



# THE EARLY NUTRITION PROGRAMMING PROJECT

Project Number: FOOD-CT-2005-007036

Acronym: EARNest

(EARly Nutrition programming - long term follow up of Efficacy and Safety Trials and integrated epidemiological, genetic, animal, consumer and economic research.)

## NEWSLETTER 8 - WINTER 2009

### Earnest completes fourth successful year

The fourth annual review of the project took place in July. The Review Panel commented that good progress had been made over the previous year and that a specific strength of the project was the comprehensive efforts that were being made to use and disseminate knowledge once accumulated. Some of the achievements outlined in the fourth annual report to the EU are highlighted below.

**Theme 1** Data collection in almost all cohorts has now been completed or is nearly complete and data entry and analyses are being performed. In the NUHEAL study, the third visit at 6.5 years old has been finished in Spain and Germany and is ongoing in Hungary. Data from the Aarhus trial on effect of fish oil in pregnancy on risk of offspring overweight at 17-18 years are currently being evaluated. In the Groningen LCPUFA study, neurological condition, cognition and behavior were examined in 341 children at 9 years of age. In the GINI study, the data entry of the food-frequency questionnaire is completed and ready for quality check. In the follow-up of subjects born SGA and randomised to standard versus nutrient enriched formula in infancy, data collection has now been completed and the data are being analysed.

**Theme 2** A draft of a comparative analysis of diet during pregnancy using data from all the major longitudinal studies holding information on dietary exposures in pregnancy across Europe has also been completed. The assessment of cardiovascular risk parameters of all participants in the Bristol (ALSPAC) cohort at age 15 is completed. The preliminary blood pressure and body composition datasets are now available for exploratory analyses. All the children from the Danish DNBC who were selected on the basis of early diet for cognitive testing at 5 years have been examined.

**Theme 3** The majority of the experimental work within Theme 3 has been completed and a substantial number of papers have been published during the year. Several papers relating to the long-term outcomes of exposure to maternal nutrient restriction at different stages of gestation with regard to the adverse responses following exposure to an obesogenic environment have also been published. The major findings have been covered in an invited review which has just been submitted to Nature Reviews Endocrinology. This concludes that clinically relevant adaptations, such as primary markers of the metabolic syndrome, are only seen if a nutritional challenge in utero is followed by a period of accelerated postnatal growth early in the postnatal period and/or if the offspring become obese.

**Theme 4** In Theme 4, data collection in the follow-up questionnaire survey of new mothers in England, Finland, Germany, Hungary and Spain has been completed. Work on the follow up data is underway, and includes an investigation of the association between mothers' stated intentions about feeding their baby and self-reported behaviors.

The findings have been disseminated in scientific publications to professionals and the general public. The publications database now includes 85 publications arising from the project. The dissemination activities over the last year include two newsletters, a number of presentations to health professionals, and three press releases during 2008/09. The Proceedings of the Budapest Conference were also published during the year. Plans for the International Conference in Munich in May 2010 are well underway. A conference website has been set up and flyers promoting the conference are being distributed at relevant meetings.

The reviewers commented that it was a large and complex project and for it to have progressed so far with so many excellent outputs was proof of good management on both a scientific and technical level. There are good reasons to be confident, therefore, that the project will meet its final objectives according to schedule during the last eighteen months.

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**Organised by the Early Nutrition Academy and the Early Nutrition Programming Project**

in collaboration with the:

- Developmental Origins of Health and Disease Society
- European Academy of Nutritional Sciences
- European Society for Paediatric Gastroenterology, Hepatology and Nutrition
- German Society of Nutrition
- International Society for the Study of Fatty Acids and Lipids
- International Union of Nutritional Sciences

**Abstract deadline 15th February 2010**

**Call for abstracts and online registration now open!**

**SAVE THE DATE!**

**Munich, Germany 6th - 8th May, 2010**

[www.metabolic-programming.org/munich2010](http://www.metabolic-programming.org/munich2010)

**THE POWER OF PROGRAMMING**

**International Conference on Developmental Origins of Health and Disease**



## Topics – International Conference 2010, Munich, Germany

### THE POWER OF PROGRAMMING Developmental Origins of Health and Disease

Venue: University Hospital of Munich – Campus Großhadern



#### **Early nutrition programming of long-term health - 5 years of European Collaborative Research:** Where are we and where do we go from here? **Integrated Session**

##### **Early life programming: health outcome and later disease**

- Impact of infant feeding on growth and obesity risk
- Weight gain and body composition
- Modulation of muscle and fat mass and metabolic response
- Perinatal life and diabetes risk
- Vascular development and health
- Programming of bone health
- Tracking of risk factors from early life to adulthood
- Food intolerance
- Understanding the early origins of disease – opportunities through new methods and integration
- Maternal nutrition: impact on pregnancy outcomes
- Dietary practice in mothers and infants
- Early fish exposure and later health outcomes **Integrated with**



##### **Mechanisms of early life programming**

- Developmental epigenetics
- Fetal-placental nutrition
- Programming of neurodevelopment **Integrated with**
- Current knowledge and future directions
- Environmental toxicants **Integrated with**



##### **Public health and economic impact of early life programming**

- Developmental origins of long-term health - public health implications **Integrated with**
- Global impact of programming
- Translating science into policy and practice **Integrated Session**



A number of workshops and specialist symposia are also planned. These will include workshops on 'Applying for EU grants' and 'Career building for new investigators' and an industry forum entitled 'The way for innovation: how to foster collaboration between industry and academia'....more details to come soon!



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## Report of Warnemunde Progress meeting, April 2009

The eighth progress meeting was held from 1<sup>st</sup> to 3<sup>rd</sup> April, 2009 at Warnemunde on the German Baltic Coast as guests of Cornelia Metges and her colleagues from the nearby Institute for the Biology of Farm Animals, Dummerstorf. We were staying in the imposing Hotel Neptune which was built in 1971 to impress the few Westerners who visited East Germany in those days and were entertained in the evening by a local male voice choir singing German sea shanties.

Professor Koletzko welcomed everybody and reminded delegates how important it was for further funding in this area of research that Earnest was seen to be effective in its use of research funds. They have put forward 3 new possible research calls to the EU which he hoped would enable fruitful collaborations established in Earnest to continue. Anne de la Hunty described how project dissemination was progressing and showed a chart illustrating the number of publications arising out of each theme. She reminded delegates of the importance of letting her know when articles had been accepted for publication so that publicity materials could be prepared in advance.

Dr Veit Grote discussed some of the additional analyses they have done on the Childhood Obesity Project data, looking at the effect of protein intakes on fat mass using skinfolds and the associations between weight for length and IGF, branched-chain amino acids and C-peptide. Professor Cristina Campoy outlined some analyses the Granada group are doing on the NUHEAL data, looking to see the effect of DHA and folate according to the MTHFR polymorphism.



Hotel Neptune, Warnemunde  
Photo: Anne de la Hunty

Marin Strom, from the Maternal Nutrition Group at Statens Serum Institut in Copenhagen, presented her work on nutrition and exercise during pregnancy and postpartum depression (PPD). Those with the lowest intake of fish had an increased risk of being prescribed drugs for PPD but no increase in risk of admission; however there was no association between LCPUFA intake and either admissions or prescriptions for PPD. A reduced risk of prescriptions for PPD was seen with vigorous activity but there was no effect on admissions. However, in women who were underweight at the start of pregnancy, activity was associated with an increase in the risk of admission for PPD. Professor Michael Symonds described some work his group have been doing on naturally small Meishan pigs looking at fat development and whether adipose tissue cell number is set early in life.

The afternoon was set aside for individual theme meetings. This was followed by a visit to the Institute for the Biology of Farm Animals, Dummerstorf. A cross-theme training workshop on assessing brain function and behaviour, organised by Sylvain Sebert and Cristina Campoy was held the following morning.

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## Report of Krakow Progress meeting, September 2009

The ninth progress meeting was held from 24<sup>th</sup>-26<sup>th</sup> September, 2009 at Krakow in Poland and was very well organised by Piotr Socha and Darek Gruzfeld from Warsaw. The trip to the Wieliczka Salt Mines, with its cavernous halls hundreds of feet below the ground, was memorable for many reasons, not least being the possibility of seeing Margaret Ashwell being cut in half by the magician who entertained us after dinner. Luckily for Margaret, he cut his assistant in two instead.

The scientific content of the meeting was equally memorable. It began with a workshop on Critical Appraisal for Early Life Epidemiology which was led by Andy Ness, Sam Leary, Laura Howe and Alex Griffiths from Bristol, UK. At the General Assembly the following day, Rhonda Smith described a conference organised by Commnet, (the network of food safety projects' communicators) in Brussels in November which will provide an opportunity to influence MEPs and policy makers on the importance of research into the early life origins of disease.

Richard Martin then described some cohort analyses they had been doing on the PROBIT data looking at accelerated weight gain and blood pressure at 6.5 years. They have developed a multi-level model of weight gain which uses all 13 measures of growth up until age 5 years and calculated the growth velocities for 0-3 months, 3-12 months and 1-5 years and looked at the effects on blood pressure. Andy Ness outlined the analyses they have been doing on the Avon Longitudinal Study of Parents and Children (ALSPAC), now that they have collected blood pressure at age 15 years. They looked at the association of modifiable maternal exposures such as age at childbirth, maternal diet and smoking to see whether changing these might have an impact on offspring blood pressure at age 15. He said that for the exposures and outcome considered there was little evidence of programming in well-nourished populations. Studies of other exposures and outcomes in different populations would extend these findings.

Sylvain Sebert, Paul Taylor and Anne-Maj Samuelsson described experiments they are doing looking at the development of appetite control and what affects this. Sylvain Sebert, using sheep as a model, has been investigating the role of ghrelin, and the effect of catch-up growth on ghrelin production while Paul Taylor and Anne-Maj Samuelsson have been looking at the effect of maternal obesity on lactation and subsequent obesity and blood pressure in their offspring.



Gardens of Wawel Castle, Krakow  
Photo: Anne de la Hunty



Monique Raats described the sources of information which mothers said had influenced them at birth and at 8 months. She pointed out that the "media" was quite low down the list and there was some discussion on the difference between information-seeking behaviour and being presented with information. New mothers were more likely to seek out helpful information.

The afternoon was set aside for individual theme meetings. The Dissemination and Exploitation Panel met the following morning to discuss how the various outcomes of the project would be relevant to different stakeholder groups. There was also a PhD training workshop and a meeting of the Childhood Obesity Project.

Drs Piotr Socha and Darek Gruzfeld are thanked by Professor Bert Koletzko for organising the meeting.  
Photo: Rhonda Smith

## Report of the Dissemination and Exploitation Consensus Platform meeting, Krakow 2009

This was the final meeting of the Dissemination and Exploitation Consensus Platform. As many of the results of the project are now available, the DECP were asked to advise on how they should be disseminated to the appropriate stakeholder groups and how they could be further developed and utilised. At the end of the project we plan to publish short summaries aimed at different stakeholder groups which highlight the outcomes of EARNEST that are most relevant to each group. We wanted to get the advice of the DECP on how best to do this at an early stage in the process.

We asked the group to look at the relevance of the various outcomes from the project for different stakeholder groups and think about how they would be useful to them. Theme leaders had been asked to prepare short presentations, looking at some of the outcomes from their theme and suggesting who they were most relevant for and why and what were the next steps to facilitate their exploitation. Members of the DECP were asked to lead the discussion from the perspective of the different stakeholders they represented. This worked very well and produced some lively and fruitful discussion.



The end result was some useful principles for disseminating and communicating various sorts of outcomes with different stakeholder groups. The group distinguished between knowledge based outcomes which could be translated into advice and other types of outcomes such as "know-how" which could be developed into a diagnostic procedure or datasets which would be of use to other researchers. The particular sensitivities of communicating to pregnant women were debated and the importance of taking into account and communicating to women's partners as well was also emphasized. It was felt that the meeting had been very helpful in coming up with guidance on how to communicate different types of results to different audiences.

Members of the Dissemination and Exploitation  
Consensus Platform in Krakow  
Photo: Rhonda Smith

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## Report on PhD training workshop “How to successfully get your PhD” held in Krakow, 26th of September 2009 (organized by the Earnest Management Team and Eurelations AG)

The intention of this international workshop was to foster the skills of PhD students in order to successfully manage their doctoral studies and the defence of their thesis. According to previous feedback questionnaires, the training was customized to the needs of the 11 participants who enrolled for this course. Focussing on tools of project and time management, interactive exercises such as the elevator pitch (imagine you meet “The Expert” in your field of research in an elevator – how do you present the essence of your work in only 2 minutes?) or the identification of stakeholders influencing your personal PhD work, participants gained an insight into key elements of successful management. Further subjects discussed were the value of first-authorship, co-operation and international team work as well as the content and style of excellent CV's in science. Tools of scientific networking were presented and fellowships as well as grant opportunities to continue the research were introduced and discussed.



For more details about the project and to read previous newsletters, please go to [www.metabolic-programming.org](http://www.metabolic-programming.org)

## RELEVANT MEETINGS

**2009**

**6th International Congress on Developmental Origins of Health and Disease**

Santiago, Chile. 19-22 November, 2009, [http://www.dohad2009.com/dohad\\_society.php](http://www.dohad2009.com/dohad_society.php)

**2010**

**Perinatal Programming The State of the Art**

Berlin, Germany. March 4-6, 2010, [www.perinatal-programming-2010.de](http://www.perinatal-programming-2010.de)

**The Power of Programming International Conference on Developmental Origins of Health and Disease**

Munich, Germany. May 6-8 2010, [www.metabolic-programming.org/munich2010](http://www.metabolic-programming.org/munich2010)

**11<sup>th</sup> International Congress on Obesity**

Stockholm, Sweden. 11-16 July, email: [ico2010@iaso.org](mailto:ico2010@iaso.org)

**2011**

**11<sup>th</sup> FENS European Nutrition Conference**

Madrid, Spain, October 26-29, 2011, <http://www.fensweb.eu>

## SOME RECENT PUBLICATIONS BY EARNEST MEMBERS

Lower protein in infant formula is associated with lower weight up to age 2 y: a randomized clinical trial. Koletzko B, von Kries R, Closa R, Escribano J, Scaglioni S, Giovannini M, Beyer J, Demmelmair H, Gruszfeld D, Dobrzanska A, Sengier A, Langhendries JP, Rolland Cachera MF, Grote V. *Am J Clin Nutr*. 2009 Jun;89(6):1836-45.

Impact of intrauterine growth retardation and early protein intake on growth, adipose tissue, and the insulin-like growth factor system in piglets. Morise A, Sève B, Macé K, Magliola C, Le Huërou-Luron I, Louveau I. *Pediatr Res*. 2009 Jan;65(1):45-50.

Forced catch-up growth after fetal protein restriction alters the adipose tissue gene expression program leading to obesity in adult mice. Bol VV, Delattre AI, Reusens B, Raes M, Remacle C. *Am J Physiol Regul Integr Comp Physiol*. 2009 May 20. [Epub ahead of print]

Early Diet and General Cognitive Outcome at Adolescence in Children Born at or Below 30 Weeks Gestation. Isaacs EB, Morley R, Lucas A. *J Pediatr*. 2009 Aug;155(2):229-34.

Maternal nutrient restriction during pregnancy differentially alters the unfolded protein response in adipose and renal tissue of obese juvenile offspring. Sharkey D, Gardner DS, Fainberg HP, Sébert S, Bos P, Wilson V, Bell R, Symonds ME, Budge H. *FASEB J*. 2009 May;23(5):1314-24.

Fever in pregnancy and offspring mortality - a longitudinal study of a cohort from 1927 to 1937 on the Faroe Islands. Helmsdal G, Olsen SF. *Acta Obstet Gynecol Scand*. 2009 Jul 28;1-3. [Epub ahead of print]

Does dietary DHA improve neural function in children? Observations in phenylketonuria. Koletzko B, Beblo S, Demmelmair H, Müller-Felber W, Hanebutt FL. *Prostaglandins Leukot Essent Fatty Acids*. 2009 Jul 15. [Epub ahead of print]

Fish and long-chain n-3 polyunsaturated fatty acid intakes during pregnancy and risk of postpartum depression: a prospective study based on a large national birth cohort. Strøm M, Mortensen EL, Halldorsson TI, Thorsdottir I, Olsen SF. *Am J Clin Nutr*. 2009 Jul;90(1):149-55.

Early diet and peak bone mass: 20 year follow-up of a randomized trial of early diet in infants born preterm. Fewtrell MS, Williams JE, Singhal A, Murgatroyd PR, Fuller N, Lucas A. *Bone*. 2009 Jul;45(1):142-9.

Maternal protein restriction affects postnatal growth and the expression of key proteins involved in lifespan regulation in mice. Chen JH, Martin-Gronert MS, Tarry-Adkins J, Ozanne SE. *PLoS One*. 2009;4(3):e4950.

Breastfeeding duration and exclusivity associated with infants' health and growth: data from a prospective cohort study in Bavaria, Germany. Rebhan B, Kohlhuber M, Schwegler U, Fromme H, Abou-Dakn M, Koletzko BV. *Acta Paediatr*. 2009 Jun;98(6):974-80.

Body composition at age 9 years, maternal folate intake during pregnancy and methyltetrahydrofolate reductase (MTHFR) C677T genotype. Lewis SJ, Leary S, Davey Smith G, Ness A. *Br J Nutr*. 2009 Aug;102(4):493-6.

Introduction of Complementary Feeding in 5 European Countries. Schiess S, Grote V, Scaglioni S, Luque V, Martin F, Stolarczyk A, Vecchi F, Koletzko B; for the European Childhood Obesity Project. *J Pediatr Gastroenterol Nutr*. 2009 Jun 16. [Epub ahead of print].

Nutritional programming of the metabolic syndrome. Symonds ME, Sebert SP, Hyatt MA, Budge H. *Nat Rev Endocrinol*. 2009 Nov;5(11):604-10.

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