BACKGROUND

The problem
Among children in many countries chronic malnutrition is widespread. Although there are more extensive data for pre-school children, the indications are that undernutrition and micronutrient deficiencies continue to impede the growth of children when they reach school, while also reducing their capacity and motivation to learn [1]. The question is whether nutrition and health education in schools can contribute directly to improving the health of school-age children, and hence, in the long term, the health of the population as a whole.

Project and institutional framework
To complement existing initiatives under the School Health and Nutrition Programme in Zambia, and in line with the objectives of the FAO/UNESCO global initiative on Education for Rural People [2], FAO assisted the Zambian Ministry of Education in developing the “nutrition education programme for basic schools” (Grades 1 to 7). The project is led by the Ministry of Education in close collaboration with the National Food and Nutrition Commission, and the Ministries of Health and Agriculture. The project started in March 2000 under FAO’s Technical Cooperation Programme (TCP) and is still ongoing, having been incorporated into FAO’s Luapula Food Security, Nutrition Action and Communication Programme in 2003. This article is therefore in the nature of a report on work-in-progress.

Objectives
The project objectives were to contribute to improving the health and nutritional status of Zambian schoolchildren aged 7-13 years, and to improve the relevance and quality of education, by

- integrating food and nutrition topics into primary school curricula in Zambia
- developing appropriate teaching and learning materials
- developing an in-service training programme for teacher trainers, education officials and primary school teachers.

The province of Luapula in northern Zambia was selected for piloting the materials; thus the project had both a national and a local focus.

THE CURRICULUM CONCEPT
The concept of nutrition education adopted by the project is embodied in the FAO Guide for Planning Nutrition Education Curricula [3] (referred to as “Planning Guide” hereafter), which extends to nutrition education the WHO concept of the health-promoting school [4]. This assumes that health and diet are above all a way of life, learnt in all the contexts of a child’s life. To be effective, nutrition education should be part of a “whole school” approach, where classroom...
learning is linked with practical action, backed up by improvements in the school environment and family and community participation [5].

Although this project was limited to the classroom context, it was hoped to accommodate many principles of “lifestyle learning” recommended by the Planning Guide, and in particular to:

- aim at behaviour and attitudes (practical awareness, automatic routines and life skills) as well as knowledge and understanding, in line with Andrien’s behavioural definition of nutrition education [6].
- engage families in supporting children’s learning, and establish a dialogue between teachers, pupils, families and school such that all parties could learn
- reach outside the classroom in other ways, for example through children’s observations, interviews and field trips.

The classroom approach for nutrition education

In the belief that nutrition education calls for a whole-person high-impact style, the Planning Guide advocates a learner-centred, active and holistic educational approach

- drawing on children’s own experience, observations, beliefs and feelings
- encouraging discussion, participation, enquiry and speculation
- calling on teachers to share their experiences and exploit their role-model status
- promoting student activity, both physical and mental
- appealing to all the faculties.

METHODOLOGY

Project activities were organized by the project Task Force in collaboration with the education authorities in Luapula, local nutritionists and the Teacher’s Training College.

Situation analysis

A situation analysis was carried out in 15 basic Schools in Luapula Province in August 2000. It confirmed the findings of previous surveys indicating a prevalence of stunting among children 6 to 59 months of 58 percent <-2 Z-Scores [7] [8] [9]. It revealed that primary school children’s general health was poor, their diet lacked variety and was short in important micronutrients; parents did not perceive children’s health problems as linked to diet; nutrition topics were not well integrated in educational materials; and the health and nutrition curriculum, teaching materials and teacher education provision urgently needed reviewing and updating. On this basis, the Task Force decided that rather than plugging gaps in existing school materials, it would be best to develop new learning modules based on the specific needs identified.

Curriculum development exercise

Utilising the Planning Guide, a participatory curriculum development exercise [10] [11] was held in Luapula in March 2001 facilitated by the project Task Force. Participants were teachers, headteachers, teacher trainers, local nutritionists and doctors; school parents and schoolchildren were consulted. Recognizing the interdependence of health and nutrition issues, the workshop identified seven priority topics to be addressed in the learning materials: undernutrition, vitamin A deficiency, iron deficiency anaemia, personal diet, malaria, diarrhoea, and personal and environmental health and hygiene, and recommended related learning objectives. These objectives were approved by the Sub-Committee on Curriculum Development of the Curriculum Development Centre (CDC) in Lusaka and the recommendations were then carried forward by the project Task Force to the ongoing national curriculum development exercise, ensuring extensive coverage of nutrition education objectives as a cross-cutting issue in the new national curriculum.

The workshop’s blueprint for the learning materials specified that they should

- aim at targeting behaviour and attitudes as well as knowledge and understanding
- involve active, experiential, participatory learning
- encourage family and community involvement
- aim to improve the school environment in terms of health, sanitation and play areas
- bear in mind vulnerable groups and children from disadvantaged households
- encourage information flow from children and the community to teachers and the school, and vice versa.

Writing the materials
The learning materials were written by four Zambian writers in line with the approved learning objectives. They were produced in English, as one of the official languages used in Zambia. Extensive reference and resource materials from CDC, MOE, NFNC, the Central Board of Health, FAO and World Health Organization (WHO) websites were made available to the writers by the education and nutrition consultants. A provincial advisory team was set up to advise on Luapula conditions and practices and to vet materials for local applicability.

First review of materials Both writers and Task Force agreed that the draft materials did not fulfil the brief, particularly with regard to their lack of strategies for behaviour change in dietary and health practices [12]. They showed a negative clinical emphasis on disease rather than a positive emphasis on food; leaned towards information delivery rather than behavioural and attitudinal learning; had little range and variety in the activities; did not strongly connect with pupils’ experiences; did little to involve family and community; were not of professional copy standard and had no uniform format. The special challenges in deriving effective classroom materials from clinical nutrition information are analysed by Sherman [13].

Revision of materials
More precise guidelines and a standard format were worked out. Each lesson in the Pupils Book was to contain
- one or two activities (often a question to discuss) accompanied by an illustrative picture
- an “Ask Yourself” question, a self-check on personal knowledge, attitude or behaviour
- a brief “Remember” message summarising the main message of the lesson
- a short reading text recapitulating the main points of the lesson
- homework, calling on pupils to find out about foods, discuss diet with families etc.

The function of the Teacher’s Book was to give teachers guidance in their handling of the lessons, to train teachers in nutrition, to suggest follow-up activities and to outline evaluation procedures. The Teacher’s Notes therefore gave
- background information for each lesson explaining the situation in Zambia, expanding the technical information and suggesting potential learning difficulties
- detailed suggestions for carrying out the lesson activities
- an optional “Event Track” with ideas for displays, presentations and shows which could be used to publicise pupils’ learning at Open Days and other events
- a learning evaluation sheet with questions for before-and-after focus group discussions with pupils.

The Grade 2 materials, and later Grade 4, were rewritten on these lines, and finally illustrated.

Field testing of Grade 2 and Grade 4 materials
- Field testing of the materials (first Grade 2, and later Grade 4) started with an orientation workshop for teachers, headteachers and District Education Officers on content, methodology, sensitive issues and monitoring and evaluation procedures. Teachers translated parts of the Grade 2 materials into the local language, Icibemba, to make them more accessible to pupils and parents. This was followed by sensitisation of parents and the school at large.

Grade 2 materials were field-tested in eight schools from two districts and the Grade 4 in twelve schools from 4 districts. There was a mix of urban and rural schools in both cases. The aims were to establish how teachable the materials were; how well they were adapted to children’s level and cultural expectations; whether they produced observable results in understanding, attitude and behaviour; whether the approaches were appreciated by teachers, parents and pupils; and whether the stakeholders would be interested in perpetuating this learning/teaching approach. A final evaluation meeting of teachers, headteachers, parent representatives and education
standards officers was facilitated by the project Task Force to share lessons learnt, identify areas for improvement and assess the sustainability of behaviour-oriented approaches.

**Evaluation of materials**
The reports of both grades concluded that the content, methods and approaches of the materials were widely appreciated by teaching staff, head teachers, parents and pupils and were generally suitable for the children’s level and culture. The lessons had had a noticeable impact, influencing many behaviours for better nutrition and health within the school and at home, not only among children, but also in families and to some extent in the community. For example:

- Teachers found the materials teachable, and well adapted to children’s level, prevailing methodologies, local practices and cultural expectations. They also found the teachers’ notes clear and informative on nutrition and health issues. Some detailed improvements were suggested.
- Pupils actively participated in the lessons and freely asked questions; headmasters confirmed that pupils from these classes were more confident and assertive.
- There was a perceptible increase in alertness and motivation, and improved attendance in some schools, which might be attributable to more frequent breakfasts and snacks, or to the interest of the lessons.
- Children and families were more aware of the importance of fruits and vegetables, variety in the diet, and frequent meals, including breakfast and snacks.
- Children’s diet improved: they were eating food before coming to school, bringing snacks to school and eating more vegetables and fruit. However it was noted that there was considerable room for improvement from one or less fruit and vegetables per day to a target of three or four.
- Grade 4 pupils became aware of the importance of locally available palm oil in the diet as a good source of provitamin A.
- Children understood the nature and importance of dirt and hygiene and how to avoid diarrhoeal diseases. Standards of cleanliness had risen in respect of washing hands and cleaning up at school and home. However in some schools there was no water supply.
- Families were encouraging handwashing, digging rubbish pits and even building latrines.
- There was a noticeable improvement at Grade 4 in understanding the causes of malaria, which before the lessons was attributed variously to washing in cold water or in the lake, not washing, or playing in the rain, as well as to mosquito bites.
- Parents and teachers agreed that children’s writing and reading had improved.
- Links between family and school had been strengthened. The homework approach encouraged parents’ active participation in the children’s learning process. Parents indicated that the homework concept should continue as children were learning concepts fast. Particularly influential in homes were the “Remember” messages, which were often pinned up, becoming a topic of discussion with neighbours and enabling children to demonstrate knowledge and reading skills to families.
- Parents said they appreciated the lessons because
  - Homework kept children busy.
  - Children’s reading and writing improved.
  - Pupils were motivated to go to school to attend nutrition lessons
  - Children developed good eating habits, and now willingly ate vegetables, in contrast with their behaviour before the lessons
  - Children took local snacks to school to eat during break time.
  - Children cleaned the house, covered food, washed their hands often and encouraged other children to do so.
  - Parents and teachers were brought together in a common endeavour
  - Other family members, including younger siblings, learnt through pupils’ homework and Remember messages.

Some of the Grade 4 parents recommended that in addition to in-service training of teachers, the approach be integrated in the pre-service training programmes for teachers.
After field testing both sets of materials were again revised, then copy-edited. The Grade 2 Pupils Book was translated into Icibemba in line with MOE policy on the use of the home language in schools. They were submitted for CDC evaluation, revised again and finally approved for use in Zambia. At the time of writing the Grade 2 materials have been published, with the financial support of UNICEF Zambia, and will be launched for use in the whole of Luapula Province in early 2006. Grade 4 materials await final approval from CDC and it is hoped to launch them at the same time. Grade 6 materials have still to go through the first revision.

RESULTS

The provisional answer to the question in the title of this article is: Yes, nutrition education can make a difference, within certain limits. However, findings from the field-testing were small-scale, impressionistic and partial. It is planned to put the impact assessment of the project on a firmer footing by carrying out a wider and more systematic evaluation in 2006, once the two finalized grade levels have been launched, which we hope will confirm and refine these first impressions with more quantitative data.

CONCLUSIONS

The effects of the materials. The materials have clearly had a favourable impact on three targets: pupils, parents and teachers. The level and duration of the impact will be better assessed by the coming project evaluation. In the meantime, we offer below some comments on the process adopted by the Project.

The advantages of working within the official framework

Although dependence on ministerial procedures sometimes slowed down activities, embedding project activities in the national institutional framework, with a Task Force of senior government staff, had many advantages not always enjoyed by independent projects. This status ensured official attention and endorsement for project activities, facilitated compliance with official requirements and gave the entrée to other official activities, such as the project’s participation in the national curriculum development exercise.

The merits of materials-led training

The effects of training and teaching are more sustainable when comprehensive, self-explanatory, procedure-based training materials are left in place. In this project such “materials-led training” operated at several levels:

- the FAO Planning Guide was employed not only to develop a local curriculum but later as one of the instruments in in-service and pre-service teacher training;
- the nutrition briefings in the learning materials acted as ongoing in-service teacher training;
- the children’s materials not only enabled children to learn but also guided teachers on classroom approaches, techniques and activities, which were often new to them.

The absolute limits of the classroom curriculum. The absolute limits of the classroom curriculum were clearly shown by the fact that children were unable to carry out some of the advice in lessons, in particular to eat more fish, beans or groundnuts (because the foods were not available at home), and to wash their hands after contact with dirty things (because the facilities were not available). This raises questions about the ethics, as well as the efficacy, of teaching children to do things which cannot be done, and signals urgent messages about action beyond the classroom curriculum. It confirms the importance of reinforcing school nutrition education messages with appropriate school, community- and home-based food, nutrition and health interventions to enable the desired behaviour changes.

Unexpected spin-offs of the materials were the improvement in reading and writing and parents’ appreciation of it, suggesting that visible tokens of scholastic achievement quite unrelated to nutrition and health may play an important role in gaining family approval. Another sweetener was children’s help in the home which reduced the caring burden on parents.

Involvement of head teachers. The school as a whole has an important part to play in students’ learning, lessons dealing with rubbish, safe water, handwashing and sanitation cannot be learned
in the absence of the appropriate facilities. Head teachers, and through them the Parent Teacher’s Associations (PTAs), must therefore be involved at all stages of the exercise. Ideally the school as a whole should be using the FAO Planning Guide to raise awareness of health and nutrition issues and develop as a health-promoting school.

REFERENCES
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