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French agency for food, environmental and occupational health & safety

Press Kit

The health risks related to dietary weight-loss practices

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Press Release

Weight-loss diets: risky practices

The French Agency for Food, Environmental and Occupational Health & Safety (ANSES) today published an expert report on the assessment of risks related to dietary weight-loss practices. The pursuit of slimness and the proliferation of diets that can be followed alone without medical supervision have prompted the authorities to question the risks related to these practices. This report will be submitted to stakeholders for consultation, in order to draw up recommendations in an opinion to be published in early 2011.

Overweight and obesity, which affect respectively 32% and 15% of people over 18 in France, are a real public health problem requiring treatment by a health professional and in some cases justifying the prescription of a diet under medical supervision. However, dietary weight-loss practices are often adopted, in the absence of overweight or any medical indication, essentially for aesthetic reasons.

The Ministry of Health therefore requested that ANSES assess the risks arising from these practices. The assessment made falls within the scope of the "body image" topic organised by the French National Health and Nutrition Programme (PNNS 2: 2006-2010).

Today's report is the result of a collective expertise process undertaken by a working group made up of scientists and nutrition experts. The work, which was validated by ANSES' Expert Committee on Human Nutrition, was based on a review of the national and international scientific literature, and on hearings.

The expert assessment shows that slimming diets, widely available to the public in stores and via the Internet, and followed without specialist recommendation or supervision, can pose risks of varying severity to health. It highlights the adverse effects on the body, including the bones, heart and kidneys, as well as psychological disturbances including behavioural eating disorders.

Analysis of the scientific data also established that following diets may cause profound changes to the body's energy metabolism. Such changes often then trigger a vicious cycle of weight regain in the more or less long term, and which may be exacerbated.

A major and recurrent consequence of the corresponding dietary deprivations and exclusions, irrespective of the diet followed, is thus paradoxically weight regain or even overweight: the more diets are followed, the more weight regain is facilitated, even more so in the absence of physical activity, which is a crucial factor in stabilising weight.

The main conclusion of this report is that seeking weight loss by dietary means can only be justified medically in the case of actual overweight[1], and that this process must be supervised by specialists – doctors specialising in nutrition, dieticians – capable of recommending the diet best suited to each individual's specific needs. ANSES also stresses that in terms of health, nothing can replace eating a well-balanced and varied diet, and ensuring that daily caloric intakes do not exceed requirements. Furthermore, to reduce the risk of weight gain, changes in eating habits must be accompanied by regular physical activity.

Considering the importance, complexity and sensitivity of this subject, ANSES hopes to enrich the consultation undertaken, by bringing this report to the attention of members of the scientific and medical community, representatives of associations and leaders of professional organisations.

The consultation will continue until 31 December 2010. All information received will be made public and will undergo a detailed analysis by the Agency while it draws up its recommendations.

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[1] The international classification defines obesity in women and in men up to the age of 65 as a BMI (Body Mass Index) equal to or greater than 30 kg/m^2.

1. Summary of the collective expert report

"Assessment of the risks related to dietary weight-loss practices"

Today, the cult of the body and its image leads to social pressure whereby the individual accepts standardised aesthetics of a 'socially acceptable' body. Furthermore, overweight and obesity, affecting respectively 32% and 15% of people over 18 in France, are a pressing public health problem which in some cases justifies the prescription of a diet under medical supervision. One consequence of these two phenomena is the development of practices, including numerous weight-loss diets, which are often followed by individuals on their own initiative without any medical justification or supervision.
Thus the INCA2 study[2] showed that over 30% of women with a 'normal' BMI[3] and 15% of 'thin' women (BMI<22), followed a weight-loss diet during the survey or had followed one in the year preceding the survey.

In this context, after receiving a solicited request from the Directorate General for Health, ANSES undertook an assessment of the risks related to dietary weight-loss practices. This did not involve a benefit-risk assessment based on each individual's specific situation, nor defining a position on whether individuals should or should not follow a diet, nor on which choice they should make. The risks were assessed within the broad categories of diets for which relevant scientific data are available.

This work is intended to provide benchmarks in order to more effectively identify the effects of weight-loss diets, to enable the authorities to propose a preventive policy for the forthcoming PNNS 3[4].

The expert appraisal, conducted in an adversarial, collective context, involved two tasks:

- identifying and characterising weight-loss diets to determine their impact on nutrient intake;
- analysing the scientific literature to identify the biological consequences of any nutritional, pathophysiological or psycho-behavioural imbalances due to weight-loss diets.

Apart from the general population, special attention was paid to certain categories of the population with physiological particularities or who were particularly vulnerable: children, adolescents, pregnant women and nursing mothers, the elderly, athletes and individuals undertaking intense physical activity.

The appraisal began by identifying examples of weight-loss diets from among those most commonly followed. The nutritional analysis of these diets, 15 in total[5], consisted in characterising them according to their intakes in energy, proteins, carbohydrates, lipids, vitamins and minerals. This characterisation revealed that these examples of weight-loss diets and their different phases can lead to nutritional imbalances and inappropriate intakes. For more than half of the diet phases, sodium intakes were above the limit recommended by the WHO[6] and they sometimes corresponded to more than twice the recommended limit.

[2] Second French Individual and National Study on Food Consumption (2006-07)
[3] BMI: Body Mass Index. 'Normal' weight corresponds to a BMI of between 20 and 25
[4] *Programme national nutrition santé* (French National Health and Nutrition Programme)
[5] The examples of diets included in this assessment were selected based on their popularity (frequent mention on the Internet or in books sold in stores or on the Internet): the Atkins Diet, the Sonoma Diet (Dr Guttersen), the Lemon Detox Diet, the Chrononutrition Diet (Dr Delabos), the Dr Cohen Diet, the Dukan Diet, the Dr Fricker Diet, the Mayo Clinic Diet, the South Beach Diet (Dr Agatston), the Montignac Diet, the Ornish Diet, the Scarsdale Diet (Dr Tarnower), the Cabbage Soup Diet, the WeightWatchers Diet, the Zone Diet (Dr Sears).
[6] World Health Organization

Three diet phases out of four led to a fibre intake up to ten times lower than the dietary reference intake.
This analysis also led to a classification proposal for the different diet phases, based on both their intakes and the contribution of proteins, carbohydrates and lipids to total caloric intake. However, this analysis cannot be regarded as a ranking of the different weight-loss diets assessed.

Following this, the literature review highlighted the risk of adverse health consequences associated with weight-loss diets.
These risks mainly include physiological disturbances (affecting bones and muscle, or kidney and liver damage), profound changes in energy metabolism and the physiological regulation of eating behaviour, as well as psychological disturbances (behavioural eating disorders). Such changes then often trigger a vicious cycle of weight regain in the more or less long term, which may actually be exacerbated by dieting. Other risks have been identified for specific population groups, including malnutrition (in the elderly), hormonal disorders (adolescent females, athletes) and growth disturbances (foetuses, children and adolescents).
The study allowed the key risks associated with different types of weight-loss diets to be specified.

- *For the general population,*

Weight loss occurs not only at the expense of body fat reserves, but also quickly leads to the subject weakening through loss of muscle mass, regardless of the level of protein intake.

Weight-loss diets have a negative effect on bone integrity (lower bone mass, osteopenia [lower than normal bone mineral density], and increased risk of fractures): an average decrease in bone mineral density of one to two percent was observed for a weight loss of 10%.

The caloric intake allowing weight to be maintained after a weight-loss diet is lower than that needed to maintain a stable weight before dieting, which thus favours weight regain, preferentially as fat.
Weight regain affects 80% of subjects after a year, and increases with time.
Physical activity which begins in the calorie restriction phase and is maintained after this period, is the main factor in weight stabilisation.

Very low-calorie diets may acutely induce sudden death, particularly in connection with cardiac arrhythmias. Weight fluctuation may be a risk factor for cardiovascular and metabolic syndrome. Very low-calorie diets cause inflammation and moderate fibrosis in the liver and portal tracts, as well as gallstones.

High-protein diets that are not very low in calories offer protein intakes exceeding the threshold of adequate intake (2.2 g/kg/d), hence the importance of a renal assessment in patients at risk of kidney failure, before any weight-loss diet is undertaken.
Low-carbohydrate diets are often associated with temporary digestive disorders and constipation related to lower fibre intake.
Depression and loss of self-esteem are common psychological consequences of repeated failures in dieting. With regard to behaviour, the cognitive restriction and disruption of eating behaviour induced increases the risk of weight regain, even beyond the initial weight status.

- *For specific population groups,*

Energy restriction during pregnancy (2nd and 3rd trimesters), as well as the underlying nutritional deficiencies cause slower foetal growth and may affect the individual's subsequent health.

The level of milk production is affected by protein-energy malnutrition. Although the quality of breast milk is relatively stable, levels of iodine, of some water-soluble vitamins and of long-chain omega-3 polyunsaturated fatty acids are influenced by the mother's diet, which can in turn affect the child's growth and development.

In children and adolescents, calorie restriction, with or without protein restriction, leads to slower growth and development during puberty. These risks are accompanied by risks of primary or secondary amenorrhoea, as well as tendinitis, bone demineralisation and iron deficiency, especially in young athletes.
The negative impact of weight loss is more pronounced among the elderly, especially with regard to loss of muscle mass and skeletal mineralisation.

In amateur sports enthusiasts, combining physical activity with a weight-loss diet is accompanied by, in the short term:

- cardiovascular risks, when a subject with vascular risk factors, who has been sedentary for several years, resumes physical activity;
- risk of hypoglycaemic and vagal episodes (and/or exacerbated by dehydration) if food restriction is significant.

In athletes engaging in intense physical sporting activity, especially those dieting to maintain low body fat (for sports where weight control is a factor of success), qualitative changes to the diet are associated with hormonal disturbances (decreased testosterone levels, oestrogen deficiency) that may be deleterious (causing bone loss in women). These disorders are related to the calorie restriction and not the stress of exercise.

The report concludes that seeking weight loss without formal medical indication carries risks that affected populations should be made aware of. Losing weight must therefore be supervised by a professional: a doctor or dietician. The report also stresses the importance of physical activity when following a weight-loss diet.

The characterisation of the risks related to weight-loss diets, undertaken by ANSES, should be supplemented by a more complete risk assessment, in particular incorporating exposure data, and data on dietary products intended for very low-calorie diets and food supplements claiming weight-loss effects, when they become available. Moreover, this work must be regarded as the forerunner of a broader and more comprehensive assessment and research process in order to better understand the key biological, pathophysiological and psycho-behavioural factors behind weight gain and regain.

2. The conclusions of the expert report

Faced with the strong growth in dietary weight-loss practices without any medical justification or supervision, ANSES conducted an assessment of the risks related to this type of practice. It highlighted a number of nutritional and psychological risks and stressed the importance of medical supervision suited to each individual's specific situation.

For the population groups concerned

• Seeking to lose weight without formal medical indication bears risks, especially when it involves unbalanced eating habits with limited variety. Thus, **undertaking a weight-loss programme requires specialised medical supervision**.

• This supervision must be adapted to the patient's weight status (BMI, waist circumference):

- in the absence of overweight: weight-loss diets are risk practices, whether or not they are recommended by doctors. The public should therefore be warned of the adverse short-, medium- or long-term consequences of following these diets, especially since they are unbalanced, associated with severe behavioural eating disorders, and may eventually lead to possible irreversible weight gain.
- the management of obesity, overweight, or significant weight gain **requires an accurate diagnosis of the causes,** an analysis of the context and an estimate of the consequences: the indication whether or not to lose weight should be questioned and the objectives and the means to be implemented should be defined. These are not limited merely to management of the diet; they should aim for an appropriate and cautious reduction in weight, planned in good time (in order to address the causal factors) and then stabilised by the appropriate means, while attempting to maintain physical and psychological health in the medium and long term.

• To reduce the risk of regaining weight, changes in eating habits should be combined with regular physical activity.

• In terms of health, nothing can replace eating a well-balanced, varied diet, and ensuring that daily caloric intake does not exceed individual requirements.

• Obesity is a multifactorial chronic disease and its management requires an interdisciplinary approach (doctor specialising in nutrition, endocrinologist, dietician, psychologist, etc.).

With regard to assessment and research

• The analysis of the potential risks related to dietary weight-loss practices should be supplemented by:

- an assessment of dietetic products intended for very low-calorie diets (meal replacements such as "protein mixes");
- an assessment of the consumption of food supplements claiming weight-loss effects.

• Several types of studies and research needed for evaluating risk could be considered by acquiring data on:

- the benefits, risks and changes to health status and weight in the medium (2 years) and long term (10 years), by analysing nutritional intakes and status (vitamins and minerals, fatty acids, etc.) in subjects with or without overweight, following weight-loss diets, with or without medical supervision; such work should take into account the different types of diets and population groups;
- the key biological, psycho-behavioural and social factors of weight gain and regain.

3. How ANSES conducted its work

The issue of health risks related to dietary weight-loss practices was addressed at the request of the Ministry of Health. The assessment was entrusted to the Expert Committee on "Human Nutrition", which set up a multidisciplinary working group, bringing together scientists and nutrition experts. The report was thus produced by a group of experts with multidisciplinary skills and approaches, and in an adversarial context. This is the first time such scientific work has been conducted. It will be presented to the Steering Committee of the PNNS.

The priorities of the assessment

ANSES's assessment focused on those dietary weight-loss practices most widely publicised in stores and on the Internet, and most frequently followed by individuals without any medical justification or supervision.

These diets differ in their nutrient composition. Depending on the diet, they recommend excluding one or more categories of foods, maintaining a single category of food or even totally excluding food. The diets investigated by ANSES were selected on the basis of their popularity, i.e. those most frequently mentioned on the Internet or corresponding to the best-selling books in stores or on the Internet. Fifteen diets[7] were thus selected.

ANSES's expert appraisal involved two tasks:

- identifying and characterising weight-loss diets to determine their impact on nutrient intake, particularly with regard to inadequate nutrition;
- analysis of the available literature to identify:
  - the biological consequences of weight-loss diets; this analysis included the identification of nutritional imbalances (macronutrients) and deficiencies in vitamin and mineral intakes;
  - the pathophysiological and psycho-behavioural consequences of weight-loss diets.

As well as considering the case of young adults, special attention was paid to certain categories of the population with physiological particularities or who were especially vulnerable: the specific cases of children, adolescents, pregnant women and nursing mothers, the elderly, athletes and individuals engaging in intense physical activity were examined.

Submission of the expert report for consultation

[7] The examples of diets included in this assessment were selected based on their popularity (frequent mention on the Internet or in books sold in stores or on the Internet): the Atkins Diet, the Sonoma Diet (Dr Guttersen), the Lemon Detox Diet, the Chrononutrition Diet (Dr Delabos), the Dr Cohen Diet, the Dukan Diet, the Dr Fricker Diet, the Mayo Clinic Diet, the South Beach Diet (Dr Agatston), the Montignac Diet, the Ornish Diet, the Scarsdale Diet (Dr Tarnower), the Cabbage Soup Diet, the WeightWatchers Diet, the Zone Diet (Dr Sears).

Several hearings were conducted while preparing this report, which will, moreover, be presented to the Steering Committee of the PNNS.

Considering the importance, complexity and sensitivity of this subject, ANSES is submitting the report for consultation among members of the scientific and medical community, representatives of associations and leaders of professional organisations.

The aim of this consultation is to gather any requests for clarification and arguments on the assessment conducted, the conclusions and initial recommendations that emerge or that should be developed in the report.
The consultation is open from 25 November to 31 December 2010. All information received will be made public and will undergo detailed analysis by the Agency.

Following this consultation, ANSES will write an opinion which will be sent to the Minister of Health in response to the initial solicited request.

4. Key figures

According to the INCA 2[8] study:

- **23.6%** of adults declared that they were following or had followed a weight-loss diet in the year preceding the survey.
- **30%** of women with a 'normal' BMI[9] and **15%** of 'thin' women (BMI < 22), followed a weight-loss diet during the survey or had followed one in the year preceding the survey.
- Overweight and obesity affect respectively **32%** and **15%** of people over 18 in France.
- **60%** of women and **44%** of men would like to weigh less.
- Among adolescent females aged 11 to 14 years, **47%** would like to weigh less.

According to the expert report produced by ANSES[10]

- **80%** of subjects regain weight a year after completing their diet
- For more than **80%** of the diet phases studied, protein intake exceeded the dietary reference intake (DRI). For some, the intakes were two to three times higher than the DRI.
- **More than half** of the diet phases studied had lipid intakes higher than the DRI and **40**% were below.
- **74%** of the diet phases proposed fibre intakes below the DRI, sometimes almost ten times lower.
- Only **26%** of the diet phases studied followed the recommendations for fibre intake.
- For **61%** of the diet phases studied, the average nutritional requirement for iron in women was not covered.
- The average nutritional requirement for calcium in adults was not covered for **23%** of the diet phases.
- **The study revealed that half** of the diets recommended to women offered magnesium intakes below the average nutritional requirement.
- For **58%** of the diet phases studied, sodium intake was above the limit recommended by the WHO[11].
- **26%** of the diet phases studied did not cover the average nutritional requirement for vitamin C.
- In **77%** of cases, vitamin D intake was below the average nutritional requirement, and vitamin E intake was insufficient in **32%** of the diet phases.

[8] Second French Individual and National Study on Food Consumption (2006-2007)
[9] BMI: Body Mass Index. 'Normal' weight corresponds to a BMI of between 20 and 25
[10] In this report, the various dietary weight-loss practices were characterised to determine their impact on nutrient intakes, particularly with regard to inadequate nutrition
[11] 5 g of salt per day, i.e. nearly 2000 mg of sodium

5. ANSES and food

Food is always under close scrutiny. Throughout the food chain, producers, distributors and the government's inspection services ensure the quality of products offered to consumers. There has never been so much study, research and control of all the inputs found in the food chain as there is today. However, given the globalisation of trade, the emergence of new lifestyles and consumer habits, the diversity of the food supply and increasingly sedentary behaviour, new nutrition-related risks are emerging and must be assessed, while not neglecting 'traditional' risks such as microbiological ones. Moreover, new risks related to environmental contaminants are also emerging.

ANSES is involved in all the stages of the food chain "from farm to fork", from primary production to the consumer's plate. The Agency assesses the health risks associated with foods, monitors the exposure of populations to contaminants and nutrients, and analyses any adverse effects. ANSES is an independent scientific body that systematically publishes the results of its studies and, when necessary, provides recommendations for risk managers in conjunction with its expert opinions.

With regard to nutrition, ANSES:

• assesses the nutritional properties of foods and ingredients used in food, as well as the associated health benefits and risks;

• develops nutritional references for the population and population subgroups;

• provides relevant scientific evidence for the drafting of national and European regulations (enrichment with vitamins and minerals and other substances, food supplements, etc.);

• helps shape public health policy and makes recommendations on nutrition (food consumption benchmarks, assessments of the benefits and risks of eating certain foods or categories of food, etc.).

The tools of health and safety

ANSES has been analysing the health impact of the nutritional quality of foods and the consumption of food supplements. In particular, the Agency has developed several tools for assessing consumers' actual exposure to nutrients:

The **Ciqual base**, which references the nutritional composition of foods. ANSES manages the French reference database on the nutritional composition of foods. The Ciqual base contains the concentrations of 42 substances in over 1300 foods. This online database is an essential tool in the food field. It is used by food manufacturers for nutrition labelling, by health professionals (nutritionists, dieticians) to determine menus and personalised guidelines for their patients, and is an essential tool for nutritional software developers and nutritional epidemiology research teams.

Oqali[12], to monitor the quality of the food supply. Run jointly by ANSES and INRA, the French observatory of food quality (Oqali) monitors the quality of food on the market by measuring and publishing the efforts made by manufacturers and distributors. In 2009, almost 15,000 products were listed.

The INCA surveys, to identify in detail how food is consumed. The INCA (French Individual Survey on Food Consumption) studies are national surveys carried out every six years. They involve gathering data on food consumption over seven days from a sample population in mainland France. In 1999, the first INCA study focused on 3003 individuals aged 3 years and over. In 2006/2007, the consumption patterns of more than 4000 participants were examined. From the data collected, ANSES has been able to obtain a detailed picture of French food habits which enables it to monitor changing trends in food consumption. By combining these consumption data with those on the nutritional composition and contamination of food, ANSES is able to determine the average nutritional intake of the French population and their exposure to contaminants.

Nutritional vigilance, to monitor the emergence of new risks. In 2009, the state entrusted the Agency with a new mission to set up and manage a nutritional vigilance system for novel foods, foods to which substances have been added for nutritional or physiological purposes, food supplements and foods intended for particular nutritional uses. The Agency began this mission with a pilot phase targeting food supplements and the first results are expected in late 2010.

The INCA study of 2006-2007[13] clearly illustrates the scale of popularity of diets.

According to this study, 23.6% of adults claim that they were following or had followed a diet in the year preceding the survey. Regardless of age, dieting is consistently found more frequently in the female population. 60% of women and 44% of men would like to weigh less. Over 30% of women with a 'normal' BMI and 15% of 'slim' women (BMI < 22) followed a diet during the survey or had followed a diet during the year. Among adolescent females aged 11 to 14 years, 47% would like to weigh less.

[12] French Observatory of Food Quality
[13] Study conducted among a representative sample of the population living in mainland France (1455 children aged 3-17 years and 2624 adults aged 18-79 years).

6. ANSES, a new player in health and safety

The French Agency for Food, Environmental and Occupational Health & Safety was created on 1 July 2010 through the merger of two French health agencies: AFSSA (the French Food Safety Agency) and AFSSET (the French Agency for Environmental and Occupational Health Safety). By incorporating their respective missions, ANSES now provides a cross-functional perspective on health issues and can identify, overall, the risks to which people are exposed through their lifestyles and consumption patterns, or the characteristics of their environment, including in the workplace.

Protecting human, animal and plant health

In terms of human health, ANSES covers three fields: food, the environment and the workplace. Its mission is also to assess risks to animal and plant health. On the basis of its scientific reports, it formulates opinions and recommendations for the authorities.

Ensuring food safety and quality

The Agency assesses health and nutritional risks throughout the agri-food sector. It evaluates the nutritional properties of substances included in food and feed, as well as the associated benefits. It monitors eating habits and trends, and identifies populations most at risk. Lastly, it assesses the health quality of water intended for consumption.

Assessing health risks related to the environment

Health and environment are closely related. ANSES assesses the impact of the environment on human health, so as to better identify health risks related to pollution of the human environment (air, water, soil). It covers several topics: cancer and the environment, exposure to biological, chemical and physical agents, regulations on the use of hazardous chemicals, etc.

Assessing health risks in the workplace

At present, concerns are growing about exposure to occupational diseases and deferred risks related to chemicals such as those found in nanomaterials or asbestos. ANSES is studying the mechanisms of exposure in the workplace and the health risks specific to different professions.