



# EARLYNUTRITION

Long-term effects of early nutrition on later health

## Frequently Asked Questions

[www.project-earlynutrition.eu](http://www.project-earlynutrition.eu)

# QUESTIONS CONCERNING EARLYNUTRITION AS AN EU PROJECT

## Q What are the key facts about EarlyNutrition?

**A EarlyNutrition is the world-wide largest project investigating programming effects for health in later life.**

The EarlyNutrition project started on February 1, 2012. The project will last 60 months and is therefore anticipated to end January 31, 2017. With EUR 8.96 million funding by the EU for 36 research institutions from 12 countries

in Europe, the United States and Australia, EarlyNutrition will implement an ambitious research programme. The project is coordinated by Prof. Berthold Koletzko of the Ludwigs-Maximilians University Munich, Germany.

The EarlyNutrition research programme is focused on the contemporary early nutrition programming hypotheses and there are four different scientific

themes which are supported by strong data and project management: mechanisms of early nutrition programming effects, observational studies of determinants in contemporary cohorts, human intervention studies on modifiable determinants and strategic integration and recommendation development; complemented by dissemination and training activities. These themes are strengthened by multidisciplinary collaboration from experts in their respective fields.

## Q Why are collaborative research projects funded by the EU?

**A Research projects requiring the collaboration of scientists from different countries are beyond the scope of national initiatives and thus receive financial support by the EU under the cooperation scheme.**

All research-related EU initiatives are administered under a common roof: the European Framework Programmes. The present framework programme 7 (FP7)

was launched in 2007 and is worth a total of EUR 8.1 billion, which aims to gain or consolidate leadership in key scientific and technology areas.

Projects are open to organisations and businesses in all EU Member States, FP7 partner states and specifically eligible countries. Specific areas and topics that will be supported in rounds of publicly advertised calls for proposals touch on many aspects of daily life, including safe

food or combating major diseases.

EarlyNutrition defined a systematic approach which builds on the expertise of researchers from 12 countries in Europe, the United States and Australia. This is necessary as research on early nutrition programming has been conducted throughout the world for years, and obesity and its related diseases have increasingly become a global health concern rather than a problem in certain countries.

## Q How many research institutions participate in EarlyNutrition?

**A Within the large-scale project EarlyNutrition established experts pool their resources, which come from 36 research institutions of 12 countries.**

The current project is based on a successful international research collaboration

funded under FP6, which investigated early nutrition programming effects and successfully determined a programming effect of early nutrition on obesity.

FP7 projects bring together the necessary complementary expertise, which is required for a research programme to

reach a common goal beyond the scope of a national initiative.

The consortium of EarlyNutrition for example includes internationally acknowledged leaders in the areas of pregnancy, infancy, nutrition, clinical trials and biomedical research.

## Q How will the success of the project progress be measured?

**A The consortium is bound by a contract with the European Commission which specifies clear reporting obligations, which the researchers have to fulfil in order to provide evidence about their progress towards identified goals and qualify for the stipulated funding.**

In addition to official reporting, the consortium will continuously present the project results online, at scientific conferences or in peer reviewed journals. In addition the partners meet twice a year in person for scientific exchange and discussions of future steps. The Early-

Nutrition project will therefore make its results and achievements publicly available to researchers as well as national stakeholders and also engages in public communication activities.

The present consortium developed a systematic research plan, which competed successfully for funding in response to a call for proposals published by the EC. The EarlyNutrition proposal was evaluated by independent experts as an outstanding research plan superior to other proposals.

On the basis of this evaluation report the project partners have signed a contract

with the EC identifying research tasks, which are associated with 182 deliverables. Progress of the research will be closely monitored internally, but also by a scientific advisory board and by independent experts the EC will assign.

Deliverables are measurable outcomes like a written report, providing details about the results obtained within a given task. At specific intervals the whole consortium will submit a report to the EC, that will include scientific results as well as financial and administrative details. These reports need to be approved by the EC before further funding are paid out to the researchers.

## Q How much will EarlyNutrition cost?

**A The total project budget is as high as EUR 11.12 million, of which no more than EUR 8.96 million will be borne by the European Commission pending the consortium will meet its stipulated obligations.**

This makes EarlyNutrition the world-wide largest project investigating pro-

gramming effects for health in later life. The Commission's effective funding is dependent on the occurred actual costs of the partners and the positive review of the official reports. Most of the financial allocation will be attributable to personnel costs, and therefore the project will create job opportunities for highly quali-

fied researchers at respected research institutions throughout Europe.

The European Commission reports that EU research funding generates significant added value for Europe. For example, one Euro of EU Framework Programme funding leads to an increase in industry added value of between EUR 7 and EUR 14.

## QUESTIONS CONCERNING OBESITY

### Q What is obesity?

**A Obesity is a medical term used to refer to extreme overweight.**

The definition of obesity is based on an excessive amount of extra body fat which is also sometimes referred to as adiposity.

A first estimate about the weight status of an individual is provided by the body mass index (BMI). A BMI between 18.5 and 25 is considered normal, individuals with a BMI outside of this range should

consult their practitioner. The BMI is calculated by using a person's weight (kg) divided by their height in metres squared (m<sup>2</sup>). People with a BMI over 25 are considered overweight, while a value over 30 may constitute obesity.

## Q Why is obesity called a modern epidemic?

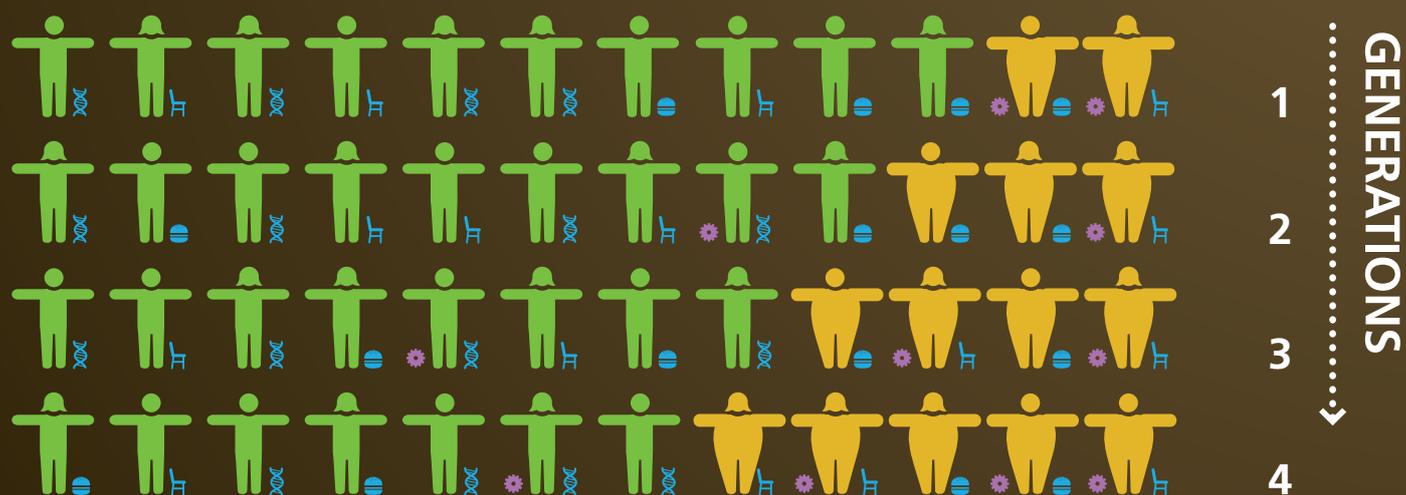
**A** The number of obese people in Europe has increased three-fold since the 1980s.

This sharp increase has been only partly

understood until recently. The technical term epidemic refers to the spreading of a disease at unexplained high rates.

Based on the latest estimates in coun-

tries of the European Union, overweight affects up to 70% of the adult population while obesity affects 10-30% of adults. With trans-generational programming of early nutrition a scientific basis for the increase in particular of overweight children may have been determined.



## Metabolic programming may be the key to understanding the epidemic dimension of obesity

 higher risk due to other factors (diet, lifestyle, genetics)

 higher risk due to metabolic programming

**Trans-Generational Metabolic Programming:** To explain the obesity epidemic researchers have postulated a trans-generational effect, ie a mechanism where health status of a parent can dispose their children towards overweight. Observational studies have confirmed that an unfavourable metabolic experience of an unborn can indeed dispose towards overweight in later life. Once established in the population, the risk of obesity may propagate from one generation to the next.

This is illustrated in the above figure, where obesity (yellow individuals) is spreading in a population with stable disposing factors towards overweight and obesity (blue icons). In addition obese mothers predispose their children towards obesity (pink icons), this effect is sufficient to increase the number of obese individuals from one generation to the next.

## Q What are the consequences of more people becoming obese?

**A** The growing prevalence of overweight and obesity is propagating an upsurge in many diseases which is associated with increasing health care costs and a decrease in the quality of life of a large proportion of the population.

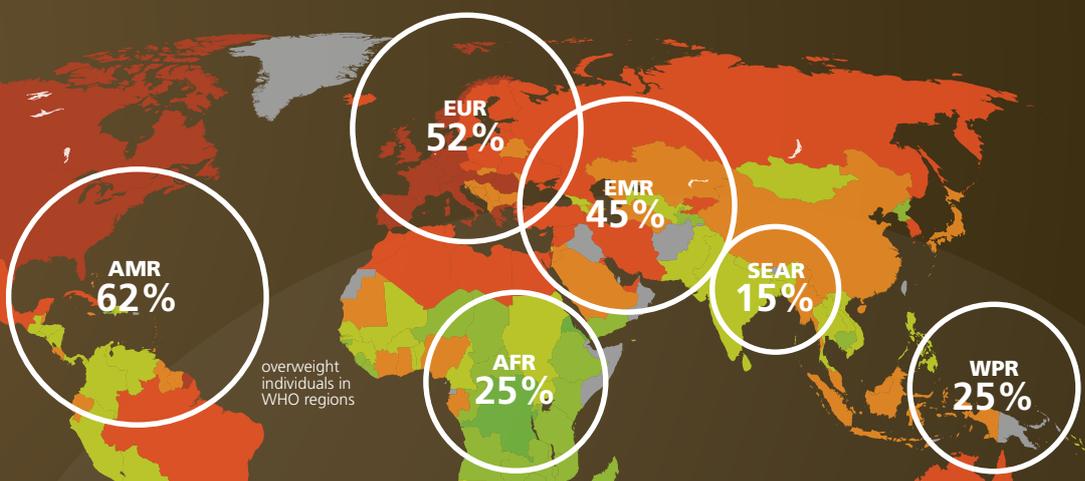
The diseases associated with obesity are diabetes, high blood pressure and the risk of other non-communicable diseases, often leading to premature death by stroke or heart attacks. Almost three

million adults die each year as a result of being overweight or obese. In addition, almost half of the diabetes burden, a quarter of the ischaemic heart disease burden and between 7% and 41% of certain cancers are attributable to overweight and obesity. According to the WHO, overweight and obesity are among the five leading causes of death globally, increasingly affecting people both in industrial and developing countries.

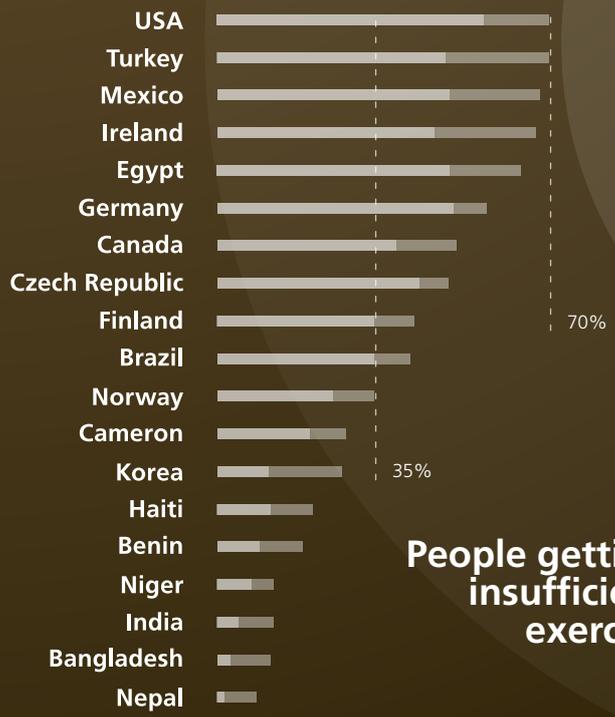
Obesity has a major impact on society

and health care systems in addition to the devastating effects on individuals. In 2010, the health care costs attributable to obesity were estimated to be between one and three per cent of the total health care costs in different European countries, with a higher rate for the United States of up to 10%. The incremental lost work-days and costs of absenteeism from high BMI was calculated to amount to a loss of up to three million productive person-years in working adults, representing an economic cost for Europe to be as high as €460 billion.

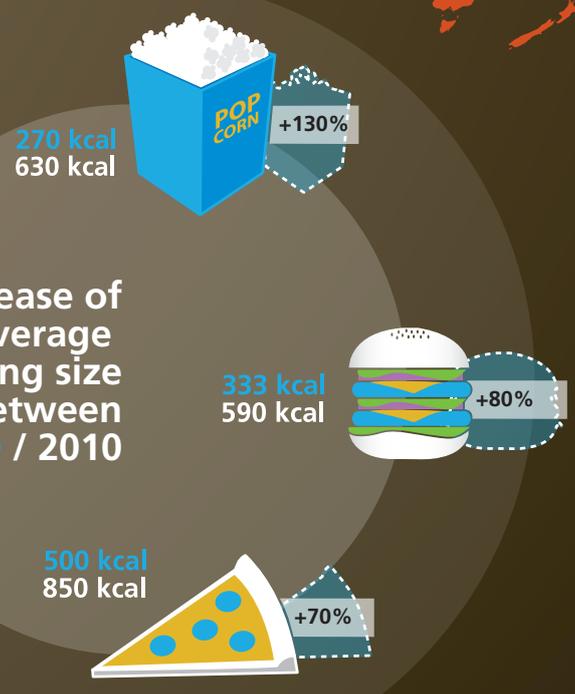
## Average energy consumption (in calories/day)



## Overweight individuals (in % of the entire population)



Increase of average serving size between 1990 / 2010



People getting insufficient exercise



390

560

700

1600

2300

Overweight individuals worldwide  
(in millions)

1960

1970

1980

2005

2010

2020

?

## Q What are the consequences of more children becoming obese?

**A Overweight and obese children not only experience an increased risk of the aforementioned diseases but also have on average a poorer quality of life.**

Overweight at an early age coincides frequently with a negative self-image, which correlates with academic underachievement, social isolation and lowered self-esteem. Of particular societal concern is the increasing number of over-

weight children as over 60% of children who are overweight before puberty will be overweight in early adulthood.

The diseases associated with obesity are therefore increasingly affecting already young adults with enormous personal and societal consequences. Globally, around 43 million children under five were overweight in 2010. In Europe, 3 of 77 million children were obese in 2004. Estimates of overweight infants

and children in the WHO European Region rose steadily from 1990 to 2008. Childhood obesity is a serious problem because it is not only a predisposition to many other childhood diseases but also to premature death.

EarlyNutrition will investigate maternal factors and mechanisms of early nutrition and lifestyle programming during pregnancy in order to identify means to interfere with the detrimental influence on child health.

## Q What are the possible causes of obesity?

**A The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended.**

Globally, there has been an increased intake of energy-dense foods that are high in fat, salt and sugars but low in vitamins, minerals and other micronutrients. In addition physical activity of individuals decreases due to the progressively sedentary nature of many forms of work, changing modes of transporta-

tion, and growing urbanisation. Besides genetic predisposition and an unhealthy life style research has determined metabolic programming by early nutrition effects as a predisposing factor for obesity and in particular the increasing number of overweight children. Besides steps that can be taken by individuals research can contribute to tackling obesity on a societal scale.

EarlyNutrition is part of an international research effort which aims to:

- identify the mechanisms underlying the development of obesity and related diseases
- detect associations between obesity and causal factors such as early nutrition and lifestyle in human observational studies
- explore practical interventions for the prevention of overweight through intervention studies
- collate and consolidate research findings in order to foster recommendations for practical applications
- disseminate these results to the appropriate audience

## Q What does the term metabolic programming refer to?

**A Metabolic programming refers to the fact that the early nutritional experience of an individual programs the health status in later life, namely predispose for overweight and obesity.**

Studies show that obese mothers and those who put on excessive weight gain

during pregnancy somehow predispose their children towards becoming overweight themselves. In addition infants during the first six months appear to be susceptible to similar programming effects. Metabolic programming occurs by currently little understood metabolic signals which are mediated by nutritional

status. Therefore, maternal diet during pregnancy and any complementary food other than breast milk influence the health of the baby later in life.

The early nutrition pathways to programme obesity are likely to be multifactorial, but once established in the population, the risk of obesity may propagate from one generation to the next.

## Q I am concerned about my weight what can I do about it?

**A Obesity can be both prevented and treated by improvements in nutrition and physical activity.**

The WHO has provided the following three general recommendations, people should strive to implement in their daily life to obtain energy balance and a healthy weight by:

- limiting total energy intake, especially from (saturated) fats and (refined) sugars
- increasing consumption of fruit and vegetables, legumes, whole grains and nuts
- engaging in regular physical activity

However, if you are concerned about your weight, you should consult your practi-

tioner, as for any other health issue.

In addition to measures taken by an individual, environments that encourage people to choose healthy foods and to regularly participate in physical activity promote healthier communities. Therefore society, employers, food industry and parents can provide a supportive environment to make a healthy life style an easy choice.

## Q Why should we tackle obesity at an early age already?

**A Childhood obesity is a serious problem because it is not only a predisposition to many other childhood diseases but also to premature death.**

Over 60% of children who are overweight before puberty will be overweight in early adulthood. As habits are established early in life and are notoriously difficult to change later early activities

are more cost effective and likely to be successful. Therefore parents and society are called upon to create a supportive environment, which favours healthy life styles to limit caloric intake and encourage physical activity.

## QUESTIONS CONCERNING THE EARLYNUTRITION PROJECT

### Q Which research results lead to the EarlyNutrition research programme?

**A The hypothesis that the foetus is susceptible to the influences of maternal obesity has been strengthened by numerous observational studies.**

These studies suggested that maternal obesity and excessive pregnancy weight gain independently increase the risk of obesity in the child. Accordingly, EarlyNutrition will investigate mater-

nal factors and mechanisms of early nutrition and lifestyle programming during pregnancy in order to help prevent later obesity.



### Q What are the aims of EarlyNutrition?

**A EarlyNutrition aims for the expansion of scientific knowledge related to metabolic programming effects.**

Several observational studies have determined that the early nutritional

experiences can dispose children towards adiposity in later life.

But mechanistic insight into how metabolic processes can determine health outcomes later in life is currently lacking. Therefore the EarlyNutrition project has

developed an ambitious research programme to elucidate the mechanisms of metabolic programming.

Scientists trust that research results will give us an idea on how to best intervene with the adverse programming effects in early life.

## Q What does the term early nutrition refer to?

**A Early nutrition determines the metabolic status of the unborn child and in the first six months after birth.**

Babies are completely reliant on their mothers, before they are born and in the first months of their lives. During pregnancy the placenta develops as a

specialised organ to control the exchange of molecules between mother and baby. The placenta controls the flow of vital nutrients from the maternal blood stream to the unborn and the disposal of waste material from the foetus. The placenta can prevent the transmission of some compounds,

including pathogens like viruses to protect the baby, while other molecules including sugar are entering unhindered. The foetal experience is therefore determined by maternal nutrition, weight, and health status including gestational diabetes. After birth mother's milk and any supplemental food including infant formula determine the early nutritional experience of a toddler.

## Q Which actions are taken?

**A The EarlyNutrition research programme is focused on the contemporary early nutrition programming hypotheses and to provide molecular insight into relevant mechanisms.**

Four different scientific themes are supported by strong data and project

management: mechanisms of early nutrition programming effects, observational studies of determinants in contemporary cohorts, human intervention studies on modifiable determinants and strategic integration and recommendation development; complemented by dissemination and training activities.

By extending to relevant stakeholders, including food industry, decision makers and national panels EarlyNutrition is committed to engage relevant stakeholders to ensure the latest scientific data are incorporated into relevant recommendations to improve clinical practice without undue delay.

## Q What can I do until there are any results, where can I get help or information?

**A If you are concerned about your weight and how it might affect your baby during pregnancy, you should consult your practitioner or midwife, as for any other health issue.**

Mothers/fathers should be aware of the potential programming effect of

early nutrition on later health of their infants. Therefore, they should inform themselves about nutritional recommendations by consulting their practitioner/paediatrician.

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calo-

ries expended. According to the WHO reducing weight can be achieved through:

- limiting total energy intake, especially from (saturated) fats and (refined) sugars
- increasing consumption of fruit and vegetables, legumes, whole grains and nuts
- engaging in regular physical activity

## REMINDER

All publications or any other dissemination relating to EarlyNutrition shall include the following statement to indicate that the information was generated with the assistance of financial support from the EU:

**“The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 289346.”**

## CONTACT

For further information, please contact the project’s dissemination partner, “biolution”.

Phone: +43-1-786 95 95

Email: [earlynutrition@biolution.net](mailto:earlynutrition@biolution.net)

Web: [www.biolution.net](http://www.biolution.net)

## RESOURCES

- „Obesity: preventing and managing the global epidemic“, Report of a WHO Consultation (WHO Technical Report Series 894)
- <http://www.euro.who.int/en/what-we-do/health-topics/noncommunicable-diseases/obesity>
- <http://www.who.int/mediacentre/factsheets/fs311/en/>
- [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Overweight\\_and\\_obesity\\_-\\_BMI\\_statistics](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Overweight_and_obesity_-_BMI_statistics)
- <http://jn.nutrition.org/content/135/4/905.long>
- <http://www.fao.org/economic/ess/syb/en/>

## FIGURE DOWNLOAD

Page 4: [www.project-earlynutrition.eu/pdf/download/EarlyNutrition\\_FAQ\\_graphic2\\_130812.eps](http://www.project-earlynutrition.eu/pdf/download/EarlyNutrition_FAQ_graphic2_130812.eps)

Page 5: [www.project-earlynutrition.eu/pdf/download/EarlyNutrition\\_FAQ\\_graphic1\\_130812.eps](http://www.project-earlynutrition.eu/pdf/download/EarlyNutrition_FAQ_graphic1_130812.eps)

BMI table: [www.project-earlynutrition.eu/pdf/download/EarlyNutrition\\_FAQ\\_graphic3\\_130812.eps](http://www.project-earlynutrition.eu/pdf/download/EarlyNutrition_FAQ_graphic3_130812.eps)

[www.project-earlynutrition.eu](http://www.project-earlynutrition.eu)

This project receives funding from the  
European Union Seventh Framework Programme (FP7/2007-2013)  
under grant agreement n° 289346

