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 7 - SPRING 2009

Report of Glasgow Progress Meeting October 2008

The eighth progress meeting was held alongside the River Clyde in Glasgow, Scotland, where, despite the rather rainy weather, we were given a very warm welcome by Professor Harry McArdle and Tim King from Aberdeen. They lived up to their reputation for providing great hospitality and had us all stripping the willow, being dashing white sergeants and doing eightsome reels at a Scottish Ceilidh in the evening.

The day had begun with an update from Professor Koletzko, who told us that we had received approval for an unfunded extension of the EARNEST project to month 66. This would allow us to hold our final international conference in Munich in May 2010. Plans for this conference are well underway and he asked everybody to advertise the conference in any presentations. There is a slide for this purpose on the website. Margaret Ashwell and Rhonda Smith described the dissemination activities that had taken place over the previous six months. Rhonda was convinced that the concept of early nutrition programming was gaining momentum amongst journalists and that more wanted to be kept up-to-date with the subject. She asked participants to let her know when a paper had been accepted for publication so that she could prepare suitable press material. Margaret said that, in response to suggestions from the reviewers at the last review meeting, we plan to develop a glossary of terms used in programming and make teaching slide sets available. She asked members to please contribute both definitions and suitable slide sets.


Photo: Rhonda Smith

Professor Berthold Koletzko and Professor Harry McArdle

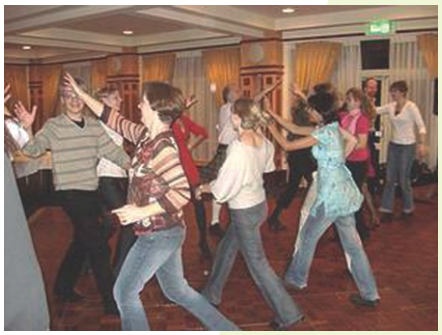
Photo: Veronica Luque

Members of EARNEST enjoying the ceilidh in the evening

During the rest of the morning, we heard some results from the different themes and had time for discussing them from a multi-disciplinary perspective. Veronica Luque from the Childhood Obesity Project, presented their results on protein intake in infancy and kidney size and function. The discussion afterwards compared these results with what might be predicted by the original epidemiological observations on fetal growth restriction and later blood pressure and also with animal studies which suggest there might be an effect on inflammation. Hella Meltzer from the Norwegian Mother and Baby (MoBa) study presented their findings on the effect of n-3 LCPUFA intake in pregnancy on gestational duration. Mothers who had pre-term births had a slightly lower intake of n-3 LCPUFA and those with higher intakes had a small increase in gestational duration. Although the effect was small, it might be important clinically and because so many Norwegian women take cod liver oil supplements during pregnancy, it is possible that the effect is minimised because the intakes of the lowest reference group are relatively high. Sylvain Sebert from Nottingham discussed some work his group have been doing on the programming of appetite: whether this occurs pre-natally and, if so, what might be the important factors? The afternoon was set aside for individual theme meetings.

A workshop on measuring body composition was organised by a group from the Institute of Child Health, London on the second day which proved very popular. Meetings of the Dissemination and Exploitation Consensus Panel, the Childhood Obesity Project and those involved in the Nutrimenthe project were also held in Glasgow .

The conference organisation is well under-way and the scientific programme will be available soon. The first conference, in Budapest in 2007, was successful in bringing together over 250 clinicians and scientists from around the world and this conference promises to be even bigger and better.

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Interaction within EARNEST

One of the wider aims of the EARNEST project is to promote inter-disciplinary interaction within the consortium. The nature of research into early nutrition programming is that it is a new field which draws on the knowledge, skills and perspectives from many disciplines and it requires a variety of experimental approaches. The EARNEST consortium includes experts from a huge variety of disciplines and provides an ideal forum for promoting further inter-disciplinary collaboration. The EARNEST coordination team therefore sent out a questionnaire to partners to ask them about their plans for further inter-disciplinary activities. They received 22 replies to their questionnaire representing 55% of the partners.

Over half of those who replied (12) said that they had planned some further collaborative work beyond their original plans as a result of being part of EARNEST, with 15 future projects planned in total. Of these, 1 has already been completed and published (Andy Ness and Harry McArdle discuss below how their work came about). Another 5 projects have been implemented and 5 more plans are being developed. A further 4 are still at the initial thoughts stage.

Those who replied to the questionnaire were very enthusiastic about further collaboration and almost all (20) said they would like to see more opportunities for interaction and exchange within EARNEST. They suggested more dedicated workshops which approach a common outcome from the different perspectives of each discipline. Special meetings for PhD students and post-docs, or greater opportunities for them to spend time with other research groups were also identified as measures to encourage greater collaboration. The importance of having adequate time and creating a social space to break down barriers was also highlighted. The co-ordination team has promised to look into the feasibility of a dedicated workshop for PhD students.

Photo: Rhonda Smith

Professor Andy Ness

Andy Ness and Harry McArdle talk about their successful collaboration

You have recently had a paper published jointly between your two research teams on maternal iron deficiency, looking to see whether the increased offspring blood pressure seen in animal models is also seen in humans. How did the initial idea come about?
Andy: My recollection is that Harry's group brought some posters to the Tarragona meeting and that they were on display in the area where we had coffee. I can't remember whether we talked about them over coffee or when we went out. I do remember we had quite a night out!
Harry: Andy is right that we discussed the data over the posters, but also had extensive e-mail discussions and then went on to develop the ideas over the next little while. Andy then set up the ALSPAC analysis.

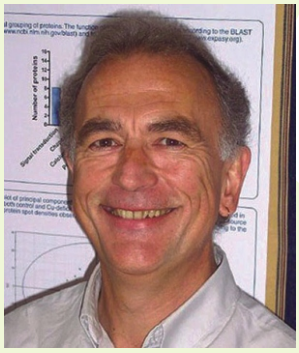

Photo: Rhonda Smith

Professor Harry McArdle

Were the same effects seen in humans as are seen in the animal models?
Andy: It is difficult to interpret the human data because iron status is hard to assess in pregnancy and low haemoglobin may prompt iron supplementation - that said the results don't seem to agree. We have lots of explanations for this which Harry and I have argued about on subsequent nights out!
Harry: That's right. The superficial result seems to be at odds with the animal data, but the iron level estimation in women was not easily done (the best tests weren't available when the data were collected). More recent data suggest that the animal data may well be right, but there is still lots of work to be done.

What are the benefits of this sort of inter-disciplinary collaboration? How does the testing of findings from animal models in epidemiological cohorts help to refine the animal models? Will your findings lead to any modifications of this animal model?
Andy: I think it's really important to demonstrate that animals models are relevant to free living humans. I think a tension is that observational studies in human populations are natural experiments that are usually less extreme than the experimental models used in animals. Harry will have to let you know if this has changed his models.
Harry: There are, in my opinion, several major benefits. First, the mechanisms that operate cannot be tested in humans, only animals. Second, the relevance to humans is easier to explain to the funding masters. Third, possible therapeutic interventions can be tested in animals with a degree (albeit small) of confidence. Our models are constantly refined, but I don't think the results will make us make major changes.

Are you planning any further collaborative work?
Andy: We are hoping to repeat our analyses when the children are older to see if an association emerges (as Harry is convinced the children were just too young!) as part the EARNEST project and we are also exploring using genetic variants of iron metabolism as instrumental variables.
Harry: Having initiated the interaction, we know we have the mechanisms in place for further collaboration, so hopefully they will arise.

How has being involved in Earnest helped with furthering collaborative research between your groups? What are the problems that need to be overcome?
Andy: It has provided us with shared scientific and social space to interact. And I think it is important not to underestimate the importance of building friendships as it is much easier to disagree with a friend and work towards a better answer. I guess my biggest problem is my scepticism about the public health importance of modifiable exposures in pregnancy in well nourished populations.
Harry: I think Andy is right about this. But I also think the education that both "sides" get is much more effective when communicated orally (especially in a night out!) than through scientific papers. The chance to have arguments and discussions should definitely never be underestimated.

Brion MJ, Leary SD, Smith GD, McArdle HJ, Ness AR. Maternal anemia, iron intake in pregnancy, and offspring blood pressure in the Avon Longitudinal Study of Parents and Children. Am J Clin Nutr. 2008 Oct;88(4):1126-33.

SIXTH FRAMEWORK PROGRAMME
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Workshop on Measuring Body Composition

Fifteen members of the EARNEST consortium attended the workshop on Current Techniques in Measuring Body Composition, organised by Kathy Kennedy, Jane Williams and Mary Fewtrell from the Institute of Child Health in London, at the EARNEST General Assembly meeting in Glasgow.

The morning started with an overview of body composition techniques currently available. The term, 'body composition' was defined and explanation into why it is relevant to measure body composition in both research and clinical settings was given. The strengths and weaknesses of using body mass index (BMI) were discussed. Participants were shown how some methods use raw data to measure body composition, for example skinfold measurements or densitometry whilst others use data to predict body composition, for example skinfold equations or bio-electrical impedance.

Jane Williams then took the participants through a detailed explanation of several techniques that are currently in use. The 'pros and cons' of each technique were introduced and a short video of each method was shown: these included skinfold measurements, bio-electrical impedance (including Tanita), whole body plethysmography (Bodpod and Peapod), deuterium dilution and dual X-ray absorptiometry (DXA). Jane then described how it is possible to combine the strengths of some techniques to create either a 3-component (3-C) (fat, fat-free mass and mineral) or a 4-component (4-C) model (fat, protein, water and mineral) of body composition. The 4-C model, which combines data from Bodpod, DXA and deuterium dilution, is currently considered the 'Gold standard' of body composition.

The third presentation, by Mary Fewtrell, was an explanation of how body composition data should be processed, how body size of subjects should be considered and how percentage fat of individuals can vary even when their BMI scores remain similar. The use of standard deviation or Z-scores for key body composition variables such as height, weight, BMI, skinfolds was also discussed.

Kathy Kennedy presented three case studies to illustrate the practicalities of running studies to measure body composition. Members divided into groups to discuss a study and then fed back to the whole group their thoughts and reasoning. Finally, there was a chance for open questions and discussion of issues raised from the morning.

Are health claims a useful tool for communicating with consumers? Report of the DECP meeting, Glasgow 2008

The purpose of this meeting of the Dissemination and Exploitation Consensus Platform (DECP) was to discuss the role of health claims in communicating health benefits to the consumer. Dr Hildegard Przyrembel, a member of the EFSA Panel on Dietetic Products, Nutrition and Allergies, gave a presentation on 'The evaluation of evidence in support of nutrition and health claims, with particular regard to claims for dietetic products for infants and young children - lessons from the 8 opinions published by EFSA so far'. She invited the group to discuss whether health claims were able to inform consumers about scientifically true relationships between the consumption of a food or constituent and a health benefit and whether scientific data can be converted into health claims. Professor Bert Koletzko gave a presentation on 'Overview of possible future claims arising out of EARNEST studies eg lower protein and obesity, prebiotics and allergy, LCPUFA and cognitive development etc'. Although EARNEST was not set up to produce evidence for health claims, it could be used for this purpose and he discussed where the evidence stood in relation to possible claims in these areas.

Two parallel discussion groups were then convened to build upon these presentations and to discuss the usefulness of health claims approved via the EC/EFSA route in communicating health benefits of food from the point of view of the infant food industry and from the point of view of the health professionals and what alternatives might be better.

Early Nutrition Academy Winter School, Sierra Nevada 2009

Around 23 delegates attended the first Early Nutrition Academy (ENA) Winter School which took place in the Sierra Nevada, a 20 minute drive from Granada. It was the ideal location for combining scientific activities and snow sports (or just a risk-free walk on the snow). The delegates, who were mostly post-docs wanting to increase their specialist knowledge, were an international crowd from both Europe and the United States.

The course covered all aspects of programming during pregancy, including evidence from epidemiological, clinical and animal studies. Talks on a variety of topics such as pregnancy and obesity, prenatal early nutrition, epigenetic modification, prenatal programming of the immune system and fetal growth and development were given by leading international experts presenting their latest experimental results. Tania Anjos, one of the delegates, commented that “The course was quite interesting and interactive as I had the opportunity to spend time with the invited lecturers.” Javier Cabellero, another of the participants, said “the course was also more pleasant than I expected: there were not only theoretical lessons but there were practical sessions like ‘academic career building’ or how to write a scientific article, and even workshops with role-playing.”

Professor Cristina Campoy, University of Granada; Frederico Lara, Puleva Biotech; M Dolores Suarez, Vice-rector of Research, University of Granada; Professor Berthold Koletzko, University of Munich

The Winter School gave the delegates the chance of participating in debates, discussions and training exercises on tailoring scientific communication to different audiences (eg, learning how to communicate scientific results to the media or to parents). All the exercises included feedback sessions where the participants could be constructively criticised by their colleagues and the lecturers. All agreed that the participants had made a very good effort and performed well, especially as most were communicating in their second language. Time was also devoted to some other essential, practical activities such as putting in grant applications and getting research funding, and how to get papers published.

The great location really helped people to get to know each other. Tania Anjos again, “Throughout the course I could feel a good scientific and social atmosphere. The evenings were very pleasant, with good food or a pool game, and usually ended up in the Karaoke bar.”

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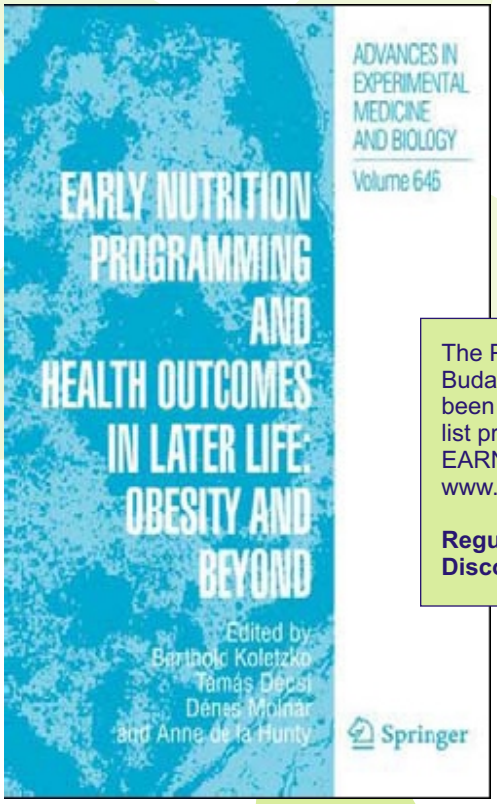
EFSA approves claim that DHA contributes to visual development of infants

Infant and follow-on formulas might one day be able to carry the claim that the long chain omega 3 PUFA, DHA (docosahexaenoic acid) contributes to the visual development of infants following the approval of this claim by the Panel on Dietetic Products, Nutrition and Allergies (NDA Panel) of the European Food Safety Authority. However for such a claim to be allowed on infant and follow-on formulas, the Infant Formula Directive will probably have to be changed first. The Commission will now have to decide how to convert the opinion into an approved claim and how to formulate the legal basis for it.

The Panel concluded that a causal relationship between DHA intake from birth and visual function at 12 months had been established by the studies submitted but that a significant effect was only seen in studies using around 0.3% total fatty acids as DHA. Studies using less than this level had not seen an effect on visual function, although not all studies using this amount have seen an effect either. The claim was originally for both DHA and ARA (arachidonic acid) but the Panel concluded that no additional benefit of DHA plus ARA had been seen over DHA alone in any of the studies submitted and that the role of ARA on the visual development of term infants could not be established therefore. The Panel commented that they could not have approved the claim without the studies carried out by the applicant.

For more details about the project and to read previous newsletters, please go to www.metabolic-programming.org



The Proceedings of the 2007 Budapest Conference have now been published. Get 20% off the list price by ordering through the EARNEST website - www.metabolic-programming.org

Regular price: € 119.95
Discount price: € 95.96

RELEVANT MEETINGS

2009
Diogenes ECO Satellite meeting. Prevention of weight (re) gain including EC-US Workshop on Early life programming of obesity
Amsterdam, The Netherlands, 4-5 May 2009, http://www.diogenes-eu.org/ECO2009

17th European Congress on Obesity,
Amsterdam, The Netherlands. 6-9 May 2009, http://www.easoobesity.org/eco2009

18th Annual Meeting of the European Childhood Obesity Group (ECOG)
Porto, Portugal. 5-7 June 2009, ecog2008@skyros-congressos.com

6th International Congress on Developmental Origins of Health and Disease
Santiago, Chile. 19-22 November 2009, http://www.dohad2009.com

2010
The Power of Programming International Conference on Developmental Origins of Health and Disease
Munich, Germany. May 6-8 2010, email: Programming@med.uni-muenchen.de

11th International Congress on Obesity
Stockholm, Sweden. 11-16 July, email: ico2010@iaso.org

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SOME RECENT PUBLICATIONS BY EARNEST MEMBERS

Bol VV, Reusens BM, Remacle CA. Postnatal Catch-up Growth After Fetal Protein Restriction Programs Proliferation of Rat Preadipocytes. Obesity (Silver Spring). 2008 Oct 2

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Halldorsson TI, Thorsdottir I, Meltzer HM, Nielsen F, Olsen SF. Linking exposure to polychlorinated biphenyls with fatty fish consumption and reduced fetal growth among Danish pregnant women: a cause for concern? Am J Epidemiol. 2008 Oct 15;168(8):958-65.

Koletzko B, Demmelmair H, Schaeffer L, Illig T, Heinrich J. Genetically determined variation in polyunsaturated fatty acid metabolism may result in different dietary requirements. Nestle Nutr Workshop Ser Pediatr Program. 2008;62:35-44; discussion 44-9. Review.

Oken E, Østerdal ML, Gillman MW, Knudsen VK, Halldorsson TI, Strøm M, Bellinger DC, Hadders-Algra M, Michaelsen KF, Olsen SF. Associations of maternal fish intake during pregnancy and breastfeeding duration with attainment of developmental milestones in early childhood: a study from the Danish National Birth Cohort. Am J Clin Nutr. 2008 Sep;88(3):789-96.

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Symonds ME. Nutrition and its contribution to obesity and diabetes: a life-course approach to disease prevention? Proc Nutr Soc. 2008 Dec 10:1-7. [Epub ahead of print]

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