Teaching Nutrition In The Primary School Setting: Recommendations For The Development Of A National Strategy For Malta

Suzanne Piscopo; Home Economics Office, Rm. 324, Faculty of Education, **University of Malta**, Msida MSD 06, Malta.
Email: suzanne.piscopo@um.edu.mt

Theme: Curriculum Development and National Priorities

Keywords: national strategy, nutrition education, formal curriculum, Primary level, teacher training

INTRODUCTION

Children are a nation's most important natural resource and their health, knowledge and capabilities can determine a country's future. Yet health and education are intertwined. Justifying the need to take local action for creating Health Promoting Schools, Dr. Desmond O'Byrne from the World Health Organisation Health Promotion Office has stated, "Good health supports successful learning. Successful learning supports health. Education and health are inseparable." (WHO, 2001, p.1)

Nutrition – what people eat – is known to be one of the key factors influencing health and school performance. However, research into the health of schoolchildren has shown that there are significant concerns about their current and future well-being; in particular due to an increase in rates of overweight and obesity and related conditions, greater reliance on fast foods, decline in the social practice of families sitting down to eat together, and lack of food selection and preparation skills. (Dixey, Heindl, Loureiro, Perez-Rodrigo, Snel & Warnking, 1999) There is evidence that the impaired childhood growth and development that result from poor nutrition are linked to chronic disease in adulthood. (Cabellero, 2001) In addition, poorly nourished children, particularly those who are overweight or obese, often experience significant social and psychological problems. (Janssen, Craig, Boyce & Pickett, 2004) Maltese schoolchildren are no exception to these trends. Available data indicate that Maltese children are among the most overweight and obese globally and that dietary habits are not in line with current expert recommendations. (Cortis, 2005; Currie et al., 2004; Formosa, 2004; Piscopo, 2004; Cassar, Chircop & Falzon, 2003; Borg & Fenech, 2001)

It is time for the Maltese government to act. Nutrition interventions are required to promote health and to decrease the risk of disease among present day schoolchildren and future adults. Schools provide one of the most effective and efficient ways to implement nutrition interventions through policies, services and learning experiences. (Whitman, Aldinger, Levinger & Birdthistle, 2001) Large portions of the population, including children, teaching staff, families and community members can be reached. Children, in particular, can be targeted at an influential stage in their lives, when lifelong dietary patterns are formed.

National investments in the education system are intended to yield benefits to individuals, communities and the nation. Such benefits include health and well-being, improved social and economic development, increased productivity and enhanced quality of life. Investments in education can therefore obtain added value by increasing the capacity of schools to promote healthy eating as they do learning. (WHO, 1998)

At the World Education Forum in Dakar, Senegal, in April 2000 the WHO, UNICEF, UNESCO, and the World Bank launched a joint initiative to Focus Resources on Effective School Health (*FRESH*). (UNESCO/UNICEF/WHO/The World Bank, 2000). This initiative emerged in response to the need for more comprehensive programming in promoting health among school children, rather than singular approaches for which the expectations are often unreasonably high. The *FRESH* approach calls for the following four core components to be implemented together in all schools:

- Health-related school policies
- Provision of safe water and sanitation as essential first steps toward a healthy learning environment
- Skills-based health education
- School-based health and nutrition services.

FRESH also lists the following requisite factors for success:

- Gaining commitment
- Theoretical underpinnings
- Appropriate content of programme
- Appropriate methods
- Appropriate timing and sequence
- Multi-strategy for maximum outcomes
- Teacher training and professional development
- Relevance
- Participation.

Given that the Maltese National Curriculum Council (NCC) has already embarked on an exercise to develop a National School Nutrition Policy focusing on promoting healthy school nutrition environments, this paper will focus specifically on the development of a national strategy for Nutrition Education in Maltese Primary schools. The factors for success as described within the *FRESH* approach will be used as a guiding framework for discussing the way forward to developing this national strategy. For the purpose of this paper, the focus will be on the formal curriculum, though some reference will be made to aspects of the informal and parallel curriculum. (UK Department of Education and Science, 1980)

DEVELOPING A NATIONAL STRATEGY FOR NUTRITION EDUCATION IN MALTESE PRIMARY SCHOOLS

Gaining Commitment

Intense advocacy for a National Nutrition Education Curriculum is required from the earliest planning stages. This is essential to influence key national leadership, to mobilise the community to place skills-based health education on its agenda, and to hold the community accountable for implementing national and international agreements. Advocating with accurate and timely data can convince national leaders and communities that prevention from an early age is important. It can also help ensure that the nutrition curriculum addresses the actual health needs, experience, motivations of the target population, rather than problems as perceived by others. (McKee, Manoncourt, Saik Yoon & Carnegie, 2000)

The Maltese Ministry of Education, possibly via the National Curriculum Council, will need to be presented with a strong case for the need of a national Nutrition Education Curriculum for Primary Schools. A number of arguments may be broached, including arguments related to Maltese children's and adults' current health status and dietary habits and their short-term and long-term health implications; as well as Maltese children's knowledge and perceptions of food and health. Specific arguments along these lines are presented in Table 1. Meanwhile, other possible arguments are related to commitments and recommendations of the Maltese National Food and Nutrition Policy and of the National Minimum Curriculum; Malta's membership of the European Network of Health Promoting Schools (ENHPS); and current provision of nutrition education in Maltese Primary schools. These latter arguments will be discussed in more detail below.

TABLE 1
A Case For Developing A National Nutrition Education Curriculum For Primary Schools: Some Preliminary Arguments

Maltese Children's and Adults' Health Status
• Maltese children, adolescents and adults have among the highest rates of overweight and obesity in the world (Currie et al., 2004; Bellizzi, 2002; Malta Department of Health Policy and Practice, 1992), and excess weight is a risk factor for a myriad of health conditions and diseases. (WHO, 2003b) • Obesity in childhood is often carried into adulthood. (Guo & Chumlea, 1999) • Cardiovascular disease is the leading cause of mortality in Malta and unhealthy eating habits and obesity are two major risk factors. (WHO Regional Office for Europe, 2005) • 10% of the Maltese population suffers from type 2 diabetes as compared to the 2-3% of their European neighbours, and this is partially brought on by unhealthy eating habits and obesity (Townsend Rocchiccioli, O'Donoghue & Buttigieg, 2005) • Type 2 diabetes is also emerging among Maltese adolescents (Personal communication, Professor J. Azzopardi, Chairperson National Steering Committee on Diabetes, 23-3-06)
Maltese Children's Dietary Patterns
• Maltese children's diets have moved away from the traditional Mediterranean orientation, towards a more Westernised one. (Piscopo, 2004) • Many Maltese schoolchildren are consuming an unhealthy diet, which is often high in energy yet low in nutritional value. Typical less healthy foods consumed are fast food meals, pizzas with high fat cheese and/or sausage toppings, sandwiches made with white bread, ham and high fat cheese, sweets, packet snacks and soft drinks. Whilst intake of fruit and water seems to be fairly high, consumption of vegetables, milk and wholegrain products seem to be low. (Cortis, 2005; Piscopo, 2004; Formosa, 2004; Cassar, Chircop & Falzon, 2003; Borg & Fenech, 2001; Camilleri, 2001) • Maltese adolescents are among the top consumers of sweets in Europe, yet only about half of the teenagers consume breakfast daily. (Currie et al, 2004) • Dietary habits are established at a young age and these habits will often persist into adulthood. (Dixey et al, 1999)
Maltese Children's Current Nutrition Knowledge and Perceptions Of Foods
• Maltese children are aware of the link between type of food consumed and health; but that they have both correct and incorrect knowledge about which foods are good and less good for health and about the nutritional value of foods. (Piscopo, 2004; Cassar, Chircop & Falzon, 2003; Debono & Scicluna, 2003; Callus & Merceica, 2002) • Maltese children associate certain healthy foods with the elderly, people suffering from high blood pressure and people trying to lose weight, which associations may act as barriers to consumption. (Piscopo, 2004) • Attributes such as 'sweet', 'flavoursome', 'fresh', 'soft', 'juicy', 'red colour', 'refreshing', 'convenient to prepare and consume' attract Maltese children to both vegetables and fruits; whereas attributes such as 'soft', 'soggy' and "*full of seeds*" are barriers to consumption. (Piscopo, 2004) • Maltese children are attracted by the positive health value of a number of vegetables and fruits, especially vitamin content. (Piscopo, 2004) • Maltese children are attracted by the positive health value of some traditional snack foods, such as *ħobż biż-ż*ejt, *qagħaq* and *biskuttelli*. (Piscopo, 2004) • Maltese children like strong flavoured soft foods and crunchy, but not too hard biscuit-type traditional foods as snacks, especially as an accompaniment to beverages, for dipping in beverages and to assuage hunger. (Piscopo, 2004)

National commitments and recommendations

Malta is currently a member of the European Network for Health Promoting Schools and committed to its goals for improving health among schoolchildren. (WHO, 2003a) At the same time, the Malta Food and Nutrition Policy (Malta Department of Health, 1990) specifies that schools have a crucial role in improving the dietary habits of the Maltese nation and that:

> *"Awareness must start from the early ages. The necessary education on nutrition in schools must be provided to both boys and girls. Periodical reviews of the contents on nutrition in the curricula need to be made to keep this in line with the Food and Nutrition Policy."* (p.54)

To date there has been no formal national review of nutrition education provision in the Maltese Primary sector, although this does not mean that nutrition education has been totally absent. Local research has shown that Primary school teachers do address different nutrition topics in their classrooms, and that schools and teachers may organise special days, weeks or year long projects along the theme of healthy eating, as well as talks on nutrition by experts for children and/or their parents. (Attard, 2001; Fenech, 2001) Some schools have also included the promotion of healthy eating within their School Development Plans, with class-based nutrition education being one of the strategies listed.

In 1999 the National Curriculum Council moved for providing an education that would facilitate the holistic development of children and would emphasise experiential learning and the development of learning tasks to encourage application of knowledge. (Malta Ministry of Education, 1999) Directly in line with this vision, the National Minimum Curriculum (NMC) has as two of its objectives 'Wise Choices in the Field of Health (Objective 11) and 'Preparing Educated Consumers' (Objective 7). The goal is not only to increase children's knowledge and awareness regarding food and healthy diets, but also to equip them with skills to adopt positive health behaviours. Some of the other NMC objectives also address these goals, though to a much lesser extent. Table 2 highlights excerpts from the NMC Objectives which directly or indirectly tackle nutrition or health.

TABLE 2a
Nutrition And Health In The National Minimum Curriculum

Objective 11 [a]: Wise Choices in the Field of Health		
Knowledge/Information	***Skills***	***Attitudes***
- Human anatomy and physiology - The nutritional value of different food - Choice, preparation and preservation of food - The production of different food - The personal harm caused through certain choices in the area of health - Basic principles of hygiene - the citizens' rights and duties in the area of health - Changes in lifestyle and health services brought about by information technology and technology in general	- Reflect on the consequences of the range of choices in the area of health - Make informed and responsible choices and decisions about personal health	- Respect for one's health and that of others - Appreciation of the importance of a healthy life

Source: Malta Ministry of Education (1999); [a] p.48-49

TABLE 2b
Nutrition And Health In The National Minimum Curriculum

Objective 7 [b]: Preparing Educated Consumers		
Knowledge/Information	***Skills***	***Attitudes***
- Distinction between need and desire; consumer choices - Legislation concerning the consumer: knowledge of the laws and other provisions dealing with the consumer's rights and responsibilities - Advertising: the difference between advertising and genuine information the way the media constructs new lifestyles and their effect on the life of different categories of people	- Comparing prices and judging price in terms of quality - Ability to analyse critically the advice or information provided by producers, sellers, catalogues, fliers and other sources	- Awareness of the conflict of interest between consumers, producers and sellers - Critical appraisal of the value attributed to the product or service by advertisements
Objective 8 [c]: Media Education		
Knowledge/Information	***Attitudes***	
- Sifting through and analysing what appears in the media, including advertisements	- Development of a critical attitude based on a system of personal values	
Objective 12[d]: Greater Awareness of the Role of Science and Technology in Everyday Life		
Knowledge/Information	***Skills***	
- Arouse curiosity concerning natural phenomena and stimulate the asking of questions about them	- The ability to apply scientific knowledge in their everyday life	

Source: Malta Ministry of Education (1999); [b] p. 43-44; [c] p.45; [d] p.49-50

Current provision of nutrition education in Maltese Primary schools

An informal content analysis of the current national Primary level Learning Outcomes document for different subjects reveals that the NMC Objectives 7 and 11 are being addressed in a somewhat superficial, ambiguous and fragmented manner. (See Table 3.) A number of nutrition related topics are interspersed throughout the list of subject-based Learning Outcomes, but though there may be some logical sequencing vertically within a subject, there is no clear horizontal integration. There is also very little detail. Thus, although there is some indication regarding which nutrition topics to teach in different areas, what is taught and how is at the discretion of the individual teacher; his or her knowledge, interest, pedagogical skills, and learning resources (personal or school). Appropriate coverage of different aspects of nutrition, utilising integrated, specific learning activities which will help establish desirable eating habits and change less desirable ones is very much up to the teacher. Yet, according to the UK Office for Standards in Education [Ofsted] (2004), messages about healthy lifestyles need to be delivered in a clear and consistent manner if children are to develop the knowledge, understanding and skills they need to nurture positive attitudes to diet and health and to make appropriate food choices. Moreover, children need knowledge, understanding and skills not only in relation to the qualities of different foods and the link with health, but also in food preparation itself. A clear statement regarding the latter seems to be missing in the current Maltese Learning Outcomes document, although one could perhaps include this under 3.1.1 Technology Education.

TABLE 3a
Nutrition Related Topics In The
Learning Outcomes For Primary Schools Years 1 – 6 Document

Drama		
Learning Outcomes for Year 1		
Sensory Awareness	1.3.2 1.3.3	Taste liquid and solid food and things to get an awareness of different tastes Smell objects and things to get an awareness of different smells
Personal and Social Development		
Learning Outcomes for Year 1		
Health and Safety	1.4.2	My body
Learning Outcomes for Year 2		
Health and Safety	2.4.2	My body
Learning Outcomes for Year 3		
Health and Safety	3.4.2	My body
Learning Outcomes for Year 4		
Health and Safety	4.4.1 4.4.2	Problem solving Decision making
Learning Outcomes for Year 5		
Health and Safety	5.4.1 5.4.2	Problem solving Decision making
Learning Outcomes for Year 6		
Health and Safety	6.4.1 6.4.2	Problem solving Decision making
Physical Education		
Learning Outcomes for Year 1		
Healthy Habits	1.1.3	Promote healthy eating habits
Learning Outcomes for Year 2		
Healthy Habits	2.1.3	Start to develop awareness of healthy food
Learning Outcomes for Year 4		
Healthy Habits	4.1.3	Develop self-management strategies of what to eat
Learning Outcomes for Year 5		
Healthy Habits	5.1.3	Develop awareness of body composition Develop awareness of how to lose, maintain and gain weight
Learning Outcomes for Year 6		
Healthy Habits	6.1.3	Develop knowledge of Carbohydrates, Protein, Fats and their function

Source: Malta Ministry of Education (2005)

TABLE 3b
Nutrition Related Topics In The
Learning Outcomes For Primary Schools Years 1 – 6 Document

Primary Science	
Learning Outcomes for Year 4	
Other Animals and Us	4.1.2 Recognise the importance of eating a balanced diet.
Learning Outcomes for Year 6	
Other Animals and Us	6.1.2 Recognise that knowledge on food groups helps us build healthy diets.
Technology Education	
Learning Outcomes for Year 3	
Materials	3.1.1 Use materials, including: sheet materials e.g. paper, cardboard, and food products.
Social Studies (Geographic Environment)	
Learning Outcomes for Year 1	
Lifestyles and Environmental Protection	1.4.2 Simple examples of how we can avoid wasting food, water and paper.
Learning Outcomes for Year 2	
Lifestyles and Environmental Protection	2.4.2 Food Sources e.g. Milk, bread, vegetables, meat.
Social Studies (Historic Environment)	
Learning Outcomes for Year 2	
Food (Theme)	2.4 Food (Theme) - Acquire knowledge on popular foods, past and present. - Understand why these foods were/are popular. - Understand how some food-related traditions are still in use.

Source: Malta Ministry of Education (2005)

Theoretical Underpinnings

Effective nutrition education is based upon theoretical approaches that have been demonstrated to be effective in influencing health-related risky behaviours. Inkeeping with this statement, and within the framework of the EHPSN, Dixey et al (1999) have developed 'A School-Based Nutrition Education Guide' targeting European students. A key tenet within this guide is that education on healthy eating should be child-centred.

> *"Being child-centred means starting with what children and young people know and how they see the world. It means listening to young people and trying to understand their concerns. It implies active and participatory teaching methods. It can be contrasted with a teacher-centred approach, which starts with what teachers think children ought to be taught*." (p.9)

In the WHO (2003c) document 'Skills For Health: Skills-Based Health Education Including Life Skills: An Important Component Of A Child-Friendly/Health-Promoting School' the emphasis on a child-centred approach is also paramount. Over the decades, educating people about health has been an important strategy for preventing illness and injury. Yet, early experiments with education relied heavily on the delivery of information and facts. Gradually, educational approaches have turned more

to skill development and to addressing all aspects of health, including physical, social, emotional, and mental well-being.

Skills-based health education incorporating nutrition education is one important component of a Health-Promoting School. (WHO, 2003c) There are a number of theories and principles supporting skills-based health education, an overview of which is given Chapter 3, pages 19-24 of the WHO (2003c) document mentioned above. The main theories are listed in Table 4 for quick reference.

TABLE 4
Theories Supporting Skills-Based Health Education

- Child and Adolescent Development Theories
- Multiple Intelligences
- Social Learning Theory or Social Cognitive Theory
- Social Influence Theory and Social Inoculation Theory
- Cognitive Problem Solving
- Problem-Behaviour Theory
- Resilience Theory
- Theory of Reasoned Action and Health Belief Model
- Stages of Change Theory or Transtheoretical Model

Source: Adapted from WHO (2003c).

Common elements exist across these theories, including the importance of personalising information and identifying personal risk behaviours, increasing motivation and readiness to take action or to change, understanding and influencing peers and social norms, enhancing personal attitudes, skills and ability to take action or change, and developing enabling environments through supportive policies and services.

Indeed, according to the WHO (2003c) document, skills-based health education is effective because teaching and learning methods replicate the natural processes by which children learn behaviour. These processes include modelling, observation and social interactions. Consequently, interactive or participatory teaching and learning methods are an essential part of skills-based health education. Learning by doing is necessary. Research has shown that if young people can practise the skills in the safety of a classroom environment, it is much more likely that they will be prepared to use them in and outside of school. The role of the teacher in delivering skills-based health education is, therefore, to facilitate participatory learning and to utilise other appropriate and efficient methods for achieving the set learning objectives. Participatory learning harnesses the experience, opinions and knowledge of students; provides a creative context for the exploration and development of possibilities and options; and affords a secure non-threatening environment that aids the learning process. (CARICOM & UNICEF, 1999)

Table 5 lists participatory teaching methods proposed by the WHO (2003c) for skills-based health education. A more detailed description, including benefits and process, of the main Participatory Teaching Methods can be found in Figure 6 on pages 16-19 of the WHO (2003c) document.

Table 6 illustrates how the WHO (2003c) conceives of using a skills-based approach in the area of Healthy Nutrition, where the focus is on Communication and Interpersonal Skills, Decision-Making and Critical Thinking Skills, and Coping and Self-Management Skills.

TABLE 5
Participatory Teaching Methods For Skills-Based Health Education

• Class discussions • Brainstorming • Demonstration and guided practice • Role play • Small groups • Educational games and simulations • Case studies • Story telling • Debates • Practising life skills specific to a particular context with others • Audio and visual activities, e.g., arts, music, theatre, dance • Decision mapping or problem trees

Source: WHO (2003c), p.15

TABLE 6
Teaching Healthy Nutrition Within a Lifeskills Approach

Communication And Interpersonal Skills	**Decision-Making And Critical Thinking Skills**	**Coping And Self-Management Skills**
Communication Skills: Students can observe and practise ways to: - persuade parents and friends to make healthy food and menu choices Refusal Skills: Students can observe and practise ways to: - counter social pressures to adopt unhealthy eating practices Advocacy Skills: Students can observe and practise ways to: - present messages of healthy nutrition to others through posters, ads, performances, and presentations - gain support of influential adults such as headmasters, teachers, and local physicians to provide healthy foods in the school environment	Decision-Making Skills: Students can observe and practise ways to: - choose nutritious foods and snacks over those less nutritious - convincingly demonstrate an understanding of the consequences of unbalanced nutrition (deficiency diseases) Critical Thinking Skills: Students can observe and practise ways to: - evaluate nutrition claims from advertisements and nutrition-related news stories	Self-Awareness and Self-Management Skills: Students can observe and practise ways to: - recognise links between eating disorders and psycho-logical and emotional factors - identify personal preferences among nutritious foods and snacks - develop a healthy body image

Source: WHO (2003c), p.11

Of note is that Social Learning Theory in particular can be considered as providing a solid basis for skills-based health education. It suggests that performing a behaviour will be affected by an understanding of what needs to be done (knowledge), a belief in the anticipated benefit (motivation), a belief that particular skills will be effective (outcome expectancy), and a belief that one can effectively use these skills (self-efficacy).

Both Social Learning Theory and Constructivist Theory provide some of the theoretical basis as to why participatory teaching techniques work. Key propositions of these two theories are presented in Table 7.

TABLE 7
Key Propositions of Social Learning Theory and Constructivist Theory

Social Learning Theory *(Following Bandura, 1977)*	**Constructivist Theory** *(Following Vygotsky, 1978)*
People learn what to do and how to act by observing others	Social interaction and the active engagement of the child in problem-solving with peers and adults is the foundation of the developing mind
Positive behaviours are reinforced by the positive or negative consequences viewed or experienced directly by the learner.	Young people tend to act in ways that they perceive to be normative or what most people their age are doing.
Retention of behaviours can be enhanced when people mentally rehearse or actually perform modelled behaviour patterns	Through cooperative work with peers to promote pro-social behaviours, the normative peer structure is changed to support healthy, positive behaviours

In developing a National Nutrition Education Curriculum for Malta one must consider that effective health education programmes utilise a variety of participatory teaching methods, addressing social pressures and modelling of skills. Programmes with a heavy emphasis on information can improve knowledge, but are generally less effective in enhancing actual behaviour. (Kirby, Short, Collins & Rugg, 1994) However, effective programmes do need to provide some basic, accurate information that students can use to assess risks and avoid risky behaviours.

Appropriate Content Of Programme

The knowledge, attitudes, and skills that comprise any proposed National Nutrition Education Curriculum should be selected for their relevance to specific health-related risk and protective behaviours. The WHO (2003c) document on skills-based health education recommends that much attention is given to the 'what' of an education programme.

> *"The central question is what behaviours or conditions must be sustained or changed to influence the health issues. Then, what knowledge, attitudes, and skills will be the most useful to address, given the behaviours and conditions to be changed? The answers to these "whats" are then used to develop programme objectives…for preventing or reducing risk behaviours and risk conditions and for promoting protective behaviours and conditions…"* (p.42)

Such analysis is required for clearly delineating the curriculum content essential to achieve the behavioural and conditional objectives. The ultimate goal is to facilitate informed decision making, the ability to practise healthy behaviours, and the creation of conditions that are conducive to health. In general, curricula that address a balance of knowledge, attitudes and skills have been most successful in affecting behaviour. (Kirby, 2001)

Stockley (1993) proposes that for nutrition education to be effective, it must be personally relevant, be clearly understandable, use foods rather than nutrients as a basis, be consistent in its dietary messages, take into account people's perception of relative risks, emphasize the benefits of change and address the barriers to making dietary changes. Over the years, a number of organizations, expert committees and research projects have proposed what should be the nutrition competencies achieved by children by the time they leave Primary school. The British Nutrition Foundation (online), the UK

Food in Schools Project (online) and the report 'Healthy eating for young people in Europe: A school-based nutrition education guide' prepared by Dixey et al (1999) on behalf of the International Planning Committee of the ENHPS all set objectives and/or outline content and methods for appropriate and effective nutrition education at the Primary level.

According to Dixey et al (1999), nutrition education should be based on certain basic premises; namely, that nutrition is important, the enjoyment of food is essential and food and eating are important and powerful expressions of cultural and social identity. The authors propose the development of formal Nutrition Education curricula based on seven broad categories of nutrition, food and eating:

- Food and emotional development
- Eating habits and socio-cultural influences
- Nutrition and personal health
- Food production, processing and distribution
- Consumer aspects of foods
- Food preservation and storage
- Food preparation.

They also offer guidance on appropriate nutrition education topics for different age groups within the Primary years (see Table 8), dividing these topics into two stages in keeping with the developmental aptitude of children.

TABLE 8
Nutrition Topics Recommended For Primary School Children

4-7-year-olds		**8-10-year-olds**	
Dominant Themes	***Typical children's questions the curriculum aims to encourage***	***Dominant Themes***	***Typical children's questions the curriculum aims to encourage***
• Sensory awareness • Preferences • Eating and drinking together	• What do I eat and drink? • What do I like to eat? • What do I feel about my eating and drinking? • What do others in my family eat? • How and when do I eat? • Where does my food come from?	• Eating habits • Food and food quality • Eating and drinking at home and at school • How food is produced	• What do I eat and why? • Where do I eat what? • Do I use a variety of foods? • Do I like the food I choose?

Source: Adapted from Dixey et al. (1999), pp. 17-18

Given Malta's high rates for obesity, which is a) a health problem in itself and b) a risk factor for a multitude of other diseases, such as hypertension, cardiovascular disease and diabetes and is partially a result of excess energy intake; given the high rate of cardiovascular disease which is linked with a number of dietary patterns including regular high intakes of foods rich in total fats, saturated fats, trans fats, cholesterol or sodium; given the fairly low rates of consumption of vegetables and fruit among children and adolescents and the high rate of consumption of sugar laden drinks; and given the emerging eating routines of children including greater consumption of take-away foods and more

eating out, one can identify a preliminary potential core content for a National Nutrition Education Curriculum for Maltese Primary Schools. (See Table 9.) This core content would address the previously mentioned issues, would be in line with the National Dietary Guidelines (Ministry of Health, 1990) and the NMC Objectives 7 and 11 (Ministry of Education, 1999), and would adopt a skills-based approach.

TABLE 9
Preliminary Core Content For A National Nutrition Education Curriculum For Maltese Primary Schools

Knowledge	**Attitudes**	**Skills**
Food groups	Being healthy will assist in having a pleasant life	Reading food labels: Choosing local, fresh, healthy foods
Food-health links	Eating is an enjoyable activity	Basic food preparation processes
Main nutrients – functions and sources	Following some basic guidelines will make it easy to consume foods for health and a have balanced diet overall	Basic strategies for food hygiene
Food labels	Trying new foods can widen ones choice of healthy foods	Observational and/or sensory analysis to distinguish between high/low fat foods, high/low sugar foods; high/low salt foods
Healthy Maltese traditional foods	It is fine to be different from peers now and again	Producing simple healthy snacks, drinks, packed lunches
Healthy foods from other cultures		Simple strategies to make home-made snacks healthier
Food production and fair trade, animal welfare, impact on the environment		Choosing healthier options when buying take-away food or when eating out

According to an evidence-based report by the UK Ofsted (2004), in the most effective schools with respect to food and nutrition education, the children were active participants in their learning and had good opportunities to put into practice what they had learned. Figure 1 describes a model of skills development, following WHO (2003c), which could serve as a guide for structuring Nutrition Education lessons using a participatory pedagogy.

Defining and Promoting Specific Skills
- Defining the skills which are most relevant to achievement of a targeted nutrition behaviour
- Generating positive and negative examples of how the skills might be applied to achieve the targeted nutrition behaviour
- Encouraging verbal rehearsal of the skills
- Correcting misperceptions where necessary regarding what the skill is and how it may be applied

⇩

Promoting Skill Acquisition and Performance
- Providing opportunities to observe the skill being applied effectively to reach the targeted nutrition behaviour
- Providing opportunities for practice with guidance and feedback
- Evaluating performance
- Providing feedback and recommendations for corrective actions to successfully achieve the targeted nutrition behaviour

⇩

Fostering Skill Maintenance and/or Generalisation
- Providing opportunities for personal practice in achieving the targeted nutrition behaviour
- Fostering self-evaluation and skill adjustment

Figure 1. Adapted from WHO (2003c). Cycle of Skills Development, p. 14. [Text adapted from Mangrulkar, L., Vince Whitman, C. & Posner, M. (2001). Life skills approach to child and adolescent healthy human development. Washington, D.C.: Pan American Health Organisation; p. 27.)]

Appropriate Methods And Resources

The WHO (2003c) has described three primary ways for implementing skills-based health education within schools:

- Core subject – Skills-based health education can be a core and/or separate subject in the broader school curriculum
- Carrier subject – Skills-based health education can be placed in the context of a so-called carrier subject that is relevant to health issues, such as Science or Social studies;
- Infusion across many subjects – Skills-based health topics can be included in all or many existing subjects by regular classroom teachers.

A critical overview of the advantages and disadvantages of each approach is given in the WHO (2003c) document pages 37-39. However, reports from a number of countries indicate that, at the Primary level, teachers often teach, or are encouraged to teach nutrition education cross-curricularly. (UK Ofsted, 2004; Celebuski, Farris & Burns, 2000; Adamson, McAleavy, Grindle & Collins, undated) A number of similarities emerged as to how and where nutrition education was incorporated with different subjects. Nutrition lessons were integrated to a great extent into Physical Education, Personal and Social Education, Science, Technology, Social Studies, English and Religion. Integration with other subjects, such Mathematics, History, Geography, Music and Art was less common.

Similar findings emerged from research with Maltese Primary teachers, which explored which aspects of Home Economics were taught in Primary schools. (Fenech, 2001) In the late 1990s and early 2000s, food and nutrition topics were mainly incorporated into Science and Social Studies lessons and this was very much based on the initiative of the particular teacher. The situation may be somewhat

different now, although still not formalised. Given that, as described earlier, the current Primary School Learning Outcomes include food and nutrition topics within a broad range of subjects, one would expect a more extensive cross-curricular approach among local teachers.

According to the UK Ofsted (2004) report on Food and Nutrition Education of young children, a cross curricular or integrated approach enables schools to provide a varied and exciting curriculum that develops children's knowledge, understanding and skills in a range of ways. It "avoids the development of a curriculum where the learning outcomes are unconnected, and the pupils are not able to gain a sufficiently clear and coherent understanding of food and nutrition that they can use in their daily lives." (p.10)

A report on Health Education provision in Ireland (Adamson et al., undated), revealed that surveyed teachers generally acknowledged the benefit of delivering health education as a cross-curricular theme. Some concern was expressed, however, about the effectiveness of using the cross-curricular approach alone, particularly with respect to depth of coverage. They felt that having the option of utilising the services of peripatetic teachers who were experts in Health Education would be beneficial. At present, the Maltese Education Division runs a Home Economics Seminar Centre which organises workshops on Healthy Breakfasts for Year 3 (7-8-year-old) children and their parents or carers, and on Healthy Eating for Year 6 (9-10-year-old) children. This centre is staffed by a small group of peripatetic Home Economics teachers who not only deliver the workshops on site, but also go to specific schools when requested. The Seminar Centre is also often consulted when schools are developing projects focusing on the theme of Healthy Eating.

In several of the health and nutrition education provision surveys mentioned earlier, teachers often expressed the need for ready-made resources to facilitate nutrition education within the Primary classroom. The Irish teachers commented that they would welcome resource packs in the form of pre-structured lessons, which were age-specific, which could be conveyed readily, which could be easily integrated into other subject areas without having to restructure materials radically; which were reproducible, and which could be used in a flexible manner. (Adamson et al., undated). Some of these teachers considered information technology as a potentially useful resource for delivering the health education theme and also as a resource base for materials. Other teachers suggested establishing 'cluster groups' across schools, enabling schools to combine financial assets to purchase resources materials and share their use.

As things stand at the moment, a National Nutrition Education Curriculum for Maltese Primary Schools would very likely be structured to follow a cross-curricular approach. Whilst necessitating a lengthier planning and development process, the outcome should result in a curriculum which Maltese children would find relevant and varied in its perspectives and opportunities for application of knowledge and practice of skills.

Appropriate Timing, Sequence And Amount

Effective health education programmes generally begin prior to the onset of risk behaviours. In the case of nutrition, the starting point should be immediate once children enter Primary school as by that time food-related attitudes and perceptions, as well as eating habits are already being formed. (Dixey et al., 1999)

The Maltese NMC (Malta Ministry of Education, 1999) stipulates that in the first two years of Primary schooling (Year 1 and 2; 5-7-year-olds) teachers should adopt a pedagogy that develops knowledge, attitudes and skills which derive from concrete experiences. This is considered as the pre-conceptual phase, and must be regarded as the formative period which precedes the one during which the school experience becomes more formal. The four years that follow (Years 3-6; 7-10-year-olds) are considered as the concrete operational phase. During this period children are encouraged to observe, reflect, think, ask questions, criticise, solve problems, engage in creative thinking, carry out research and assimilate new knowledge. A National Nutrition Education Curriculum for Primary

Schools would need to be based on this curricular framework, so that children would develop the knowledge, attitudes and skills to enable them to further their formal education in Secondary school.

According to the UK Ofsted (2004) report on Food and Nutrition Education for young children, when schools were effective in their delivery, account was taken of the fact that education begins in the home and that by the age of 3, at the start of the foundation stage of education, children have already learned a great deal about food. Then, by the age of 5, when they enter Key Stage 1 (ages 5-6 years), their knowledge of food is quite extensive, overlaid with their personal likes, dislikes, preferences, customs and opinions. Effective nutrition education programmes took heed of these factors and built on what children already knew, understood and could do. Programmes articulated clearly what was to be achieved, why, by what means and over what timescale. They also specified how success in doing so would be measured.

Dixey et al (1999) have proposed that a planned and sequential Nutrition Education curriculum is crucial for success. This means that what is offered to children, either within the classroom or as part of the whole school experience, needs to be planned, coordinated and appropriate to their developmental stage. Also known as a spiral curriculum, this approach involves repeating and extending the work on a topic in a dialectical fashion as children develop. Of note is that the curriculum means the sum total of the pupil's experience and not just the taught curriculum.

Research also shows that behavior change correlates positively with the amount of nutrition education received. (Connecticut State Department of Education, 2006) As a general guide, reports have proposed that a minimum of 50 hours per year of nutrition education is required for achieving desired goals and/or effecting positive attitudinal and behavioural change. (Lytle & Achterberg, 1995) In the US, during the late 1990s, among the Elementary teachers who did teach nutrition, the mean number of hours spent on nutrition education was only 13; way below the 50 hours thought to be necessary for impact on behavior. (Celebuski, Farris & Burns, 2000) The situation in Malta is not known and may be somewhat difficult to assess in the absence of a formal, structured curriculum.

Given that a planned and sequenced curriculum across the Primary years is recommended; and given that the age and stage of the learner need to be considered, so that concepts should progress from simple to complex, with later lessons reinforcing and building on earlier learning, adequate instruction time per nutrition theme or concept, across different subjects would need to be woven in when developing a cross-curricular Nutrition Education programme.

Different Departments of Education and similar entities around the world have developed websites to assist teachers who want to teach nutrition to their young students. One example is the 'Food - a fact of life' website developed by the British Nutrition Foundation (online). The website provides up-to-date, accurate and consistent information about healthier eating and related downloadable resources, or online interactive learning activities for different age groups. The website particularly supports practical work with food, providing suggestions and resources for a selection of food preparation activities.

Multi-Strategy For Maximum Outcomes

A truly comprehensive Nutrition Education curriculum is three pronged, focusing on the formal, informal and parallel curriculum. As indicated at the outset, this paper will not discuss this issue at length. Suffice it to say, however, that because the determinants of behaviour are varied and complex, only coordinated multi-strategy approaches can achieve the intensity of efforts that yields sustained behaviour change in the long term. Linking formal Nutrition Education with complimentary strategies promoting healthy eating throughout the school and community reinforces consistent health messages and provides multiple opportunities for students to practise healthy habits. (Connecticut State Department of Education, 2006)

According to the UK Ofsted (2004), good practice is evident when a clear and coherent policy steers the management of school wide nutrition education. Schools are encouraged to conduct an audit of the school environment and subsequently develop a plan of action including formal Nutrition Education, as well as environmental interventions, to ensure that an integrated approach is followed for promoting health eating. Moreover, special initiatives such as healthy eating projects, theme weeks, special days should be interspersed throughout the calendar year to ensure repeated and consistent exposure of messages and practices promoting good nutrition.

The draft Maltese National School Nutrition Policy is already focusing on the informal and parallel curriculum. Thus, a National (formal) Nutrition Education Curriculum could eventually be integrated within this policy to make it more comprehensive.

Teacher Training And Professional Development

In discussing skills-based health education the WHO (2003c) states that teachers ideally should receive quality training in both pre-service and in-service contexts. Dixey et al (1999) compiled data on whether or how nutrition education was included in initial teacher training in a number of European countries. Their findings indicated that formal training was minimal. Some teacher training courses did include a health education component, especially if within the national or regional school system there were specialist Health Education, Home Economics or Sports teachers teaching at the Primary level. In many other countries, nutrition education was often integrated within training on teaching Science or Environmental Studies.

The situation in Malta is fairly similar, although perhaps with one slight advantage. Most of the teachers in service are often self-taught with regards to food and nutrition science and nutrition pedagogy. Up till recently, very little pre-service training on teaching nutrition to Primary school children was provided, and in the past decade no formal in-service training has been organised by the Education Division. Since 2000, Primary level student-teachers have been offered more hours of instruction, both on nutrition content and pedagogy. As from 2004 all Primary level student teachers have approximately 8 hours of instruction on nutrition science and food sociology and about 8 hours of instruction on nutrition pedagogy as a compulsory component of their B.Ed. (Hons) course.

Surveyed Maltese Primary school teachers have generally reported a willingness to acquire skills and be given resources to teach nutrition in their classrooms. (Cassar et al., 2003); Fenech, 2001) This is a positive finding considering that teacher training enhances teachers' preparedness for teaching Nutrition Education and has positive effects both on curriculum implementation and on student outcomes. (Kann, Collins, Paterman, Small, Ross & Kolbe, 1995) Trained educators are more likely than those who are not specifically trained in a particular learning area to implement programmes as intended; that is, to teach all of the required content and to use effective, high-quality teaching and learning methods (Kann et al., 1995)

A US report on Nutrition Education in Public Elementary schools (Celebuski et al., 2000), revealed that teachers who had some type of training, or who received high support were more likely to use active learning strategies, integrate nutrition lessons in other subjects and involve families in nutrition education than teachers with no training or with low support. In addition, teachers with in-service training were more likely to use instructional materials that were up-to-date and age-appropriate than teachers with no training.

Based on results from surveys conducted in the UK and the US (UK Ofsted, 2004; Celebuski et al., 2000; Adamson et al., undated), areas where a majority of teachers felt in-service training would be useful were obtaining the latest nutrition information, coordinating nutrition education across subjects and across year groups, improving their ability to communicate nutrition concepts and teach related skills, and involving parents in nutrition education.

The US CDC's (1996) 'Guidelines for School Health Programs to Promote Lifelong Healthy Eating', describes successful professional development for teachers in the area of nutrition. It suggests that

training should focus on giving teachers the skills they need to provide innovative, targeted nutrition education. Characteristics of effective in-service teacher training as described in the CDC document are outlined in Table 10.

TABLE 10
Characteristics of Effective Nutrition Education Professional Development For Teachers

- Meets the specific needs of the teachers
- Is based on the teachers' level of nutrition knowledge and experience
- Help teachers understand the importance of fully implementing the selected curriculum and become familiar with its underlying theory and concepts.
- Assists teachers in assessing and improving personal eating practices and makes them aware of the behavioral messages they give as role models.
- Suggests diverse teaching strategies, models behavioral change techniques and give teachers practice in using them;
- Involves multiple sessions spaced across time so that teachers can try out the newly learned techniques in their classrooms and report on their experiences to the training group
- Provides post-training sessions so that teachers can share experiences with their peers

Source: Adapted from US Department of Health & Human Services – CDC (1996)

A similar document produced by the British Department of Health/Ministry of Agriculture, Fisheries and Food (1998), provides guidance for those responsible for the training and development of Primary school teachers on the inclusion of information on food and nutrition in training courses. The document a) specifies the objectives of training in food and nutrition for all involved in pre-service training of Primary teachers; b) provides guidance on suggested food and nutrition components to be reached through pre-service training for Primary teachers; c) provides guidance in food and nutrition training for Primary teachers already in post.

The document specifies Subject Content Statements to inform training according to different needs, particularly given that certain schools may have specialist teachers who would also be in a position to provide guidance to school administration or other teachers in planning subject content. Thus, these Statements are presented in two tiers:

- Tier One, covers material relevant to all primary teachers;
- Tier Two, covers material relevant to a primary specialist teacher.

Table 11 presents an overview of knowledge, understanding and skills which all Primary school teachers should obtain in order to teach food and nutrition effectively. The listed statements were developed by the authors of British Department of Health document, in keeping with the standards that trainees need to achieve to be awarded Qualified Teacher Status in the UK.

TABLE 11
Knowledge, Understanding And Skills Essential For Primary School Teachers To Teach Food And Nutrition Effectively

Knowledge and Understanding
Programmes could include elements designed to help teachers to: • Develop on understanding of why education in food and nutrition is important • Understand and debate relevant food and nutrition issues accurately and precisely and become enthusiastic about, and interested in, the knowledge and practice related to food and nutrition • Evaluate information and resources and distinguish those which are accurate, relevant and at the appropriate level from those which are not • Use investigative, experimental and practical skills effectively to provide evidence on which to base decisions and opinions relevant to food and nutrition • Develop other aspects of a child's education such as numeracy, literacy, personal and social development and skills in graphical communication, information and communication technology and citizenship using the medium of food and nutrition • Understand and apply the scientific principles underlying the study of food and nutrition in the curriculum.
Communication Skills
Programmes could include elements designed to help teachers to: • Make the food and nutrition content of the curriculum and the methods used to present it accessible, appropriate and lively • Identify sources of information, agencies and people who can support their teaching • Measure and assess accurately what they have learnt and what they have taught their pupils • Teach food and nutrition in school with a high degree of motivation and competence.

Source: Adapted from British Department of Health/Ministry of Agriculture, Fisheries and Food (1998), p. 5

In the UK a number of teacher training initiatives have been launched to begin to address the issues of improving teachers' nutrition knowledge, their practical food-handling skills and their overall ability to plan and teach nutrition effectively. (UK Ofsted, 2004) 'Food Partnerships' have been established in some regions as part of a joint Department of Health and Department for Education and Skills 'Food in Schools' programme. (UK Department for Education & Skills & DATA, 2003) These partnerships bring together, on a local level, a number of Primary school teachers and a specially trained Secondary Food Specialist teacher in order to provide a trainer of trainers set up. The specific goals of this partnership scheme can be seen in Table 12.

TABLE 12
Goals of the UK 'Food Partnerships' Project

• To increase Primary school teachers' confidence and competence in teaching food and nutrition • To develop a supportive network between the schools with regard to food issues • To develop a coherent strategy for teaching food and nutrition at a local level • To increase pupils' experience of working with food • To increase pupils' knowledge of food and nutrition • To help to raise standards of achievement in food education

Source: UK Department for Education & Skills & DATA (2003)

Apart from the recent new provision for pre-service training in nutrition, some Maltese teachers are being updated on nutrition and health issues, during school Staff Development Days, through one-off presentations by Home Economics lecturers or teachers, or by Health Promotion specialists. This is not sufficient. A more structured, formalised and on-going teacher training is necessary and should be an integral component of the plan of action for implementation of a National Nutrition Education Curriculum.

Relevance
The importance of the relevance of a National Nutrition Education Curriculum has already been referred to in various instances. Nutrition education must be relevant to the reality and developmental levels of children and must address risks that have the potential to cause most harm to the individual and society. Nutrition education goals, teaching methods and learning materials need to be appropriate to the age, experience and culture of children and the communities they live in, and need to recognise what the learner already knows, feels and can do. The USDHHS-CDC (1996*)* describes how different educational strategies should be used for children at different stages of cognitive development, reiterating that nutrition education can only succeed when students believe it is relevant to their lives.

Participation
An effective formal National Nutrition Education Curriculum will develop mechanisms to allow involvement of students, parents, teachers and the wider community at all stages. The participation of these various stakeholders in the design and implementation of the Nutrition Education Curriculum can help ensure that the needs and concerns of all these constituencies are met in culturally and socially appropriate ways. Participants whose concerns are addressed are more likely to demonstrate commitment to and ownership of the curriculum, which in turn enhances sustainability and effectiveness. A collaborative approach can reinforce the desired nutrition behaviours through providing a supportive environment for the children both at school and at home.

The Maltese NMC encourages a greater recognition of the role of parents in the education of their children and recommends that schools include parental school involvement and parental education in their School Development Plan. (Ministry of Education, 1999) Family involvement is a particularly important element in effective nutrition education for Primary school students. In the UK, schools exhibiting the most effective practice with respect to nutrition education of young children recognised the importance of involving parents or carers in their strategies to promote healthy eating and were increasingly making efforts to do so. (UK Ofsted, 2004)

The US report on Nutrition Education in Elementary schools (Celebuski et al., 2000) explored which strategies, if any, teachers used to encourage family involvement. Surveyed teachers were asked the extent to which they or their schools used any of following eight strategies to involve parents in the nutrition education of their children:

- Including parents in homework assignments
- Sending home educational materials to help parents learn about nutrition or teach their children about nutrition
- Inviting parents to attend nutrition classes
- Inviting parents to attend special events, such as School Lunch Week or tasting parties
- Inviting parents in nutrition-related careers to speak to the class
- Asking parents to give in-class demonstrations
- Asking parents to send healthful snacks to school
- Offering nutrition workshops or screening services for parents.

With the exception of asking parents to send healthful snacks, a majority of teachers reported that they or their schools used these strategies to a small extent or not at all.

To date, the extent or type of family or community involvement in formal Nutrition Education in Maltese Primary schools has not been rigorously explored. However, research has shown that Maltese parents, particularly the mother, generally determine food provision for Primary school children and that they have a crucial role with respect to a) the messages they transmit to their children on food and health and b) the food choice behaviours they model in front of their children. (Piscopo, 2004; Costa, 1998) At the same time, Maltese mothers have both correct and incorrect knowledge about which foods are good and less good for health and about the nutritional value of foods (Piscopo, 2004; Bonnello, 2000). Thus, parental education on Healthy Eating is an immediate need. The Home Economics Seminar Centre is perhaps the only formalised setting where parents are co-learners with their children in Nutrition Education. Such opportunities for involvement should increase. School Councils and Parent Teachers Associations could also provide the setting for involvement in formal Nutrition Education planning, implementation and evaluation.

CONCLUSION

The way forward to developing a National Nutrition Education Curriculum for Maltese Primary schools is clearly multi-faceted and will require multiple resources. A process will need to be initiated which has the support of national leadership and policymakers and brings together key stakeholders. The curriculum will need to include a sequential framework of Food and Nutrition learning outcomes at different stages of Primary schooling, guidance for integration of food and nutrition topics through different subjects and using a skills-based approach, suggestions for family and community involvement, identification and production of learning resources which are age and culturally-appropriate, and an outline of food and nutrition competencies to be reached by teachers via pre-service or in-service training. Above all, the formal Nutrition Education will need to be complimented with a supportive informal curriculum and school environment, which will foster a whole school approach to healthy nutrition for the Maltese Primary school child.

REFERENCES

Adamson, G., McAleavy, G., Grindle, N. & Collins, K. (undated). An investigation of the provision for health education in schools during 1998/99. Ireland: Department of Education.

Attard, K. (2001). Comprehensive health policies for Maltese primary schools: An exploratory study. Unpublished B.Ed. (Hons) dissertation, University of Malta

Bellizzi, M. (2002). Childhood obesity: The emerging global epidemic. Paper presented at the World Health Assembly, May 2002, Copenhagen

Borg, T & Fenech, S. (2001). The impact of Home Economics on Maltese boys' lifestyles and those of their families. Unpublished B.Ed. (Hons) dissertation, University of Malta

British Department of Health/Ministry of Agriculture, Fisheries and Food. (1998). Guidance on food and nutrition in primary teacher training. London: Department of Health and Ministry of Agriculture, Fisheries and Food in association with the British Nutrition Foundation

British Nutrition Foundation. (online) BNF Healthy Schools. Appropriate food and nutrition understanding for pupils aged 5 to 7 years/aged 7 to 11 years
Available at http://www.nutrition.org.uk/
Accessed on 23-3-06

British Nutrition Foundation. (online). 'Food - A fact of life'
Available at http://www.foodafactoflife.org.uk
Accessed on 23-3-06

Caballero, B. (2001). Early nutrition and risk of disease in the adult. Public Health Nutrition, 4(6A), 1335–6.

Callus, N. & Merceica, R. (2002). Knowledge, attitudes and influences related to food choices: A study of Year 5 and Year 6 primary state school children. Unpublished B.Ed. (Hons) dissertation, University of Malta

Camilleri, R (2001). School tuckshops: Targeting secondary school pupils. Unpublished B.Ed. (Hons) dissertation, University of Malta

CARICOM & UNICEF. (1999). Health and Family Life Education: Empowering young people with skills for healthy living. An information package. Bridgetown, Barbados: CARICOM & UNICEF

Cassar, E., Chircop, N. & Falzon, M. (2003). Promoting nutrition education in Maltese primary schools: The development of a resource pack for Year 3 children. Unpublished B.Ed. (Hons) dissertation, University of Malta

Celebuski, C., Farris, E. & Burns, S. (2000). Nutrition education in public elementary school classrooms. Washington, DC: US Department of Education, National Center for Education Statistics

Connecticut State Department of Education. (2006). Action Guide for School Nutrition and Physical Activity Policies. CT: Connecticut State Department of Education

Cortis, G. (2005). Is Home Economics influencing Form 4 pupils? An exploratory study on the consumption of packed lunches in Maltese schools. Unpublished B.Ed. (Hons) dissertation, University of Malta

Costa, G. (1998). Influences on food choice of Maltese primary school children. Unpublished B.Ed. (Hons) dissertation, University of Malta

Currie C. et al. (Eds.). (2004). Young people's health in context: International report from the HBSC 2001/02 survey. WHO Policy Series: Health policy for children and adolescents Issue 4, Copenhagen: WHO Regional Office for Europe

Debono, F. & Scicluna, S. A. (2003). An evaluation of the programme 'A healthy breakfast for a good start'. Unpublished B.Ed. (Hons) dissertation, University of Malta

Dixey, R., Heindl, I., Loureiro, I., Perez-Rodrigo, C., Snel, J. & Warnking, P. (1999). Healthy eating for young people in Europe: A school-based nutrition education guide. International Planning Committee of the European Network of Health Promoting Schools

Formosa, E. (2004). The impact of Home Economics on female pupils & their families: Focus on diet-related and social health issues. Unpublished B.Ed. (Hons) dissertation, University of Malta

Guo, S.S. & Chumlea, W.C. (1999). Tracking of Body Mass Index in children in relation to overweight in adulthood. American Journal of Clinical Nutrition, 70(1), 145S-8S.

Janssen, I., Craig, W.M., Boyce, W.F. & Pickett, W. (2004). Associations between overweight and obesity with bullying behaviours in school-aged children. Pediatrics, 113(5), 1187–94.

Kann, L., Collins, J. L., Paterman, B. C., Small, M. L., Ross, J. G., & Kolbe, L. J. (1995). The School Health Policies and Programmes Study (SHPPS): Rationale for a nationwide status report on school health. Journal of School Health, 65, 291-4

Kirby, D. (2001). Emerging answers: Research findings on programmes to reduce teen pregnancy. Washington, D.C.: National Campaign to Reduce Teen Pregnancy

Kirby, D., Short, L., Collins, J., Rugg, D. (1994). School based programmes to reduce sexual risk behaviours: A review of effectiveness. Public Health Reports, 109, 339-361

Lytle, L.A. & Achterberg, C. (1995). Changing the diet of America's children: What works and why? Journal of Nutrition Education, 27(5), 250-60

Malta Department of Health. (1990). The Malta food and nutrition policy. Malta: Department of Health

Malta Department of Health Policy and Practice. (1992). Health Vision 2000: A national health policy. Malta: Department of Health Policy and Practice

Malta Ministry of Education. (2005). Learning outcomes for Primary schools Years 1 – 6. Available at http://www.curriculum.gov.mt/docs/syllab_pr_learningoutcomes.pdf
Accessed on 23-3-06

Malta Ministry of Education. (1999). National Minimum Curriculum: Creating the future together. Malta: Ministry of Education

McKee, N., Manoncourt, E., Saik Yoon, C., & Carnegie, R. (Eds.) (2000). Involving people, evolving behaviour. UNICEF

Piscopo, S. (2004). Socio-ecological factors influencing food choices and behaviours of Maltese primary schoolchildren. Ph.D. thesis, University Of Birmingham, UK

Stockley, L. (1993). The promotion of healthier eating: A basis for action. London: Health Education Authority

Townsend Rocchiccioli, J., O'Donoghue, C.R. & Buttigieg, S. (2005). Diabetes in Malta: Current findings and future trends. Malta Medical Journal, 17(1), 17

UK Department for Education and Skills and DATA. (2003). Establishing a food partnership between primary and secondary schools. UK: DfES and the Food Partnership

UK Department of Education and Science. (1980). A view of the curriculum. London: H.M. Stationery Office

UK Department of Health. (online) Food in Schools Toolkit. Teaching about food.
Available at http://foodinschools.datacenta.uk.net/
Accessed on 23-3-06

UK Office for Standards in Education (Ofsted). (2004). Starting early: Food and nutrition education of young children. UK: Office for Standards in Education

UNESCO/UNICEF/WHO/The World Bank. (2000). Focusing Resources on Effective School Health: A *FRESH* start to enhancing the quality and equity of education. World Education Forum 2000, Final Report. Dakar, Senegal.

US Department of Health and Human Services - Centers for Disease Control & Prevention. (1996). Guidelines for school health programs to promote lifelong healthy eating. Morbidity and Mortality Weekly Report, 45, RR-9

Vince Whitman, C., Aldinger, C., Levinger, B., & Birdthistle, I. (2001). Education For All 2000 assessment. Thematic studies: School health and nutrition. Paris: UNESCO.

Vygotsky, L. S. (1978). Mind in society. Cambridge, MA: Harvard University Press

WHO. (1998). Information series on School Health, Document 4. Healthy nutrition: An essential element of a Health Promoting School, Geneva: WHO

WHO. (2000). Local action: Creating Health Promoting Schools. Geneva: WHO

WHO. (2003a). European Network of Health Promoting Schools (online).
Available at http://www.who.int/school_youth_health/gshi/hps/en/print.html
Accessed on 23-3-06

WHO. (2003b). Global strategy on diet, physical activity and health.
Available at http://www.who.int/dietphysicalactivity/media/en/gsfs_obesity.pdf
Accessed on 23-3-06

WHO. (2003c). Information series on School Health, Document 9. Skills for health: Skills-based health education including life skills: An important component of a Child-Friendly/Health-Promoting School. Geneva: WHO

WHO Regional Office for Europe. (2005). Highlights on health in Malta. Copenhagen: WHO