

A conference for health and
education professionals

An age-old dilemma

Good nutrition for older people



Wednesday 5th March 2008
W5, at the Odyssey, Belfast

The Dairy Council for Northern Ireland

An age-old dilemma

Good nutrition for older people

Programme of events

09.30

Registration and coffee

10.00

Professor Sean Strain, University of Ulster

Chairperson's introduction

10.15

Dr Jayne Woodside, Queen's University, Belfast

Introduction and overview – nutritional needs of older people

10.50

Dr Paula Moynihan, Newcastle University

Oral health – impact on diet and nutrition related quality of life

11.25

Coffee

11.45

Professor Michael Rennie, University of Nottingham

Muscle health – diet and exercise strategies for maintaining muscle

12.20

Professor Ian Rowland, University of Reading

Pre- and probiotics – are there benefits for older people?

12.55

Lunch

2.00

Dr Susan Lanham-New, University of Surrey

Bone health – insights for osteoporosis prevention and treatment

2.35

Professor Helene McNulty, University of Ulster

Cognitive function – can the right diet slow brain aging?

3.10

General discussion

3.30

Close

Nutritional needs of older people

**Dr Jayne V Woodside,
Nutrition and Metabolism Group,
Centre for Clinical and Population Science,
Queen's University Belfast**

The World Health Organisation defines older people as being of 60 years of age and above. Based on this definition, the proportion of older people in Europe is currently around 20%, with a predicted increase to 25% by 2020. This increase in the proportion of older adults in the population arises both from an increasing average life expectancy as well as from a declining birth rate.

The incidence of disability increases with ageing, with over a third of the older population limited by chronic conditions such as arthritis, hypertension, cardiovascular disease, diabetes, hearing impairment, orthopaedic impairment, cataracts, age-related macular degeneration and cancer. Therefore, as the older population increases, so will both the incidence of these diseases and the proportion of the population with disability. Strategies to reduce the age-related decline in mobility and reduce chronic disease prevalence will therefore be important for healthy ageing.

Older persons are more likely to be in marginal nutritional health and thus to be at higher risk of nutritional deficiency in times of stress or health problems. Physical, social and emotional problems may interfere with appetite or affect the ability to purchase, prepare or consume an adequate diet. Ageing-related physical changes include change in body composition, energy expenditure, physical activity, bone loss, taste, cognitive function, immune function, dentition, digestive function and eyesight. The physiological changes that occur with ageing may affect requirements for several nutrients, and the higher prevalence of disease and drug administration in older people may also affect nutritional requirements and nutritional status.

Nutrition is likely to play an important role in preventing many changes once thought to be inevitable consequences of growing older. The potential impact of dietary manipulation on the maintenance of physical and cognitive function throughout old age has profound consequences for the optimisation of health, independence and well-being in older people, which is particularly important in this era of an ageing population. Encouraging better nutrition is a cost-effective way of potentially decreasing the incidence and progression of age-related disease.

The impact of oral health on diet and eating-related quality of life in older adults

**Dr Paula Moynihan,
School of Dental Sciences,
Newcastle University**

Diet is an important determinant of health and quality of life at any age but especially in older people it is the key link between oral and systemic well being. Eating difficulties are more common in later life and may arise as a result of a sore mouth, swallowing difficulties and chewing and biting difficulties.

Reduced salivary flow rate is common in the elderly and results in a sore mouth, swallowing difficulties, impaired mastication, problems with denture fit, alterations in taste, and increased susceptibility to oral infections. These factors may contribute to under nutrition.

In the UK 46% of people aged 65 years and over have no teeth. The chewing and biting ability of an edentulous person is severely impaired, swallowing is less well coordinated, susceptibility to a sore mouth is increased and taste sensation reduced – all impacting on eating and well being. Many studies have shown denture wearers avoid foods that are difficult to chew and have a low intake of fruits, vegetables and fibre. Analysis of data from the British NDNS of people aged 65 years and over showed that only 9% of the edentulous sample achieved the recommended target to consume 400g fruits and vegetables per day.

The association between tooth loss and poor diet has, however, not been proven to be causal and many factors other than eating ability impact of food choice. Furthermore, if poor dentition is the reason for a poor diet one would expect that dental intervention alone would improve diet, but research shows this is not the case. Tooth loss is unlikely to be solely responsible for a poor diet in older age, however, when a person is exposed to several factors that contribute to a poor dietary intake such as ill health, depression or social isolation, additional problems with eating caused by ill fitting dentures or other oral conditions may tip the balance resulting in under nutrition.

Tooth loss also impacts upon enjoyment of food and eating related quality of life. Data from the Oral Health Report of the British National Diet and Nutrition Survey of people aged 65 years showed that 17% reported that oral health impacted on patterns of daily living especially eating and speaking on a regular basis.

Research at Newcastle University has shown that dietary intervention contemporaneous with the provision of dentures results in positive dietary changes. Recent research at Newcastle University has also shown that rehabilitating edentulous patients with implant-supported dentures has positive impacts for both ability to comply with dietary advice and also eating related quality of life.

Muscle health: diet and exercise strategies for maintaining muscle

**Professor Michael J Rennie,
University of Nottingham School of Graduate Entry Medicine and Health,
Derby City Hospital**

It is received wisdom that with ageing comes, for most people, a loss of muscle mass and strength and increased fatigability. The pertinent question is to what extent can this be reduced?

Before providing trite answers like “by eating a more healthy diet and taking more exercise” we need to identify what “healthy” and “exercise” mean - and possibly what “more” means in the context of human ageing. Can we specify exactly the incidence of sarcopenia in a British population and what goes wrong with muscle to cause sarcopenia? Do we know how diet and exercise work their putative benefits? Do we know what the optimal diet and exercise regimens are currently? The answers, sadly, are at best “only partly”.

Most data is available from abroad and the incidence of sarcopenia in the UK among different age groups from 50 to the oldest old is poorly defined, a gap yet to be filled. If we accept results from American studies we might guess that the problem of wasting of muscle in the general population is of about 0.5 - 2% per annum, with about 25% of men and women having sarcopenia i.e. muscle masses of 1 SD below the mean. This means that kilotons of muscle are lost every day in otherwise healthy people.

By what means? The idea that a pernicious metabolic goblin is consuming muscle, though figuratively attractive, is probably wrong, and certainly we have no data showing any increase in muscle protein breakdown in elderly men and women. Similarly, we contend that there is no evidence of a markedly decreased rate of muscle protein synthesis in the basal state. Rather we believe that in the muscles of elderly people (and many people with more serious wasting diseases) there is a condition we have characterized as “anabolic resistance” a failure to respond appropriately by building protein and decreasing its breakdown after meals are eaten. Simply feeding more protein will not alter this state of affairs if there is an inability to respond due to a lack of capacity of muscle.

Exercise might help here. Exercise of all types is anabolic but the kind of exercise that builds muscle to increase strength and improve hip stability is resistance exercise which has been shown to stimulate muscle protein synthesis markedly, and to act synergistically with food to induce positive protein balance. We do not yet have a dose response relationship between the amount of exercise and the mode, required to maintain or build muscle although this is being worked upon actively. Suffice it to say that there are indications that resistance exercise in the elderly seems to have a rejuvenating effect in overcoming anabolic resistance so that more efficient use of food protein helps maintain or even grow muscle. Dietary advice would include recommendations not to eat more protein as a result of doing more exercise but eat to cover energy needs (guided by appetite), to nevertheless less eat a diet with a relatively high protein energy ratio, limit fat and high glycaemic carbohydrate foods and do resistance exercise sufficient to attain a new steady state of muscle mass and then maintain it by visits to the gym at a less frenetic rate say twice a week rather than three times.

Pre- and probiotics: are there benefits for older people?

**Professor Ian Rowland,
Department of Food Biosciences,
University of Reading**

Probiotics are live microorganisms that, when administered in adequate amounts confer a health benefit on the host, whereas a prebiotic is described as a non-digestible food ingredient that beneficially affects the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria (e.g. bifidobacteria and lactobacilli) in the colon that have the potential to improve host health. The prime target of such functional food ingredients is the gut, although here is emerging evidence that they may have beneficial effects at other sites in the body.

There is evidence that the microflora of the colon alters with age, with an increase in species diversity and lower numbers of bifidobacteria. The implications for health have not been established. In numerous human trials prebiotics have been shown to increase the numbers of bifidobacteria, but there are few studies in older people.

In older subjects, disorders of the GI tract, such as diarrhoea and constipation, are the third most prevalent cause of visits to family doctors. Diarrhoea is a frequent complication of antibiotic treatment (antibiotic associated diarrhoea: AAD) and is common in hospitals and chronic care facilities for older people. AAD usually occurs 2–8 weeks after treatment with antibiotics probably due to disruption of the intestinal microflora allowing overgrowth of opportunistic enteric pathogens, in particular *Clostridium difficile*. In a meta-analysis of 25 clinical trials (not all in older patients), probiotics had a significant effect (overall RR = 0.43, $p < 0.001$) and a recent randomised placebo-controlled trial in older hospitalised patients (mean age 74 years) receiving antibiotics, reported that a probiotic drink containing *L. casei* reduced the incidence of diarrhoea (odds ratio 0.25) and prevented *C. difficile* infection (0% vs 17% in placebo group). Fewer studies have been conducted with prebiotics and have not shown consistent results.

A number of clinical trials have been conducted with conventional and probiotic-enriched yogurts and fermented milks in elderly subjects with constipation. Of 7 studies, 5 showed significant laxative effects and one showed a significant improvement in transit time. There are reports that prebiotics such as fructooligosaccharides, galactooligosaccharides and inulin exert mild laxative effects although in most studies to date the effects do not reach statistical significance.

Studies in animal models provide evidence that pro- and prebiotics can beneficially influence various stages in the initiation and development of colon cancer. There is, however, limited evidence from epidemiological studies for protective effects of products containing pro- and prebiotics in humans, but recent dietary intervention studies in healthy subjects and in polyp and cancer patients have yielded promising results on the basis of biomarkers of cancer risk (decreased cell proliferation and reduction in DNA damage in rectal biopsies), and in terms of grade of colorectal tumours.

In terms of beneficial effects of pro and prebiotics at other sites in the body, the most well established is the effect on immune function which shows evidence of decline with age. Probiotic supplementation has been shown to improve immune biomarkers and to influence the incidence and duration of infections in older subjects. Another potentially beneficial effect is the increased absorption of calcium seen after prebiotic consumption. The effect is most apparent in adolescents, but there some positive data in post menopausal women.

Overall it may be concluded that the evidence for beneficial effects of pro- and prebiotics in older people is promising, although more, larger scale intervention studies are warranted in most areas.

Bone health: insights for osteoporosis prevention and treatment

**Dr Susan Lanham-New,
Faculty of Health and Medical Sciences,
University of Surrey**

Throughout the life cycle, the skeleton requires optimum development and maintenance of its integrity to prevent fracture. Bones break because the loads placed upon them exceed the ability of the bone to absorb the energy involved. This may be the result of a number of factors: reduction in bone mass, change in bone distribution; loss of cancellous/cortical micro-architecture; accumulation of damaged bone; change in the material properties of the remaining bone. Current figures estimate that 1:3 women and 1:12 men over the age of 55 years will suffer from osteoporosis in their lifetime and in the UK, at a cost in excess of £1.7 billion per annum.

The pathogenesis of osteoporosis is multi-factorial. Both the development of peak bone mass in the younger population and the rate of bone loss in postmenopausal women and elderly people are determined by a combination of genetic, endocrine, mechanical and nutritional factors, with evidence of extensive interactions within and between these groups. Sensible and simple nutritional advice, which is based on sound scientific evidence, is of paramount importance to encourage the optimisation of bone health throughout the life cycle.

There are now good data to suggest that calcium supplements are effective in reducing bone loss in late menopausal women (>5 years post-menopause), particularly in those with low habitual calcium intake (< 400mg/d). A meta-analysis that includes 15 trials indicates that calcium supplementation at levels between 500 and 2000 mg/day reduces postmenopausal bone loss. In younger postmenopausal women who are not vitamin D deficient, calcium supplementation has little effect on BMD. Vitamin D and calcium supplementation studies have been shown to reduce fracture rates in the institutionalized elderly but there remains controversy as to whether supplementation is effective in reducing fracture in free-living populations. Low vitamin D status has been implicated in an increased risk of falling, and a recent meta-analysis has shown that vitamin D supplementation reduces the risk of falls among institutionalized and free-living elderly people.

The role of other micronutrients on bone remains to be fully defined, although there are promising data in the literature for a clear link between vitamin K nutrition and skeletal integrity including fracture reduction.

Cognitive function: can the right diet slow brain ageing?

**Professor Helene McNulty,
Northern Ireland Centre for Food and Health (NICHE),
University of Ulster**

Impaired cognitive function is a common problem of ageing, ranging in severity from mild memory loss to dementia. The term dementia describes a set of symptoms characterised by a significant decline in memory and thinking sufficient to impair functioning in daily living. An estimated 24 million people in the world suffer from dementia, and this is predicted to rise to 81 million by 2040.

In recent years, there has been a growing interest in the possibility that lifestyle and dietary factors may play a role in altering the risk of cognitive decline and dementia. Increasing age and low education are well recognised risk factors, but independently of these factors, recent evidence identified high blood pressure, high lipid levels and obesity as significant predictors for the development of dementia.

A number of studies have examined the potential role of the specific foods (e.g. fish, fruit/vegetables) or nutrients (e.g. n-3 fatty acid, antioxidants, vitamin B12, folate) in maintaining cognitive function in aging. However, it is sometimes difficult to interpret such evidence, since poor diet may be both a cause and a consequence of poor cognitive function. For most dietary factors suggested to play a role, conclusive evidence from good quality randomised trials is lacking. Such evidence is necessary to prove that a particular dietary factor can in fact benefit cognitive function.



The Dairy Council for Northern Ireland
Shaftesbury House
Edgewater Office Park
Edgewater Road
Belfast, BT3 9JQ
Tel. (028) 9077 0113
Fax. (028) 9078 1224
www.dairycouncil.co.uk