EU-funded project on the elderly

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Background

With improvements in health-care, living standards and socioeconomic status, more adults are living to old age. The proportion of the world’s population aged 65 and over is projected to increase from the current 6 per cent to 15 per cent by the year 2025. If you take the population of Europe in 1990, 13.7 per cent was over 65 and it is predicted that by 2025 this proportion will have increased to 22.4 per cent (US Census Bureau, 1993). By the twenty-second century it is estimated that there will be more Europeans over 60 years than under 20. This demographic shift creates a major public health problem; that with increasing age there is an increased risk of development of a number of age-related pathologies. With ageing, there is loss of bone tissue, reduced respiratory function, decline in cognitive function, impaired immune function, increased susceptibility to infection and increased risk of heart disease and cancer, all of which reduce the quality of life (Barnett, 1994; Khaw, 1997). However, there is now increasing evidence that many of the biological changes and risk for chronic disease which have been attributed to ageing are really due to sub-optimal diets and nutrient intakes (Blumberg, 1994; Beckman and Ames, 1998; Morrissey and O’Brien, 1998). While nutritional status surveys of the elderly have shown a relatively low prevalence of frank nutrient deficiencies, there is a marked increase in risk of malnutrition and evidence of subclinical deficiencies with a direct impact on function (Blumberg, 1997). The significance of these observations becomes clear with the recognition that nutritional status influences the age-related rate of functional decline in many organ systems. The evidence is therefore undisputed that diet and nutrition are directly linked to many of the chronic diseases afflicting older adults (Committee on Diet and Health, Food and Nutrition Board, Commission on Life Sciences, National Research Council, 1989).

The public health challenge

A major societal challenge, and one that has been identified by the European Union, is to improve quality of life and prevent or reduce disability and dependency in this ageing population. In the light of the evidence
already outlined, diet and nutrition present themselves as a fundamental part of the solution to this challenge as well as to the public health challenge to reduce morbidity. The effect of age on nutrient requirements is difficult to quantify for older adults because there is such great variability in ageing (Chernoff, 1995). Different individuals age at different rates and, within a particular person, ageing occurs at different rates within the cells and systems of the body. Generally it is assumed that energy intake and energy expenditure decrease with age. The declining need for energy is primarily due to a reduction in the amount of lean body mass and a more sedentary lifestyle. Unfortunately with this decline in need for energy comes a critical risk of malnutrition. Decreasing energy intake with advancing age has important implications for the diet in terms of protein and micronutrients (Blumberg, 1997). Although there is a decrease in energy requirements with advancing age, there is no parallel decrease in the need for most other nutrients – in fact, protein and certain vitamin requirements may actually increase (Chernoff, 1995). Increases in the status of vitamins B6, B12 and folate, for example, will offer significant protection against cardiovascular disease, and certain deficits of neurocognitive function (Blumberg, 1994). Dietary quality becomes difficult to ensure when overall energy intake is low and requires a careful selection of nutrient-dense foods. At present, it seems that the gap between actual nutrient consumption common among older adults and the recommended intakes from diets associated with health promotion and prevention of chronic diseases is large (Blumberg, 1997). This begs the question, why does food consumption decrease to such an extent with advancing years and what are the factors that affect both food choice and food consumption?

Factors affecting food intake of elderly people

Food choice, like any complex human behaviour, is influenced by many interrelating factors. It is not determined entirely by physiological or nutritional need, but is also influenced by social and cultural factors. A number of models seeking to delineate the effects of likely influences have been put forward in the literature (for a review, see Shepherd (1989)). In one particular model, the various factors influencing food choice have been categorised as those related to food, to the individual making the choice and to the external economic and social environment within which the choice is made (Shepherd, 1985).

One of the well established factors that affects food choice is the sensory perceptions to food stimuli. Chemical and physical properties of the food are perceived by the individual in terms of sensory attributes. These sensory attributes of foods can be categorised, in broad terms, as appearance, texture, trigeminal mouthfeel, odour and taste. The ability to perceive these sensory attributes in addition to actually liking them determines whether or not an individual consumes a particular food (Shepherd, 1999). There are inter-individual variations in sensitivity to stimuli and, as ageing progresses, the senses (individually or together) may degenerate. For example, the number of taste buds decrease with increasing age, which in turn causes a gradual decrease in sensitivity to tastants (Schiffman et al., 1979). The impact a change in sensory capability has on food preferences and food intake is unclear. From a physiological point of view, one might assume that a consumer will require an increase in the intensity of a certain stimulus in proportion to any decrease in sensitivity to that stimulus. For this reason, a recommendation to enhance the flavour of foods has been widely advocated. On the other hand, from the psychological viewpoint, it can be argued that a person’s preferences are entirely acquired, and can be continuously re-acquired during a slow decline in sensory capability. The real truth may lie somewhere in the middle for there is little doubt that certain types of texture (e.g. hard or sticky foods) may cause problems for elderly people.

Age-related deficits in taste and smell have been reputed to decrease the enjoyment of food, reduce food consumption and lead eventually to malnutrition and ill health (Schiffman, 1997). On the other hand, a number of studies have reported that under-nutrition per se is a causative factor in producing alterations in taste and smell (Davidson et al., 1998). The evidence is clear that elderly people often suffer from olfactory and/or taste deficits. However, what is not
clear is the impact of these deficits on food choice, nutrition and health.

**Objectives of HealthSense**

One of the key objectives of HealthSense is to generate scientific data on the relationship between sensory physiology and food preferences. Reliable and valid tests will be developed to measure the capability of the four types of sensory perception (texture, trigeminal, odour, and taste), which have a direct impact on preferences before and during consumption. Another objective is to study the degradation of sensory capability in the ageing and determine how this affects their food preferences and general wellbeing. Free-living European consumers in five different age categories will express their preferences for real foods which represent the typical range of texture and flavour types encountered. Comparisons of these preferences across the different age sections and across cultures will be made and related to the sensory capabilities (including interactions and compensations between the senses) of the individuals tested. The role of past experiences with food, recalled by memory, and how these influence preferences, will also be objectively determined. It is well recognised that memory plays a significant role in personal preferences and aversions, in meal patterns and in meal satisfaction. Methods will be developed to test sensory memory (visual, auditory, olfactory, gustatory, tactile and other somato-sensory). The immediate social context within which a meal is eaten can also influence food choice and consumption. For example, work by de Castro and de Castro (1989) has shown that the amount of food consumed increases with an increasing number of individuals present at a meal. HealthSense will gain insight into the influence of situational factors on the relationship between sensory impressions and food appreciation. This relationship will then be validated in real life situations, with optimised food products. The data generated from each of these sensory-oriented tests will be used by both the food industry and health policy makers to develop foods with optimal sensory attributes for elderly consumers.

As outlined earlier, other factors influencing food choice include those relating to the individual making the choice. For instance, psychological differences between individuals, such as personality, may have a significant influence on food choice (Shepherd and Farleigh, 1986). Factors relating to the external economic and social environment within which the choice is made will also affect food choice (Shepherd, 1999). The culture in which individuals are brought up will strongly influence the types of choices made, and social interactions will have a profound effect on attitude towards food and eating behaviour (Shepherd, 1999). There are also many factors in the context within which the choice is made that are likely to be very important. HealthSense will address each of these issues in detail by way of qualitative and quantitative EU surveys. A series of group discussions and in-depth interviews will be set up in five European countries to investigate and quantify the attitudes of elderly people with respect to food-related issues and how these may affect food choice behaviour. The surveys will examine possible influences on food choice including: taste, price, healthy eating, convenience, availability, appearance, ease of preparation and portion size. The mentality of the ageing towards food will also be studied – in other words, whether people “live to eat” or “eat to live” will be investigated. HealthSense will review the provisioning strategies of different household types and how factors such as distance of shops from consumers, who helps with the shopping, affect food choice. HealthSense will also obtain knowledge on how nutritional information is likely to be received and practised among elderly people according to their health and socio-demographic status. It will determine the best way to communicate nutritional information.

In summary, this project brings into sharp focus the issues which determine the choice of foods and how the ageing and elderly deal with barriers to food choice and enjoyment. An understanding of the mechanisms of food choice and acceptance is an integral part of all attempts to improve the competitiveness of the European food and drink sector. As there would now appear to be both a need and an economic environment for the development of foods specifically designed for a rapidly growing elderly population (Peleg, 1993), the information which HealthSense produces will underpin the development of the European industry and will support continuous advances in food technology, which, in turn,
will provide significant opportunity for companies to produce cutting-edge nutritious foods.

References

Committee on Diet and Health, Food and Nutrition Board, Commission on Life Sciences, National Research Council (1989), Diet and Health: Implications for Reducing Chronic Disease Risk, National Academy Press, Washington, DC.