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Original Article

The French National Nutrition and Health Program: 2001–2006–2010

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Summary

Objectives: Established in 2001–2005 then extended to 2010, the French National Nutrition and Health Program (PNNS) is a nutrition policy whose objective is to improve the health status of the population by acting on one of its major determinants, nutrition.

Methods: Nine priority objectives focusing on diet, physical activity and nutritional status were determined. Program strategies are based on fundamental principles including food culture, pleasure, and gastronomy. This multidisciplinary program involves stakeholders from ministries, research and educational institutions, food industry, healthcare, and consumers.

Results: More than 75 % of the public health actions planned were accomplished or in progress by the end of 2005, particularly those concerning nutrition communication, education, research and nutritional surveillance. Dietary guidelines were established and are now considered the official reference in France. Actions focusing on the healthcare system, economic actors and players and specific population groups need further development.

Conclusions: The success of a public health program like the PNNS requires a combination of synergistic and complementary actions, measures, regulations and laws. A national study at the end of the PNNS will determine if objectives were achieved.

Keywords: Nutrition policy – Dietary intake – Physical activity – Nutrition communication – Nutrition goals.

The overall objective of the National Nutrition and Health Program ("Programme National Nutrition Santé" or "PNNS") implemented in France in 2001 by the Ministry of Health is to improve of the state of health of the entire population, by intervening at the level of one of its major determinants, nutrition. Such an ambitious public health program is motivated by the well-established role of diet in the development and clinical expression of chronic diseases and illnesses which are widespread in France as in most industrialized countries.

Cardiovascular disease (32 % of deaths) and cancer (29 % all deaths in men, 23 % in women) are the leading cause of mortality in France [1]. Diabetes and hypercholesterolemia rates continue to rise, and obesity affects 7 to 10 % of adults [2] and 15 to 17 % of children [3; 4] which has increased dramatically in recent years. In addition to their consequences on morbidity and mortality, these pathologies have considerable economic costs. Direct and indirect costs of ischemic heart disease were estimated at 4.5 billion Euros in 1986 [5] and costs attributable to obesity ranged from 2.1 to 6.2 billion euros in 2002 and account for 1.5 to 4.6 % of total health expenditures in France [6].

Although physiologic, genetic and numerous environmental factors contribute to the initiation and development of these pathologies, nutrition is considered one of the main determinants in which offer many possibilities for public health intervention and prevention. The purpose of this paper is to present the actions and measures implemented and completed during the first stage of the French National Nutrition and Health Program (PNNS1 2001–2005). Finally, the progress of PNNS1 and strategies planned for the second stage of the program PNNS2 (2006–2010) will be discussed.

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Objectives of the PNNS

The PNNS includes nine high-priority nutritional objectives for the general population which were conceived by an expert committee on nutrition and public health (Tab. 1). Five of these objectives concern dietary intake (fruits and vegetables, calcium, vitamin D, lipids, carbohydrate, fiber and alcohol); one relates to physical activity (in daily life) and three concern nutritional markers (cholesterol, blood pressure and obesity). Each objective is defined by quantitative improvement indicators. In addition, 10 objectives were defined for specific population groups (pregnant and lactating women, children, adolescents, elderly, and those who are socially and financially disadvantaged) and concern specific nutrients (Tab. 2).

Principles of the PNNS

The PNNS is based on several fundamental principles (Tab. 3). The program combines synergistic, complementary and consistent actions, measures, regulations and laws. Even if carried out under ideal conditions, it is understood that no single action or measure alone can be truly effective in achieving the global objectives of the program. The PNNS also combines different strategies oriented towards education, communication, information, the nutrition and food environment, food composition, availability, accessibility and affordability. Aside from the general population and specific population groups, actions are also oriented towards other target groups such as health and education professionals, social workers, local and regional officials, NGO and economic actors (i.e. food and catering industry, retailers, etc).

The act of eating includes cultural, social and psychological aspects, so it was important to emphasize the freedom of individual food choice and to account for notions such as pleasure, conviviality and gastronomy in the PNNS. Other principles include: developing understandable, scientifically valid messages that are adapted to lifestyles; using a positive behavioral approach that promotes protective factors rather than food restriction (although certain guidelines could and should advise limiting or reducing the intake of some excessively consumed foods); developing messages that are coherent, complementary and without contradiction.

Since 2001, the PNNS is directed by a Steering Committee which unites stakeholders from both public and private sectors: ministries, health agencies, the social healthcare system, research and educational institutions, the food and agricultural industry, consumer organizations and scientific experts. The PNNS Steering Committee holds monthly meetings to assure coordination and dialogue between major actors involved in the implementation of the PNNS. A French Interministerial

Table 1 The 9 priority nutritional objectives of the PNNS

1. Increase fruit and vegetable consumption: reduce the number of 'low consumers' of fruit and vegetables by at least 25 %[(a)]
2. Increase the calcium intake: reduce by 25 % the population whose calcium intakes fall below the recommended nutritional level[(b)] and reduce the prevalence of vitamin D deficiency by 25 %.
3. Reduce the average contribution of total fat intakes to less than 35 % of total daily energy intake; reduce by one-quarter in the population average saturated fat intakes (less than 35 % of total fat intakes).
4. Increase carbohydrate consumption so that they contribute more than 50 % of daily energy intakes, by increasing the complex carbohydrate intakes, reducing simple sugar intakes, and increasing fiber intakes by 50 %.
5. Reduce alcohol intakes among those who consume alcoholic drinks to less than 20 g per day. This objective is aimed at the general population and is based on a nutritional context (excessive contribution to energy intakes), and is not oriented to those people with existing chronic alcoholism and require specific treatment.
6. Reduce mean blood cholesterol levels in the adult population by 5 %.
7. Reduce systolic blood pressure in adults by 10 mmHg.
8. Reduce the prevalence of overweight and obesity (BMI >25 kg/m^2) in adults by 20 % and prevent the increase in prevalence of obesity among children.
9. Increase daily physical activity by an increase of 25 % in the number of people doing the equivalent of at least a half an hour of brisk walking per day (such as climbing stairs, or shopping/errands by foot). Sedentary behavior in children, which is a risk factor for chronic illness, should also be addressed.

[(a)] A 'low consumer' of fruit and vegetables is defined as someone consuming less than one and a half portions of fruit and less than two portions of vegetables (excluding potatoes) daily. Available data in France currently estimate that 55 % of men and 64 % of women aged 45–60 years old are 'low consumers' of fruits and 72 % of men and 64 % of women are 'low consumers' of vegetables.

[(b)] It is estimated that 42 % of men and 59 % of women 45–60 years old have calcium intakes lower than the 1992 recommended nutritional intakes.

Table 2 The 10 specific nutritional objectives for special population groups. (PNNS/Public Health Law of August 2004)

1. Reduce average consumption of sodium chloride (salt) to less than 8 g/person per day.
2. Reduce the prevalence of iron deficiency anemia among women of childbearing age to less than 3 %.
3. Improve folate status among women of childbearing age, particularly for those planning pregnancy, to decrease the incidence of neural tube defects.
4. Promote maternal breastfeeding.
5. Improve calcium and vitamin D status in children and adolescents and reduce the frequency of iron deficiency anemia to less than 2 % among children 6 months to 2 years and less than 1.5 % among children 2 to 4 years old.
6. Prevent, screen, and limit malnutrition among older adults and improve their calcium and vitamin D status.
7. Reduce the frequency of iodine deficiency to 8.5 % among men and 10.8 % among women.
8. Improve nutrition status of disadvantaged people by reducing vitamin and mineral deficiencies
9. Protect individuals following restrictive diets from vitamin and mineral deficiencies, provide nutrition care for individuals with eating disorders.
10. Address food allergy problems.

Nutrition Policy Committee meets annually to decide upon the strategic direction of the government's nutrition policies based on the steering committee's reports. Finally, a Regional PNNS Steering Committee is in charge of coordinating national strategies with the Regional Public Health Plan.

Methods

Several strategies oriented towards different target groups have been developed since 2001. Figure 1 shows a time-dependent flow chart of various actions implemented during the first phase of the PNNS.

Action No. 1: Provide and promote comprehensive nutrition communication for all consumers.

The first strategy of the PNNS was to disseminate clear, simple and comprehensive information about the public health nutrition program and its objectives. A PNNS logo (Fig. 2) was created representing the official colors of the French flag (blue, white, red) with a smile which serves as a reminder that health is perfectly compatible with pleasure. The logo serves to authenticate all documents and tools produced for the PNNS as well as the implemented actions that conform to its objectives. It was then highly publicized so that the PNNS would be known and recognized by the general population.

Internet websites (www.sante.gouv.fr and www.mangerbouger.fr) were developed for the general public and professionals to facilitate easy access to information about the PNNS.

Next, dietary reference guidelines for the general population were published (Fig. 3). These guidelines provide practical benchmarks for food intakes and include quantitative and qualitative information for making daily food choices. For example, in addition to recommending at least 5 portions of fruits and vegetables per day, the guidelines suggest how these foods can be consumed (at each meal or as a snack), their different forms available (purchased fresh, frozen, or canned) and how they may be eaten (raw, cooked, prepared).

National food-based guides were developed for the general population and specific population groups (children, adolescents, seniors, and pregnant women). These guides explain dietary intake guidelines and offer practical advice on how to reach PNNS recommendations without making dramatic lifestyle changes. In the general population guide, a series of "consumer" portraits are presented that reflect different individual situations such as those with particular taste preferences, professional, familial or cultural obligations, or various limitations (financial, time, cooking skills, etc). To use the guide, readers are asked to reflect what type of consumer they are. In other words, how does their personality, habits or lifestyle impact their dietary behaviors? Typical examples are: "I often eat in restaurants", "I skip meals, I don't have time for lunch", "I have to prepare meals for my family", or "I don't cook". Regardless of age, gender, lifestyle or dietary behaviors, each reader is likely to recognize him- or herself in one or more of the 25 portraits listed and is provided appropriate nutrition advice for a given situation. About 6 million copies of this guide were distributed in addition to a special edition for healthcare professionals (700 000 copies) since 2002. Guides for specific population groups were published on the same model, and distributed over subsequent years: children 0–18 years in 2004 (2.7 million copies); adolescents in 2005 (750,000 copies per year); seniors and their caretakers in 2006 (1.5 million copies); pregnant women in 2007 (1.5 million copies). Finally, a guide on physical activity designed for the general population was published in 2004 (700,000 copies).

As a spin-off to these guides, yearly mass media campaigns were launched to support the different PNNS recommendations. The first five years (2001–2005) focused on the promotion of increased fruit and vegetable consumption, physical activity, and encouraging foods rich in whole grains while reducing those with added sugars. In addition, short television programs are scheduled to air on French television channels

Table 3 Principles of the PNNS

- Each individual is free to choose the food that best suits his/her cultural and social background.
- The term "nutrition" refers to both food intake and energy expenditure through physical exercise.
- The act of eating has strong cultural, social and psychological aspects: in France it is a much-sought-after pleasure. The PNNS takes into account a multi-dimensional (biologic, symbolic and social) perspective of the act of eating.
- The strategies developed and the messages promoted under the PNNS are based on solid scientific expertise, provided by public authorities.
- The purpose of the actions implemented within the PNNS is to promote nutritional protection, reduce exposure to risk factors for chronic disease and protect at-risk groups from exposure to specific problems; they reflect a general desire to see a positive change in the nutritional environment and in human health.
- The strategies, actions and messages developed under the PNNS must be cohesive and without contradiction (either explicit or by omission).
- The major actions outlined in the PNNS are implemented according to discussions within the steering committee and, on a regional level, under the terms of the regional public health plan.
- Incentive measures are the preferred option, especially when they can be adapted to different categories of players. However, regulatory measures may be introduced where necessary, to meet efficiency and equality criteria.
- The PNNS strictly forbids any form of discrimination based on eating habits or a specific nutritional status.
- The PNNS may not forbid or ban the consumption of any type of food (unless the consumption thereof is forbidden by law).

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by the end of 2007, and 2008, 2009 to demonstrate how the PNNS guidelines can be put into practice and other media campaigns are planned for 2006–2010. To reach as large of an audience as possible, other media such as posters, leaflets, and kits were developed for distribution in schools, food services and catering, and companies. In general, the campaign messages are designed to be practical and adaptable to many situations. As an example, the physical activity campaign demonstrated how to easily incorporate "the equivalent of at least 30 minutes of brisk walking per day", into daily activities, such as taking the stairs or getting off the metro, bus or tram one stop earlier and then walking the rest of the way to one's destination.

In 2004, a public health law was enacted requiring that any media (television, radio, cinema, press, and internet) advertising manufactured/processed foods and beverages must be accompanied with health messages. Implemented in February 2007, this law requires that food advertisements must include health messages such as: "For your health, eat at least 5 fruits and vegetables per day", "For your health, get regular physical activity", "For your health, limit the amount of fat, sugar, and salt in the foods that you eat", "For your health, try to

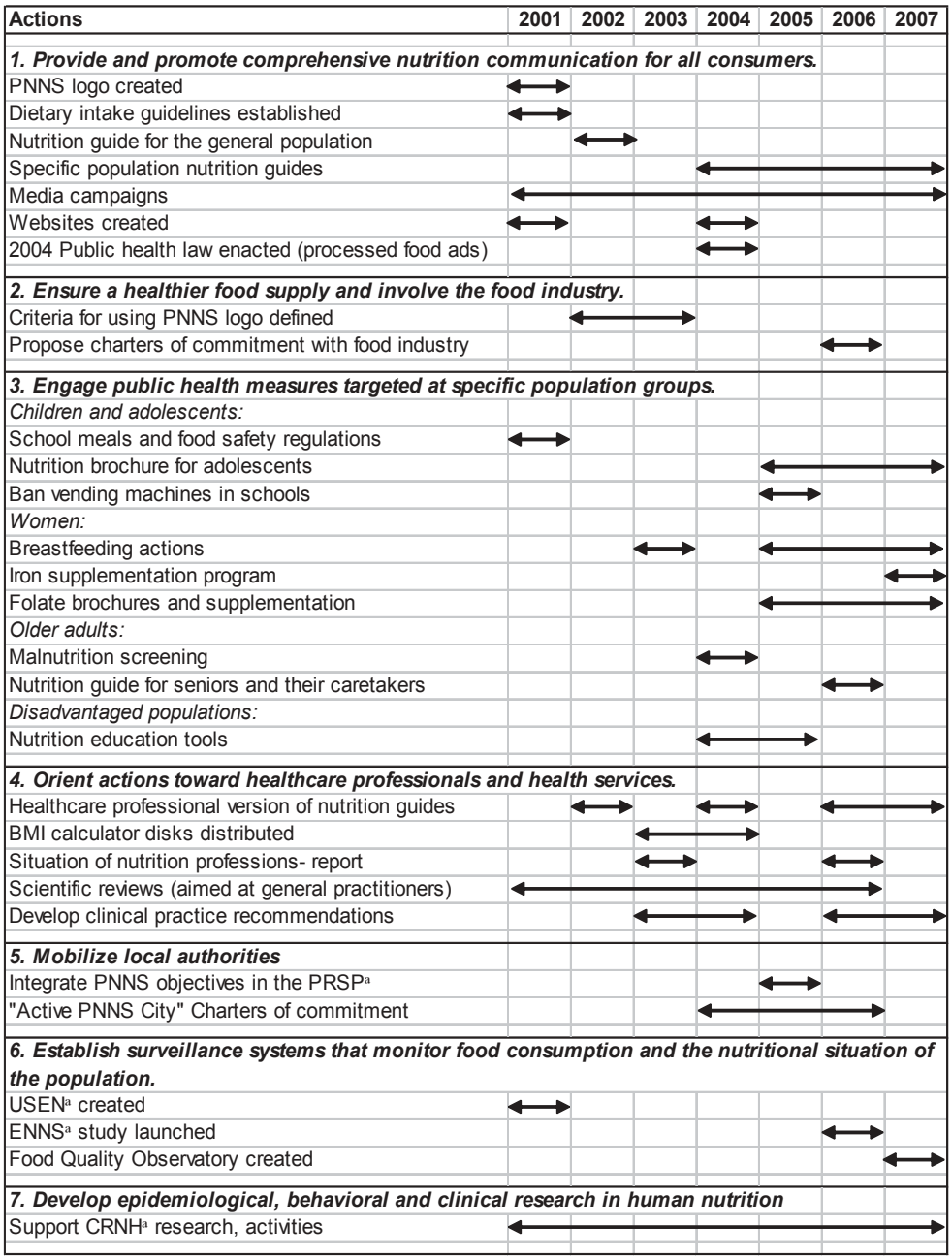

Figure 1 Time-dependent flow chart of actions implemented

[a] PRSP: Regional Public Health Plan; USEN: Nutritional Epidemiology Surveillance Unit; ENNS: National Nutrition and Health Study; CRNH: Centers for Research in Human Nutrition

avoid snacking between meals". Food industry companies who choose not to promote health messages on these types of food products are instead obliged to pay a tax amounting to 1.5 % of their television, radio, and press marketing expenses to the National Institute of Health Education and Prevention (INPES) who is responsible for promoting public health messages and education.

Action No. 2: Ensure a healthier food supply and involve the food industry.

Between 2001 and 2006, a series of actions involving the food industry were implemented to impact the food supply, distribution and to increase the availability of healthier food choices. As an example, a PNNS objective aimed to reduce the average salt intake of the entire population by 20 % over a five year period, thus a 4 % reduction in average salt intake per year. In addition to reducing the salt content in products that are particularly significant contributors in the diet, proposed measures targeted "high salt consumers" (intakes >12 g/d) and aimed to educate and encourage consumers to take a pro-active role in controlling their daily dietary salt intakes. Similarly, another task force comprised of the food and catering industry, retailers and consumer associations was established in 2005 to address the PNNS objectives concerning carbohydrate intakes (i. e. encourage consumption of complex carbohydrate food sources, reduce consumption of refined sugars, increase fiber intakes).

In 2002–2003, a task force group defined criteria that would permit the use of the PNNS logo on communication media such as posters, brochures, leaflets, etc. developed by food industry firms. The evaluation committee of the INPES is responsible evaluating requests for PNNS logo use and ensuring that such media conforms to the PNNS objectives.

In 2006, it was proposed to involve economic actors in the food industry in the implementation of PNNS2 through formal commitments. The goal of these charters of commitment is to improve the nutritional composition and quality (by decreasing added sugar, fat or salt) of a maximum number of

Figure 2 The PNNS logo

PNNS DIETARY RECOMMENDATIONS THAT CORRESPOND TO THE NUTRITIONAL GOALS OF THE PNNS FOR CHILDREN AGED 3 AND OVER AS WELL AS TEENAGERS. FORMS AND QUANTITIES MUST BE ADAPTED ACCORDING TO AGE.

Fruits and/ or vegetables	**At least 5 a day**	• At each meal and as snacks •Raw, cooked, in natural state or prepared •Fresh, frozen or tinned. •One freshly squeezed fruit or a half-glass of fruit juice with no added sugar, at breakfast or as a snack
Bread and other cereal products, potatoes and pulses	**At each meal and according to appetite**	• Favour variety: bread, rice, pasta, semolina/couscous, wheat, potatoes, lentils, dried beans, etc. (including brown bread and other whole grains) •Choose breakfast cereals that are low in sugar, limit very sugary varieties (chocolate cereals, with honey) or particularly fatty and sugary or filled cereals
Milk and dairy products	**3 a day (or 4 according to the portion size and calcium concentration)**	•Vary the products •Favour natural products and those richest in calcium, as well as products that are low in fat and salt: milk, yogurt, cottage cheese, etc.
Meat Fish and seafood Eggs	**Once or twice a day**	•The quantity should be inferior to the side dish made of vegetables and starches •If twice a day, reduce portions size at each meal •Vary types and choose the least fatty pieces (veal, chicken breast without skin, minced beef with 5% fat, etc). •Limit fried and breaded preparations •Fish: at least twice a week, fresh, frozen or tinned.
Added fat	**Limit intake**	•Favour fats of plant origin (olive oil, rapeseed oil, etc.) •Give preference to variety •Limit consumption of products of animal origin (butter, cream, etc.).
Sugary products	**Limit intake**	• Limit sugary drinks (soda, fizzy drinks, fruit squashes and nectars) and sweets •Limit fatty and sugary products (cakes and pastries, desserts containing cream, ice cream, chocolate bars, etc.)
Drinks	**Drink as much water as you like**	• Water is the only recommended beverage during and apart from meals. •Limit sugary drinks. •No alcoholic drinks and premix (mixture between soda and alcohol)
Salt	**Limit intake**	• Choose iodised salt. •Do not add salt before tasting. •Reduce the amount of salt to cooking water. •Limit consumption of salty and fatty products: deli meats, crisps, other salty prepared foodsƐ
Physical activity	**A minimum of 30 minutes of brisk walking per day (or equivalent)**	• Integrate any type of physical activity in your daily life: walking, cycling, gardening, gym, yoga, swimming... •Limit inactivity and sedentary activities (television, computer or video games...)

Figure 3 The dietary guidelines

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existing food products. New products will be held to a higher nutritional standard, particularly for salt, sugar and fat which concern public health. Other actions designed to improve the food supply focus on portion sizes, product presentation, communication and marketing (especially to children), accessibility of products to disadvantaged populations, and the quality of the overall food supply in terms of the PNNS2 priorities. These charters of commitment will be clearly defined and compliance with PNNS objectives will be monitored with regular progress evaluations.

Action No. 3: Engage public health measures targeted at specific population groups.

Actions oriented toward children and adolescents

In coordination with the Ministry of National Education, nutrition education actions that encourage "healthy eating" at an early age were developed in addition to actions that create an environment conducive to adequate nutrition for children and youth. In particular, an official circular titled, 'Regulation on the Composition of School Meals and Food Safety' was published in 2001 [7]. This regulation encouraged school food service managers to offer fresh foods, quality products, and well-balanced meals as well as to take an active role in developing nutrition education. Initially optional, this regulation will be modified in an interministerial decree in 2008 to ensure that the measure is implemented in all schools. Efforts to improve the nutrition environment at schools have also been made since the initiation of PNNS, such as removing the traditional, nutritionally inadequate morning snacks and light meals previously served in French schools and banning school vending machines (Public Health Law enacted in 2004 and effective since September 2005).

Since 2005, a national brochure on diet and physical activity designed for adolescents has been distributed by life science and biology teachers to their students (750,000 teenagers) each year which has been integrated into their class programs.

Actions oriented towards mothers

Breastfeeding

Many actions were developed to promote breastfeeding. Accomplished actions include training maternity care staff to assist mothers with breastfeeding following new births (implemented in 2003), promoting breastfeeding during prenatal consultations (in progress), and providing information about introducing complementary foods for infants (2006). In addition, since 2005, community-based healthcare professionals have been receiving a validated scientific document summarizing the health benefits of breastfeeding.

It is also planned to have each maternity center appoint a specialist to answer questions about breastfeeding and provide telephone support for women who are having difficulties with breastfeeding at home before 2010. Breastfeeding will be systematically promoted during the fourth month pregnancy visit with a physician or mid-wife who will also provide a brochure about the subject. An internet forum for young women will be created to encourage dialogue and positive communication about breastfeeding. In 2007, PNNS nutrition guides for pregnant women and lactating women were distributed and nutrition guides for infants and toddlers (birth to 3 years) are currently available in maternity centers. PNNS dietary guidelines and nutrition information specific to pregnant women will be included with maternity health booklets. Moreover, it is planned to initiate a parliamentary progress report on breastfeeding legislation and its application as well as include comparisons with other European Union countries and propose necessary changes.

Iron deficiency

A guide for healthcare professionals was distributed in 2007 to raise awareness about potential iron deficiency among pregnant women and to encourage supplementation when necessary.

Folate status

To reduce the incidence of folate deficiency and the risk for neural tube defects, PNNS actions were implemented to increase awareness about the importance of adequate folate intakes. In 2005, a campaign was initiated to inform physicians that they could now prescribe a folate supplement (400 µg/capsule) whose cost would be reimbursed by social security, to women at risk for folate deficiency and those planning a pregnancy. Brochures with information about folate were also distributed to healthcare personnel, teachers, as well as young women and those of childbearing age.

Actions oriented toward older adults

Since older adults (>75 years) living alone often face nutritional and dietary problems such as food accessibility, consumption and preparation, actions were developed to establish malnutrition screening and clinical practice nutrition recommendations (2006). A training module emphasizing the recognition of and risks for malnutrition was developed for healthcare professionals and distributed in healthcare establishments. A similar training program will also be created for home healthcare aides. A special PNNS nutrition guide designed for caretakers of older adults was distributed in 2006.

Actions were implemented to improve calcium and vitamin D status among older adults who are at higher risk for bone fractures. Combined calcium and vitamin D supplementation for older adults living at home and in assisted care facilities

is being promoted and supported by clinical practice recommendations.

Actions oriented toward disadvantaged people

Nutrition education tools were developed and training sessions were provided for those working at food assistance organizations to inform them of the nutritional problems specific to this population. A booklet presenting information and recipes on how to eat healthy on a small budget were made available through food aid organizations. In addition, charitable associations were encouraged to improve the nutritional quality and distribution of the foods offered. A non-perishable chocolate flavored food product called "Vitapoche" enriched with vitamins and minerals was developed for distribution to homeless individuals at food assistance organizations and shelters.

Forthcoming actions will involve social networks in health education measures, particularly the 123 Family Welfare Centers which maintain regular contact with families and individuals who are recipients of social welfare and housing programs. For example, certain nutrition education documents will be adapted for this population and more training opportunities for professionals will be developed. Families will be informed of the PNNS nutrition and physical activity guidelines while taking into account their financial limitations and cultural backgrounds. Furthermore, specific actions for disadvantaged populations will be developed to help improve access to medical care and prevention programs.

Two main goals to improve food aid that are consistent with PNNS recommendations are being considered. The first goal is to increase the availability of fruit, vegetables and fish. Currently, only 3 % of fish products and less than 8 % of fruits and vegetables are taken from the market and distributed free of charge to humanitarian associations. Increasing these amounts will be a priority; areas in which the food aid 'chain' can be improved and measures contributing to their implementation will be proposed. A second goal is to ensure that nutrition guidelines are made available and volunteers of food aid organizations receive adequate training.

Action No. 4: Orient actions toward healthcare professionals and health services

Various documents and tools were developed specifically for healthcare professionals in order to impact their daily practice and to position the PNNS as a reference for nutrition recommendations.

To assist and encourage the systematic evaluation of nutritional status of adults and children, a simple tool consisting of a disk that calculates Body Mass Index (BMI) was created with accompanying user guides for healthcare professionals. Approximately 300,000 adult BMI disk calculators were distributed in 2003–2004 to general practitioners, dietitians, and other professionals in healthcare establishments for use in their daily clinical practice. Similarly, 150,000 disks for calculating BMI for children distributed to pediatricians, school doctors, maternal and child welfare workers, and pediatric specialists, along with a user guide and growth charts for boys and girls. Additionally, an anthropometric and growth chart data management software (CALIMCO) program was made available by CDROM in 2004 and downloadable on the internet in 2006 (see Appendix).

Special versions of each national nutrition guide and physical activity guide were distributed (around 300,000 copies of each) to healthcare professionals who were also encouraged to discuss diet and physical activity with their patients and provide strategies for disease prevention, weight monitoring and follow-up.

Other actions focused on developing nutrition care in the hospital setting. Local Food and Nutrition Liaison Committees (Comités de Liaison Alimentation Nutrition, CLAN) were established in hospitals. The CLAN team includes doctors, administrative and food-service managers, dietitians, nurses and consumer representatives who are in charge of implementing specialized nutrition consultation services for patients with malnutrition, obesity, eating disorders as well as those who require home care nutrition support. Beginning in 2002, a recommendation was made to establish a CLAN in each healthcare establishment. Thus far, in 2005, about 30 % of healthcare establishments have an existing CLAN.

Clinical practice recommendations were developed for pregnancy, malnutrition, nutritional status, geriatric nutrition, and food allergies. Screening tools such as algorithms and nutritional assessment questionnaires have been made available online (www.nutrimetre.org) for healthcare facilities to standardize treatment of malnutrition. The French National Authority for Health also developed clinical practice recommendations for obesity and the diagnosis and treatment of hospitalized patients with malnutrition.

In coordination with French Expert Committees, reviews based on validated scientific information were written (between 2001 and 2006) to assist healthcare professionals stay current with scientific information. Reviews include topics related to the PNNS such as diet, nutrition and cancer, prevention of osteoporosis, diet and hypertension, food allergies, breastfeeding, physical activity and salt and blood pressure.

Finally, a report was published in 2003 [8] detailing the current situation of the dietitian profession in France (i.e. professional responsibilities, conditions of practice, positions filled, career evolution, etc.) and made proposals to help evolve the dietitian profession. A law modifying the profession and academic training of dietitians was enacted in 2007. This bill

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defines the dietitian profession, establishes a State diploma which replaces existing diplomas and determines the sanctions applicable to illegal practice and usurpation of the dietitian title. The law defines the dietitian as a professional who provides nutrition advice, education and with a medical referral, establishes an individualized therapy plan for patients with nutrition or metabolic disorders. Dietitians will also contribute to the definition, evaluation and quality control of food service as well as public health prevention activities in the field of nutrition.

Two specific action plans that focus on screening and treatment of nutritional disorders and involve the healthcare structure and health professionals are planned for the period 2006–2010: 1. Screening and medical care for childhood, adolescent and adult obesity, 2. Prevention, screening and treatment of malnutrition.

Action No. 5: Mobilize local authorities

Another PNNS goal aimed to improve local networks which would support national measures and provide a communication platform for different groups. A brochure detailing the regional organization of the PNNS was distributed in 2003 and nutritional objectives were subsequently integrated into the Regional Public Health Plan (PRSP) in 2005.

A charter of commitment was developed for participating cities who committed to implementing specific PNNS actions at the local level. Volunteer cities were given strategies on how to develop community nutrition and health projects that correspond to the PNNS objectives. A total of 65 cities in France had signed the charter of commitment as an active participating PNNS city in 2006. Through these charters, active PNNS cities commit to implementing public policies that are more consistent with the PNNS objectives. Examples include improving the school food supply (i.e. school meals, drinking fountains), improving the variety of sports in schools and communities, improving local fruit and vegetable distribution, and introducing measures that target disadvantaged populations and senior citizens.

Action No. 6: Establish surveillance systems that monitor food consumption and the nutritional situation of the population

In 2001, the Nutritional Epidemiology Surveillance Unit (Unité de Surveillance et d'Epidémiologie Nutritionnelle, USEN) was created specifically to monitor the nutritional status of the population and particular risk groups and to assess whether or not PNNS objectives are being achieved. The USEN is also responsible for analyzing trends in attitudes and dietary behaviors which is necessary for developing and reorienting public health activities.

Various nutritional surveillance studies have been implemented during the first phase of the PNNS. The National Nutrition and Health Study (Etude National Nutrition Santé, ENNS) is a year-long study initiated in January 2006 and designed to monitor the changes in indicators corresponding to PNNS objectives. The ENNS is a cross-sectional study of individuals living in the France metropolitan area and is collecting dietary intake data, anthropometric data, biochemical markers of nutritional status, demographic and physical activity information. The study includes 5,200 adults (aged 3 to 74 years). This national study will be repeated in 2011. Other initiated studies focus on older adults, populations living in French territories, disadvantaged populations and obesity and overweight among children.

A food quality observatory created in 2007 will serve to centralize and process nutrition data (composition, portion size, etc.) as well as economic data (prices, information and promotions, purchasing behaviors, etc.). This tool monitors changes in food supply quality, particularly regarding nutritional aspects and also monitors the efforts of food industry professionals and verifies compliance with PNNS charters of commitment. Another objective includes monitoring the food supply market which will assist in public policy decisions, orienting the direction of actions, risk management measures as well as evaluation and impact of public policies. This observatory regularly publishes data on the changes in the nutritional composition of foods available on the market, therefore providing an incentive for food industry companies to improve the quality of their food products.

Action No. 7: Develop epidemiological, behavioral and clinical research in human nutrition

One of the goals of the PNNS was to develop nutrition research oriented towards public health, particularly through strengthening inter-institutional networks. Research is an important aspect of any public health program, as it contributes to creating a scientific foundation which will help direct and guide program objectives and policy strategies. Various research institutions have invested millions of Euros in many nutrition-related programs since the PNNS was initiated. The French National Research Agency alone dedicated more than 12 million Euros per year in 2005, 2006, and 2007 for grants in the field of human nutrition.

Finally, the Center for Research in Human Nutrition (Centres de Recherches en Nutrition Humaine, CRNH) consisting of a network of research units from several institutions (universities, hospitals, research) was established. The purpose of the CRNH is to coordinate epidemiological and clinical research programs, particularly those based on PNNS objectives.

Results

Table 4 summarizes the actions completed or in progress during the first phase of PNNS. More than 75 % of the actions planned were accomplished or were in progress by the end of the first phase of PNNS in 2005, particularly the strategic aims that concern communication, information, education, research development and establishing nutritional surveillance. Areas needing further development include actions involving the healthcare system and economic actors as well as measures that are directed towards specific population groups. However, it should be noted that numerous actions that were initially unplanned were added throughout the course of program and efficiently developed.

The criteria used for program evaluation vary according to the actions and tools developed and are therefore inherently diverse. In certain cases, criteria involved assessment, ad hoc post-tests or specific surveys using adapted qualitative and/or quantitative methodologies that evaluate public perceptions of communications and campaigns. In other cases, functional criteria were used to evaluate actions, recommendations and propositions or indirect criteria were used to assess the mobilization of actors. Thirty-two actions and tools were evaluated by the end of PNNS1. Since the results from the evaluation are too numerous and lengthy to be reported here, further details regarding the evaluation of actions developed, measures implemented and the tools developed during the PNNS1 can be accessed on the French Ministry of Health website (see Appendix).

Discussion

The French National Nutrition and Health Program consists of a combination of synergistic and complementary actions, measures, rules and laws that promote protective factors through diet and physical activity, and reduce risk factors related to chronic diseases. As of 2005, more than three-quarters of the planned actions were completed during the first phase of the PNNS. Most importantly, the first phase of the PNNS paved the pathway for establishing a set of fundamental dietary guidelines which is now considered the official reference in France. Following the results from the evaluation, areas needing further development have become a priority for the second phase of the PNNS extended to 2010.

France had no existing nutrition policy in place until the implementation of the PNNS, which is now considered one of the most advanced public health nutrition programs in Europe. In a recent review of European national nutrition action plans, France was highlighted as one of the six out of 15 EU member states (prior to enlargement in 2004) to have an operational nutrition policy that complies with the World Health Organization (WHO) Global Strategy on Diet, Physical Activity and Health [9; 10]. Similar to the other six countries with operational nutrition policies (Denmark, Finland, Sweden, Netherlands, and the UK), the PNNS emphasizes a multidisciplinary approach and promotes stakeholder involvement from both private and public sectors. The PNNS also includes most of the nutritional recommendations of the WHO Global Strategy as well as those not covered by the

Table 4 Summary of actions completed during the period 2001–2005

The Six Strategic Aims	Actions planned	Actions completed or in progress
Aim 1 Inform and guide consumers towards healthy food choices and an adequate nutritional status. Educate youth and create a favorable environment that encourages satisfactory food consumption and nutritional status.	19	18
Aim 2 Prevent, screen and treat nutritional disorders within the healthcare system	19	13
Aim 3 Involve the food industry, including restaurant and food service businesses as well as consumers, through consumer organizations.	4	2
Aim 4 Establish population-wide food and nutrition surveillance systems.	6	6
Aim 5 Develop epidemiological, behavioral and clinical research in human nutrition.	4	4
Aim 6 Engage public health measures targeted at specific population groups.	38	25
Total	**90**	**68**

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Global Strategy and provides clear and quantified dietary recommendations over a specified time frame. Consistent with the other European countries with operational nutrition plans, the PNNS provides detailed strategies for reducing social disparities, although target groups differ between countries [9]. Finally, to optimize its efficacy, the PNNS includes an epidemiological and nutrition surveillance and evaluation plan that will enable regular program revision based on its results and the most recent research knowledge. In conclusion, the PNNS is an example of one of the few comprehensive and ongoing public health plans established in Europe that comply with international guidelines. A national study at the end of the PNNS will determine if objectives were achieved.

Appendix – List of PNNS related web sites

Ministry of Health (theme: nutrition): www.sante.gouv.fr
National Institute of Health Education and Prevention (INPES): www.mangerbouger.fr
Department of Hospitalization and Organization of Care (DHOS): www.nutrimetre.org
Calimco software: http://www.sante.gouv.fr/htm/pointsur/nutrition/logiciel/install.html

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