

NUTRITION

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STATE OF KNOWLEDGE

RECOMMENDATIONS CONCERNING
DIET, PHYSICAL ACTIVITY AND
SEDENTARY BEHAVIOUR FOR ADULTS

Abstract

In France, official dietary and physical activity recommendations have been publicised since 2001 as part of the National Nutrition and Health Programme (PNNS). Following the evolution of scientific data and recent reports from the French Agency for Food, Environmental and Occupational Health Safety (ANSES) and the opinion of the Haut Conseil de Santé publique (HCSP), the Directorate General of Health (DGS) has put Santé publique France in charge of updating the recommendations concerning diet, physical activity and sedentary behaviour among the adult population.

During the development of these operational recommendations, Santé publique France has considered the knowledge, beliefs and behaviours of the population concerning diet, physical activity and sedentary behaviour in order to prepare messages that are as comprehensible and acceptable as possible. Expectations concerning advice on diet, physical activity and sedentary behaviour differ from person to person with the agency having set itself the goal of formulating two levels of recommendations, thus combining the simplicity of advice for all users and accuracy for those most involved.

Santé publique France is based on a committee combining expertise in epidemiology, health prevention and promotion, information and communication, literacy as well as professionals in contact with the public, notably populations with low socioeconomic status.

Different study phases among the population aged 18 to 64, including people in precarious situations, as well as professionals from the social and health sectors that relay these recommendations, have resulted in the reversal or validation of choices throughout the design process.

At the same time, Santé publique France has consulted the bodies involved in the renewal of the recommendations - DGS, ANSES, and HCSP - to guarantee the concordance of its formulation work with the scientific basis in the ANSES reports and the HCSP's opinion.

The recommendations were then presented to the Directorate for Food (DGAL), the Directorate for Social Cohesion (DGCS) and the Directorate General for Competition Policy, Consumer Affairs and Fraud Control, then to the economic sector, consumer associations and environmental associations.

The new recommendations for the adult population from Santé publique France will be the subject of a communication device during 2019.

KEYWORDS: METHOD, DEVELOPMENT, RECOMMENDATIONS, BENCHMARKS, NATIONAL NUTRITION AND HEALTH PROGRAMME (PNNS), DIET, PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR

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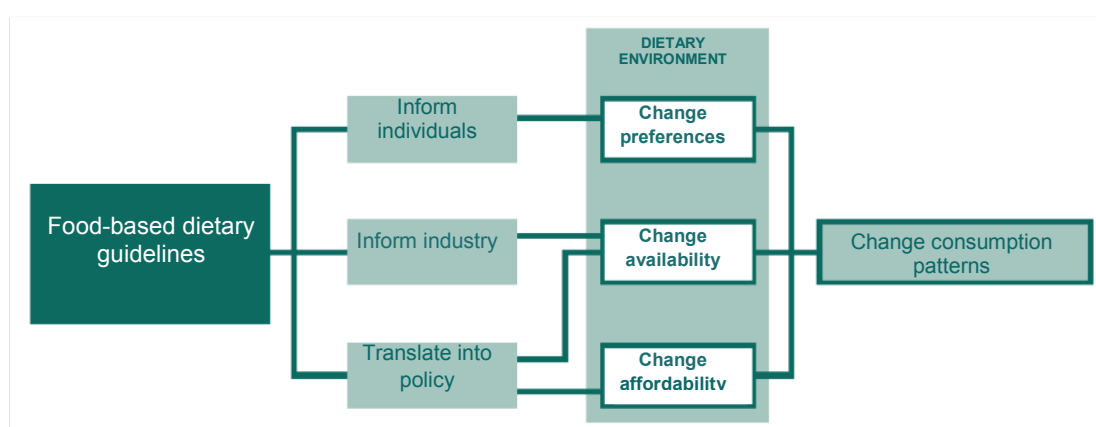
1. HISTORY OF THE CREATION OF FRENCH RECOMMENDATIONS CONCERNING DIET, PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR FOR THE GENERAL PUBLIC

According to the United Nations' Food and Agriculture Organization (FAO), the "Food Based Dietary Guidelines - FBDG" are *short scientific-based, practical and accessible messages. Thus, they may help consumers make healthy dietary choices in and to adopt a healthy lifestyle, which allows them to achieve a satisfactory nutritional state and contributes to preventing malnutrition in all its forms. Unlike nutritional references - which are standards applicable worldwide - the FBDG are adapted to specific nutritional, geographical, economic and cultural conditions* (FAO, 2016).

In addition to helping consumers with their dietary choices and informing them, the FBDG can also serve as references for the establishment of nutritional standards in the different settings: meals served in educational and healthcare establishments, in food aid programmes or to guide the food offer. Therefore, they are likely to have repercussions on consumption by informing individuals, informing manufacturers in the food sector and by guiding policies. Thus, they may act on the "food environment" of the population (see Figure 1).

FIGURE 1 |

Three main paths by which dietary recommendations based on food choice can affect the food environment and, consequently, consumption patterns



The FBDG can be used not only to identify foods in line with nutritional requirements but also those that have a lesser effect on the environment. Therefore, for several years, some countries such as Germany or Sweden have considered environmental sustainability concerns in their national FBDG (Gonzalez Fischer and Garnett, 2016).

As physical activity and diet both relate to "lifestyle habits", many countries combine recommendations concerning physical activity (PA) with dietary recommendations. Recently, advice aiming to reduce sedentary behaviour, that is to say time sitting, have also formed part of these two types of recommendations (U.S. Department of Health and Human Services, 2018). In fact, it has been shown that sedentary behaviour represented a risk factor for health (notably an increase in mortality) regardless of the level of physical activity practised, with this

negative effect being more significant the more time the individual spends sitting (Chau, 2013). Thus sedentary behaviour has a negative effect on health not only for inactive and sedentary people but also for active and sedentary people.

In some countries, recommendations as defined by the FAO are disseminated to the general public by a governmental body for several decades. In France, it was only in 2001 that the introduction of the National Nutrition and Health Programme (PNNS) allowed the development of official French dietary and physical activity recommendations and the distribution thereof.

These recommendations have been defined for several populations: adults, pregnant women, over 55s, children and teenagers. They are distributed to the general public via different communication channels (nutrition guides, the website mangerbouger.fr, media campaigns, etc.) but also by professionals in the health sector, the social sector or even in national education.

Some PNNS recommendations are also relayed via health messages on food advertising. In fact, since 2007, article L2133-1 of the Public Health Code, based on the law of 9 August 2004 concerning the public health policy, requires those advertising manufactured food products to place, on their ads, health messages including the content of some of these recommendations¹.

Since the creation of the first PNNS nutritional recommendations in 2001, scientific knowledge concerning links between diet and health and physical activity and health have evolved. Food patterns, lifestyles (higher sedentary behaviour, lower physical activity in some categories) also evolved. As a result, as other countries use them regularly, these recommendations should be reviewed for the population with this new knowledge in mind.

1. These messages are as follows: "For your health, practice a physical activity regularly"; "For your health, eat at least five fruit and vegetables per day"; "For your health, avoid eating too much fat, sugar, salt"; "For your health, avoid snacking between meals".

2. THE PROCESS OF DEVELOPING NEW RECOMMENDATIONS CONCERNING DIET, PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR

2.1 Development of the science fund

2.1.1 Diet

In France, the development of the scientific base used to establish recommendations concerning diet, physical activity and sedentary behaviour has been carried out by the French Agency for Food, Environmental and Occupational Health Safety (ANSES). Therefore, in response to a referral from the directorate general of health (DGS), this agency published its report on the updating of dietary recommendations for adults in December 2016 (ANSES, 2016). Several parameters were considered to complete this update: the dietary reference values (RNP), the bioavailability of nutrients, links between consumption of various food groups and the risk of chronic diseases, dietary habits of the French population and the risk linked to exposure to food contaminants. The developments recommended by the ANSES are notably the increase in the consumption of legumes, wholegrain products and certain vegetable oils, the significant reduction in consumption of charcuterie and non-poultry meats². In an opinion³ published in September 2017 in response to a referral from the DGS, the Haut Conseil de Santé publique (HCSP) specified the dietary recommendations provided by the ANSES considering the global context of public health to ensure the interest of these recommendations for the entire adult population (see extract from the opinion in Annex 1). Santé publique France then used these recommendations to formulate new dietary recommendations intended for adults.

2.1.2 Physical activity and sedentary behaviour

In April 2012, the DGS entrusted the ANSES with updating the scientific fund on which the PNNS' nutritional recommendations (food and physical activity) introduced since 2001 were based.

The review of the recommendations is based on an analysis of the most recent scientific data at the time of the expertise, on links between physical activity and health as well as on the determinants of physical activity and sedentary behaviour.

Distinct recommendations have been made on the increase of physical activity and the reduction of sedentary behaviour. The types of physical activity recommended have been specified: aerobic, muscle strengthening, flexibility and balance. Specific recommendations for children, teenagers, adults, pregnant women, those in the post-partum period, those going through the menopause, people aged 65 and over, and disabled people have been announced.

This expertise has been the subject of a report and an opinion from the ANSES published on 26 February 2016 (ANSES, 2016).

2. <https://www.anses.fr/fr/content/l%E2%80%99ANSES-actualise-les-rep%C3%A8res-de-consommations-alimentaires-pour-la-population-fran%C3%A7aise>

3. <https://www.hcsp.fr/explore.cgi/avisrapportsdomaine?clefr=600>

The technicality of these new recommendations has proven the need to simplify their formulation to make them accessible by the general public and easy to use by professionals working on the promotion of physical activity and the reduction of sedentary behaviour. Santé publique France has created a working group to proceed with the first step of the dissemination -of the recommendations by focusing notably on experts having contributed to the ANSES report.

A summary of the new recommendations, illustrated by numerous examples of physical activities, has been prepared by the working group (Escalon and the working group “Dissemination of the physical activity - sedentary behaviour recommendations”, 2017) and published on the Santé publique France website⁴ (see summary of the main proposals for adults in Annex 2).

These recommendations are also online at mangerbouger.fr, in different forms, aimed at three target audiences:

- the general public, in a dedicated space: Move more;
- health professionals, in the Pro/health professionals space⁵;
- actors on the ground working to promote physical activity or reduce sedentary behaviour in the Pro/local communities space⁶, - and promoted *via Health in action*, a review aimed at health, social and education professionals (Escalon *et al.* 2017).

Santé publique France deemed it necessary to continue with this first dissemination step with a view to formulating more synthetic recommendations and messages which are more accessible to the general public.

2.2 Santé publique France's working method

The work to formulate new recommendations concerning diet, physical activity and sedentary behaviour for adults by Santé publique France took place according to the following process:

- drafting of the formulations of the new recommendations by Santé publique France with the support of the thematic committee;
- pre-tests - formulations of the recommendations and new notions - among several samples of the population aged 18 to 64 and professionals (health and social sectors);
- update with the thematic committee after pre-tests;
- two-stage concertation process with the bodies involved in renewing the recommendations: DGS, HCSP and ANSES;
- presentation of the recommendations to the Directorate for Food (DGAL), the Directorate for Social Cohesion (DGCS) and the Directorate for Competition, Consumption and Fraud Control (DGCCRF);
- presentation to the economic sector, consumer associations and environmental associations.

This process took place between June 2017 and December 2018.

4. <http://invs.santepubliquefrance.fr/Publications-et-outils/Rapports-et-syntheses/Maladies-chroniques-et-traumatismes/2017/Synthese-pour-les-professionnels-des-recommandations-de-l-ANSES-de-fevrier-2016-sur-l-activite-physique-et-la-sedentarite>

5. <http://www.mangerbouger.fr/pro/sante>

6. <http://www.mangerbouger.fr/pro/collectivites-locales/agir-74/outils-et-contacts-pour-agir/synthese-des-nouvelles-recommandations-sur-l-activite-physique-et-la-sedentarite>

2.2.1 The support of a thematic committee

To appropriately formulate the new recommendations on diet, physical activity and sedentary behaviour from the PNSS for the adult population, Santé publique France has created a thematic support committee (TSC). This TSC was the subject of an individual appointment, for one year, ratified by the Director General of Santé publique France in June 2017.

This TSC ensures that the formulations of the recommendations are:

- understandable by the vast majority, including by people with low literacy levels;
- acceptable by all considering the entire population and specifically groups facing significant economic difficulties;
- usable by education, health and social sector professionals, those responsible for relaying these messages to the general public;
- accompanied by practical advice.

Within this TSC, Santé publique France wants to include, in addition to people from Santé publique France (competencies in epidemiology, health prevention and promotion, communication and literacy), external qualified persons whose “on the ground” competences in health prevention and promotion, communication sciences and sports sciences have been judged essential for fulfilment of the mandate set out. The list of members is in Annex 3.

2.2.2 The working process

The work of the group was based on an analysis of the data provided by Santé publique France, on thinking of the sub-groups, round tables and debates, coordinated by two committee coordinators.

Santé publique France has submitted the pre-test protocols (qualitative and quantitative studies) envisaged.

A summary of these studies, as well as a study based on the explicit and implicit measures carried out on physical activity and sedentary behaviour, was presented to the TSC which then carried out work to update the documents evaluated.

Santé publique France also presented its work during an initial meeting with the DGS, the HCSP and the ANSES to ensure their concordance with the scientific bases issued by the bodies involved in the renewal of the recommendations. A second meeting was used to discuss the final formulations.

The TSC was not asked to comment on, approve or modify the final updates made by Santé publique France.

2.2.3 Preliminary remarks

Santé publique France asked the TSC to base its work on two axes from the *IGAS 2016-020R report: Evaluation of the National Nutrition and Health Programme 2011-2015 and 2016 (PNNS3) and the obesity plan 2010-2013*:

- *“Adopt a system for updating the recommendations with two reading levels allowing the combination of simplicity for all users and precision for the most involved users”*
- *“It is recommended that social inequalities concerning nutrition are included in subsequent PNNS. Therefore, public health actions should consider the social gradient of*

these inequalities and target people with low socioeconomic status (specifically in terms of communication)”.

Based on these preliminary remarks, the TSC was asked to consider:

Concerning diet:

- the formulation of consumption recommendations (excluding alcohol);
- the formulation of general advice (transverse) based on the behaviours;
- the proposal of a visual representation of the recommendations.

Concerning physical activity and sedentary behaviour:

- a short slogan-type message aimed at the entire population and promoting an active lifestyle;
- the formulation of physical activity and sedentary behaviour recommendations and additional information.

2.2.4 Resources

The TSC has based its thinking and its works on different resources presented by Santé publique France.

The scientific fund

- *Updating of the PNNS recommendations: review of the food consumption recommendations. Opinion of ANSES. Collective expertise report. December 2016.*
- *Updating of the PNNS recommendations: review of the recommendations concerning physical activity and sedentary behaviour. Opinion of ANSES and Collective expertise report. February 2016*
- *The summary for professionals of the ANSES February 2016 recommendations concerning physical activity and sedentary behaviour (Santé publique France, August 2017)*
- The opinion of the HCSP concerning the review of dietary recommendations for adults for the future National Nutrition and Health Programme 2017-2021 (16 February 2017)
- The collective Inserm expertise. Change nutritional behaviours. Regulations, marketing and influence of health communications. Paris, Inserm 2017.

Studies and assessments carried out by Santé publique France

- The qualitative pre-tests and post-tests of the communications carried out for the last fifteen years on the recommendations published in 2001: media campaigns; information documents for the general public, for specific populations, for disabled people; educational tools for professionals, website
- A qualitative study on the understanding and perception of the recommendations (Ipsos 2007)
- The assessment of the nutritional health messages displayed on food advertising before/after the introduction of the public health regulation (BVA 2007 and Ifop 2011)

A qualitative study on the temporality of food consumption and representations of portion size (Ifop 2014)

Other

- “Plant protein” workshops WWF/Inra, WWF study⁷
- A presentation of the notion of literacy*⁸ (Ruel J, Allaire C, Moreau AC *et al.*) to allow the committee to reflect on the design of suitable messages.
- Santé publique France has also carried out research on the methodology concerning the development of physical activity recommendations.

International recommendations

The TSC studied censuses recently carried out by Santé publique France on recent recommendations from other countries, in terms of both content and graphic representations:

- Census of dietary guidelines from the FAO website and extraction of recommendations published in 2013 or later⁹;
- Choice of international and French visual nutritional representations (websites such as “Quoi dans mon assiette” (What’s on my plate));
- Identification of the messages and graphic representations concerning physical activity/sedentary behaviour.

External contributions

In terms of diet, various stakeholders sent a letter explaining their point of view on the HCSP’s recommendations concerning their products or requested a meeting with Santé publique France which offered to provide a written contribution. Letters and/or contributions have been provided by several of them.

This includes:

- the National Association of Food Industries (Ania),
- the Union of Plant Protection Industries (UIPP),
- the International Sweeteners Association,
- Alliance 7 (grocery products and the union of breakfast cereal manufacturers),
- Interbev (livestock and meat interprofession),
- dairy products (Syndifrais, Syndilait, professional institute of milk consumption),
- the national federation of packaged and bottled waters,
- The French dietician/nutritionist association
- Agence BIO (French agency for the development and promotion of organic agriculture);
- Climate Action Network

The content of each letter has been studied in a meeting by the TSC.

During its work on physical activity and sedentary behaviour, Santé publique France wanted the opinion of an additional expert and heard an external person, Professor Chantal Simon.

7. https://www.wwf.fr/sites/default/files/doc-2017-11/171109_rapport_vers_une_alimentation_bas_carbone_saine_abordable_0.pdf

8. Literacy is the “capacity to understand, assess, use and appropriate written texts to participate in society, meet its objectives and develop its knowledge and potential” (OECD, 2013). Literacy in health is “knowledge, motivation and the capacity to identify, understand, assess and use information on health when making a decision in the context of care, disease prevention and health promotion to maintain or improve the quality of life” (Sorenson et al. 2012)

9. <http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/en/>

Santé publique France also used its communication agency in charge of the nutrition programme, Madame Bovary, to prepare “short messages” on physical activity and sedentary behaviour based on the TSC’s guidelines.

3. DIETARY RECOMMENDATIONS

3.1 Challenges identified, guidelines and choices made by the TSC

3.1.1 Challenges and guidelines

The objectives of the thematic support committee were, based on the opinion of the HCSP, to formulate new dietary recommendations from the PNNS 4, to define general advice and to propose a visual representation of the recommendations. In addition, it should be noted that the review of the nutritional health messages on food advertising¹⁰ will be carried out in 2019 by Santé publique France.

In its opinion, the HCSP made recommendations for 12 food groups compared with 8 in the 2001 recommendations. The TSC considered the need to limit the number of food groups for better accessibility, with each new recommendation signifying an additional constraint. In this respect, it studied recent international recommendations: concerning, for example, pulses, seven countries out of ten classify them in a family of proteins. When it comes to nuts, of eight national recommendations studied, five class them in a “proteins” family, two in fats and one in fruit and vegetables.

The committee also agreed on the need to consider parameters other than nutritional needs alone: the environment, material living conditions and consumption habits of the population. For example, it decided, even though the HCSP did not issue recommendations for eggs and potatoes, not to bypass widely-consumed foods. However, it appeared essential, to consider consumers’ practices and time constraints, to include ready meals in the recommendations. The Nutri-Score, developed in 2017 by the public authorities, can help with choosing between these products.

The TSC has highlighted the importance of considering the acceptability and practicality of recommendations concerning unfamiliar foods because they are rarely consumed: pulses, organic foods, nuts, nut oil, etc.

It studied the information appearing in the HCSP’s opinion which, due to “unnecessary” complexity (e.g. “oils rich in ALA”) could be reduced or removed; as well as the information which, potentially anxiety-provoking (the issue of contaminants), should be formulated so as to deliver a message allowing the best acceptability possible.

The TSC also revisited the communication used up until now for certain recommendations, based on quantification by day (e.g. 5 fruit and vegetables per day). In fact, although it allows memorisation, it is not always well understood and leads to multiple misinterpretations among the public (5 fruit and vegetables per day means 5 fruits + 5 vegetables per day for a non-negligible portion of the population). The notion of portion, even the weight indication, could be tested.

The TSC deemed that it could also be relevant, with a view to a new two-level communication, to work on other types of recommendations, not necessarily quantified. With this in mind, Santé publique France has selected a document from its census that could represent an avenue for work. It is a Swedish brochure that structures the non-quantified recommendations

10. Article L.2133-1 of the Public Health Code provides that advertisements for beverages [...] or manufactured food products must contain health information. The decree of 27 February 2007 lays down the conditions relating to health-related information to accompany advertising or promotional messages for certain foods and beverages. It defines the messages and the conditions for their distribution in various media. This regulation leaves the possibility for advertisers to choose between placing the nutritional health message (s) or paying a contribution to Santé publique France.

around three notions (organised like a traffic light): *More* (green), *Switch to* (yellow), *Less* (dark orange) (Annex 4).

These three notions appeared to be very interesting to help change practices. The members of the TSC translated the *Switch* notion with “Swap for” but have also worked the notion “Move towards” to have an approach based on the gradual change of habits and personal rhythm, by avoiding provisions that may be perceived as too normative.

To then test this new structuring of the recommendations, it was important to combine illustrations with the text: they increase understanding, recall and adherence to the advice. A model has been prepared on the graphic principle of the traffic light, although the latter is deemed a source of possible confusion with the 5-colour Nutri-Score system recently introduced by the public authorities.

Finally, the TSC studied different visual representations illustrating the quantified dietary recommendations which could be relevant: daily plate, weekly plate, food portions represented by a fist or a container (bowl, scoop) from the international census but also from supports created notably by Santé publique France.

3.1.2 Choice of the thematic support committee

The TSC has established three types of recommendations and opted for visual representations to be pre-tested:

- **Simplified recommendations for people farthest away from recommendations or resistant to "normative" recommendations - (visual below)**

MORE

- Fruit and vegetables, fresh, frozen or tinned
- Pulses (lentils, beans, chickpeas, etc.)
- Unsalted nuts (almonds, hazelnuts, walnuts, pistachios, etc.)
- Physical activity

MOVE TOWARDS

- Wholegrain or semi-wholegrain starches: bread, pastas, rice, flour, etc
- Organic foods (fruit and vegetables, wholegrain starches and pulses, etc.)
- Rapeseed oil and nut oil
- Nutri-Score A and B products

LESS

- Meat and charcuterie
- Salt
- Sweet products and sugary drinks
- Products with a Nutri-Score of D and E
- Time spent sitting

Daily, and in your way, move towards a more varied diet and try to move more. Every small step counts and results in a big difference!

To find out more, www.mangerbouger.fr

Public Health Agency France

This document includes a classification of foods or recommendations under three headings “More”, “Move towards”, “Less”. It does not make quantified recommendations.

- **A table of recommendations for professionals and for the general public looking for more detailed information - Annex 5**

This document outlines recommendations in food groups, main recommendations and additional data.

- **General advice to be included in the different supports - Annex 5 bis**

Three visual representations have been chosen then adapted to the recommendations selected by the TSC. They are then tested. This includes:

- The Eatwell Plate programme (UK gov) with the addition of the Nutri-Score
- The Nutrition Memo recommendations curve (Santé publique France) with the addition of the Nutri-Score
- as well as a representation of the three meals of the day from the *Nutrition Memo*

The Eatwell Plate was interesting, due to the combination of quantified and non-quantified recommendations and the inclusion of the traffic light colour visual (simplified nutritional labelling system used by the English). The *Nutrition Memo* recommendations curve, developed with deaf and hearing-impaired people with reading difficulties, was judged easy to access.

3.2 Evaluations, concertation stages and updating

3.2.1 Studies carried out

The pre-testing of the formulations of the new dietary recommendations was based on a mixed method (Steckler A, 1992): two qualitative studies and one quantitative study were carried out between March and October 2018.

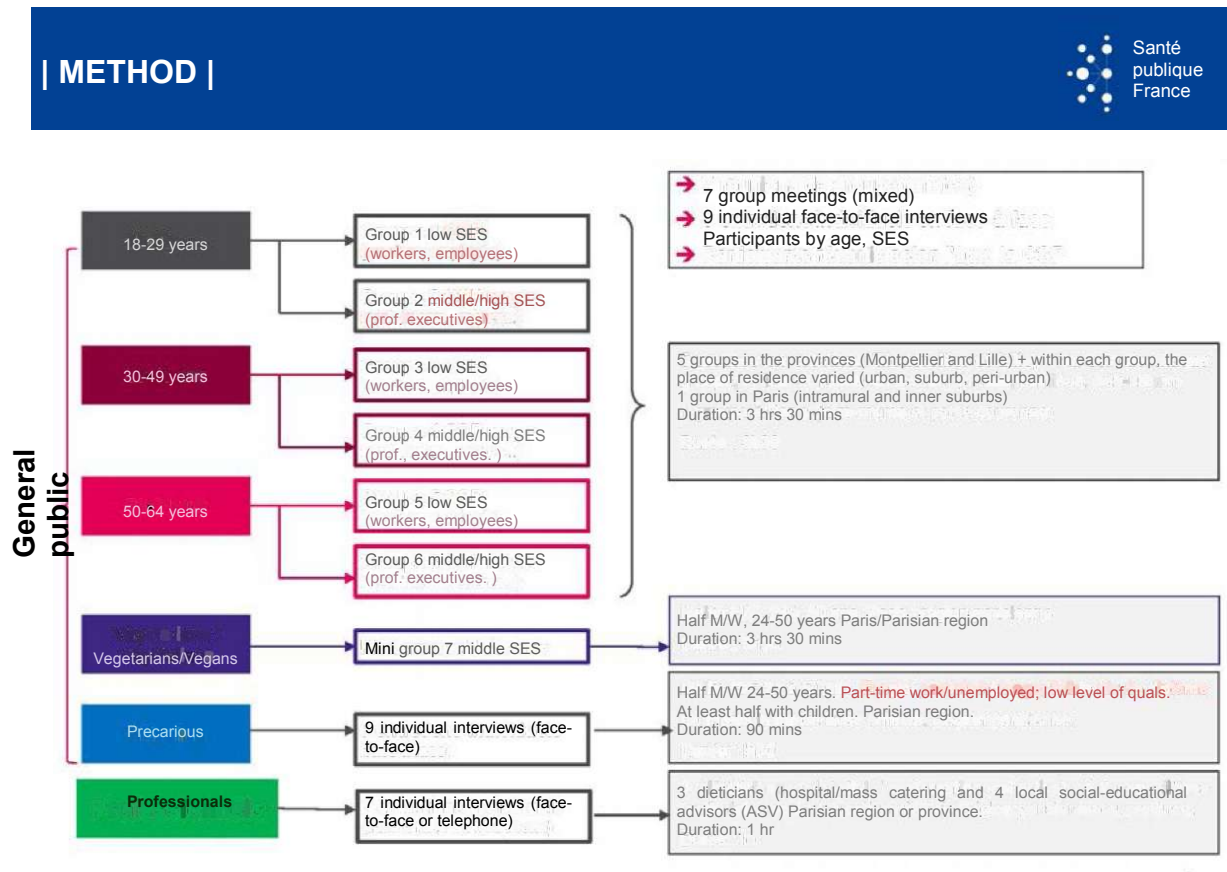
The first study - qualitative - was carried out to test the choices developed by the TSC concerning general advice and the communication principle at two levels (simplified recommendations and the detailed table). The simplified recommendations were tested by using a formatted poster with several illustrations (p. 14). Some other graphic supports to illustrate the recommendations were tested (see above). The results were used to choose formulations when several options were available, to modify certain messages and to develop the graphic support for the simplified recommendations.

The second study - quantitative - is based on the results of the previous study to confirm or deny certain results and measure the level of adherence to a new version of the detailed recommendations and messages.

The third study - qualitative - aimed to verify the understanding of some difficult-to-formulate notions and the simplified communication principle (more graphically accomplished than the first qualitative study).

A. Qualitative study on the first version of the dietary recommendations and nutritional messages

The objectives of this study were to test the communication principle at two levels and to identify the best formulations for the new recommendations. It was carried out using semi-structured interviews in groups and individual face-to-face interviews among two types of population: the general public (aged between 18 and 64) and health or social professionals in contact with low socioeconomic status (SES) people.



Although the group interviews were performed with people with different SES, the individual interviews only concerned low SES persons, those mainly targeted by the nutritional prevention actions of Santé publique France. In addition, in order to understand the levers for a change in dietary behaviour, a group of six vegetarians and vegans were questioned specifically on their reasons for consuming less animal products in favour of certain foods now recommended by the ANSES and the HCSP (pulses, nuts, wholegrain products).

This study proved a very favourable response to a formulation of the recommendations at two levels regardless of SES. In fact, these two levels of recommendations were deemed to be complementary but also able to work separately and for two distinct audiences. The simplified recommendations were deemed to be achievable, with a friendly tone and non-guilt-creating. The interviewees felt that the efforts needed to change dietary habits were finally being considered. According to them, these simplified recommendations were intended for those most distant from the recommendations while the more detailed table of recommendations would be useful for those looking for a “balanced diet”.

The graphical representation of the simplified recommendations allows a good understanding of the key points and the choice of whether to read the content in each section. The test also showed an expectation of illustrations representing the pleasure of eating.

Most of the recommendations and messages seemed to be already known but some created surprise such as the possibility of replacing meat with pulses (rarely consumed) or the promotion of unfamiliar foods such as nuts or rapeseed and nut oils; the discovery that consumption of fruit juices should be limited as should dairy products which were deemed good for health also made an impression. Finally, although the promotion of certain organic products and the way the advice was formulated was relatively well accepted, a very strong mistrust of this type of crop was sometimes noted. Unanimously, those asked requested that the recommendations be accompanied by explanatory elements and practical advice but that these are not systematically based on examples of portions or weights.

Several recommendations were formulated in two different ways so the participants could choose the formulations that were clearer to them; thus the verb "limit" was preferred to "do not exceed" (due to its less injunctive nature) and "favour" to "prefer" to avoid value judgements); the expression "in small quantities daily" to "avoid excess" (excess being difficult to represent); the word "pollutant" to "contaminant" (akin to an epidemic thus difficult to master). Certain words or phrases were removed as they were poorly understood ("grain products" which often meant "breakfast cereals" or "supply locations") or even a recommendation rejection phenomenon ("consider the milk and cheese already contained in the meals you prepare").

In addition, this pre-test allowed a large number of participants to discover the Nutri-Score and they deemed it very useful for helping them to choose foods provided that the latter is shown on the majority of products.

Based on the lessons of this qualitative study, Santé publique France has reformulated certain dietary messages and recommendations, then carried out a second study to quantitatively evaluate the level of adherence to the new formulations.

B. Quantitative study on a second version of the recommendations, the perception of organic and pulses

The previous study having shown that it was necessary to justify the recommendations and to give advice for their implementation, the recommendations were completed either by a nutritional element explaining the basis of the recommendation or by a practical example of the recommendation. One or the other type of precision has been chosen based on the needs identified during the qualitative study. For example, although we know why fruit and vegetables and dairy products are recommended, one doubt remains: is it at least five or ten fruit and vegetables that are recommended per day? How can two dairy products per day be counted? In addition, the nutritional interest in consuming unfamiliar products such as nuts, wholegrain products, pulses or even fatty fish or nut or rapeseed oils is unknown; the people asked in the qualitative study were waiting for this information to be able to judge the usefulness of these new foods.

The main objective of this study was to measure the level of adherence to these new formulations while considering the socio-demographic variables. This level of adherence has been measured by testing several criteria including the clarity of advice, the provision of new information, the ease of applying the advice in daily life and the incentive to follow the advice given. Special attention has been paid to the perception of organic foods and pulses which are the subject of new recommendations and which were not always favourably welcomed during the qualitative study.

The study was carried out by surveying a representative national sample of the French population aged between 18 and 64, composed of 2,000 people. The representativeness of the sample was guaranteed using the quota method. This sample was then randomised in two sub-samples of 1,000 people to expose them to one of the two types of messages: a short formulation of the messages or a complete formulation of a practical example or a nutritional justification (Annex 6).

The study showed that the precisions made to the recommendations lead to better adherence fairly systematically (see Annex 7). This better adhesion has been particularly observed in people with low socioeconomic status (the lowest SES, levels of qualifications and income)¹¹ for messages concerning fruit and vegetables, fruit juices, nuts, wholegrain products, dairy products and pulses.

In terms of the message “If you can, favour organic fruit and vegetables”, the level of adhesion obtained for the entire sample was much lower than for the other messages. It also seemed more difficult to apply for the low SES persons compared with the high SES persons.

| PERCEPTION OF THE ADVICE |

If you can, favour organic fruit and vegetables



- **This advice gives new information to 34% of people asked (lowest figure for the messages tested):**
 - 41% among <bac vs. 32% among >bac
- **This advice is deemed annoying for 45% (highest figure):**
 - 49% of low SES vs 42% high SES
- **It is easy to apply in my daily life for 46% (lowest figure):**
 - 39% of low SES- vs 53% high SES
- **I am encouraged to follow the advice (lowest figure): 58%**
 - 54% of low SES- vs 63% high SES

These results confirmed the observations made during the qualitative study (financial barrier and significant scepticism on the benefits of organic products for health). However, the formulation of the advice (“If you can, favour organic fruit and vegetables”) was judged sufficiently open and encouraging during this first study to be acceptable for all.

11. Results obtained after univariate analysis of the data.

In terms of pulses, the criteria likely to encourage their consumption or not was evaluated based on the barriers and levers identified during the qualitative study. The results showed that it is essentially their high fibre content and low price that motivated their consumption and less the fact that they can represent a meat alternative. It was also essentially for reasons of taste that the people asked were not prepared to use pulses as a meat alternative. However, almost two thirds of people (high SES more than low SES) intended to occasionally replace meat and poultry with pulses.

| PULSES |



- **Sources of motivation to consume pulses (n=1000)**
 - Fibre content: 52%
 - Alternative to other foods (accompaniment or meats): 52%
 - Health and well-being reasons: 24%
 - Cheap foods: 58%
 - Good taste: 21%
 - Easy to cook; 18%
- **Intention to occasionally replace meat and poultry with pulses for 62%**
 - 55% of low SES vs 67% of high SES
 - Due to the misdeeds of meat: 68% (on health and the environment)
 - To limit meat: 50%
 - High cost of meat; 42%
 - Defending animals: 16%
- **No intention of replacing meat with pulses, mainly for reasons of taste (70%)**

In conclusion, this quantitative study has confirmed several observations made during the previous qualitative study, by showing that the inclusion of an element explaining or justifying the dietary advice in the message increased the level of adherence of the people asked. This result is even more significant as it concerns populations with low socioeconomic status, representing the audience that Santé publique France wants to reach. The message encouraging the consumption of organic fruit and vegetables is acceptable but cannot really be followed due to the high price of these types of foods and defiance towards this culture; pulses seem to represent a food towards which the population can move because they are interesting in nutritional terms (high in fibre) and inexpensive. Therefore, the mention “because it is rich in fibre” has been retained in the recommendation.

In the qualitative study, the inclusion of pulses in the “meat, fish and eggs” group grabbed the attention of the participants who considered this information to be new. In the quantitative study, the incentive to eat pulses seems to be linked to their fibre content and to the fact that they can represent an alternative to meat. Therefore, it was decided to separate pulses from the “meat, fish and eggs” group and mention their natural fibre content in the principal recommendation concerning this food group.

New formulations of the messages have arisen from this study. Again, they required a new and final qualitative study for their finalisation.

C. Qualitative study on the formulation of simplified recommendations phase 2

Following the two previous studies, the comments made by the ANSES, the DGS and the HCSP and the new proposals from the TSC, an additional qualitative study was carried out to test a new version of the simplified recommendations. It also allowed the testing of the perception of the notions of raw and processed food and “sustainable” food.

This study was carried out by means of a semi-structured interview among five groups of people aged 18 to 64 and essentially from low SES (see below). The meetings, each lasting 3 hours, were held in Lille, Paris and Tours during the week of 18 October 2018. The groups were mixed (50% men and 50% women).

Several formulations were tested to question the notion of “controlled” consumption of fish and dairy products in the simplified recommendations which are not quantified. This notion particularly concerns fish considered to be a healthy and under-consumed food. The formulation “reasonable consumption” was preferred. Considering the relatively low consumption of fish relative to the recommendations and the questions raised by the notion of “controlled consumption”, it was judged to be more relevant to communicate information on alternating consumption of fatty fish and lean fish which is still not known. For dairy products, as the term “reasonable consumption” suggested in the groups may introduce a value judgement, the formulation “sufficient but limited consumption of dairy products” was preferred to express the need to consume these foods in moderation.

This study also confirmed the difficulty, for low SES persons in particular, to associate frozen and tinned with fresh fruit and vegetables. This association is a source of surprise, even indignation, for some. However, specifying the recommendation of five fruit and vegetables per day using “for example, three portions of vegetables and two of fruit” was particularly welcome, confirming the results of the quantitative study.

The notion of processed foods raised questions; it appeared that it was difficult to represent a non-processed food, contrary to what an ultra-processed food evoked (which evoked chicken nuggets or even ready meals including lots of additives).

The notion and the term itself “sustainable food” was not understood by the persons asked or deemed useful for explaining the need to consider the impact of certain food choices on the environment (and thus health) such as favouring seasonal fruit and vegetables, buying locally-produced or organic products.

In conclusion, the simplified recommendations aimed to transmit accessible information. They are designed as major guidelines, not quantified, which are supplemented by quantified and detailed recommendations for the most involved people.

D. Limits and strengths of the studies implemented

The qualitative studies and quantitative surveys using quotas carried out to pre-test the formulations of all future recommendations of the PNNS include some limits. One of them, common to both types of study, concerns the declarative character of the responses able to lead to a social desirability bias corresponding to the tendency of individuals to give socially-desirable responses.

The qualitative studies concern relatively small samples, which may be considered a limit, if they are considered from a quantitative point of view. However, their objectives and their method are different. The objective of the qualitative studies is mainly to identify explanations concerning the suitability or rejection of a subject studied, here the formulation of recommendations. This type of study allows the emergence of certain arguments not identified prior to the study, which is not possible in quantitative studies where questions and responses

are constructed *a priori*. A limit of the group interviews method in qualitative studies is the possible influence on the opinion of the group of ideas put forward by “leaders” with this limit being counteracted by the use of individual interviews.

Finally, the quantitative interviews with quotas lead to a lower quality representativeness of the random surveys in as far as those difficult to reach are not surveyed.

3.2.2 The concertation and exchange process

Santé publique France has established a concertation protocol with the bodies involved in renewing the recommendations on diet, physical activity and sedentary behaviour.

The agency presented its work - the committee's methodology and objectives, recommendations tested and results of the first studies - during an initial meeting in May 2018 with the DGS, the ANSES and the HCSP to ensure their concordance with the scientific bases of the ANSES reports and the HCSP's opinion.

A second meeting in mid-November 2018 was used to present the next phases of the TSC's studies and work and to discuss the final formulations of the diet, physical activity and sedentary behaviour recommendations for the three communication formats developed by the group.

At the end of November, Santé publique France communicated, during a meeting, the new recommendations to the DGAL, the DGCS and the DGCCRF, then presented them in December to the economic sector, consumer associations and environmental associations.

4. PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR RECOMMENDATIONS

4.1 Challenges identified, guidelines and choices made by the TSC

4.1.1 Challenges and guidelines

The objectives of the TSC, based on the *Summary for professionals of the ANSES recommendations from February 2016 concerning physical activity and sedentary behaviour* (Santé publique France, August 2017) were to work on the proposed formulations of recommendations and short messages concerning physical activity. It identified a number of points for discussion. Notably:

Recommendation- Grouping in one recommendation physical activity and sedentary behaviour or having one physical activity recommendation and a second recommendation concerning sedentary behaviour specifically.

- For physical activity, re-examining the choice of frequency: 30 mins per day or 2.5 hrs per week or both. Does the “30 mins per day” recommendation not risk placing blame on people not having met this physical activity time during the day and who cannot “defer” this 30 mins to another point in the week? Conversely, if the recommendation from the WHO as well as other countries is 150 mins per week, the daily frequency, for those most distant from physical activity, is this preferable for integrating a habit?
- Reconsidering the phrase “5 days per week or more” *versus* “every day” in terms of understanding.
- Integrating or not the notion of moderate and high intensity considering the likely difficulty in understanding and appropriation (notably by the less active) of these terms.
- Specifying or not the different types of physical activity (strength, aerobic, flexibility) considering the risk of discouraging those who are least active.
- For sedentary behaviour, retaining or not the two notions “Reduce the time spent sitting” and “Break sedentary behaviour” considering the potential difficulty in perception of the difference between the two notions and the real feasibility notably in the work environment.
- Studying potential framing: health benefit or risk, others.

Short messages

- Have a message common to physical activity and sedentary behaviour or specific messages?
- Study the most relevant types of framing. Is the approach by the health benefit or risk relevant for all target groups (low socioeconomic status persons; inactive persons, etc)? What other approaches could be explored (pleasure, hedonism, self-efficacy, positive emotions, etc)?

4.1.2 Choices of the TSC

Recommendations

- Formulate neutral recommendations, without framing.
- Make two distinct recommendations for PA and sedentary behaviour to highlight the new information on sedentary behaviour.
- Test several types of quantification with different audiences: 30 mins per day/2 hrs 30 mins per week to determine which recommendation is the most appropriate.
- Reformulate the notion of moderate and vigorous intensity in a simple, even graphic, way or by referring to the perceived intensity of each.
- For physical activity, test two levels of messages: a synthetic recommendation in one sentence, summarising the types of physical activity with a single word; a more detailed recommendation specifying the types of physical activities recommended (aerobic, muscle-strengthening, flexibility and balance training).

Short messages

Although the short message was originally conceived as a slogan, possibly used for health messages on food advertising or as a campaign signature, the TSC has recommended that several short messages co-exist, being alternated according to the communication contexts.

These messages should rather be based on the individual's personal approach, their perception of their capacities and their possibility of doing physical activity (according to the *Be active your way* principle in several Anglo-Saxon countries). The benefits of physical activity on general well-being or the promotion of a physiological benefit may also be explored.

Results

The members of the TSC worked on preparing a series of messages and formulating recommendations. These proposals were reviewed and enriched by the communication agency responsible for the nutrition programme (Madame Bovary) who then presented the committee with 12 formulations for the recommendation on physical activity, 14 formulations for the recommendation on sedentary behaviour and 21 short messages. The TSC chose a selection which were tested by Santé publique France by means of several evaluations.

4.2 Evaluations, concertation stages and results

4.2.1 Results of the studies

Two studies were carried out by Santé publique France to test different formulations of recommendations on physical activity, the reduction of sedentary behaviour and breaking up sedentary behaviour aimed at adults.

4.2.1.1 A qualitative study

Using a qualitative study, Santé publique France pre-tested different possible formulations of the new recommendations and short "slogan" messages to make sure that they are heard, understood and result in the adherence of the public, specifically those most distant from the practice of physical activity.

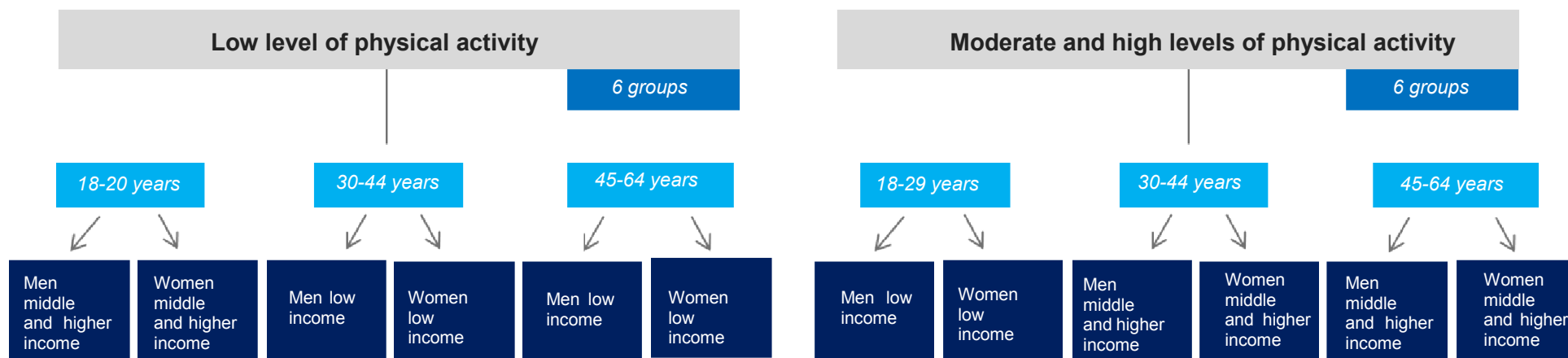
The qualitative study aimed to:

- assess the understanding of the recommendations disseminated on physical activity and the notions they include (frequency, intensity, types of physical activity) and that of the new recommendations on the daily limit of sedentary behaviour and the breaking up of sedentary behaviour;
- identify the reason for adherence or lack of adherence to the messages (recommendations and short messages);
- develop ways to optimise the messages.

Method

The study was carried out in March 2018 among 72 people questioned in groups (12 groups of 4-5 people) or in the context of individual interviews (12 face-to-face interviews).

The people questioned were split into groups according to their gender, age, income level per unit of consumption and level of physical activity. The sample was composed as follows:



The same criteria were used to select those to be questioned in individual interviews:



Elements tested

The recommendations concerning physical activity and those concerning sedentary behaviour were tested using different methods.

For physical activity, two levels of formulation were tested: a synthetic recommendation in one phrase; a detailed recommendation in two phrases, specifying the types of physical activities recommended (aerobic, muscle-strengthening, flexibility and balance training).

For the synthetic recommendation, several formulations of the three notions presented in the recommendations were tested. For the frequency, one formulation per day and one formulation per week were proposed (30 mins/day; 2 hrs 30 mins/week); the types of physical activities were summarised by adjectives (varied physical activities; different physical activities); the intensity was described by its degree (moderate to vigorous intensity; moderate and vigorous intensity), by adjectives (energetic, sustained, dynamic physical activities) or by physiological consequences (which speed up your breathing, which make your heart beat faster).

For the detailed recommendation, a formulation was tested, adding to the synthetic recommendation, details of the recommended physical activities, formulated according to a proposal from the TSC:

“Practice at least 30 minutes per day of dynamic aerobic physical activities. In addition, it is recommended to do activities that develop strength, flexibility and balance at least twice a week”.

For sedentary behaviour, the messages prepared by Santé publique France were tested, on breaking up sedentary behaviour alone and on the combination “breaking up sedentary behaviour and reducing total daily sedentary behaviour”.

Breaking up sedentary behaviour

- Sitting all day? Take time to walk and stretch every 2 hours.
- Sitting for more than 2 hours in a row? Take time to walk
- Do not sit for too long: move at least every 2 hours.
- Do not sit for too long: walk a little at least every 2 hours.

Breaking up sedentary behaviour and reducing daily sedentary behaviour

Either two messages disseminated in parallel:

- Limit the amount of time you spend sitting daily as much as possible.
- Every day, get up every 2 hours and walk a little.

Or one message for both notions:

- Limit the amount of time spent sitting for long periods daily as much as possible. Get up every 2 hours and walk a little.

Results

Physical activity

The study showed a preference among the participants for the daily frequency “30 mins per day”, judged achievable due to its duration, clear and encouraging a more specific frequency than “2hrs 30 mins per week” for the less physically active. In addition, this frequency referred to more varied and less intense physical activities, including daily activities.

The formulation of the intensity of physical activities with the adjective “dynamic” has been chosen because it evoked a wide range of possible activities (sports and everyday physical activities) and the intensity was perceived as moderate and achievable by all. The adjective also benefited from a positive connotation, assimilated to a character trait or a notion of vitality. For physical activities, the formulation “varied physical activities” was preferred to “different physical activities” in as far as the adjective “varied” included, in the representations, an idea of freedom and choice in the physical activities to be practiced (everyday sports and activities).

The formulation of the detailed recommendation “Practice at least 30 minutes of dynamic aerobic physical activities per day. In addition, it is recommended to do activities that develop strength, flexibility and balance at least twice a week” has been the subject of differing perceptions.

Some people deemed it to be clearer and more precise than its alternatives “varied physical activities” or “different physical activities” but for many people asked, it referred to a goal that is very difficult to achieve, even unattainable, in terms of time spent and the intensity of the effort required. Reasons mentioned were the accumulation of the types of activities mentioned, the increase in the recommended time and the intensity seeming more significant with the terms “aerobic” and “strength”. It was demotivating for most people with a low level of physical activity for whom the goal seemed unattainable or at least too restrictive. However, this detailed formulation of the recommendation was judged to be achievable even motivating for some people having a high level of physical activity and prepared to make the extra effort.

The formulation of the two types of physical activities mentioned in the detailed recommendation were reconsidered. For many participants, the term “aerobic” referred to very sporty activities suggesting sustained effort over time, intense and devoid of pleasure. This term appeared to be potentially discouraging for the least active. The term “strength” evoked very hard physical activities such as muscle building and combat sports which do not suit everyone and are seen as mainly male activities. However, the term “flexibility” was associated with more female activities, potentially excluding men.

Sedentary behaviour

Generally speaking, the participants suggested only using one message concerning breaking up sedentary behaviour. Messages on the limitation of sedentary behaviour alone or its combination with breaking up sedentary behaviour were poorly understood or perceived.

Of the four formulations tested on breaking up sedentary behaviour, the one selected by participants was “Sitting for more than 2 hours in a row? Take time to walk”, appreciated due to the fact that the message encouraged action and included both a question and a solution. In addition, interrogative formulations at the start of a phrase, inviting people to consider their own behaviour, were preferred to negative formulations, which were deemed too authoritative. The formulation “take time” was considered gentle encouragement, in a register considering the wishes and well-being of the individual. Finally, the verb “walk” alone was perceived as the most appropriate for breaking up sedentary behaviour because it is more specific than “move”, which was deemed to be too vague by low socio-economic status persons, and more applicable than “stretching”, considered to be impractical in the professional setting in particular.

The message on limiting sedentary behaviour, potentially disseminated in parallel with a message on breaking up sedentary behaviour (“Limit the amount of time you spend sitting daily as much as possible”) raised awareness that it is negative, even risky, to sit down too much. However, this was criticised due to the fact that it didn’t offer a solution for limiting sedentary behaviour while that on breaking up sedentary behaviour was perceived as a proposal of a solution. In addition, it is the message which seemed the most difficult to

implement for the majority of participants working in a seated position. In fact, for them, sedentary behaviour at work was suffered and not chosen, perceived as a constraint on which they had limited flexibility without changing working conditions. Few of them considered the possibility of limiting the time spent sitting in their “personal” time, notably in the evening.

Therefore, one suggestion from the participants was to add to the general recommendations on sedentary behaviour examples of solutions to reduce or break it, at work or outside of work, such as “cycling rather than driving, taking breaks at work or even taking a walk in order to visit something or take in some fresh air”.

The formulation of a recommendation on the two recommendations concerning sedentary behaviour (“Limit the time spent sitting daily as much as possible. Get up every 2 hours and walk a little”) was poorly understood. The participants struggled to perceive the link between the two messages. For some, they were the same. For others, there was a difference in the different target audiences: those who like being advised, managed and those who prefer more freedom and flexibility. For others still, one of the messages posed a problem and the other a solution.

Short messages

Thirteen short slogan-type messages were presented to the participants (see Annex 8), who were invited to select the three they deemed to be most relevant (and the three they felt were least relevant). The three short messages selected were “To feel good, be active everyday”; “To be well: 2 hrs 30 mins of physical activity per week, at your pace, your way”; “All activities are good for moving more!; Find yours”. The elements appreciated in the messages tested were in fact the suggestion of a benefit; the choice and freedom left up to the individual and the short formulations. Not so popular were the use of the imperative, the absence of a reason or justification and complex, confusing or approximative formulations.

The results of this study on the recommendations were used in the second study coordinated by Santé publique France for testing the formulations of the recommendations on physical activity and sedentary behaviour.

4.2.1.2 A study based on implicit and explicit measures

The formulation of the recommendations was tested in a second social psychology study carried out in collaboration with researchers at Grenoble Management School (GEM).

The purpose was to test the formulations using a method not based on people’s statements so as to reduce the social desirability bias. A test of the different formulations, the majority of which referred to the results of the qualitative survey, was carried out by implicit and explicit measures (self-declared).

The principle of the implicit measures is to ask the respondent to complete a task on the computer not directly based on the subject of the study so as to focus their attention on performing this task and not on the subject of the study. They cannot control or construct their response and this allows the consideration of responses automatically activated in the individual’s brain. It has been shown that there is an association between the automatic assessments of physical activity and the adoption of the behaviour (Bluemke et al. 2010; Brand and Schweizer, 2015; Schinkoeth and Antoniewicz, 2017).

Method

A first laboratory study was carried out on a sample of 360 students to validate the principle of using the implicit measures. A controlled experiment was then carried out online with a sample of 1213 individuals aged between 18 and 64, representative according to the gender quotas crossed with age, socio-economic status and region. A questionnaire was also given

to the participants to collect, by self-reporting, several determiners concerning physical activity and breaking up sedentary behaviour: the intention, the attitude, the self-efficacy¹² and measures of the reaction of individuals relative to the messages seen (ease of understanding, level of authority perceived).

More details of the principles of the implicit measures and the method are provided in Annex 9 (summary of the survey report).

Elements tested

GEM tested several formulations on physical activity and breaking up sedentary behaviour resulting from the proposals from the TSC “Formulation of the PNNS recommendations” and GEM’s research hypotheses. The latter were as follows: the most effective formulations were likely to be 1) those expressing as specifically as possible¹³ certain elements of the recommendations: intensity for physical activity, the action required to break sedentary behaviour; 2) those adopting easy-to-process information on the frequency of physical activity; 3) the least normative recommendations for the recommendation on breaking up sedentary behaviour. Six messages concerning physical activity and four on breaking up sedentary behaviour were tested (and compared to a message presented to the experiment’s control group on preserving the environment through car-sharing):

Physical activity recommendations:

- Practice varied and dynamic physical activities of moderate to high intensity for at least 2 hrs 30 mins per week
- Practice varied and dynamic physical activities of moderate to high intensity for at least 30 mins per day.
- Practice varied and dynamic physical activities for at least 2 hrs 30 mins per week.
- Practice varied and dynamic physical activities for at least 30 mins per day.
- Practice varied physical activities that increase your heart rate for at least 2 hrs 30 mins per week
- Practice varied physical activities that increase your heart rate for at least 30 mins per day.

Recommendations on breaking up sedentary behaviour

- Sitting all day? Take time to walk at least every 2 hours
- Do not sit for too long: Take time to walk a little at least every 2 hours
- Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours.
- Do not sit for too long: Take time to go up and down the corridor or up and down the stairs at least every 2 hours.

12. Perception of their capacity to perform a behaviour.

13. Social psychology uses the term “imagery levels” to evoke the more or less abstract character of a formulation.

Results

Physical activity

The formulation “Practice varied and dynamic physical activities for at least 30 minutes per day” has been recommended for several reasons. The “30 minutes per day” duration appears the most appropriate because this is easier to understand and requires no mental calculation. It also increased the feeling of being able to follow the message’s recommendation for those with a low or moderate level of physical activity.

In addition, the first part of the message “Practice varied and dynamic physical activities” encouraged implicit attitudes towards intense and moderate physical activity for all participants regardless of their level of activity (compared with the control group).

In addition, for individuals with a high level of physical activity, the recommended formulation has positive effects on their attitude (declared) relative to intense physical activity, their perception of being able to practice moderate physical activity and their intention to practice intense physical activities.

Breaking up sedentary behaviour

The study showed that both formulations could be used:

- “Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours” ;
- “Do not sit for too long: Take time to walk a little at least every 2 hours”.

Considering only the implicit measures concerning sedentary behaviour, a single message tested resulted in implicit reactions towards sedentary behaviour that were more negative compared with the control group: “Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours”.

The message “Do not sit for too long: Take time to walk at least every 2 hours” was also recommended because it reduced the attitude declared towards sedentary behaviour among individuals with a high level of sedentary behaviour and increased the feeling of being able to break sedentary behaviour among women with a low or moderate level of physical activity.

4.2.2 The concertation and exchange process

The process of developing recommendations on physical activity and sedentary behaviour and the results of the qualitative study were presented to the DGS and the ANSES in May 2018. The study based on the implicit and explicit measures was then in progress; the main principles were presented.

In terms of physical activity, following the presentation of the qualitative survey, the ANSES considered the testing of the messages recommending 2 hrs 30 mins per week and the ANSES report recommended daily practice of at least 30 mins. The arguments discussed by the TSC were advanced. The two frequencies were tested for the following reasons: the recommendation “30 mins/day” was more likely to instil a habit but risked discouraging some people in case of non-completion of the 30 minutes in the day while a weekly recommendation could avoid this pitfall. In addition, the “2 hrs 30 mins/week” was recommended by the WHO and used in many other countries as confirmed by the benchmark achieved by Santé publique France.

The results of the qualitative survey and the survey of the implicit measures confirmed the preference of the adults asked for a formulation of the frequency per day, in line with the recommendations from the ANSES.

Some results of the qualitative survey were also the subject of discussions and adjustments in the context of exchanges with the TSC. Therefore, for the physical activity recommendation endorsed by the qualitative survey (“At least 30 minutes of varied and dynamic physical activities per day”, the term “varied” has been removed. Indeed, in the recommendations from the ANSES, the three types of additional physical activity are recommended per week and not per day. The risk of keeping “varied” and “per day” in the same recommendation would have meant it appeared difficult to do varied physical activities in a single day.

The terms “physical activities that build strength, flexibility and balance” have been replaced with “muscle strengthening, flexibility and balance training activities” in response to the poor perception of the terms “strength” and “flexibility” in the qualitative survey.

The questioning, notably by those doing low levels of physical activity, of the additional recommendation to practice several types of physical activities led the TSC to propose including this in a second level of recommendations and presenting it as providing an additional health benefit. The recommendations would thus be complemented by additional data.

The mention of the possible progressiveness of the practice of physical activity in the recommendations has also been discussed and approved by the TSC. The possibility and the interest, in health terms, of practising a little physical activity, for people who do little, has been the subject of advocacy in scientific literature (de Souto Barreto, 2015) and is one of the general recommendations from the ANSES report (ANSES, 2016).

The survey based on implicit and explicit measures was presented to the TSC in July 2018. The results on physical activity, concordant with those from the qualitative survey, did not result in any major change to the recommendation’s formulation.

In terms of breaking up sedentary behaviour, the results of the study concerning the implicit measures suggested favouring a long formulation while, according to the qualitative survey, short formulations were preferred. In addition, the results on explicit measures recommended a shorter and more effective formulation for the target groups that Santé publique France is looking to target as a priority, namely people with a high level of sedentary behaviour and women with a low or moderate level of physical activity. This formulation was preferred with an adjustment aiming to make the recommendation even more accessible.

5. FINAL FORMULATIONS OF THE RECOMMENDATIONS

The recommendations concerning alcohol consumption were developed separately from the recommendations concerning diet, physical activity and sedentary behaviour for adults. They apply to the opinion of experts relative to the evolution of the public discourse concerning alcohol consumption in France published by Santé publique France and the National Cancer Institute following a referral from the directorate general of health and the Interministerial Mission for the fight against drugs and addictive behaviour (Santé publique France, 2017). This opinion was followed by two qualitative test phases. The recommendations concerning alcohol consumption will be published as part of the PNNS. As a result, they are included in the recommendations presented below.

All of these recommendations for adults will be the subject of a communication and social marketing device in 2019.

Some general advice

- Take pleasure in eating: favour variety, take time to eat and taste.
- Favour home-made meals where possible
- Pay attention to the quantities and portion sizes you consume.
- Eating well also means considering the environment by choosing foods from local producers, seasonal foods and, if you can, organic foods.

Detailed recommendations

More

→ Fruit and vegetables

Main recommendation:

At least 5 fruit and vegetables per day, for example 3 portions of vegetables and 2 fruits

Additional data:

- The recommendation is to eat at least 5 fruit and vegetables per day, whether this is fresh, frozen or tinned. If you eat less than this, remember that increasing your consumption of fruit and vegetables even slightly is good for your health.
- If you can, favour organic fruit and vegetables.
- For the best taste, favour seasonal fruit and vegetables and local products.
- Fruit juice is very high in sugar and low in fibre. If you drink this, the recommendation is to consume no more than one glass per day and to favour pressed fruit.
- Do you like dried fruits: dates, raisins, dried apricots, etc? They can be consumed but only occasionally as they are very sweet.

In addition to fruit and vegetables, the recommendation is to consume a small handful of nuts each day as they are rich in omega 3: unsalted walnuts, hazelnuts, almonds, pistachios, etc.

→ Pulses: lentils, beans, chickpeas, etc

Main recommendation:

Pulses at least twice a week as they are naturally rich in fibre

Additional data:

- Pulses may accompany poultry, fish or meat. They may also replace meat and poultry; in this case, the recommendation is to serve them with a grain product such as a salad of red beans and sweetcorn, couscous with chickpeas or a lentil curry served with rice.
- Pulses are naturally rich in fibres and contain plant proteins.
- If you can, favour organic pulses.

→ Physical activity

Main recommendation:

At least 30 minutes of dynamic physical activities per day

Additional data:

- A little physical activity is already good, more is even better.
- For more health benefits, the recommendation is to do muscle strengthening, flexibility and balance training activities twice a week.
- There are many opportunities to be active:
 - in your daily activities (take the stairs, walk or cycle),
 - by playing a sport or engaging in physical leisure activities (swimming, ball games, gardening, etc.)
- If you restart or start a sport, you are advised to do so gradually.

Move towards

→ Wholegrain starches

Main recommendation:

At least one wholegrain starch per day as they are naturally rich in fibre

Additional data:

- Starches (pastas, bread, rice, flour, potatoes) can be consumed every day. It is recommended to consume the wholegrain version when they are grain-based: wholegrain bread, wholegrain rice, wholegrain pastas, etc.
- Wholegrain starches are much richer in fibre than refined products (such as white bread for example)
- Grain breads, semi-wholegrain pastas or semi-wholegrain rice are also good alternatives to refined products.
- If you can, favour organic starches.

→ Fish

Main recommendation:

Fish twice a week, including fatty fish (sardines, mackerel, herring, salmon)

Additional data:

- The recommendation is to eat fish twice a week including fatty fish because fatty fish are rich in omega 3.
- There is a wide range of fish available. They can be consumed in all forms: fresh, frozen or tinned.
- Fish has many nutritional qualities. But some fish can contain pollutants, which is why varying the species is recommended.

→ Rapeseed, nut and olive oil

Main recommendation:

Added fats - oil, butter and margarine - can be consumed every day in small quantities. Favour rapeseed, nut and olive oil

Additional data:

- Rapeseed and nut oils are rich in omega 3.
- It is preferable to use butter as a spread at breakfast or raw on vegetables, for example.

→ Dairy products: milk, yoghurt, cheese, white cheese

Main recommendation:

2 dairy products per day

Additional data:

- Two dairy products per day, for example one plain yoghurt and a piece of cheese or cheese grated on pasta.
- To vary flavours, alternate between yoghurt, milk, white cheese and cheeses. Vary the types of cheese.
- Fresh cream and butter are made from milk but are high in fat. They are not considered as dairy products. Milk-based desserts (cream desserts, flans) are not either as they usually contain too much milk and are often very sweet.

Less

→ Alcohol

Main recommendation:

To reduce risks, it is recommended to limit its consumption to a maximum of two glasses per day and not to consume alcohol every day: **maximum two glasses per day and not every day**

Additional data:

Health risks linked to alcohol consumption during life increase with the quantity consumed. If you consume alcohol, to limit the risks to your health during your life, the following is recommended:

- do not consume more than 10 standard glasses per week and no more than 2 standard glasses per day;
- have alcohol-free days.

And each time you consume alcohol, it is recommended to:

- reduce the total quantity of alcohol you drink;
- drink slowly, while eating and alternating with water;
- avoid risky places and activities;
- make sure that you are surrounded by people you know and that you can get home safely

Generally speaking, the safest option is not to consume alcohol in case of:

- driving;
- handling tools or machines (DIY, etc.);
- practising dangerous sports;
- consumption of certain medicines;
- presence of certain pathologies.

It should be noted that French legislation allows a blood alcohol level of 0.5 g/L or 0.2 g/L for those holding a licence for less than two years, however there is an increased risk between 0 and 0.5g/L.

→ Sugary drinks, fatty, sugary, salty and ultra-processed foods

Main recommendation:

The recommendation is to limit sugary drinks, fatty, sugary, salty and ultra-processed foods

Additional data:

- Water is the only drink recommended. Fruit juices, sugary drinks and soft drinks, even diet drinks, “energy” drinks must be limited as far as possible; in any case, no more than one glass per day.
- Water can also be provided by unsweetened tea, coffee (in moderation) and infusions.
- Sweetened breakfast cereals, cakes, chocolate, desserts, ice creams, biscuits, charcuterie and some ready meals often contain a lot of sugar, fat or salt. To help you choose between several products, you can use the Nutri-Score by limiting your consumption of products D and E.
- In addition to being fat, sweet or salty, these products are often ultra-processed, that is to say they contain many additives (colourings, emulsifiers, preservatives, flavour enhancers, aromas, etc). These additives appear on the list of ingredients, often with the letter E. Their precise impact on human health is still unknown. As a precaution, favour additive-free foods or foods with the shortest list of additives. When possible, favour home-made and use fresh products, tinned foods or unprepared frozen foods such as plain vegetables or plain fillets of fish.

→ Salty products

Main recommendation:

The recommendation is to reduce your salt consumption

Additional data:

- A lot of the salt we consume comes from processed products: charcuterie, ready meals, dehydrated soups, cheese, and bread.
- You can reduce the amount of salt you add during cooking.
- To add taste, consider spices, condiments, aromatics and herbs.
- At the table, taste before adding salt and do not add salt to tinned products.
- Favour iodised salt (indicated on the label).

→ Charcuterie

Main recommendation:

Limit charcuterie to 150g per week

Additional data:

- 150g of charcuterie, this equates to 3 slices of cooked ham. Sausages, lardons, bacon, poultry ham, tinned meats, dried and raw hams all count as charcuterie.
- Among these foods, favour cooked ham and poultry ham.

→ Meat

Main recommendation:

Favour poultry and limit other meats (pork, beef, veal, mutton, lamb, offal) to 500g per week.

Additional data:

- 500g of non-poultry meat per week, this equates to around 3 or 4 steaks.
- For enjoyment and variety, you can alternate during the week between meat, poultry, fish, eggs and pulses.

→ Time spent sitting

Main recommendation:

Do not sit for too long: Take time to walk a little every 2 hours

Additional data:

- Even if you already do 30 mins of dynamic physical activities per day, it is beneficial to reduce the time spent sitting as well
- At work, if you can, consider walking a little every 2 hours.
- Outside of work, limit the amount of time spent sitting as much as possible: think about screen time for example.

Nutri-Score

The Nutri-Score is a logo present on the packaging of processed food products and drinks. Non-processed products such as fresh fruit and vegetables or fresh fish are not affected; the same applies to alcoholic drinks. The application of the Nutri-Score is not mandatory. Food companies and distributors have the choice of whether to add the logo to better inform consumers of the nutritional quality of products.

Products are placed on a 5-level scale:

- from the most favourable product in nutritional terms (category A)
- to the least favourable product in nutritional terms (category E)

How is a product's score calculated?

To rank each product, research teams have developed a score which considers, per 100g of product, the content of:

- **nutriments and foods to be promoted:** fibres, proteins, fruit and vegetables
- **nutriments to be limited:** energy, saturated fatty acids, sugars, salt

After calculation, the score obtained by a product allows it to be allocated a letter and colour.

How does the Nutri-Score help you choose which products to buy?

In addition to dietary recommendations, the Nutri-Score can help you when you go shopping to:

- choose between several products on the same shelf: breakfast cereals, for example, may have a score between A and E;
- compare the nutritional quality of one product from different brands: as an example, lasagne sold in supermarkets can have a score of A, B, C or even D depending on the brand.

What about pesticides and additives?

Only nutritional aspects are considered in the calculation of the Nutri-Score. It does not include aspects such as additives or pesticides. In the current state of knowledge, there is no score taking these different aspects into account.

The "AB" logo is used to identify products from organic production. Therefore, it may be used in addition to the Nutri-Score.

The additives appear on the list of ingredients. As a precaution, favour additive-free foods or foods with the shortest list of additives. When this is possible, we recommend cooking yourself and avoiding the consumption of ultra-processed products.

Simplified recommendations

<i>INCREASE</i>	<ul style="list-style-type: none">• Fruit and vegetables• Pulses: lentils, beans, chickpeas, etc.• Nuts: unsalted walnuts, hazelnuts, almonds, pistachios, etc.• Homemade• Physical activity
<i>MOVE TOWARDS</i>	<ul style="list-style-type: none">• Wholegrain bread or grains, wholegrain pastas and rice, wholegrain flour• The consumption of fatty and lean fish alternatively• Rapeseed, nut and olive oil• Sufficient but limited consumption of dairy products• Seasonal foods and locally-produced foods• Organic foods
<i>REDUCE</i>	<ul style="list-style-type: none">• Alcohol• Sweet products and sugary drinks• Salty products• Charcuterie• Meat (pork, beef, veal, mutton, lamb, offal)• Products with a Nutri-Score of D and E• Time spent sitting

Daily, and regardless of your lifestyle, find your own way of having a more balanced and varied diet and being more active. Each small step counts and results in a big difference!

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ANNEX 1/ Table of HCSP recommendations

The HCSP recommends the following food recommendations:

Food group	Main recommendation	Additional data*
Fruit and vegetables	At least 5 per day	<ul style="list-style-type: none"> ⤴ Recommended portion sizes are 80 - 100g ⤴ The recommendation is to increase your consumption regardless of the initial consumption level ⤴ No more than one glass of fruit juice per day which counts as one portion of fruit and vegetables up to this limit. Favour fresh pressed fruit juice ⤴ Dried fruits may count towards the consumption of fruits. However, their consumption should be limited and must not take place in between meals. ⤴ All forms of fruit and vegetables are considered as fresh, frozen or tinned. For tinned fruits, favour fruits in a light syrup but don't consume this syrup. ⤴ Favour fruit and vegetables grown using production methods reducing exposure to pesticides (according to a precautionary principle).
Nuts with no added salt Almonds, hazelnuts, walnuts, pistachios	A small handful per day	<ul style="list-style-type: none"> ⤴ This group of foods includes many allergens the consumption of which is not recommended for those with identified allergies
Pulses lentils, chickpeas, beans, etc.	At least twice a week	<ul style="list-style-type: none"> ⤴ Favour pulses grown using production methods reducing exposure to pesticides (according to a precautionary principle).

Food group	Main recommendation	Additional data
		<ul style="list-style-type: none"> ▲ Pulses can also be considered as alternatives to meat and poultry
Wholegrain and unrefined products Unrefined* bread, pasta, rice and other grain products	To be consumed daily, opting for wholegrain or unrefined products instead of refined products	<ul style="list-style-type: none"> ▲ Favour grain products grown using production methods reducing exposure to pesticides (according to a precautionary principle), ▲ Only unsweetened wholegrain breakfast cereals can be included in this group
Dairy products Milk, yoghurt, cheeses and dairy products present in prepared products	2 dairy products per day	<ul style="list-style-type: none"> ▲ Recommended portion sizes are: 150mL milk, 125g yoghurt, 30g cheese ▲ The number of dairy products may be increased to three per day when portion sizes are smaller ▲ Favour cheeses low in fat and with a high calcium content ▲ Considering the risks of contaminants, vary the dairy products consumed
Meat and poultry	Limit consumption of "red"* meat and favour poultry instead of beef, pork, veal, mutton, horse, boar, deer	<ul style="list-style-type: none"> ▲ For "red"* meat lovers, limit consumption to a maximum of 500g/week
Fish and seafood	Twice a week	<ul style="list-style-type: none"> ▲ Including fatty fish ▲ Vary the species and the supply locations (especially in the case of usual high consumption) to limit exposure to contaminants
Charcuterie	Limit consumption	<ul style="list-style-type: none"> ▲ If you want to eat this, do not exceed 150g/week ▲ Within this group, favour cooked ham
Oils, fats and spreads	Avoid excessive consumption Favour rapeseed and nut oils (rich in ALA) and olive oil without increasing the usual quantity of fats, oils and spreads	<ul style="list-style-type: none"> ▲ Compared to oils low in ALA (including sunflower and peanut oils) ▲ Animal fats are to be used raw and in a limited quantity
Sugary products	Limit consumption of sugary products	<ul style="list-style-type: none"> ▲ Sugary drinks form part of sugary products ▲ Breakfast cereals are usually sugary, even sugary and fatty ▲ Limit the consumption of sugary and fatty foods (cakes, chocolate, dairy desserts and ice cream)
Drinks	The only recommended drink is water	<ul style="list-style-type: none"> ▲ Limited the consumption of sugary and sweet-tasting drinks: <ul style="list-style-type: none"> ○ Their consumption must be exceptional and limited to one glass per day. Favour fruit juices in this category of products ○ Diet drinks have the advantage of having no calories compared with sweetened drinks but as they

Food group	Main recommendation	Additional data
		<p>taste sweet, their consumption should be limited</p> <ul style="list-style-type: none"> ▲ Unsweetened tea, coffee and infusions can contribute to your water intake ▲ Alcohol: the consumption recommendation will be defined by Santé publique France which will publish the results of its expertise in the 2nd quarter of 2017.
Salt	Reduce salt consumption	<ul style="list-style-type: none"> ▲ Be aware of the accumulation throughout the day ▲ Salty foods and adding salt: <ul style="list-style-type: none"> ○ Salty foods include foods rich in salt and strongly contributing foods (e.g. bread) ○ Limit the addition of salt when cooking and at the table ○ Taste before adding salt to dishes ○ Do not add salt when cooking tinned products ▲ Favour iodised salt
<p>Some foods or food groups are not the subject of a specific recommendation (e.g. Potatoes, eggs or refined grain products). For these foods or food groups, no scientific argument can be used to establish a recommendation or a specific consumption limit; they can be consumed as far as this consumption does not contravene other consumption recommendations.</p>		

The HCSP also insists on useful transversal notions constituting general advice:

- **Make sure that daily food intake is as close to the recommendations as possible without each meal necessarily needing to be so. Although the consumption of certain products is to be limited (in terms of frequency and quantity), they are not prohibited. Their consumption can be included in a healthy diet.**
- **Favour variety in all its forms: vary supply locations and methods as well as product origins. These elements are important for nutritional balance and to limit exposure to environmental contaminants and to move towards a sustainable diet.**
- **Avoid excessive portions and consumption. If it remains exceptional, excess food will not disturb the general diet balance.**
- **Set aside enough time to eat and enjoy meals.**
- **Avoid snacking and specifically the consumption of fatty, salty and sugary products outside of mealtimes.**
- **To move towards a sustainable food¹ in line with consumption recommendations, favour raw products, seasonal foods, short**

¹Sustainable development - economically effective, socially fair and ecologically sustainable development.

Review of the dietary recommendations for adults **Circuits²** and production methods that respect the environment, that is to say limit inputs.

- **Organic³** is a production method that limits inputs and constitutes a way to limit exposure to pesticides. However, it is unable to completely eliminate certain contaminants present in the environment (heavy metals, dioxins, mycotoxins, organophosphorus pesticides, etc). In addition, recourse to organic products is a complementary element to the main consumption recommendations, which are those of the priority choice criteria: for example, for fruit and vegetables, the consumption recommendation is at least 5 a day whether they are organic or not; if they are from organic farming, it is a bonus. A fatty and/or sugary product is a fatty and/or sugary product even if it is organic.
- Grilled products or those with significant browning (from the barbecue or toaster) must not be consumed regularly. It is best to remove the burnt parts in contact with the flame or parts heavily browned.
- Food supplements are not recommended outside of medical prescriptions, notably in certain specific populations (pregnant women, newborns, the elderly, people suffering from chronic diseases, etc).
- Restrictive weight-loss programmes are to be avoided unless medically indicated and, in any case, must be monitored by a health professional.

The specialist health prevention, education and promotion committee held its meeting on 16 February 2017: 7 members of 13 qualified members were present, no conflict of interest, the text was approved by 7 voters, 0 abstention, 0 vote

²Short circuits: supply circuits involving a limited number of economic operators committed to cooperation and local economic development; they also involve close geographic and social relationships between producers, processors and consumers

³organic: certified agriculture according to the specifications of organic agriculture

ANNEX 2 / Summary of the recommendations on physical activity and sedentary behaviour of the summary from the group of experts coordinated by Santé publique France in 2016

Physical activity

Practice at least 30 minutes of aerobic activity (moderate and high intensity) at least 5 times a week.

In addition to aerobic activities, the following is recommended:

- muscle strengthening activities, one or two days a week;
- exercises developing flexibility and the ability to make broad movements 2 to 3 times a week;
- balance exercises at least two days a week (specifically for those aged over 65).

Sedentary behaviour

Regardless of the context (work, travel, home, leisure), the following is recommended:

- reduce the total time spent sitting or lying down each day (outside of sleeping and mealtimes);
- walk for a few minutes and stretch after spending 2 hrs sitting or lying down and make a few movements that activate the muscles and move the joints (rotate your shoulder, pelvis, ankles, wrists, hands, head).

ANNEX 3 / List of members of the TSC

Coordinators

Corinne Delamaire, Project and scientific expertise manager in health promotion, and Laurence Noirot, editor, Diet and Physical Activity Unit, Directorate of Health Prevention and Promotion, Santé publique France

External members

Public health communication and psychosocial influence of the media

Didier Courbet, professor of communication sciences, Aix-Marseille University; Assistant director of the Institute of Research in Information and Communication Sciences (IRSIC)

Health prevention and promotion, physical activity, precarious populations

Paul Daval, Director of the Saint-Denis healthcare facility

Health promotion and prevention, actions on the ground

Christel Fouache, Local director of health prevention and promotion, Ireps Pays de la Loire

Health prevention and promotion, actions aimed at vulnerable populations

Stéphanie Petit, dietician

Health prevention and promotion, actions on the ground, health-environment

Sarah Vernier, CRES-PACA project manager

Physical activity

Anne Vuillemin, university professor at the Faculty of Sports Sciences in Nice

Organisation of Santé publique France

Cécile Allaire, Project manager in accessibility, Unit of the elderly and vulnerable populations, Directorate of Health Prevention and Promotion, Santé publique France

Valérie Deschamps, epidemiologist, nutritional monitoring and epidemiology team, mixed team: University Paris 13, Epidemiology and Statistics Research Centre, COMUE Sorbonne-Paris-Cité - Directorate of non-transmissible and diseases and trauma, Santé publique France

Hélène Escalon, Project and scientific expertise manager in health promotion, Diet and Physical Activity unit

Directorate of health prevention and promotion, Santé publique France

Aurélien Nisand, Communication manager, Diet and Physical Activity unit, Directorate of Health Prevention and Promotion, Santé publique France

Anne-Juliette Serry, Head of the Diet and Physical Activity Unit, Directorate of health prevention and promotion, Santé publique France

One-minute advice

MORE

Vegetables, fruit and berries
fish and shellfish
nuts and seeds
exercise



SWITCH TO

Wholegrain
healthy fats
low-fat dairy products



LESS

red and processed meat
salt
sugar
alcohol



In truth, most people know perfectly well what they should eat. It's no secret: vegetables are good for you and sugar isn't. But knowing and doing are two different things, so we'll give you advice and handy tips here to make it easier for you to adopt successful eating habits that are sustainable for both your health and the environment. So you can **find your own way** of eating greener, not too much and be active. After all, even tiny steps can make a huge difference.



Livsmedelsverket

ANNEX 5 / Table of recommendations from the TSC (pre-tested with a qualitative study)

Food group	Main recommendation	Additional data
Fruit and vegetables	At least 5 portions per day (80 - 100g)	<ul style="list-style-type: none"> - In all forms: fresh, frozen or tinned. - Try to increase your consumption - No more than a glass of fruit juice per day, preferably pressed. - Dried fruits should be consumed occasionally as they are very sweet. - If you can, favour organic fruit and vegetables. - Nuts with no added salt (walnuts, hazelnuts, pistachios, almonds, etc): a small handful per day. They are not recommended for those with nut allergies.
Bread, pasta, rice, flour, potatoes	<p>One per meal Or one portion per meal</p> <p>At least one wholegrain or semi-wholegrain food per day</p>	<ul style="list-style-type: none"> - If you can, favour organic grain products, - In terms of breakfast cereals, only unsweetened wholegrain cereals are part of this group
Milk, yoghurt, cheese	<p>2 per day Or 2 portions per day</p>	<ul style="list-style-type: none"> - One portion = 150mL of milk = 125g of yoghurt = 30g of cheese - Consider the milk and cheese already contained in the meals you prepare or buy - Considering the risks linked to contaminants (or pollutants), vary the dairy products consumed

Meat and poultry, fish, eggs, pulses	<p><u>Alternately:</u></p> <p><u>Meat and poultry</u> Favour poultry and do not exceed (or stick to) 500g of meat* per week</p> <p><u>Pulses (lentils, beans, chickpeas, etc):</u> At least 2 per week; they can replace meat and poultry</p> <p><u>Fish and seafood:</u> Twice a week (including fatty fish*)</p>	<p>* <i>beef, pork, veal, mutton, horse, boar, deer</i></p> <p>- If you can, favour organic pulses.</p> <p>* <i>salmon, mackerel, sardine, herring, etc</i> - In all forms: fresh, frozen or tinned. - Vary the species and the supply locations (especially if you consume large quantities) to limit exposure to contaminants (or pollutants)</p>
Fatty, sugary, salty foods	<p><u>Sugary products and drinks, salty products, ready meals with Nutri-Score D and E</u> Limit consumption</p> <p><u>Charcuterie (including cooked ham) Limit consumption.</u> Do not exceed 150g week and favour cooked ham</p>	<p>- <i>Part of this group: breakfast cereals except unsweetened wholegrain cereals, cakes, chocolate, dairy desserts, ice creams, fizzy drinks, fruit juices and biscuits, etc.</i></p> <p>- <i>Also part of this group: sausages, lardons, bacon, tinned meats, dried, raw hams, etc</i></p>
Oils, butter, margarine	<p>Every day in small quantities. <u>Or:</u> Avoid excess Favour rapeseed oil and nut oil.</p>	<p>- Butter is to be limited and reserved for use raw or as a spread</p>

Food group	Main recommendation	Additional data
Drinks	The only recommended drink is water	<ul style="list-style-type: none"> - Consumption of sugary drinks and sweet-tasting drinks must be exceptional and must not exceed one glass per day. In this case, favour fruit juice - Also limit sweetened drinks whose consumption maintains the taste for sugar - Unsweetened tea, coffee and infusions can contribute to your water intake
Salt	Reduce salt consumption	<ul style="list-style-type: none"> - Reduce the addition of salt when cooking and at the table - Do not add salt before tasting - Do not add salt when cooking tinned products - Favour iodised salt - Beware of very salty foods: bread, prepared soups, charcuterie, certain cheese, etc.

ANNEX 5bis/General advice









Your diet can be balanced over several days.

The key thing is to have a diet close to the recommendations and to move as far as possible towards a diet that respects the environment: seasonal products, local products and organic products

Beware of quantities consumed: size of fast food meals, portions on the plate, etc.

ANNEX 6 - Formulation of dietary recommendations tested with a quantitative study

Formulation of recommendations tested (1/2)

	Sample A	Sample B
Fruit and vegetables	 The recommendation is to eat at least 5 fruit and vegetables per day	The recommendation is to eat at least 5 fruit and vegetables per day. For example, 3 portions of vegetables and 2 fruits
Fruit juice	 The advice is not to drink more than one glass of fruit juice per day. Favour pressed fruit instead	The advice is not to drink more than one glass of fruit juice per day because it is very sugary and low in fibre. Favour pressed fruit instead
Nuts	 Unsalted walnuts, hazelnuts, pistachios, almonds, etc: a small handful per day is recommended	Unsalted walnuts, hazelnuts, pistachios, almonds, etc are rich in omega 3: a small handful per day is recommended
Starches	 Bread, pastas, rice, flour, potatoes: one starch per meal is recommended	Bread, pastas, rice, flour, potatoes and pulses (lentils, dried beans, chickpeas, etc): one starch per meal is recommended
Wholegrain starches	 Wholegrain bread, wholegrain or semi-wholegrain pastas, wholegrain rice, etc: the advice is to consume at least one wholegrain or semi-wholegrain starch per day	Wholegrain bread, wholegrain or semi-wholegrain pastas, wholegrain rice, etc: the advice is to consume at least one wholegrain or semi-wholegrain starch per day as they are rich in fibre
Dairy products	 Milk, yoghurt, white cheese, cheese twice a day	Milk, yoghurt, white cheese, cheese twice a day e.g. one plain yoghurt and 1 piece of cheese or cheese grated on pasta, etc
Alternate meat, poultry, fish, eggs, pulses	 The advice is to alternate between meat, poultry, fish and eggs	The advice is to alternate between meat, poultry, fish, eggs and pulses (lentils, dried beans, chickpeas, etc)
Limit meat	 The advice is to limit meat (beef, veal, pork, lamb, mutton, game, offal) to 500g per week	The advice is to limit meat (beef, veal, pork, lamb, mutton, game, offal) to 500g per week (or the equivalent of 3-4 steaks per week)





Formulation of recommendations tested (2/2)

Sample A

Sample B

Pulses



Put pulses on the menu at least twice a week: lentils, dried beans, chickpeas, etc

Put pulses on the menu at least twice a week as they are rich in fibre: lentils, dried beans, chickpeas, etc.

Limit charcuterie



Limit charcuterie to 150g per week

Charcuterie should be limited to 150g per week (approx. 3 slices of cooked ham)

Favour certain oils



Favour rapeseed oil and nut oil if you can

Favour rapeseed oil and, if you can, nut oil as they are rich in omega 3

Organic fruit and vegetables



If you can, choose organic fruit and vegetables

-

Fruit and vegetables + nuts



-

The recommendation is to eat at least 5 fruit and vegetables per day And, due to their high omega 3 content, a small handful of unsalted walnuts, hazelnuts, pistachios, almonds, etc.

ANNEX 7 - Summary of the main indicators - quantitative study

SUMMARY OF THE MAIN INDICATORS



	Fruit/vegetables		Fruit juice		nuts		Wholegrain starches		Dairy products		VPO		Lim. Meat		Charcuterie		Pulses		Oils	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
% agreement																				
Important precisions for understanding this advice	71	76	75	81	75	81	76	82	72	76	76	79	76	79	76	80	75	77	71	78
Gives me new information	34	41	59	62	61	66	56	59	46	51	48	55	57	57	62	61	56	60	64	67
Easy to apply in my everyday life	64	68	67	69	61	63	64	67	76	79	75	73	68	71	63	63	71	68	59	65
Encourages me to follow this advice	76	77	67	73	65	68	68	72	70	72	77	74	68	70	67	66	69	67	62	69
	✓		✓		✓		✓		✓	✓			✓		✓		✓		✓	

Significant difference compared with the other sample

ANNEX 8 / Short messages tested in the qualitative study on the formulation of recommendations on physical activity and sedentary behavior

- To feel better, move as you feel.
- To feel better, move as you want.
- All activities are good for moving more! Find yours.
- Every occasion is good for moving more
- At least 30 minutes of physical activity per day: when your heart beats faster, your health is improving!
- At least 2 hrs 30 mins of physical activity per week: when your heart beats faster, your health is improving!
- To be well: 2 hrs 30 mins of physical activity per week, at your pace, your way.
- What if you find different ways to move more?
- The less you sit down, the more you move, the better you feel.
- The less you sit down, the more energy you use, the better you feel
- Every day, sit down a little less and move a little more.
- The less you sit down, the more you move, the more energy you have!
- Be active every day to feel better.

ANNEX 9 / Test using implicit and explicit measurements of formulations of future recommendations from the PNNS concerning physical activity and sedentary behaviour - Summary of the research report

Project managed by Carolina O.C. WERLE, Olivier TRENDEL and Amanda P. YAMIM from **Grenoble Management School** in collaboration with H  l  ne ESCALON from **Sant   publique France**

This report presents the results of the test on the implicit and explicit effects of different formulations on the future PNNS recommendations on physical activity and sedentary behaviour aimed at adults. The interest of using implicit measures (in addition to explicit measures) to evaluate the formulation of the PNNS recommendations on physical activity and breaking up sedentary behaviour is that the former can consider the responses automatically formed in the brain, by reducing the influence of the social desirability bias. In addition, there is a link between automatic evaluations of physical activity and the adoption of the behaviour (e.g. Bluemke et al., 2010; Brand and Schweizer, 2015; Schinkoeth and Antoniewicz, 2017). Therefore, evaluating the best formulation of the future PNNS recommendations on physical activity and breaking up sedentary behaviour by using implicit measures to identify the type of formulation that activates most quickly in the memory positive associations between the activity recommended by the recommendation (here the practice of varied physical activities at a given frequency and with a given intensity or the adoption of actions to break sedentary behaviour), while controlling the social desirability bias.

To test these associations, we used implicit association tests (*IAT - Implicit Association Test*). The implicit association test is used to quantify the strength of spontaneous associations between the concepts (Greenwald, McGhee, and Schwartz, 1998; Trendel and Warlop, 2005). It is used to test spontaneous associations activated in the memory (Fazio and Olson, 2003) by using as a measure of association the reaction speed to the concepts studied. The implicit association test measures the ease with which a person associates target concepts with attributes with opposing valency.

In the case of this project, the target concepts used are, for example, "intense physical activity" and "inactivity". As an example, the attributes are "pleasant" and "unpleasant". We also measured explicit attitudes (that is to say self-reported), beliefs and intentions towards the behaviours studied (intense physical activity, moderate physical activity, actions to break sedentary behaviour and sedentary behaviour).

The project's purposes concerning physical activity recommendations were:

1. To identify the type of physical activity recommendation formulation which has the most positive effect on implicit attitudes towards intense physical activity and moderate physical activity.
2. To measure the effect of the physical activity recommendations on explicit attitudes, beliefs and intentions towards intense physical activity and moderate physical activity.

The project's purposes concerning breaking up sedentary behaviour recommendations were:

1. To identify the type of breaking up sedentary behaviour recommendation formulation which has the most positive effect on implicit attitudes towards actions to break sedentary behaviour.
2. To measure the effect of the breaking up sedentary behaviour recommendations on explicit attitudes, beliefs and intentions towards actions to break sedentary behaviour and towards sedentary behaviour in general.

Methodology

After an initial validation stage at the laboratory of the Grenoble Management School (GEM) with a sample of 360 students between March and April 2018, a controlled experiment was carried out online between 26 April and 12 May 2018. A representative sample of 1213 individuals aged between 18 and 64 was randomly assigned to one of 12 representative sub-samples (12 groups of approx. 100 people) who were exposed to the different recommendation formulations. The representativeness of each sub-sample has been guaranteed using the quota method (variables: gender, age, PCS of the respondent: PCS+/PCS-/other inactive, Region: Ile de France/Province). Following controls carried out to eliminate outlying responses, the final sample was divided between two sub-samples according to the type of recommendation tested (n= 706 for the physical activity and n= 507 for sedentary behaviour).

Procedure. Participants in an online panel were recruited by BVA to participate in this study in exchange for remuneration in the form of vouchers. After having given their informed consent to participate in the study, the participants were informed that the government plans to launch new messages on health (one of the recommendations tested) or preservation of the environment (control group) and that they would be exposed to one of these messages (see Table 1).

Table A1. Experimental conditions according to the type of recommendation tested

Condition	Physical activity recommendations	Breaking up sedentary behaviour recommendations
Condition 1	Practice varied physical activities that increase your heart rate for at least 2 hrs 30 mins per week.	Do not sit for too long: take time to go up and down the corridor or up and down the stairs at least every 2 hours.
Condition 2	Practice varied physical activities that increase your heart rate for at least 30 mins per day.	Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours.
Condition 3	Practice varied and dynamic physical activities for at least 2 hrs 30 mins per week	Do not sit for too long: Take time to walk a little at least every 2 hours
Condition 4	Practice varied and dynamic physical activities for at least 30 mins per day.	Sitting all day? Take time to walk at least every 2 hours
Condition 5	Practice varied and dynamic physical activities of moderate to high intensity for at least 2 hrs 30 mins per week.	NA
Condition 6	Practice varied and dynamic physical activities of moderate to high intensity for at least 30 mins per day.	NA
Condition 7	If you travel, rather than taking your car, consider car-sharing.	If you travel, rather than taking your car, consider car-sharing.

Study on the physical activity recommendations

The study concerning the physical activity recommendations uses a type-3 experimental plan “level of imaging of the formulation: weak versus moderate versus strong” x 2 (duration in the message: 2 hrs 30 mins per week versus 30 minutes per day) with a control group (exposure to a car-sharing message). The participants were randomly assigned to one of the 7 experimental groups. The effect of the formulations is assessed on the implicit associations towards intense PA and also towards moderate PA. The implicit associations were measured by two implicit associations tests designed by GEM:

- **The intense PA IAT:** this test verifies the implicit associations between the concepts “intense physical activity” vs. “inactivity” and the attributes “pleasant” vs. “unpleasant”. Six images of intense PA and six images of inactivity tested during a previous qualitative study were selected to represent the concepts tested. The words used to represent the attribute “pleasant” are: joy, love, holidays, good, pretty, success, marvellous and superb. The words used to represent the attribute “unpleasant” are: dead, disease, war, disgusting, accident, failure, bad and terrible.

- **The moderate PA IAT:** this test verifies the implicit associations between the concepts “moderate physical activity” vs. “inactivity” and the attributes “pleasant” vs. “unpleasant”. Six images of moderate PA tested during a prior qualitative study were selected to represent the moderate PA concept; for inactivity, the same photos of inactivity as those used in the intense PA IAT were used. We have used the same words to represent the attributes “pleasant” and “unpleasant” as those used in the intense PA IAT.

In addition, to measure the explicit attitudes towards intense and moderate physical activity as well as other variables able to be influenced by the recommendations (e.g. self-efficacy towards intense and moderate physical activity and the intention to practice it), we designed a questionnaire managed online via the Qualtrics platform. The questionnaire measured different variables including the explicit attitude towards intense and moderate physical activity, towards moderate physical activity and towards the message’s recommendation, the intention to practice intense physical activity and moderate physical activity, the ease of understanding the message and the level of authority perceived from the message. The questionnaire also measured a number of individual characteristics including the level of physical activity of individuals (GPAQ).

Main results concerning the physical activity recommendations

The results show that the messages lead to positive effects compared with the control group for implicit attitudes towards moderate physical activity and for implicit attitudes towards intense physical activity, with the exception of the message “Practice varied physical activities that increase your heart rate for at least 30 minutes per day”.

There is no difference between the control group and the experimental conditions for the majority of the explicit variables measured, with the exception of the ease of understanding the message. The message “Practice varied physical activities of moderate to high intensity for at least 2 hrs 30 mins per week” is judged to be less easy to understand compared with the other four messages tested. Generally speaking, the participants found it easier to understand the message with the formulation “30 minutes per day” compared with the formulation “2 hrs 30 mins per week”. The need to do a mental calculation to understand the recommendation was also greater for the formulation “2 hrs 30 mins per week” compared with the formulation “30 minutes per day”.

Results according to the physical activity level of individuals

Among those with a low or moderate level of physical activity, the duration “30 minutes per day” increases self-efficacy to follow the recommendation in the message more significantly compared with the duration “2 hrs 30 mins per week”. These results suggest that the duration “30 minutes per day” is more relevant than “2 hrs 30 mins per week”.

For individuals with a high level of physical activity, the messages “Practice varied physical activities which increase your heart rate” and “Practice varied and dynamic physical activities” increase the explicit attitude towards intense physical activity. For these same individuals, the message “Practice varied and dynamic physical activities” with the formulation “30 minutes per day” increases the self-efficacy to practice moderate physical activities and the intention to practice intense physical activities. This message is also judged as easier to understand than “Practice varied physical activities that increase your heart rate”.

Individuals with a high level of physical activity have a lower self-efficacy for practising intense physical activities when they are exposed to the message “Practice varied physical activities of moderate to high intensity” with the formulation “30 minutes per day”. Their intention to practice moderate physical activities is also lower when they are exposed to this message. These results suggest that, among those with a high level of physical activity, the message “Practice varied and dynamic physical activities” with the formulation “30 minutes per day” is the most effective.

For individuals with a low or moderate level of physical activity, the message “Practice varied physical activities that increase your heart rate” is judged to be too authoritative. As mentioned previously, for individuals with a low or moderate level of physical activity, the duration “30 minutes per day” increases self-efficacy to follow the recommendation in the message more significantly compared with the duration “2 hrs 30 mins per week”. The other differences between the messages and the duration are not statistically significant among this target group.

Conclusion

Generally speaking, the results suggest that the most appropriate duration for the recommendations is “30 minutes per day” because it is easier to understand and does not require any mental calculation. This duration also increases the self-efficacy to following the message’s recommendation among people with a low or moderate level of activity.

The message “Practice varied physical activities that increase your heart rate” is to be avoided because, relative to the control group, this is the only one that did not increase implicit attitudes towards intense physical activity when associated with a duration of 2 hrs 30 mins per week. This message was also judged as too authoritarian by individuals having a low or moderate level of physical activity. Therefore, this message will be avoided based on the results of this study.

When it is associated with a duration of 30 minutes per day, the message “Practice varied physical activities of moderate to high intensity” reduces the self-efficacy for practising intense physical activities and the intention to practice moderate physical activities in individuals with a high level of physical activity. In addition, for individuals with a high level of reactance, this message reduces the intention to practice intense physical activities. This message should also be avoided according to our results because its efficacy among people with a high level of physical activity or a high level of reactance is not guaranteed.

The message “Practice varied and dynamic physical activities” yields positive results in terms of implicit attitudes towards intense and moderate physical activity relative to the control group for all participants, regardless of their level of physical activity. This message is also judged as easier to understand than the message “Practice varied physical activities that increase your heart rate”. In addition, this message has positive effects for individuals with a high level of physical activity. It notably increases their explicit attitude towards intense physical activity. For these same individuals, this message, when it is combined with the formulation “30 minutes per day” increases the self-efficacy to practice moderate physical activities and the intention to practice intense physical activities. Given these results, we recommend using the message “Practice varied and dynamic physical activities” with a duration of 30 minutes per day.

Recommended formulation: “Practice varied and dynamic physical activities for at least 30 minutes per day”

Study on the breaking up sedentary behaviour recommendations

The study concerning the recommendation on breaking up sedentary behaviour uses a type-2 experimental plan (level of imaging of the formulation: weak versus strong) x 2 (level of normativity of the message: suggestive versus normative) with a control group (exposure to a control message: message on car-sharing). The participants were randomly assigned to one of the 5 experimental groups. The effect of the formulations was verified based on the implicit associations with sedentary behaviour. The implicit associations were measured by an implicit associations test designed by GEM:

The sedentary behaviour IAT: this test verifies the implicit associations between the concepts “sedentary behaviour” vs. “movement” and the attributes “pleasant” vs. “unpleasant”. Six images of

sedentary behaviour (the same images of inactivity used in the intense and moderate PA IAT) and six images of movement representing certain actions for breaking up sedentary behaviour were selected to represent the concepts. The same words to represent the attributes "pleasant" and "unpleasant" were used as those used in the two physical activity IATs.

In the study on breaking up sedentary behaviour, the participants were firstly randomly exposed to one of the 5 experimental conditions. They then completed a short quantitative questionnaire on the computer, similar to that designed for intense physical activity and for moderate physical activity, but adapted to sedentary behaviour and to actions to break sedentary behaviour. This questionnaire also measured the explicit attitude towards sedentary behaviour, self-efficacy towards breaking up sedentary behaviour and towards recommendation of the message, the intention of breaking up sedentary behaviour and the level of authority perceived from the message. The questionnaire also measured individual characteristics including the individual's level of sedentary behaviour.

Main results concerning breaking up sedentary behaviour recommendations

A single message tested makes the implicit reactions towards sedentary behaviour more negative (i.e. more effective) relative to the control group: "Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours". The other three messages do not differ from the control in terms of implicit attitudes towards sedentary behaviour.

There is no difference between the control group and the experimental conditions for the majority of the explicit variables measured.

Results according to the level of sedentary behaviour of individuals

Among individuals with a high level of sedentary behaviour, the message "Do not sit for too long: Take time to walk at least every 2 hours" reduces the explicit attitude towards sedentary behaviour compared with the messages "Do not sit for too long: Take time to go up and down the corridor or to go up and down the stairs at least every 2 hours" and "Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours". Among individuals with a low level of sedentary behaviour, there is no difference between the messages.

The effect of the messages on self-efficacy towards breaking up sedentary behaviour is influenced by the type and the level of physical activity of the individuals. For women with a lower moderate level of physical activity, the message "Do not sit for too long: Take time to walk at least every 2 hours" increases self-efficacy towards breaking up sedentary behaviour in comparison with the message "Sitting all day? Take time to walk at least every 2 hours".

Main effects of the level of physical activity and sedentary behavior

The results show the main effects of the level of physical activity and sedentary behaviour of individuals. Individuals with a high level of physical activity have weaker attitudes towards sedentary behaviour, much greater self-efficacy to break sedentary behaviour and a stronger intention to break sedentary behaviour compared with individuals with a low or moderate

level of physical activity. The most sedentary individuals have less self-efficacy to break the sedentary behaviour than those who are less sedentary.

Conclusion

The results show that the only message able to reduce implicit attitudes towards sedentary behaviour is “Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours”. Therefore, the implicit results suggest that this message would be the most effective among the four formulations tested.

However, it should be noted that the message “Do not sit for too long: Take time to walk at least every 2 hours” reduces the explicit attitude towards sedentary behaviour relative to the other two messages but only among individuals with a high level of sedentary behaviour. This message also increases the self-efficacy to break sedentary behaviour among women with a low or moderate level of physical activity. These results suggest that, among the sedentary or inactive target groups, the message “Do not sit for too long: Take time to walk at least every two hours” is potentially effective. Given these results, we recommend using the message “Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours” to target the general population. The message “Do not sit for too long: take the time to walk at least every 2 hours” may also be considered, with a positive explicit effect among sedentary or inactive individuals.

Recommended formulations: “Sitting all day? Take time to go up and down the corridor or up and down the stairs at least every 2 hours” or possible “Do not sit for too long: Take time to walk at least every 2 hours”.

List of abbreviations

ANSES: French Agency for Food, Environmental and Occupational Health Safety
DGAL: Directorate for Food
DGCCRF: Directorate for Competition, Consumption and Fraud Control
DGCS: Directorate for Social Cohesion
DGS: Directorate for Health
FAO: Food and Agriculture Organization of the United Nations
FBDG: food-based dietary guidelines
GEM: Grenoble Management School
GPAQ: Global Physical Activity Questionnaire
HCSP: High Council for Public Health
IAT: Implicit Association Test
INPES: French Institute of Health Education and Prevention
INRA: *French Institute* for Agricultural Research.
INSERM: *French Institute* of Health and Medical Research
IREPS: French Regional Institute of health promotion and education
OMS: World Health Organization
PA: Physical Activity
PNNS: French National Nutrition and Health Programme
RNP: dietary reference values
SES: socioeconomic status
TSC: thematic support committee
VPO: meat/fish/eggs
WHO: World Health Organization
WWF: World Wildlife Fund