

# Food-based dietary guidelines and implementation: lessons from four countries – Chile, Germany, New Zealand and South Africa

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## Abstract

*Objective:* Food-based dietary guidelines (FBDGs) are globally promoted as an important part of national food and nutrition policies. They are presented within policy as key features of the strategy to educate the public and guide policy-makers and other stakeholders about a healthy diet. This paper examines the implementation of FBDGs in four countries: Chile, Germany, New Zealand and South Africa – diverse countries chosen to explore the realities of the FBDG within policy on public health nutrition.

*Design:* A literature review was carried out, followed by interviews with representatives from the governmental, academic and private sector in all four countries.

*Results:* In all four countries the FBDG is mainly implemented via written/electronic information provided to the public through the health and/or education sector. Data about the impact of FBDGs on policy and consumers' food choice or dietary habits are incomplete; nutrition surveys do not enable assessment of how effective FBDGs are as a factor in dietary or behavioural change. Despite limitations, FBDGs are seen as being valuable by key stakeholders.

*Conclusion:* FBDGs are being implemented and there is experience which should be built upon. The policy focus needs to move beyond merely disseminating FBDGs. They should be part of a wider public health nutrition strategy involving multiple sectors and policy levels. Improvements in the implementation of FBDGs are crucial given the present epidemic of chronic, non-communicable diseases.

## Keywords

Food-based dietary guidelines  
Implementation  
Nutrition policy  
Dietary habits  
Chile  
Germany  
New Zealand  
South Africa

Chronic, non-communicable diseases (NCDs), especially cardiovascular diseases, cancers, obesity and type 2 diabetes mellitus, kill more people every year than any other cause of death<sup>1</sup>. Four factors in the epidemiology of these diseases – poor diet, physical inactivity, tobacco and alcohol use – are of overwhelming importance to public health.

To educate the public and inform policy-makers about a healthy diet, for many years food-based dietary guidelines (FBDGs) have been globally promoted as an important part of national food and nutrition policies. The Plan of Action endorsed at the 1992 International Conference on Nutrition called on governments to provide to the public 'qualitative and/or quantitative dietary guidelines relevant for different age groups and lifestyles and appropriate for the country's population'<sup>2</sup>. Based on this call, many countries have developed FBDGs for the population and/or subgroups of the population. More recently, the 2004 World Health Organization (WHO) Global Strategy on Diet, Physical Activity and Health<sup>3</sup>

encouraged governments to provide FBDGs in order to advise national nutrition policy, nutrition education, intersectoral interventions and collaborations. Effective implementation of FBDGs at population level and in policies is needed in order to contribute to halting the current NCD epidemic.

## Method

The information in the present paper is based on a systematised literature review of FBDGs which shaped questions to be asked of key informants responsible for their implementation in different countries.† Research questions were: What is the role of FBDGs? How are they implemented and monitored? What are their successes and barriers to success in promoting diet-related health?

† The study draws upon work conducted for a thesis on 'The role of food-based dietary guideline implementation within fruit and vegetable promotion programmes', conducted at City University.

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Interviews were conducted by email or telephone with key stakeholders and representatives from public and private institutions in four countries, chosen as case studies: Germany, Chile, New Zealand and South Africa. These were chosen to be diverse by level of development (national income) as well as geographical location. For the literature review, electronic health, education and social science databases were searched. The review primarily considered studies published after 1995 and available in English, German or Spanish. The search terms used were: food based dietary guidelines, dietary guidelines (+country name), nutrition guidelines, food pyramid. The search was also performed for the German and Spanish translation of 'dietary guidelines'. Literature on how to develop FBDGs was not considered. 'Grey' literature, e.g. national reports on FBDG implementation and evaluation, was also sought. Unpublished documents received from the interviewees were also reviewed.

Interviews were conducted with one person from four key institutions in each country. The informants came from: the Ministry of Health (nutrition unit), the 5 A Day fruit and vegetable programme, the academic sector and the fruit and vegetable production and trading sector, included as key 5 A Day participants.

Since in Germany the governmental responsibility for nutrition does not lie with the Ministry of Health (BMGS – Bundesministerium für Gesundheit und Soziales) but with the Ministry of Consumer Affairs, Nutrition and Agriculture (BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz), exceptionally a representative of both ministries was interviewed.

The methodology was approved by the Ethics Committee of City University. Interviews were carried out in August and September 2005. Each interview partner received an invitation to be interviewed. Choice as to whether information was elicited by phone or by email was left to the interviewee's decision. Questions were prepared for posing by voice or email in English, German or Spanish. Potential interviewees were contacted and followed-up by email, if they did not respond to the initial inquiry within a week. None of the designated interviewees declined to participate. Most chose to answer the research questions via email. Telephone interviews were carried out with three interviewees and answers were recorded by the researcher (I.K.). All interviews were held in the mother tongue of the interviewee and, where necessary, translated into English.

## Results

### *The role of FBDGs*

FBDGs emerged for the first time in the late 1960s, in Scandinavia<sup>4</sup>. FBDGs are defined by WHO/Food and Agriculture Organization of the United Nations (FAO) as 'the expression of principles of nutrition education mostly

as foods'<sup>2</sup>. The purpose of the guidelines is to educate the population and to guide national food and nutrition policies as well as the food industry. Dietary guidelines are advocated as a practical manner to reach nutrition goals set for the population, while considering the setting, social, economic and cultural factors as well as the physical and the biological environment.

Following the call of the International Conference on Nutrition, the WHO and FAO organise (sub-) regional training workshops for national government representatives from the health, nutrition and agricultural sectors, in order to support especially medium- and low-income countries in the development of FBDGs (and of national food and nutrition action plans). The WHO nutrition policy database<sup>5</sup> monitors the development and implementation of national food and nutrition action plans and if countries have FBDGs. Presently 27 out of 52 countries in the WHO European Region have FBDGs<sup>6</sup>, as do 22 out of 37 countries in the WHO Western Pacific Region<sup>7</sup>.

When formulating FBDGs at national levels it is often difficult to separate the scientific from the political process and therefore some countries opt to open the process for a stakeholder discussion or involve all stakeholders from the beginning in the formulation. The government may not be the leader in the dietary guidelines development, but it is important that it oversees the process and publicly endorses the dietary guidelines. Dwyer<sup>8</sup> argues that an endorsement from the private sector is also valuable for successful implementation. The development and revision processes of FBDGs have been subject to fierce debates and lobbying from the side of food producers and processors<sup>4,8,9</sup>.

### *Implementation of FBDGs*

To implement FBDGs, the WHO and FAO<sup>2</sup> recommend that each country shall formulate a qualitative version for the public and a quantitative version and background material aimed at health professionals and policy-makers. To reach the general public, WHO and FAO suggest the use of a variety of media, so that all age groups can be reached and various levels of literacy are taken into account. In addition, all (government-sponsored) food distribution, food services and nutrition programmes should receive the information about the FBDG, should adopt it and apply it as pioneers. WHO/FAO<sup>2</sup> also proposed that process and outcome evaluation should accompany the implementation of FBDGs. The EURODIET report also makes recommendations for the implementation of dietary guidelines<sup>10</sup>: first, dietary guidelines can serve as communication tool and second as a 'springboard' for other, broader health strategies. Hence, the EURODIET authors make a distinction whether dietary guidelines are promoted per se (e.g. via a leaflet or other material) or if they form part of a wider health promotion/disease prevention strategy at population

level. The latter is judged more likely to lead to behavioural changes, while aiming at either a specific target group or a setting or focusing on specific approaches (advocacy, local project, etc.).

In general, not much literature could be identified that documents the implementation of FBDGs at national levels. Schneeman<sup>11</sup> outlines some general challenges to FBDG implementation. These are to:

- increase awareness and motivate behavioural change;
- move from the provision of information to messages targeting behaviour changes;
- address all socio-economic segments in the population;
- maintain integrity of all messages developed;
- translate the FBDG into other languages or dialects.

Much of the literature found in this area comes from the USA, where the responsibility to implement the FBDGs lies with the government and a public–private partnership that was founded especially to implement them<sup>12</sup>. Implementation occurs mainly via educational materials and the government-sponsored food programmes for schools and low-income families. All school lunches and breakfasts need to meet the FBDGs and the US Department of Agriculture supports schools to implement them, including nutrition education to motivate schoolchildren to make healthy choices<sup>13</sup>.

If FBDGs are not put into practice, one could assume that they are not understood. Constraints to put FBDGs into practice are, however, many more than lack of knowledge or misunderstanding of FBDGs. FBDGs are mainly developed taking nutrition and epidemiological evidence into account<sup>14</sup>, while consumer perceptions and attitudes may not be reflected. FBDGs are rather a ‘top-down’ than a ‘bottom-up’ approach. Consumers are not directly involved in the development and dietary guidelines may figure fairly low on the public agenda<sup>10</sup>.

Also, food choice is guided by price, taste, convenience and other factors<sup>12</sup>. Additional influences are varying messages given by health professionals, the media and others, and the food preferences of family members, which in particular women may take into account as well as (family) income. Last but not least, ‘healthy foods’ – such as fruit and vegetables – may be perceived as unattractive, not tasty, time-consuming or simply boring (especially for children)<sup>15</sup>.

All barriers and particular challenges have important implications for the implementation of FBDGs. Consequently, it is equally or even more important to focus on removing the barriers to follow the FBDG than to inform and educate the public about it.

Also, agricultural policies can be seen as a barrier to the implementation of FBDGs<sup>16</sup>. The WHO European Office emphasises that ‘food policies in many countries have a production bias in contrast to a health bias’<sup>17</sup>. It recommends that agriculture policies should be reoriented to

focus more on consumer health, while consumers need to be made more aware about how they can meet the FBDG with regional products, in particular locally produced fruit and vegetables. This, however, means running against powerful interests, ready to defend long-established subsidies for certain foods, as in Europe, where the Common Agricultural Policy financially supports the destruction of fruits and vegetables and the removal of orchards in order to maintain a high price.

#### ***Four country case studies: implementation, monitoring, successes and barriers***

Table 1 gives an overview of the implementation, monitoring, success factors, barriers and the relevance of the FBDG for the national food and nutrition policies in the four casestudy countries.

##### *Chile*

Chile was the first Latin American country where experts from the National Institute of Food Technology and Nutrition (INTA) and the Ministry of Health (MINSALUD) developed a set of FBDGs in 1997. Health professionals, in particular the nutritionists of the provincial public health services, were trained in using and communicating the FBDG. Pamphlets and other written information were given to health and education professionals, who then passed the information to the public or patients. In addition, health and other community associations received training in using the FBDG. The FBDG is also found on some food products.

In 2004 a review of the dietary guidelines was initiated and many of them reformulated. The new FBDGs are published together with recommendations for physical activity and tobacco control and stress prevention messages<sup>18</sup>. In 2002 the INTA formally evaluated the dissemination of the FBDG through a survey among the responsible nutritionists of the provincial health services. The number of persons who had participated by then in educational sessions about the FBDG was 36 120. In addition, 10 different manuals for various population groups had been developed at regional level and more than 500 000 leaflets, posters and flyers distributed<sup>19</sup>. Monitoring also takes place through small-scale studies evaluating consumer education programmes<sup>20</sup> and a survey on knowledge about the FBDG among primary health-care professionals. This survey showed that knowledge of the FBDG by health professionals is low, except for nutritionists. Regarding improvements in FBDG implementation, the private sector and the mass media should be included more in its dissemination. Further, changes are desired in the motivation of the professionals, especially of the nutritionists, as they have a key role in promoting the FBDG.

**Table 1** Comparison of the main characteristics of FBDG development, implementation and monitoring

	Chile	Germany	New Zealand	South Africa
Year of latest FBDG	2005	2005	2003	2003
Visual aid complementing FBDG	Previously a pyramid, but not for last version	Three-dimensional pyramid with food circle at the bottom	No	No
Institutions developing FBDG	INTA/MINSALUD	DGE	MoH, public consultation carried out	Multidisciplinary, public-private group, coordinated by the Nutrition Society of South Africa
Main institutions implementing FBDG	INTA/MINSALUD	DGE, BMELV, AID, BMGS, BzGA	MoH, PHO, DHB, NHF	National and provincial DoH
Main paths of implementation*	Train nutrition and education professionals and community associations in FBDG use and promotion	FBDG available on BMVEL website	Dietary guidelines available in hard copy and on MoH website, also from NHF and distribution at PHO and DHB to public and patients	Dietitians trained at provincial level to teach FBDG to public and patients
	Material distribution to public and patients	Materials for nutritionists and school teachers available from DGE and consumer material from AID		Educational materials developed
Monitoring of FBDG implementation	Official monitoring survey in 2002	Via the population consumption profile compiled through national nutrition surveys (every 5 years) and agricultural statistics	Materials for children, adolescents and older people evaluated in 1998	It is too early to evaluate the implementation and impact of the FBDG
	Smaller studies on consumers' and health professionals' knowledge of FBDG		MoH suggests national nutrition surveys to monitor compliance (every 10 years)	
Successes and factors in FBDG implementation*	Wide dissemination of FBDG and much material is available	Some positive, qualitative changes in consumption profile visible	Good level of awareness and/or usage of the FNG by public health nurses and physicians, midwives, nutritionists and the food industry	All stakeholders promote the same messages
	Leadership of the health sector	Many contributing activities through policies and research in consumer protection and health promotion	Teachers in schools and pre-schools use the FNG	
	Training for primary health-care professionals			
	Primary health care is well established and functioning throughout the country			
Barriers to FBDG implementation*	Low financial support for the dissemination of the FBDG Little participation and support from the mass media	Lack of education and/or low income in part of the population Activities to date do not reach low-income groups	Materials not distributed much beyond the health sector Knowledge of FNG does not mean behavioural change No distribution through mass media General practitioners and practice nurses have a low level of familiarity	Overall poverty and food insecurity DoH funds devoted to other priorities such as HIV/AIDS No visual tool accompanies FBDG DoH lacks communication skills

Table 1 Continued

	Chile	Germany	New Zealand	South Africa
Suggested changes in FBDG implementation*	Involve the mass media and the private sector more Start teaching the FBDG at early ages Other sectors should join implementation	Better target specific groups e.g. older people and parents More promotion of physical activity needed Use all communication channels fully	More funding needed	FBDG to be complemented by visual aid DoH needs to involve NGOs in FBDG implementation Other sectors and policies need to consider the FBDG, including education, social welfare and agriculture
FBDG as policy part*	FBDG is an essential part; policy link to other health promotion initiatives needed	FBDG is an essential part; FBDG is an important consumer guidance	FNGs are the MoH's position with respect to healthy diet; nutritionists, regulatory agencies and the food industry use them as an authoritative opinion	FBDG is core to the nutrition policy and other policy initiatives should fit with them

FBDG – food-based dietary guideline; INTA – National Institute of Food Technology and Nutrition; MINSALUD – Chilean Ministry of Health; DGE – German Nutrition Society (Deutsche Gesellschaft für Ernährung); BMELV – Ministry of Consumer Affairs, Nutrition and Agriculture (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz); AID – ‘info-service consumer protection, food, agriculture’ (Infodienst Verbraucherschutz, Ernährung, Landwirtschaft); BMGS – Ministry of Health (Bundesministerium für Gesundheit und Soziales); Bzga – Federal Centre for Health Education (Bundeszentrale für gesundheitliche Aufklärung); MoH – Ministry of Health; PHO – primary health-care organisation; DHB – district health board; NHF – National Heart Foundation; FNG – Food and Nutrition Guideline; NGO, non-government organisation.  
\*Based on information from the key informants.

Germany

In Germany the first set of FBDGs was issued in 1985 (for the Federal Republic of Germany at that time); revised sets were published in 1991 and in 2000. In the 2005 the FBDG was reviewed but not changed, while the accompanying food pyramid was re-shaped. The German Nutrition Society (DGE – Deutsche Gesellschaft für Ernährung) issues the FBDG. The BMELV endorses, promotes and implements the FBDG, also via DGE and the ‘AID info-service consumer protection, food, agriculture’ (AID – Infodienst Verbraucherschutz, Ernährung, Landwirtschaft), both co-financed by the BMELV. The FBDG implementation is seen as a success from a qualitative point of view, since some changes in the dietary behaviour can be seen. However, dietary habits differ according to socio-economic strata: low socio-economic groups have a worse profile. In addition, a high percentage of the adult population is overweight, which indicates that they are not following the FBDG, which could be seen as a failure of these. To improve FBDG promotion, it would be important that all institutions and communicators in the area of nutrition adopt the FBDG and communicate it together, and this way the target groups would be better reached.

New Zealand

In 1985 the New Zealand Ministry of Health (MoH) issued dietary guidelines for the first time<sup>4</sup>. These were then revised and reissued in 1991 as the food and nutrition guideline (FNG) for adults (i.e. the term ‘food-based dietary guidelines’ is not used in New Zealand). In addition, the MoH also published an FNG for all main groups along the life course: toddlers, children, adolescents, pregnant women, breast-feeding women and older people<sup>21</sup>. A background paper for health professionals and a pamphlet for lay persons are issued for all FNGs. The FNG for adults was revised in 2000, which for the first time included a public consultation. In 2003 the current set was published. The FNGs are implemented and all costs for it borne by the MoH through their publication on the internet and in hard copy. The food industry also reproduces the FNG<sup>22</sup>.

In 1998, the MoH commissioned a formal evaluation of the written health education materials (booklets) for children, adolescents and older persons from the mid-1990 through focus groups discussions and key informant interviews. Neither among the older people nor among the parents and children/adolescents had many seen the booklets. Some of the adolescents found the materials unappealing and outdated. Parents found explications too complicated. Older people, however, found the booklets informative. Many participants made concrete suggestions on how to improve the materials<sup>23,24</sup>. Today the development of health education materials always includes focus group discussions with consumers.

The following success factors were highlighted:

- the MoH has a good system of disseminating the FNGs widely through mailings, newsletters and conference presentations;
- all material is free of charge, available online and in hard copy;
- the education sector uses the FNGs and familiarises children and the community with the guidelines.

Important barriers mentioned were the following:

- the FNG materials are not much distributed beyond the health sector, e.g. they are not available in public meeting or community places;
- consumer awareness is limited since the FNGs are not disseminated through mass media;
- knowledge does not equal behaviour change – even if people know the FNG, they do not change their behaviour;
- cost and availability of healthy foods limits adherence for certain population groups;
- cultural issues.

### South Africa

Until the recent development of the FBDG in South Africa, nutrition education was carried out *ad hoc*<sup>25</sup>. Between 1997 and 2001 a multidisciplinary group developed the current FBDG intended for all persons over the age of 7 years without special dietary needs. The implementation lies with the national and provincial Departments of Health (DoH), which developed explanatory teaching and education materials<sup>26</sup>. Dietitians and other health professionals were trained to communicate the FBDG. Despite this, there seems to be a lack of trained personnel, especially at community level. For example, the strategic plan of the integrated nutrition policy of the Kwazulu-Natal Province<sup>27</sup> includes nutrition education as a focus area, but points out that nutrition advisers are lacking. The plan does not mention the FBDG as a tool or a benchmark for knowledge, while it aims to measure changes in knowledge and attitudes. This suggests that communication of the FBDG even within the governmental structure could be improved. While FBDGs are seen as an important part of nutrition policy, food insecurity is still a main problem. Thus the FBDG can only be part of a larger strategy focused on combating hunger and deficiencies, but also encouraging self-sufficiency and economic sustainability. Therefore it would be important that, for example, the national Integrated Nutrition Programme, the Agricultural Policies for Household Food Security and the Poverty Alleviation Programme are consistent with the FBDG.

### Discussion

FBDGs are mainly implemented via written/electronic information provided through the health and/or education

sector but a broader approach to include them into wider health promotion strategies, as recommended by EURODIET<sup>10</sup>, is not seen. This 'traditional' mode of FBDG dissemination per se, the lack of funds, and the challenge to reach the low-income population and to overcome poverty are the main barriers identified to successful implementation. When suggesting changes, the informants concurred that more stakeholders should be involved to better reach consumers. Notably, environmental or policy changes to complement FBDG implementation were not listed. Positive changes towards a wider approach are the 'Healthy Eating – Healthy Action' Strategy in New Zealand<sup>28</sup>, which includes the promotion of environmental changes and calls on a variety of stakeholders to participate, or the new Chilean publication<sup>18</sup> which combines the FBDG with advice on physical activity, tobacco and mental well-being. However, while nutrition education and information are important, a pamphlet alone cannot work<sup>29</sup>. Focusing on nutrition information alone may increase health inequity, if only certain parts of the population are reached<sup>10</sup>. Thus, important lessons learnt are to emphasise 'reaching the hard to reach', work with many stakeholders and add complementary environmental changes.

Evaluation of FBDG implementation is a weakness in all four countries. Chile is the only country that performed a survey to estimate the population reached. Chile<sup>30</sup> and New Zealand<sup>23,24</sup> conducted focus group discussions to evaluate their understandings of their FBDG, but there seems to be no coherent evaluation plan in any of the four countries examined. This finding is confirmed by Lachat *et al.*<sup>31</sup>, who found that while nutrition monitoring and surveillance is carried out in several countries, food and nutrition policies are not evaluated. An open question here is what indicators would be needed. Through national dietary surveys or sales data the dietary intake is measured, but it may take a long time to see changes and a direct relationship to FBDG promotion would be hard to establish. Hence, intermediate indicators, such as understanding the message or increased availability and accessibility of 'eat more' foods, should be used as well.

FBDGs give positive and negative messages regarding a total diet. The 'bad news' needs to be part of the nutrition information given to the population as well as at the policy level. Policy-makers should support e.g. fruit and vegetable promotion, but they should also focus on the 'eat less'/'instead of' messages e.g. through controlling the marketing of foods high in sugars, salt and/or fats to children.

Another issue that requires some reflection is conflict of interest, which may be present within the government (agriculture vs. health) or between FBDG promoters and parts of the food industry. Since consumer research showed<sup>20,32</sup> that the pyramid is known because it is on the packages of foods, it is important to ensure that the food processing industry uses the official FBDG. Thus, to ensure 'buy-in' to the FBDG from all sectors is important,

while it will be a challenge to overcome conflict of interest and avoid undue influences on FBDG formulation.

All in all, rapid improvements in FBDG implementation are needed in order to make a contribution to halting the global epidemics of obesity and other nutrition-related NCDs. At the same time, it is clear that FBDGs have a foothold in the policy and public health nutrition world. From the present study, a number of recommendations can be suggested to consolidate and improve on that status.

### Emerging recommendations

The following recommendations correspond to the issues concerning FBDG implementation discussed in the four case studies and are derived from the interviews or inspired by the literature review<sup>3,10,33</sup> and addressed to specific stakeholders.

#### **Monitoring of FBDG implementation**

National governments should evaluate FBDG implementation regularly, using intermediate indicators and identifying barriers to success. At regional and global level the WHO and FAO could coordinate a common mode of monitoring to help assess the contribution of all stakeholders to FBDG implementation. Food and health non-government organisations (NGOs) could provide a valuable 'watchdog' function to ensure that government conducts such monitoring regularly.

#### **Successes and factors in FBDG implementation**

Multistakeholder involvement in promoting and implementing FBDGs at national level is important but national governments should endorse the FBDG and lead its implementation, highlighting its value in training not just for health professionals but also for non-health professionals who influence food availability and dietary habits, such as kindergarten and school teachers, caterers and administrators of health and social services. The food and catering industry should use the official, national FBDG and make those foods recommended as 'eat more' readily available in worksite, school and hospital cafeterias, restaurants and fast-food chains and improve the nutritional quality of processed foods to fit with the FBDG through product reformulation. NGOs should form inter-sectoral alliances to promote and endorse the official/national guidelines. At global level WHO/FAO should continue to support FBDG development where not existing and subsequent implementation and monitoring, while identifying best practices.

#### **Changes in FBDG implementation**

FBDGs need to be promoted through the various mass media, often the most important source of information for

the public, especially in lower socio-economic groups. The multistakeholder approach could also be used when developing or revising FBDGs at national level and when implementing the FBDG to ensure consistency of message. This focus on information should be accompanied by (and not be used as a substitute for) continued environmental interventions and other sustainable changes.

#### **FBDGs as part of wider food and health policies**

The FBDG should form the bedrock for governmental health strategies and in particular be used to align wider agriculture, food and nutrition policies. In turn, these should support FBDG implementation. Bodies such as national food and nutrition councils should be a source of advice on health-centred policy change and implementation<sup>34</sup>. School food policies, for example, should require meals and snacks offered to comply with the FBDG, including local supply networks. Thus FBDGs could become a policy and organising tool as well as a scientific tool.

### References

- 1 World Health Organization (WHO). *Chronic Diseases – A Vital Investment. Global Report on Chronic Diseases*. Geneva: WHO, 2005.
- 2 World Health Organization (WHO)/Food and Agriculture Organization of the United Nations. *Preparation and Use of Food-based Dietary Guidelines*. WHO Technical Report Series No. 880. Geneva: WHO, 1998.
- 3 World Health Organization. *Global strategy on diet, physical activity and health. World Health Assembly Resolution 57.17* [online], 2004. Available at [http://www.who.int/gb/ebwha/pdf\\_files/WHA57/A57\\_R17-en.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA57/A57_R17-en.pdf). Accessed 16 July 2007.
- 4 Truswell AS. Dietary goals and guidelines: national and international perspectives. In: Shils ME, Olson JA, Shike M, eds. *Modern Nutrition in Health and Disease*, 8th ed. Malvern, PA: Lea and Febiger, 1994; 1612–25.
- 5 World Health Organization. *Global Database on National Nutrition Policies and Programmes* [online], without date. Available at <http://www.who.int/nutrition/databases/policies/en/index.html>. Accessed 16 July 2007.
- 6 World Health Organization (WHO). *Food and Health in Europe: A New Basis for Action*. WHO Regional Publications, European Series No 96. Copenhagen: WHO Regional Office for Europe, 2004.
- 7 Florencio C. Dietary guidelines development and utilization in the Western Pacific Region. *Presentation at the WHO Regional Consultation for the Western Pacific in preparation for the Global Strategy on Diet, Physical Activity and Health* [online], 2003. Available at [http://www.who.int/dietphysicalactivity/media/en/gskon\\_cs\\_report\\_wpro.pdf](http://www.who.int/dietphysicalactivity/media/en/gskon_cs_report_wpro.pdf). Accessed 16 July 2007.
- 8 Dwyer J. Nutrition guidelines and education of the public. *Journal of Nutrition* 2001; **131**(11 Suppl.): 3074S–7S.
- 9 Lang T, Heasman M. *Food Wars*. London: Earthscan, 2004.
- 10 Stockley L. Toward public health nutrition strategies in the European Union to supplement food-based dietary guidelines and to enhance healthier lifestyles. *Public Health Nutrition* 2001; **4**(2A): 307–24.

- 11 Schneeman BO. Evolution of dietary guidelines. *Journal of the American Dietetic Association* 2003; **103**(12 Suppl. 2): S5–9.
- 12 Guthrie JF, Smallwood DM. Evaluating the effects of the Dietary Guidelines for Americans on consumer behavior and health: methodological challenges. *Journal of the American Dietetic Association* 2003; **103**(12 Suppl. 2): S42–9.
- 13 Lin BH, Guthrie J, Frazao E. Popularity of dining out presents barrier to dietary improvements. *Food Review* 1998; (May–Aug): 2–10.
- 14 Kearney JM, McElhone S. Perceived barriers in trying to eat healthier – results of a pan-EU consumer attitudinal survey. *British Journal of Nutrition* 1999; **81**(Suppl. 2): S133–7.
- 15 Seymour J, Fenley MA, Yaroch AL, Khan LK, Serdula M. Fruit and vegetable environment, policy and pricing workshop: introduction to the conference proceedings. *Preventive Medicine* 2004; **39**(Suppl. 2): S71–2.
- 16 Lobstein T. Suppose we all ate a healthy diet...? *Eurohealth* 2004; **10**(1): 8–12.
- 17 World Health Organization Regional Office for Europe. *Intersectoral Food and Nutrition Policy Development. A Manual for Decision-makers. EUR/01/5026035* [online], 2001. Available at <http://www.euro.who.int/Document/E73104.pdf>. Accessed 16 July 2007.
- 18 INTA/MINSALUD (National Institute of Food Technology and Nutrition/Ministry of Health). *Guía para una vida saludable. Guías alimentarias, actividad física y tabaco* [Guide for a healthy life. Dietary guidelines, physical activity and tobacco] [online]. 2005. Available at [http://www.minsal.cl/ici/nutricion/primeraparte\\_guia\\_para\\_una\\_vida\\_saludable.pdf](http://www.minsal.cl/ici/nutricion/primeraparte_guia_para_una_vida_saludable.pdf). Accessed 16 July 2007.
- 19 Olivares S, Zacarias I, Benavides X, Boj T. Difusión de guías alimentarias por los servicios de salud. Presentation at the *Congreso Chileno de Nutrición, Vina del Mar, 24–27 November 2004*.
- 20 Domper A, Zacarias I, Olivares S. Evaluacion de un programma de informacion en nutricion al consumidor. *Revista Chilena de Nutrición* 2003; **30**(1): 43–51.
- 21 Baghurst K. Dietary guidelines: the development process in Australia and New Zealand. *Journal of the American Dietetic Association* 2003; **103**(12 Suppl. 2): S17–21.
- 22 New Zealand Health Strategy. *DHB Toolkit: Improve Nutrition* [online], 2001. Available at [http://www.moh.govt.nz/moh.nsf/pagesmh/5508/\\$File/nutrition-toolkit.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/5508/$File/nutrition-toolkit.pdf). Accessed 16 July 2007.
- 23 Cameron J, Brinsdon S. *Evaluation of Food and Nutrition Health Education Resources. Eating for healthy children. Eating for healthy adolescents*. Wellington: Ministry of Health, 1998.
- 24 Trustin G, McCracken H. *Eating Well for Healthy Older People. An Evaluation Report prepared for the Ministry of Health*. Wellington: Ministry of Health, 1998.
- 25 Love P, Maunder E, Green M, Ross F, Smale-Lovely J, Charlton K. South African food-based dietary guidelines: testing of the preliminary guidelines among women in Kwazulu-Natal and the Western Cape. *South African Journal of Clinical Nutrition* 2001; **14**(1): 9–19.
- 26 Department of Health. *South African Guidelines for Healthy Eating for Adults and Children over the age of seven years*. Pretoria: Department of Health, Directorate: Nutrition, 2004.
- 27 Provincial Directorate. *Integrated Nutrition Programme. Strategic Plan 2003/4–2007/8*. Durban: Health Ezimpilo Kwazulu-Natal, Directorate: Nutrition and District Personnel, 2003.
- 28 Ministry of Health. *Healthy Eating – Healthy Action: Oranga Kai – Oranga Pumau Implementation Plan: 2004–2010*. Wellington: Ministry of Health, 2004.
- 29 Gibney MJ, Wolmarans P. Dietary guidelines. In: Gibney MJ, Margets BM, Kearney JM, Arab L, eds. *Public Health Nutrition*. Oxford: Blackwell, 2004; 133–43.
- 30 Yañez R, Olivares S, Torres I, Guevara M. Validación de las guías y de la pirámide alimentaria en escolares de 5° a 8° básico. *Revista Chilena de Nutrición* 2000; **27**(3): 358–67.
- 31 Lachat C, Van Camp J, De Henauw S, Matthys C, Larondelle Y, Remaut-De Winter AM, *et al.* A concise overview of national nutrition action plans in the European Union Member States. *Public Health Nutrition* 2005; **8**(3): 266–74.
- 32 Geiger CJ. Communicating dietary guidelines for Americans: room for improvement. *Journal of the American Dietetic Association* 2003; **101**(7): 793–7.
- 33 World Health Organization Regional Office for Europe. *European Charter on Counteracting Obesity. EUR/06/5062700/8* [online], 16 November 2006. Available at <http://www.euro.who.int/Document/E89567.pdf>. Accessed 16 July 2007.
- 34 Lang T, Rayner G, Rayner M, Barling D, Millstone E. Policy councils on food, nutrition and physical activity: the UK as a case study. *Public Health Nutrition* 2005; **8**(1): 11–19.