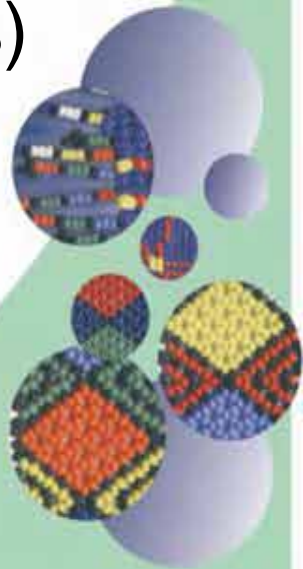
SYNTHESIS of PROTEIN in the BODY



FUNCTIONS of PROTEIN in the BODY

- Provision of amino acids
- Building materials for growth and maintenance of blood, muscle and skin
- Act as enzymes (facilitate chemical reactions)
- Part of hormones (regulate body processes)
- Regulators of fluid balance
- Antibodies (inactivate foreign invaders)
- Source of energy and glucose

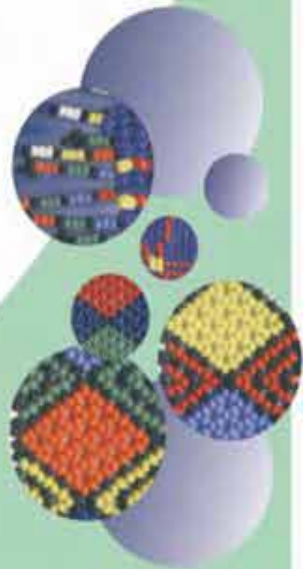
(Mahan & Escott-Stump, 2004; Whitney & Rolfes, 2008)



PROTEIN REQUIREMENTS

- **Dietary goal = 15-20% of total energy intake**
- **RDA = 0.8g protein/ kg body mass/ day (adult)**

(Institute of Medicine, 2003)



ENERGY & PROTEIN DEFICIENCY DISEASES

Kwashiorkor

- A protein deficiency occurs even though energy intake is adequate.

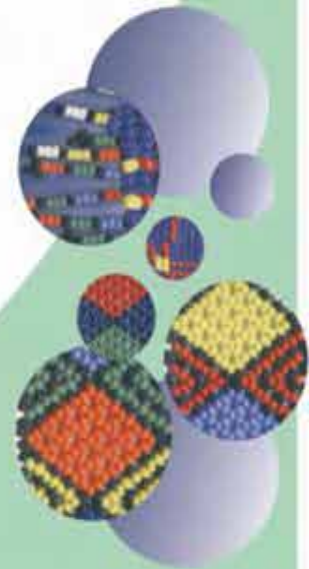
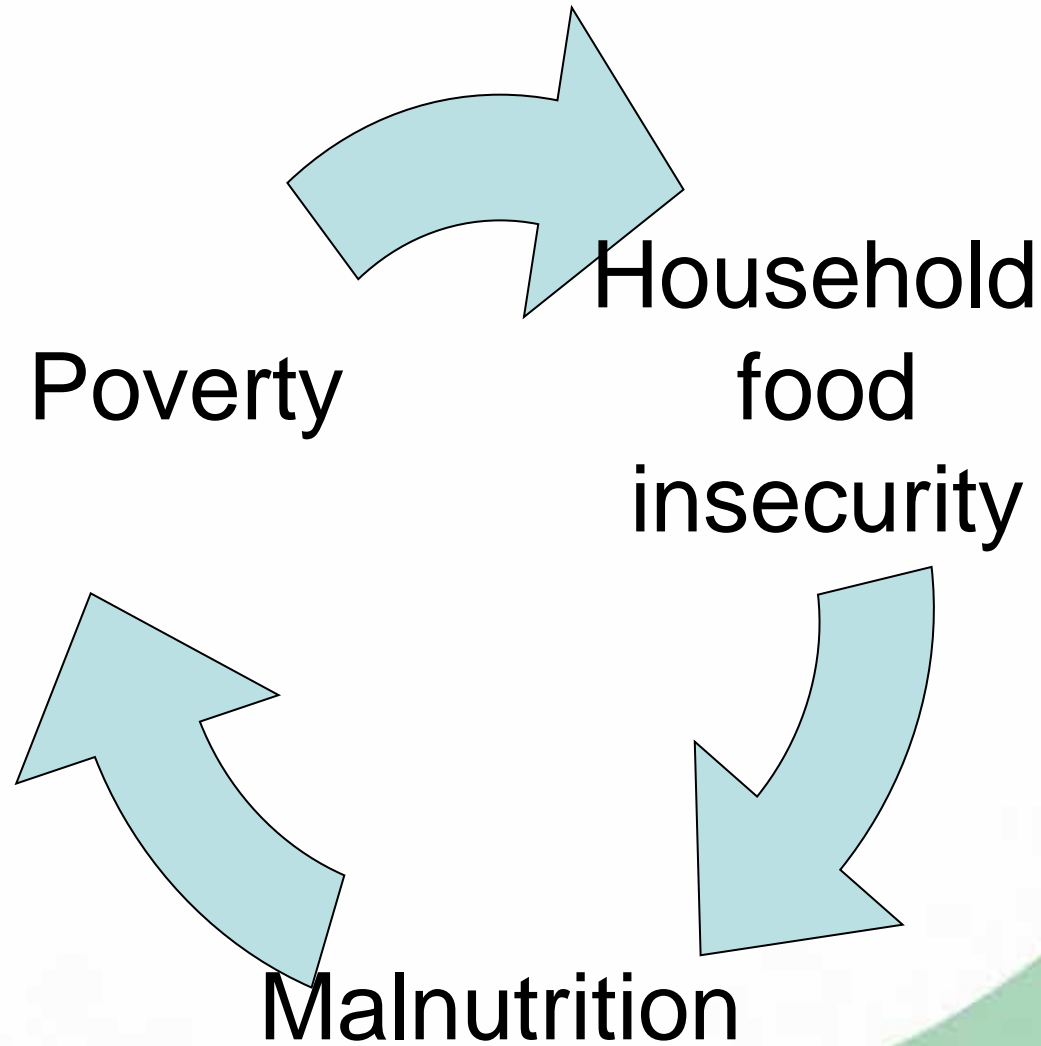
Marasmus

- Protein deficiency resulting from low energy intake.
- The dietary protein used for energy.

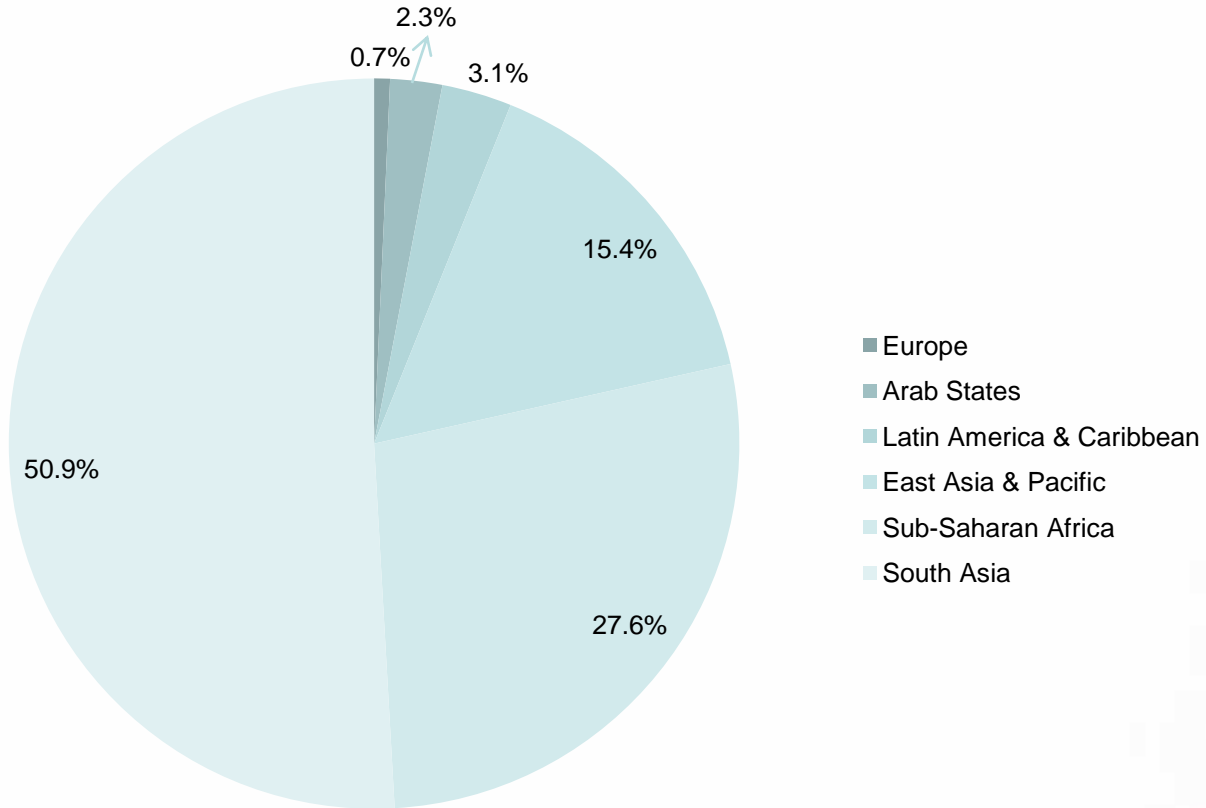
Both most lethal form of malnutrition



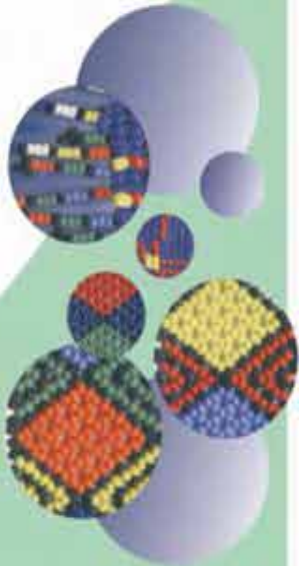
VICIOUS CIRCLE of POVERTY and HUNGER



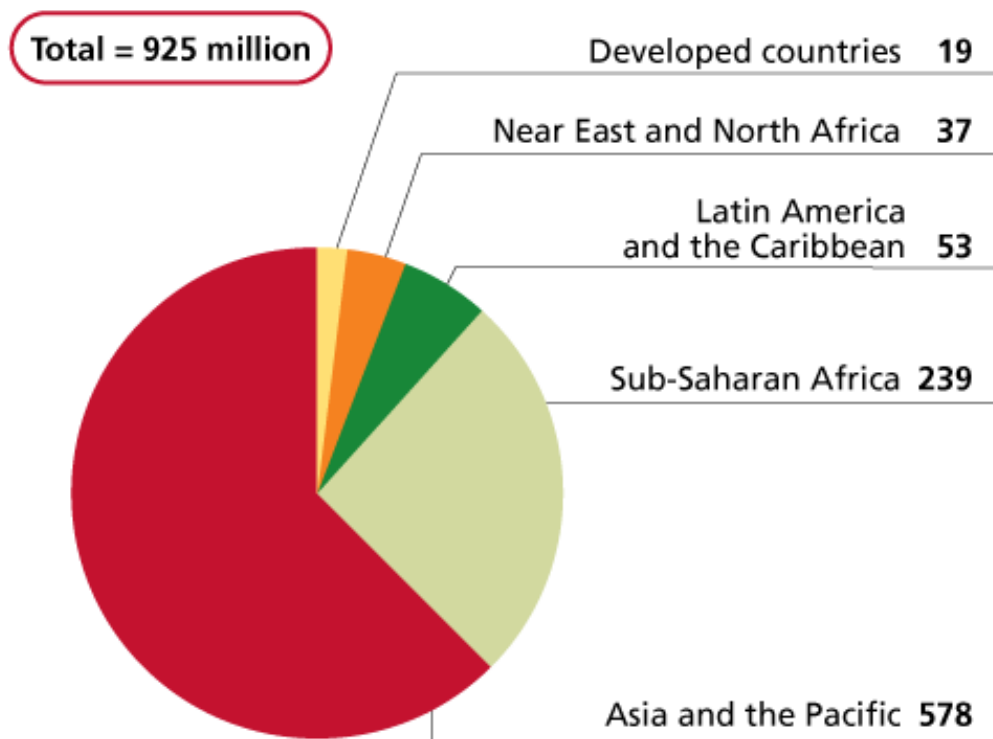
DISTRIBUTION of the POOR in DEVELOPING COUNTRIES



IFPRI. 2010. Global hunger index.

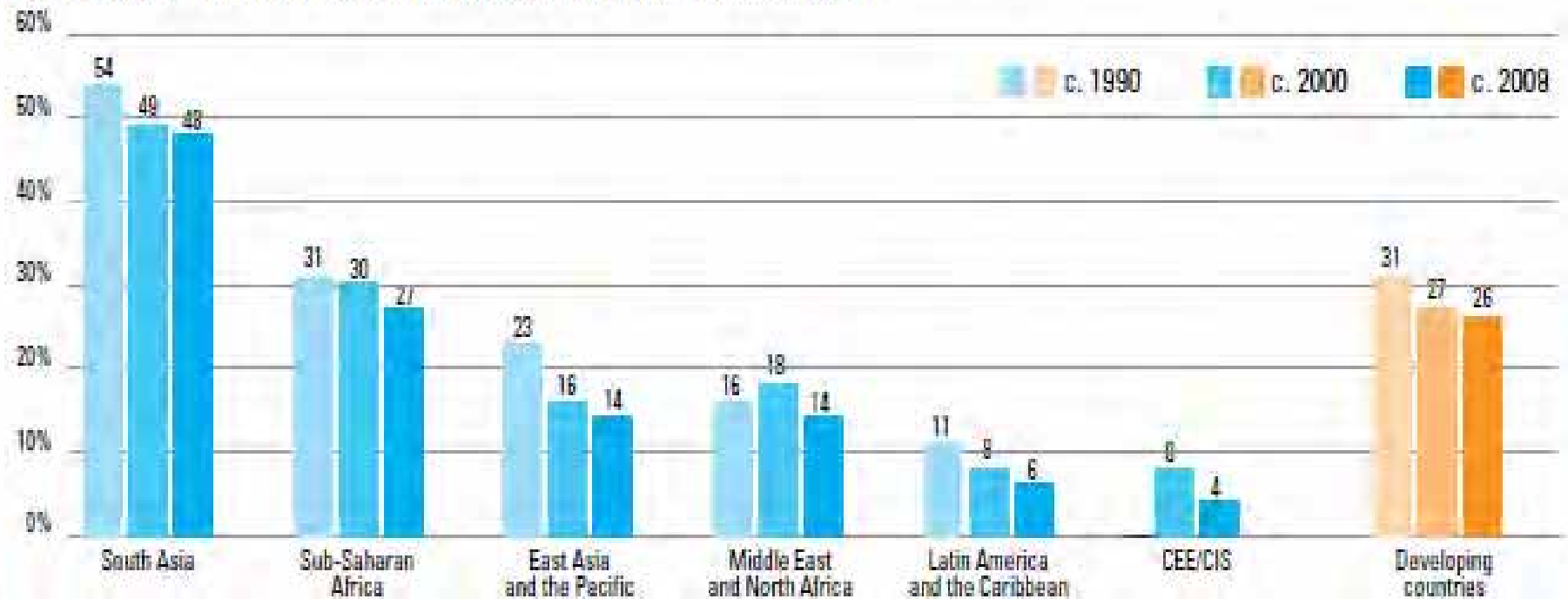


PREVALENCE of HUNGER GLOBALLY



The UNDERNOURISHED in DEVELOPING COUNTRIES and AFRICA

Percentage of children 0–59 months old who are underweight, by region

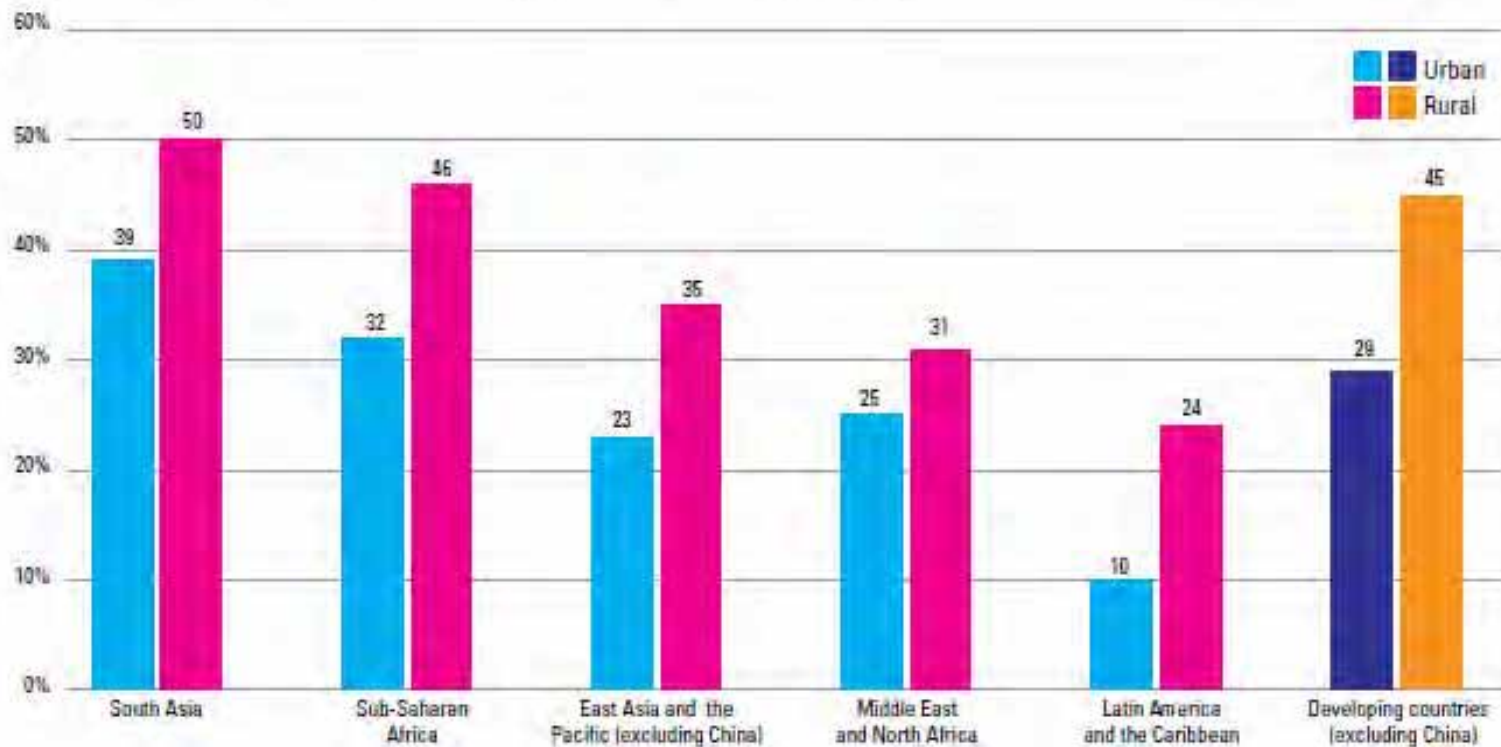


UNICEF. 2010. Progress for children. Achieving the MDGs with equity. Number 9.



The STUNTED in DEVELOPING COUNTRIES and AFRICA

Percentage of children 0–59 months old who are stunted, by area of residence



UNICEF. 2010. Progress for children. Achieving the MDGs with equity. Number 9.

FOOD PRICES



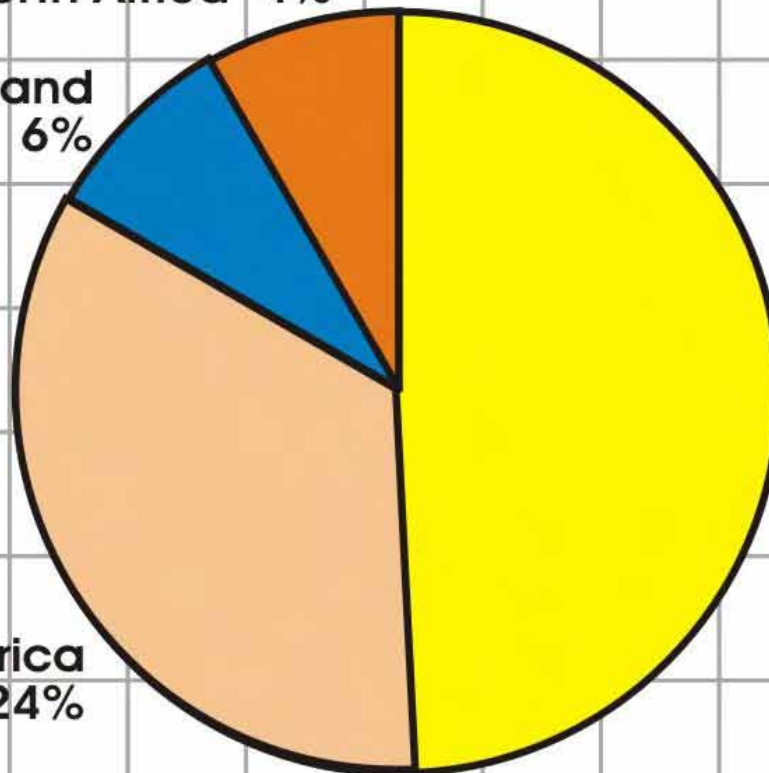
Regional impacts of high food prices: additional undernourished in 2007 (millions) (FAO, 2008)

Near East and North Africa 4%

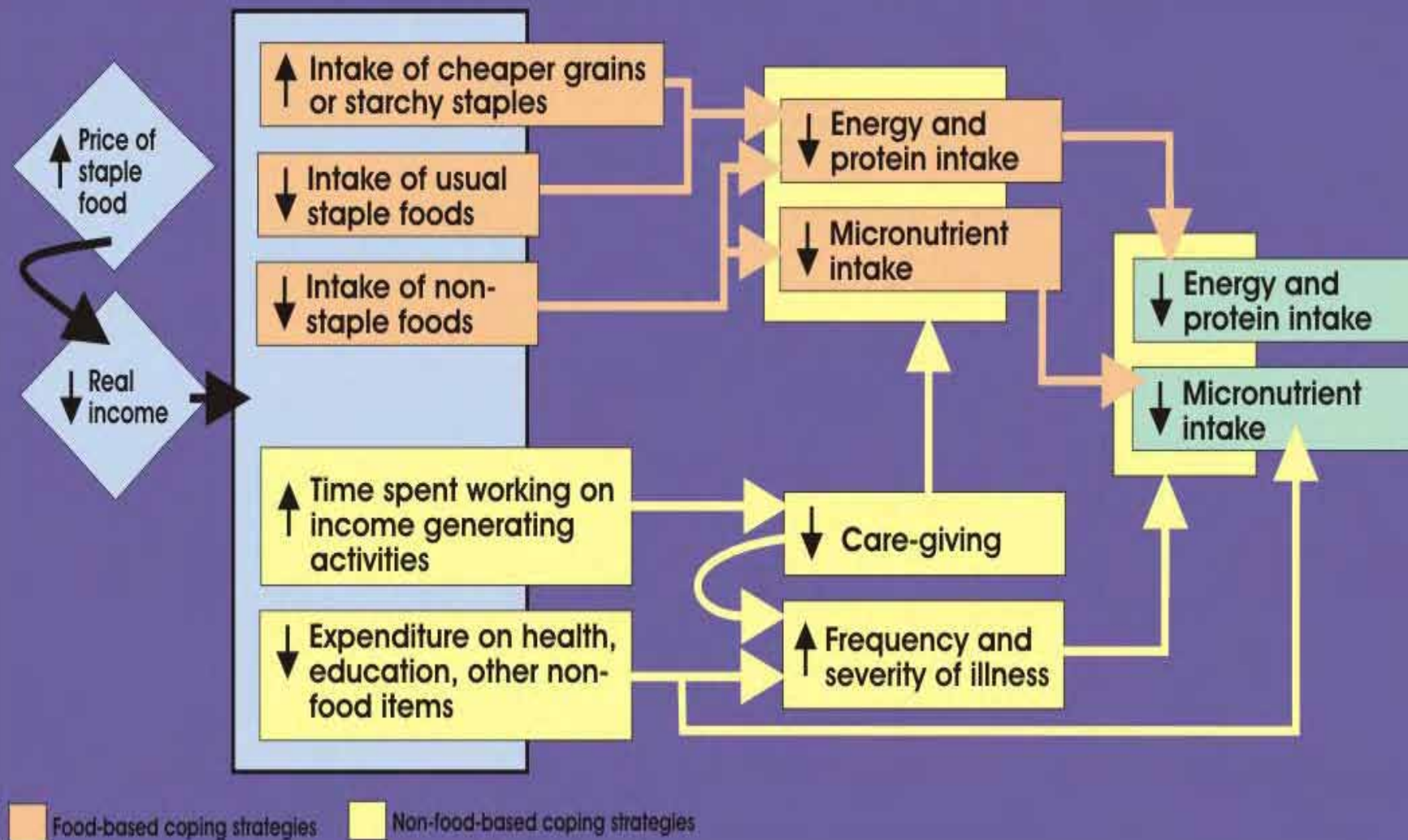
Latin America and the Caribbean 6%

Sub-Saharan Africa 24%

Asia and the Pacific 41%



Household coping behaviours and nutrition impacts following a sudden rise in food prices (FAO, 2008)



COPING DIET

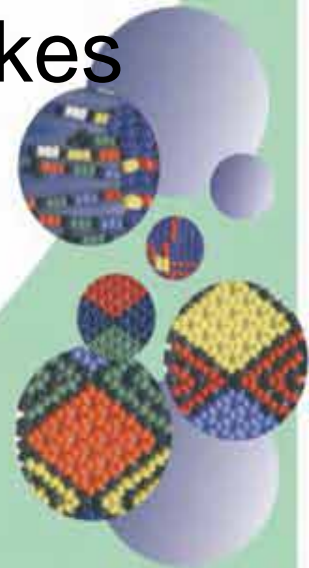
- Cheaper staples / carbohydrate-rich foods



- Poor-quality monotonous diet nutritionally inadequate in protein, fat & micronutrients
- Energy intake may still be sufficient, but both macro-and micronutrient intakes compromised



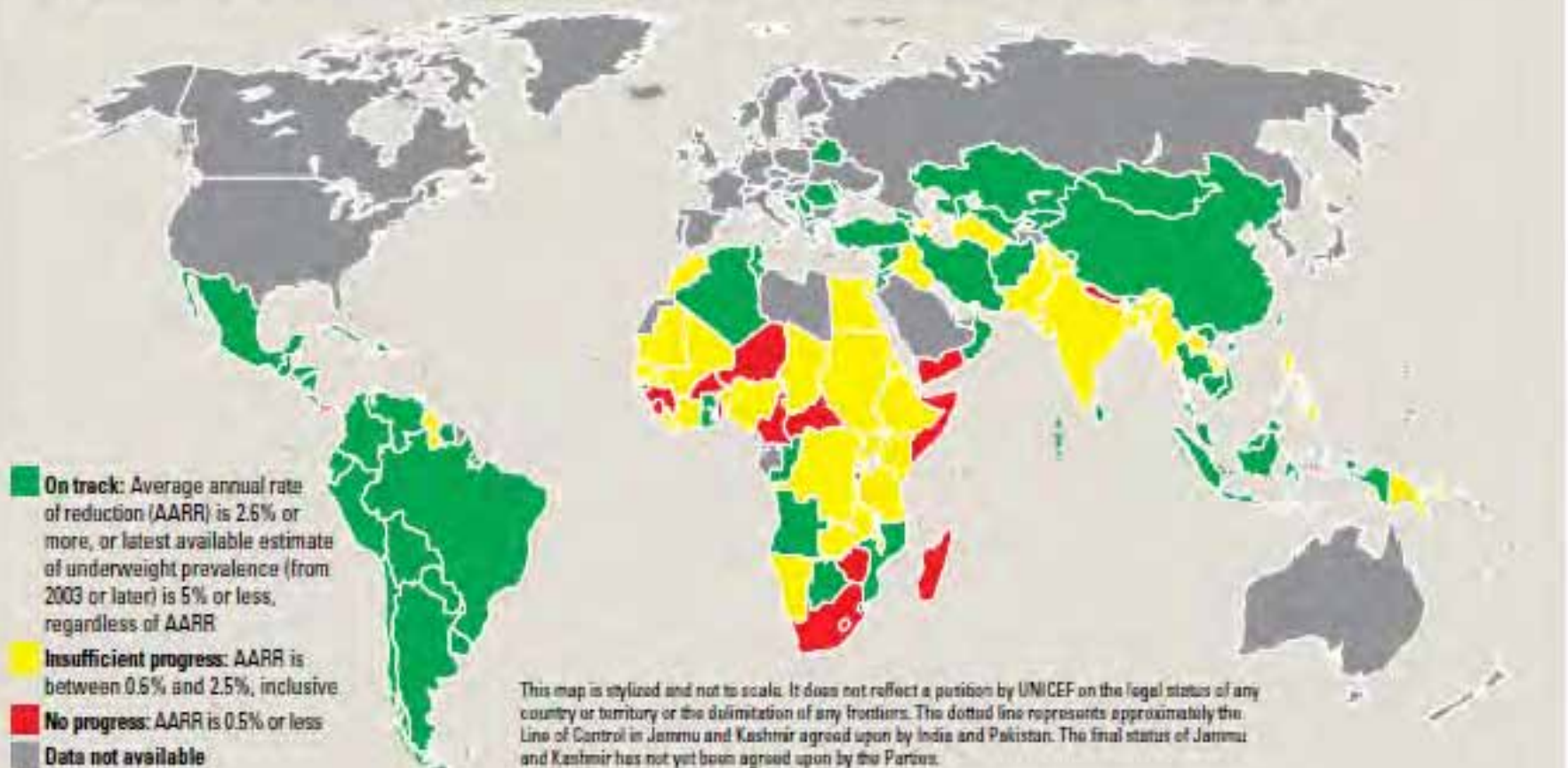
- Malnutrition and poor health



MDG 1 PROGRESS

62 countries on track to meet MDG 1 target

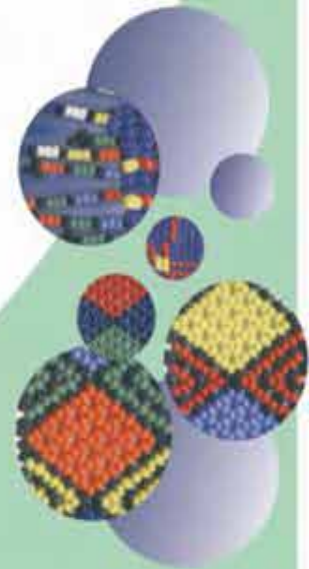
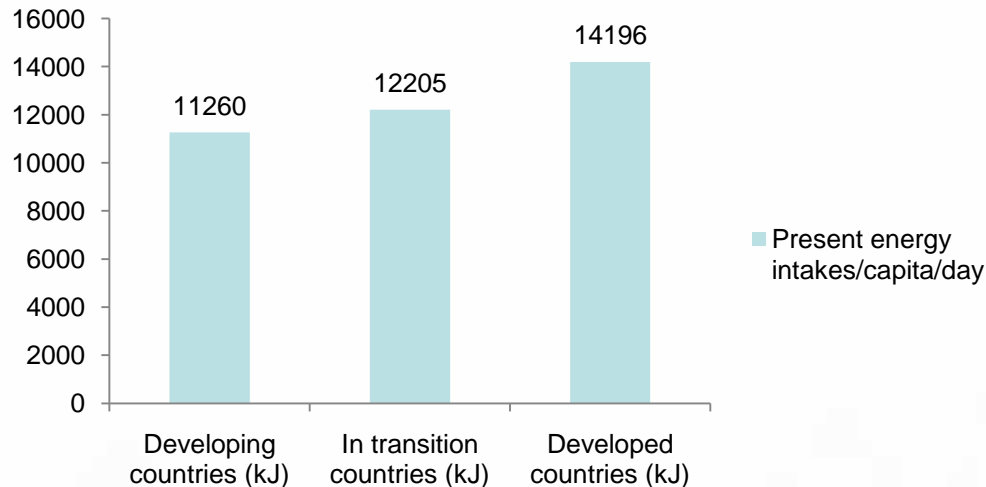
Progress is insufficient to meet the MDG target in 36 countries, and 20 countries have made no progress



FOOD CONSUMPTION PATTERNS GLOBALLY

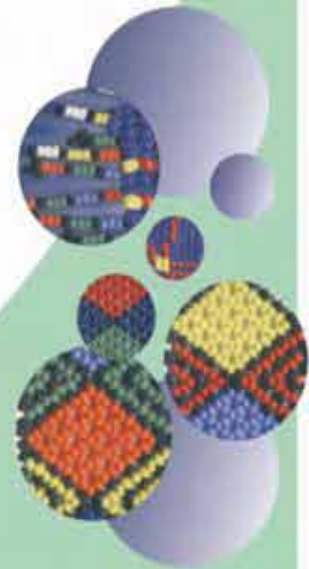
- Food production = available kJ/capita/day
- Shift away from diets based on staples, legumes, vegetables and fruit
- Higher intakes of animal foods, sugars, fats and alcohol

Present energy intakes/capita/day

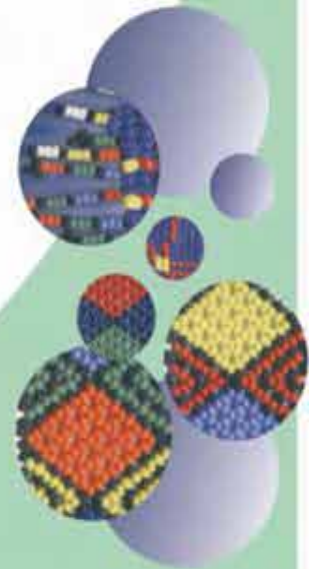
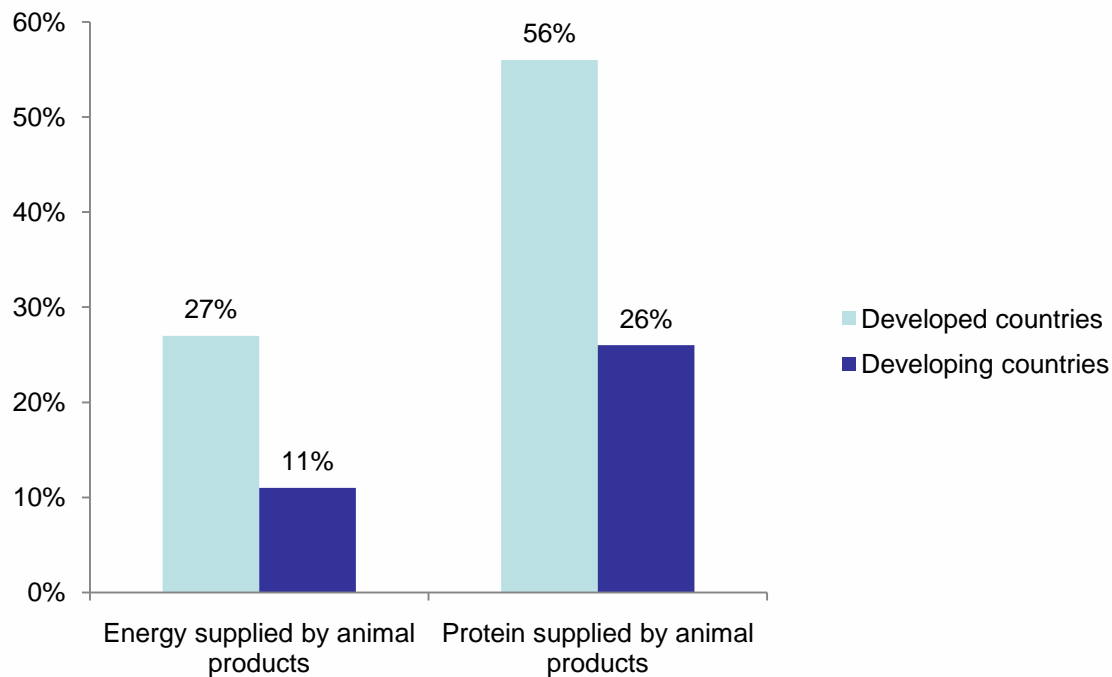


FOOD CONSUMPTION PATTERNS GLOBALLY

- Per capita energy supply from animal and vegetable sources declined in countries in transition, but increased in developed and developing countries.
- Similar trend for protein supply.
- Since 1970-2000's – demand for animal protein in developing countries 3X > developed countries

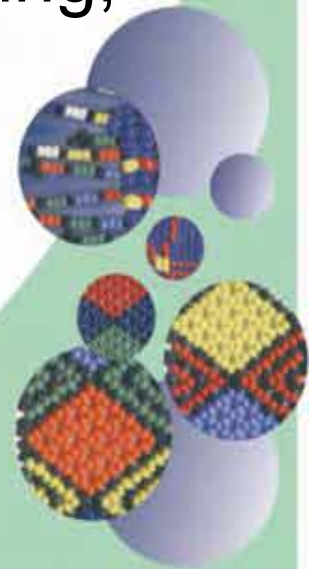


PROTEIN CONSUMPTION PATTERNS

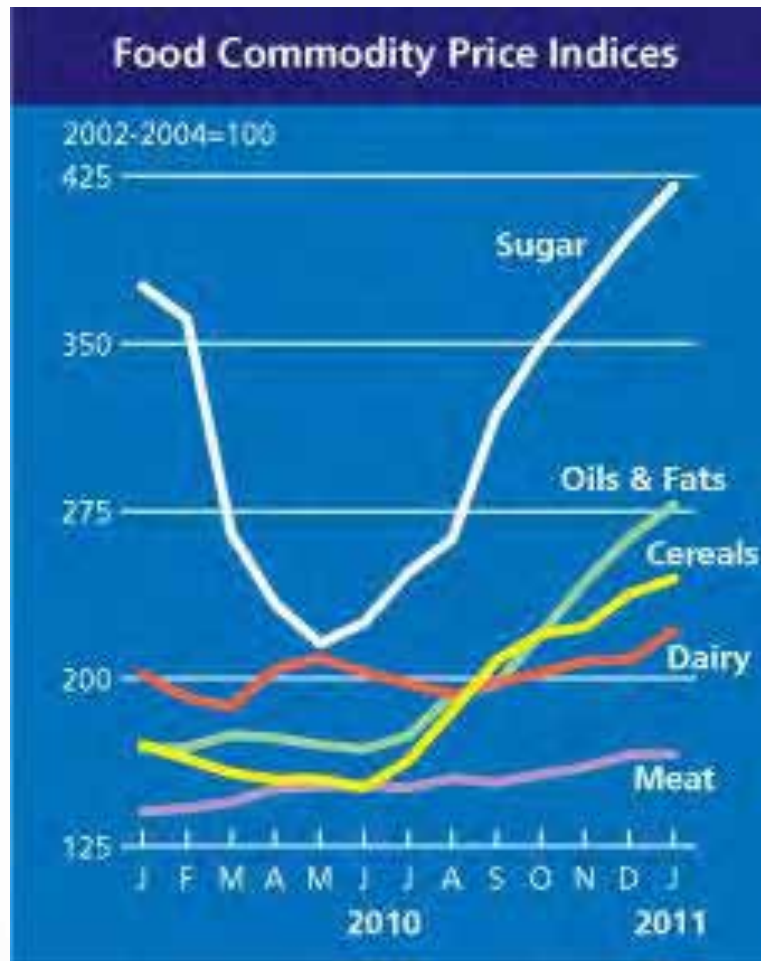


PROTEIN PRODUCTION and CONSUMPTION PATTERNS

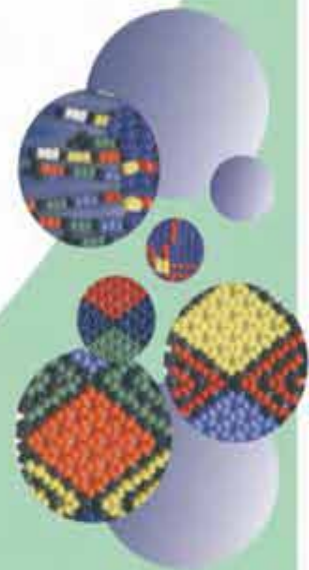
- In SSA – per capita supply of kJ remained stagnant
- Although global supply of protein is increasing, the distribution of the supply is unequal.
- Intakes of vegetable protein still higher in developing countries and animal protein in developed countries.



FAO FPI



www.fao.org/worldfoodsituation/foodPricesIndex/en/

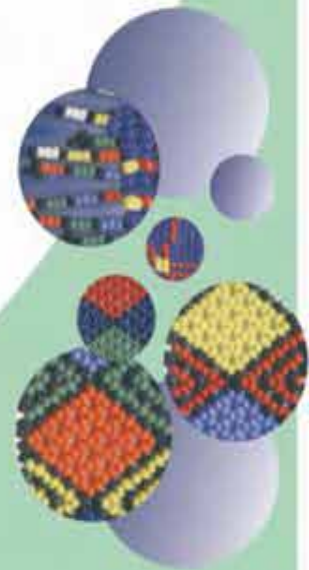


UNEQUALITY of PROTEIN DISTRIBUTION

- Under nutrition :
 - 35% of all child deaths
 - 11% of global disease burden
- Over nutrition :
 - Global epidemic of DoL
- Double burden of disease

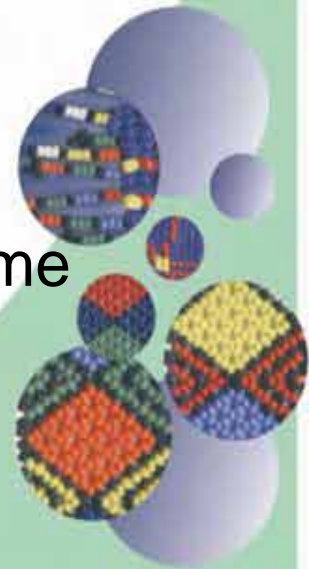
UN Standing Committee on Nutrition. 2010. 6th report on the world nutrition situation.

Hawkesworth et al. 2010. Phil Trans Res Soc, 4083-3097.



CONCLUSIONS

- Increased food production – also protein sources
- Mainly inequality in distribution and consumption
- Per capita protein consumption has increased, but in SSA not much improvement in food consumption patterns have been observed.
- Diets in developing countries may change as income rises and also when food prices increase.



CONCLUSIONS

- Protein important for:
 - Health and wellbeing throughout life cycle
 - Infections
- Quality of protein important
- A variety of foods is important for health



RECOMMENDATIONS

Agricultural planning and trade aspects need to be considered in the context of providing a healthy, balanced meal for all.

Private-Public Partnerships





THANK YOU!

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or

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