

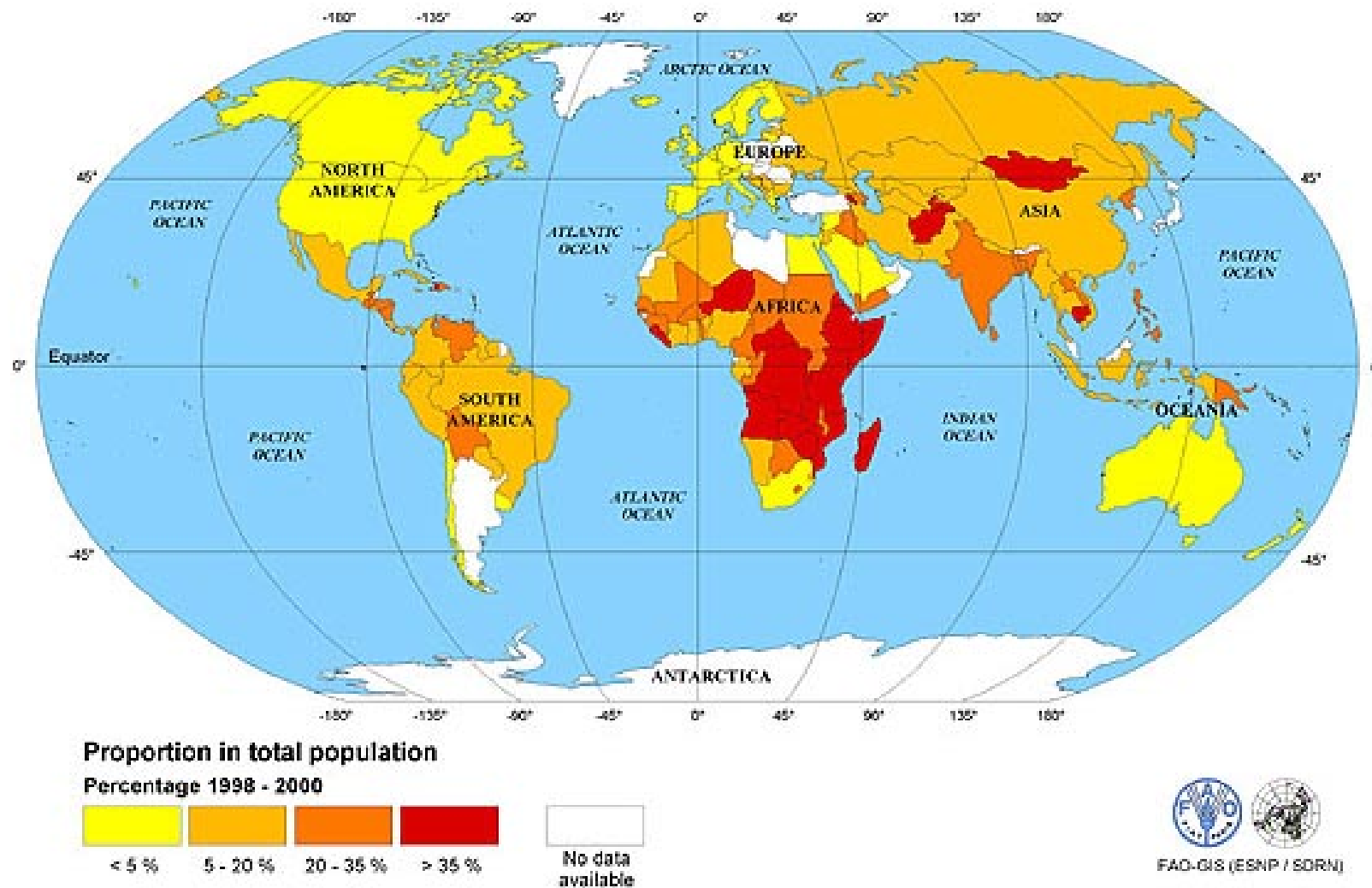
# THE PROTECTIVE ROLE OF MILK AND DAIRY PRODUCTS IN CHILDREN'S NUTRITION

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# World situation – malnutrition and starving



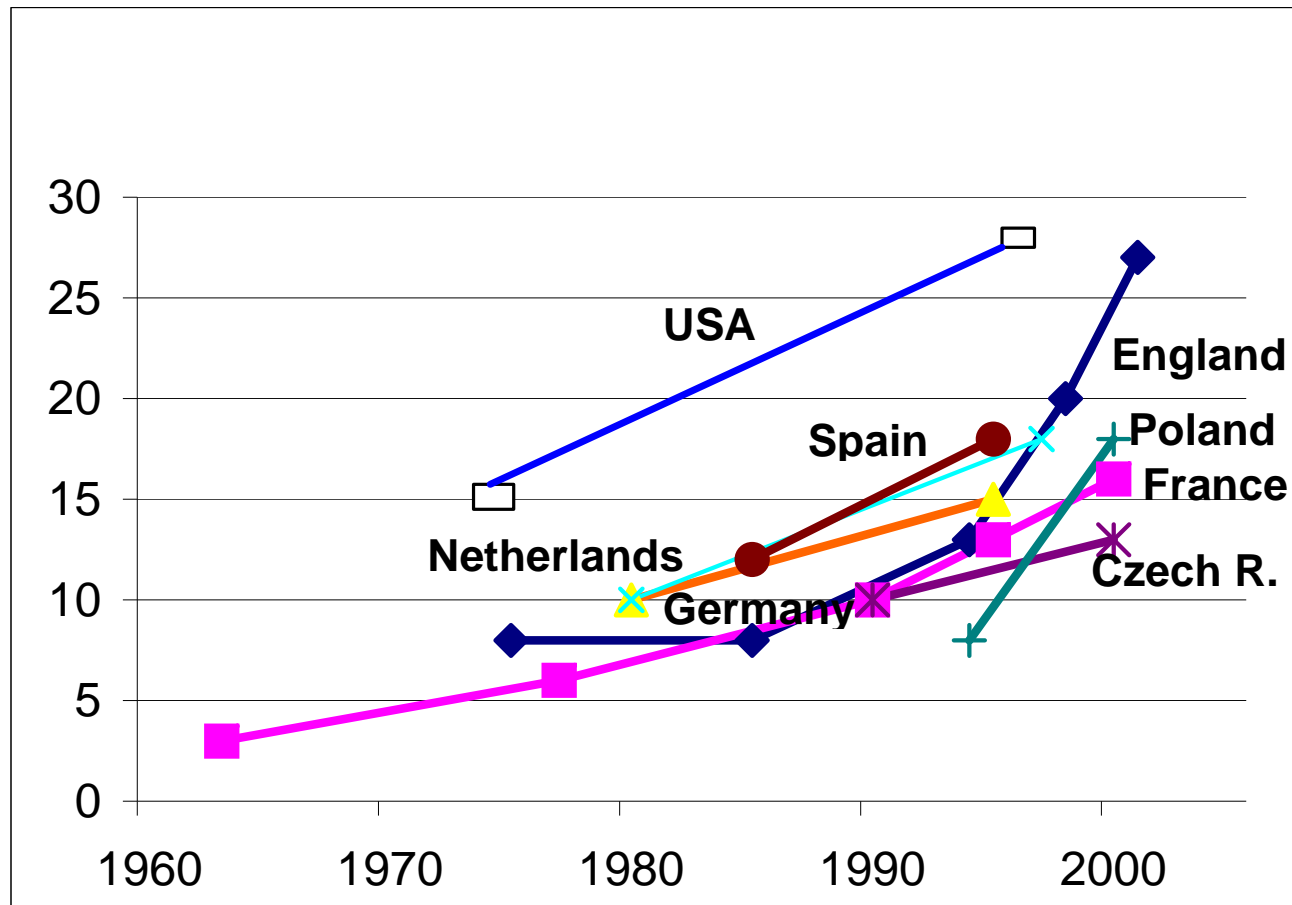
# World situation – overweight and obesity

Slovenia (55,6%)



**Percentage of obese and overweight population by country.**  
Source: OECD Health Statistics, 2004.

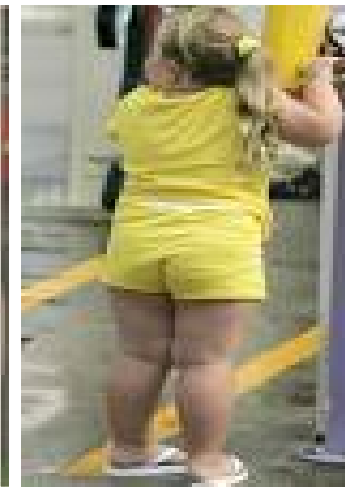
# Overweight and obesity - children



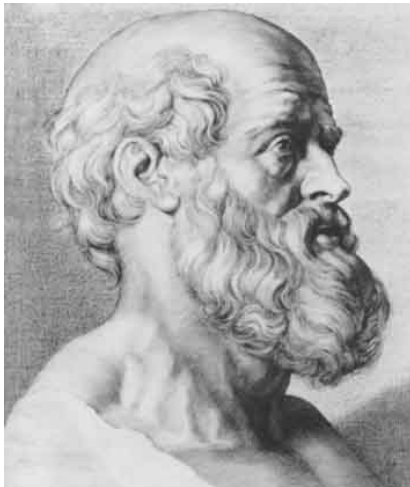
Rising prevalence of overweight in children aged 5-11 (source: IOTF); 1 in 5 children is overweight

# World situation - health

- Obesity
- Anorexia
- Cardio-vascular diseases
- Diabetes
- Hypertension
- Cancers
- Allergies
- GIT infections
- IBS, IBD



# Protection of health by food



“Let food be thy medicine, and medicine thy food”

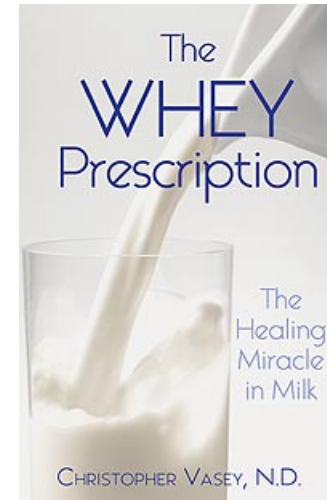
Disease is not a punishment inflicted by the gods but rather the product of environmental factors, diet, and living habits



Ginger is consumed in China as food and medicine

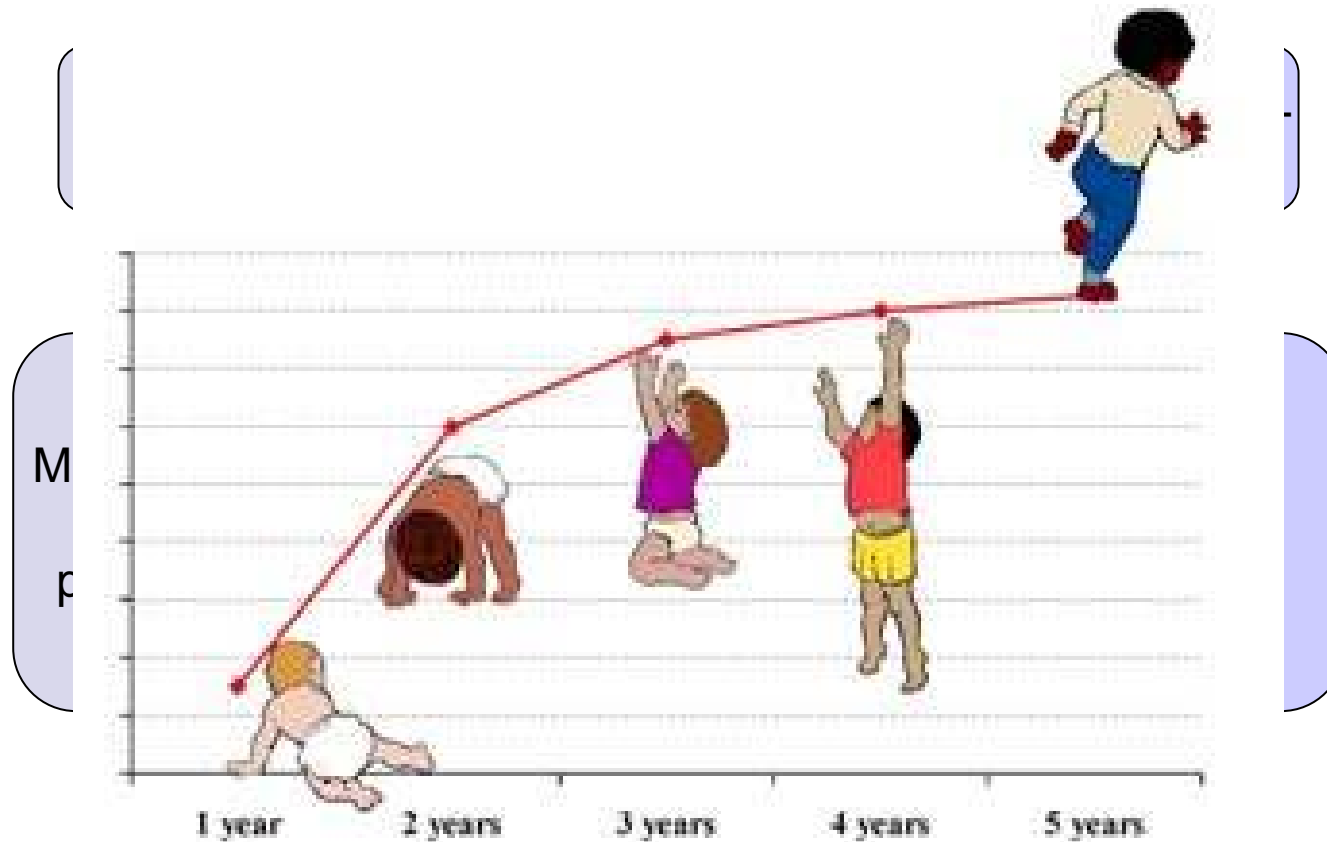
# Protection of health by dairy food

Beneficial influence  
on human health



- ➔ Ayurveda (2500 BC) – consumption of yoghurt for the maintenance of overall well being
- ➔ Ayurveda – healing properties of whey
- ➔ Plinius (76 BC) – recommended fermented milk for treating GIT disturbances

# Scientific progress



Early nutrition modulates growth and functional development of the child and exert lifelong programming effects on health, disease, mortality risks and quality of life in adulthood

# Milk and dairy products – low energy nutrient dense food

Energy dense foods – energy content  $\geq 963-1170$  kJ/100 g  
 For milk (3,5 % fat, 3,3 % proteins, 4,7 % lactose)

Component	Quantity (g)	kcal	kJ
fat	3,5	32	133
proteins	3,3	13	61
lactose	4,7	19	80
$\Sigma$		64	274

Recommended daily values

1 – 3 year	4 – 6 year	7 – 9 year
5000 kJ	6400 kJ	7900 kJ
5,5 %	4,3 %	3,5 %

# Milk and dairy products – main components

- Proteins (all essential a.a, high BV (91; caseins-77, whey proteins-104)
- Fat (energy, essential f.a, CLA, vitamins; A, D, E, K)
- Lactose (energy, enhancer of calcium absorption, regulator of GIT microbiota)
- Minerals (20 minerals that are considered to be nutritionally essential; good bioavailability)
- Vitamins (B-complex, B<sub>12</sub>)

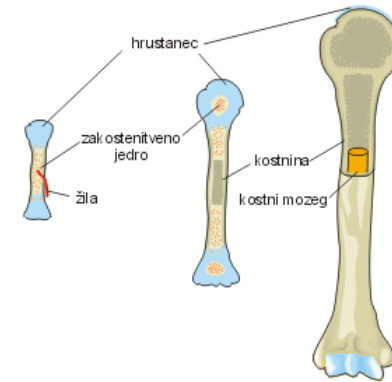
# Milk – high level of Calcium

Development, strength,  
density of bones  
(lactose, lactulose, en-  
phosphopeptides)

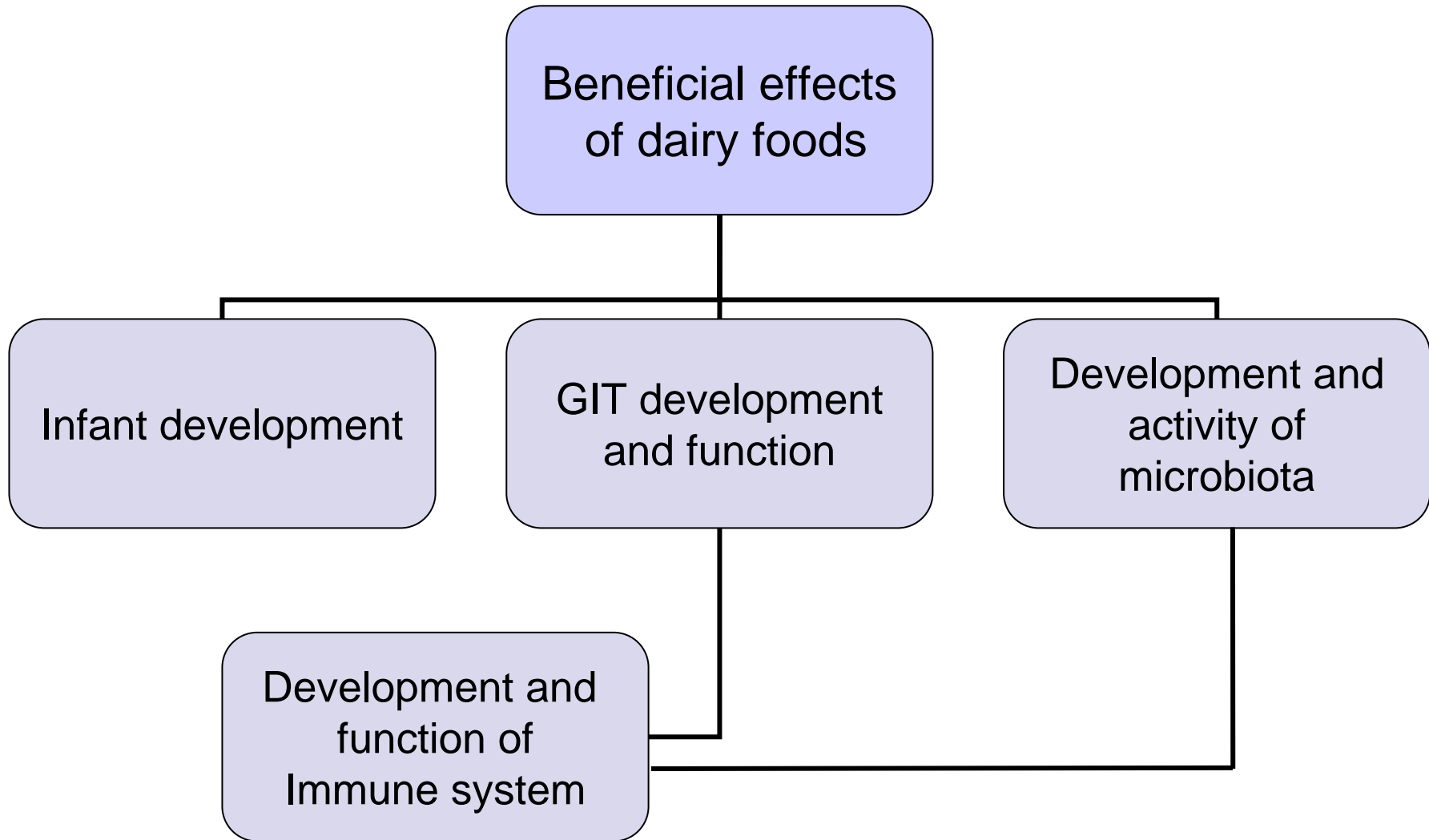
Adequate Vit D supply  
– proteins are nutrient  
for bone health

Ca

Beneficial effect on  
blood pressure (high  
Mg, K, low Na, ACE)



# Milk and dairy products – biologically active compounds





# Bioactive peptides

MILK PROTEINS

Digestion

Process/fermentation

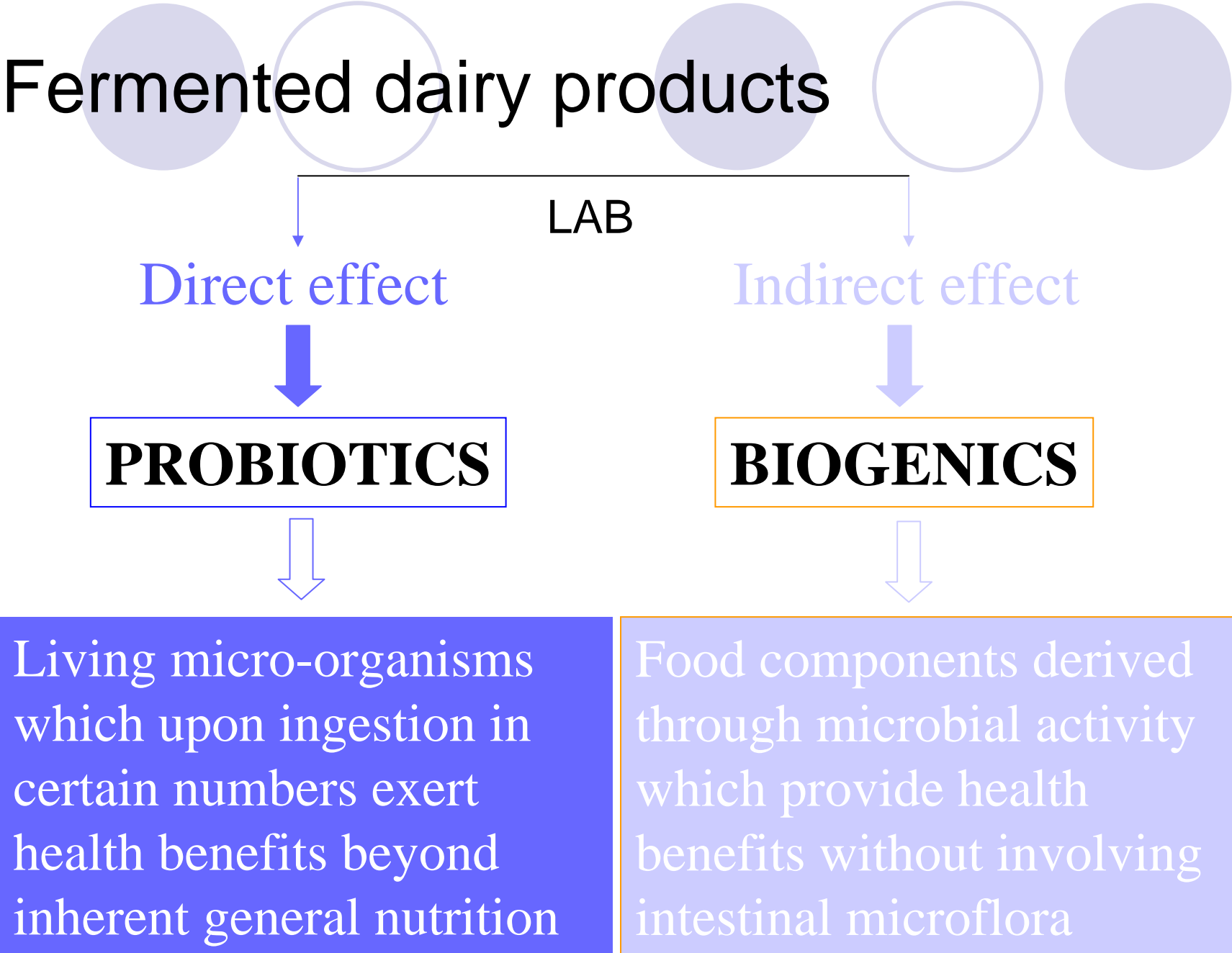
BIOACTIVE PEPTIDES

- ➔ Cardiovascular system
- ➔ Gastrointestinal system
- ➔ Immune system
- ➔ Nervous system

- ➔ Anti-hypertensive
- ➔ Anti-microbial
- ➔ Immunomodulatory
- ➔ Anti-oxidative

FUNCTIONAL EFFECTS

# Fermented dairy products



Direct effect

Indirect effect

**PROBIOTICS**

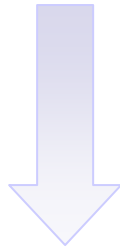
**BIOGENICS**

Living micro-organisms which upon ingestion in certain numbers exert health benefits beyond inherent general nutrition

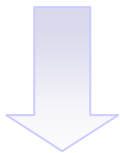
Food components derived through microbial activity which provide health benefits without involving intestinal microflora

# Fermented dairy products – bioactive components

LACTOSE

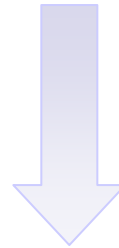


LACTIC ACID



reduction of pH  
promotion of digestibility  
better utilisation of Ca  
inhibition of pathogenics

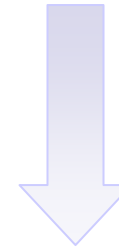
PROTEINS



BIOACTIVE  
PEPTIDES

$\beta$ -GALACTOSIDASE  
EXO-POLYSACCHARIDES

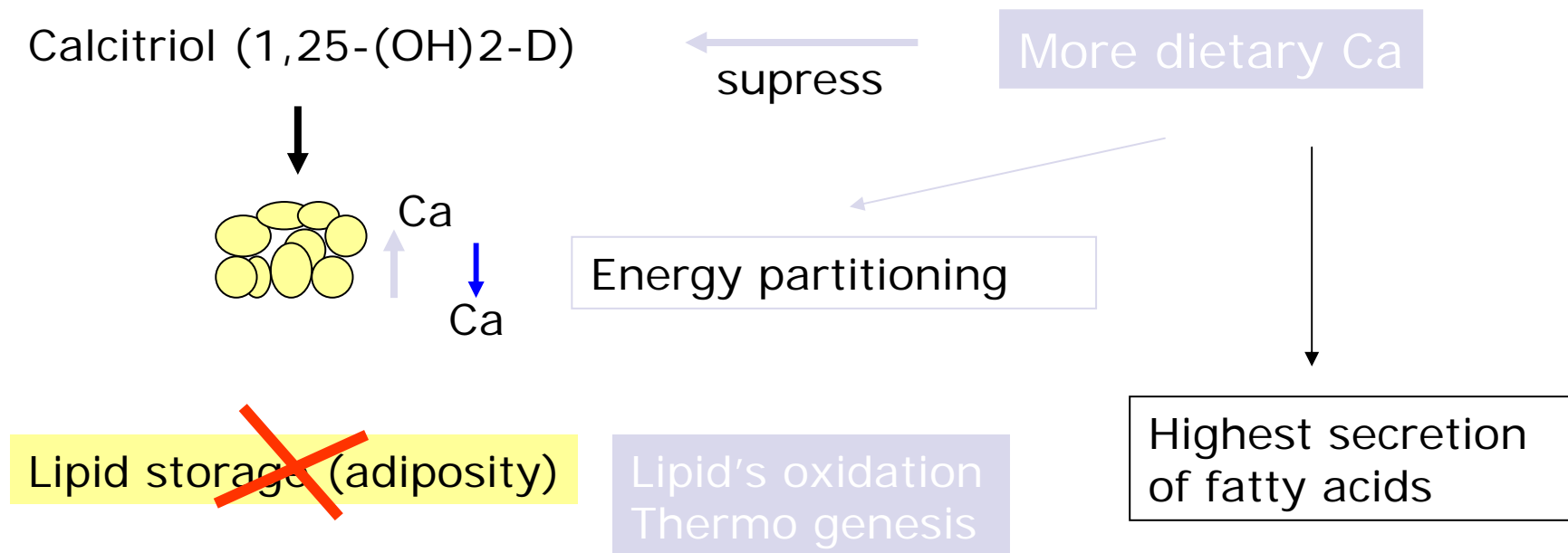
FAT



FATTY ACIDS  
(butyric acid)

# The Role of Dairy Foods in Weight Management

- Dietary calcium and dairy foods modulate adipocyte lipid metabolism



Milk and dairy foods (Ca) – 2x higher effect!

# Protective role of Dairy food in children's nutrition

- ✓ Hypertension (bioactive peptides)
- ✓ Osteoporosis (Ca, vit D, lactose, bioactive peptides)
- ✓ Gastrointestinal health and general well-being (lactose intolerance, viral diarrhea, AAD, travelers' diarrhea, *Helicobacter pylori* gastritis)
- ✓ Regulation of body-weight