



# Measuring Dutch meals

Healthy diet and safe food  
in the Netherlands

*Summary and Key messages*



**rivm**

National Institute  
for Public Health and  
the Environment



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### *Summary and Key messages*

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## PREFACE

This brochure contains the summary and key messages of a report that was originally published in Dutch. This report, prepared by the National Institute for Public Health and the Environment (RIVM) and entitled “*Ons eten gemeten; Gezonde voeding en veilig voedsel in Nederland*”, has been presented to the Minister of Public Health, Welfare and Sport of the Netherlands on september 1, 2004.

The report comprises 364 pages and contains an extensive overview and critical analysis of the current scientific knowledge regarding the ‘healthy’ as well as the ‘safety’ aspects of diet and food in the Netherlands. Both aspects, moreover, are described in a coherent and so far unprecedented way. Furthermore, the current implications on public health of an (un)healthy diet and (un)safe food are compared, and also discussed in relation to the health loss or gain from other important lifestyle factors like smoking, alcohol use, and (lack of) physical activity. Also an analysis is included of the Dutch government policy and initiatives since 1983 concerning the promotion of a healthy diet and the ensurance of food safety.

Finally, the data and conclusions presented in this brochure, should of course be viewed in the context of the Dutch situation. This means that the observed or calculated disease cases and deaths and all the reported health losses and gains must be considered relative to the *total population of 16 million people* in the Netherlands. Also, the reported recommendations on nutrient or food intake, as well as the mentioned guidelines, food laws and regulations all pertain to the current (2004) situation in the Netherlands.



## KEY MESSAGES

***Dutch people are less healthy than they could be due to an unhealthy diet. In particular, they eat too much and they eat the wrong types of foods.***

- Over the past century, the Dutch diet has become healthier and safer. As a result, general health has improved and life expectancy has increased. However, nowadays health is threatened because an unhealthy diet is consumed, and because the number of people who are overweight is increasing.
- The percentage of people classified as obese has doubled in the last 25 years to approximately 10% of the adult population. It is predicted that this figure will rise to 15% within the next 20 years. Most alarmingly, there is a comparable increase in the percentage of children who are overweight. Overweight and obesity are caused by an energy-dense diet in combination with a lack of physical activity, resulting in an energy disbalance.
- The unfavourable composition of the Dutch diet (based on the study of five important dietary factors) also leads to considerable health loss. The intake of saturated and *trans* fatty acids is too high, while fish, fruit and vegetables are not eaten enough.
- Overweight and unfavourable dietary composition each account for approximately 40,000 cases of adult-onset diabetes, cardiovascular diseases and different types of cancer in total per year. The unfavourable dietary composition is twice as likely to result in death than overweight: 10% of all deaths in the Netherlands are attributable to the composition of the diet and 5% to overweight. In terms of the average life expectancy of all 40-year-olds, this means that the unfavourable dietary composition reduces life-expectancy with 1.2 years, while overweight will shorten life-expectancy by 0.8 years. It is not known what proportion of the health problems caused by overweight can be attributed to the diet.
- The overall health loss caused by an unhealthy diet is comparable to that caused by smoking. Measured in DALYs (Disability Adjusted Life Years: a summary measure which combines death and illness, using a disability weighing factor for the seriousness of the disease), the annual health loss due to an unhealthy diet is between 300,000 and 400,000. This figure includes 245,000 DALYs caused by the unfavourable dietary composition and an unknown proportion of the 215,000 DALYs due to overweight. In the case of smoking, the annual health loss is estimated to be just over 350,000 DALYs.

***Dietary interventions can reverse a substantial proportion of the health loss. However, if the current trends continue, life expectancy may fall.***

- Approximately *one half* of all deaths and illnesses due to the unfavourable dietary composition can be avoided by means of dietary interventions which are considered feasible (based on small-scale experiments). In particular, reducing the content of saturated and *trans* fatty acids in foods and a higher consumption of fish, fruit and vegetables appears to be effective. In the case of overweight and obesity, approximately *one quarter* of all deaths and illnesses can be prevented, assuming an average weight loss of three kilograms per person.

- These modeled dietary interventions are in line with the current favourable trends in fish consumption and the decreasing content of saturated and *trans* fatty acids in the diet. However, the trends for overweight and the consumption of fruit and vegetables show a very unfavourable picture. This indicates that these aspects call for a far more forceful preventive approach.
- If these trends continue (and other factors remain unaltered) life expectancy in the Netherlands will start to fall for the first time in many decades.

***Functional foods and dietary supplements do not offer a solution to the health problems caused by an unhealthy diet.***

- Consumers who follow the dietary guidelines have no need for functional foods or supplements. Only certain specific risk groups (such as infants and elderly persons with a low micronutrient status) will benefit from such products. Even in that case, the health gains will be limited.
- In many cases, no evidence exists to support the health claims made for such foods and supplements. The consumer may well be misled by extravagant advertising.
- Some bio-active ingredients represent a real chance of health loss because they may be consumed in excessive quantities. This is particularly the case with vitamin supplements in which the unit dose (far) exceeds the safe upper level of intake, like for example seen with vitamin B6. Such products are currently freely available. The safe upper level can also be exceeded when several ‘enriched’ products are used in combination.

***In recent years, the Dutch food has become demonstrably safer in terms of chemical and microbiological contamination. Nevertheless, food safety is often the subject of negative media coverage.***

- The food consumed in the Netherlands has become safer over the past 20 years. For example, the contamination of animal products with *Salmonella* has reduced considerably, as has the concentration of dioxins in foods and human breast milk.
- Food safety generally reaches the news only when problems occur, usually due to unavoidable incidents (‘Good news is no news’). This creates a distorted picture of the actual situation.
- The government and private sector have been engaged for a long time in efforts to increase food safety and to provide a high degree of consumer protection. Food in the Netherlands, therefore, is now safer than ever before.

***Nevertheless, unsafe food leads to health loss and new threats are emerging.***

- Although the overall number of incidents involving *Salmonella* contamination has decreased in the Netherlands, food infections continue to present a persistent problem. Each year, there are between 300,000 and 700,000 reported cases of gastroenteritis and several hundred other cases of serious illness. Food infections account for some 20 to 200 deaths each year. The overall annual health loss is estimated to be between 1,000 and 4,000 DALYs.
- In some cases, chemical contamination and the presence of naturally occurring chemical compounds in food lead to a limited degree of health loss in the popula-



tion (either demonstrable or theoretically estimated). In terms of actual illness allergens form the most important category of agents, but must be considered separately given the differences in individual susceptibility. In the Netherlands the overall health loss attributable to chemical contamination and allergens is estimated to be between 1,500 and 2,000 DALYs per annum.

- Experts predict that food in the Netherlands will become even safer in future. This is largely due to the increased attention being devoted to food safety. At the same time, new threats to food safety may emerge. They include new types of food infection, the globalization of food production chains, the increasing consumption of raw or unprocessed products, and the over-consumption of functional foods and dietary supplements.

***Effective risk communication with the consumer is essential in any food safety incident or crisis.***

- There are no indications that the consumer has a persistent or increasing loss of confidence in food safety. However, this confidence is subject to major fluctuations when incidents or crises occur.
- The major problems attaching to food safety incidents are that of assessing the actual risk to health and the unpredictability of public perception. Effective methods for assessing the actual health effects are not always available. Alongside the objective, calculated risk, the consumer's perception of risk will often form a far more important factor. This perception will be determined by factors such as the perceived seriousness and controllability of the risk or its expected consequences, as well as the nature and extent of media coverage.
- Risk management (and hence crisis management) therefore requires an understanding of both the actual risk and the perceived risk. Adequate measures together with open and transparent communication with the consumer form the basis for success.

***Much greater health gains are to be made through encouraging a healthy diet than through improving food safety. This has consequences in terms of the priorities to be set.***

- The comparison of the health gains theoretically attainable from a healthier diet on the one hand and improved food safety on the other, shows a clear preference for the former. Just through ensuring a proper dietary composition, separate from avoiding overweight, the maximum health gains (in DALYs) are some 40 to 100 times greater than the current overall health loss due to unsafe food.
- Besides the potential health gains, other factors must be considered when establishing priorities. These include the current trends and the feasibility of the proposed interventions. Consequently, three priorities have been identified:
  1. The promotion of a healthy diet, with the secondary aims of:
    - Reducing overweight and obesity (major health gains, unfavourable trends and interventions which may not be fully feasible).
    - Promotion of a proper dietary composition (major health gains, variable trends and variable feasibility of interventions).

2. The maintenance and (where necessary) improvement of the current high level of food safety (limited health gains, important social mandate and good feasibility of interventions).
3. Improvement of risk assessment methodologies and of risk communication with the consumer, particularly in the event of a food safety incident or crisis.

***The main opportunities for creating a healthier diet and enhancing food safety are to be found on the supply side, i.e. in the hands of the private sector.***

- The private sector can make a major contribution to a healthier diet and safer food. This can be done by restricting the supply of ‘unhealthy’ foods, reducing portion sizes, reducing advertising for ‘unhealthy’ foods (particularly that targeting children), offering a more affordable range of ‘healthy’ foods, increasing the traceability of products or ingredients, and by introducing new (food safety) technologies.
- Experts expect great gains from product modification, whereby the composition of foods will be made healthier and consumers will not be required to alter their eating habits dramatically.
- The private sector could do more to address its responsibilities with regard to the issues above, becoming even more active than it already is.

***The consumer also has an important role to play.***

- The human environment has a major influence on people’s eating habits. However, each consumer has overall responsibility for choosing the food he or she eats, and for its safe storage and preparation. A significant cultural shift is required to render a healthy diet and concern for one’s weight a social norm. Eventually, this shift must lead to permanent and sustainable behavioural changes.

***The government must create the necessary conditions, and may be required to take enforcement action where appropriate.***

- If consumers are to fulfil their responsibilities, they must be given adequate information about a healthy diet and safe food. But they must also put that knowledge into practice. This will require education, information campaigns and practical skills training, together with a more explicit representation of their interests by consumer organizations in order to ensure adequate product information.
- The Dutch government must maintain the current high level of food safety. It must also invest in an adequate response to new developments in the commercial food chains, in crisis management and in effective consultation with the consumer.
- A thorough understanding of the actual nutritional situation in the Netherlands is essential to proper food policy. This calls for an effective monitoring system which will not only ‘keep a finger on the pulse’ but will also be essential in evaluating and further developing policy with regard to healthy diets and food safety.
- An integrated strategy seems to offer the best potential for promoting healthier eating habits. Such a strategy must not only address the supply side, but also the consumer and his or her environment. There should therefore be a combination of pricing policy, legislation, guidelines for the catering industry, measures applying

to public places, health education and a shift in social norms. These measures should eventually lead to the 'healthy choice' becoming the 'easy choice.' An active approach on the part of government and the various societal organizations is called for.



## SUMMARY

### 1 Introduction

There are many aspects to food and nutrition. In this summary, which deals with the past, present and future, questions are answered from a health perspective. How healthy is the Dutch diet? How safe is Dutch food? What health gains can be achieved through better diet and eating habits and by reducing overweight<sup>1</sup>? What is the appropriate balance between the desire for a healthy diet and that for ensuring food safety? How will this affect the various parties involved in food production, distribution and consumption?

In answering these questions, a pragmatic definition of the terms ‘healthy diet’ and ‘safe food’ is applied. A healthy diet relies on both the *composition* and the *quantity* of food consumed. Thus we should eat neither too much nor too little (energy intake in balance with energy expenditure), and the composition of the diet should be in line with the recommended guidelines. With regard to food safety, the emphasis is not only on possible microbiological or chemical contamination, but also on potentially harmful naturally-occurring constituents. Where the amount of such substances (either in or on the supplied/consumed foods) is below the level which could be considered harmful to human health, the term ‘safe food’ is applied.

The findings presented in this report can assist the Ministries of Public Health, Welfare and Sport (VWS) and Agriculture, Nature and Food Quality (LNV) in the Netherlands in their development of a view on healthy diet and safe food. The information is also of significance to other parties, including the local and national organizations which attempt to promote healthy diets and better health, organizations which control food safety, those which produce, process, distribute, sell or prepare food (including the agricultural sector, the food industry, supermarkets, restaurants, schools, staff canteens and healthcare institutes), organizations engaged in food and nutrition research and, of course, the people most closely involved: consumers and consumer organizations.

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<sup>1</sup> Overweight is defined as a Body Mass Index (BMI) equal to or greater than 25; severe overweight (obesity) is defined as a BMI equal to or greater than 30.

## 2 Main findings

### 2.1 How healthy is the Dutch diet?

#### *a. A healthy diet and safe food have contributed to the improvement of general health and have increased the average life expectancy*

Food is a primary life requirement. Today, people in the Netherlands live much longer than previous generations. That is partly due to the availability of a sufficient quantity of good quality food. The Dutch now live in an era and a part of the world with abundant food supply, and stringent control of food safety aspects. Furthermore, they now have access to greater scientific knowledge concerning healthy eating habits and food safety.

#### *b. And yet obesity is now one of the greatest threats to public health*

- In the Netherlands, the percentage of people who may be described as obese has doubled over the past 25 years to approximately 10% of the adult population.
- The most worrying trend is the increase in the number of young children who are overweight or obese. In 1997, the percentage of overweight persons in the 2 to 20 age group varied between 7% and 16%, depending on age. In the case of girls aged 6, this represented a 100% increase compared to the 1980 figures, while for boys aged 6, there had been a 200% increase (see *figure 1*). The trend is of particular concern because eating habits, like so many aspects of lifestyle, are acquired in these formative years.
- Among those with only primary or lower vocational education, obesity is roughly three times more prevalent than among those with higher vocational training or a university degree. However, the increase over time is seen in both groups.

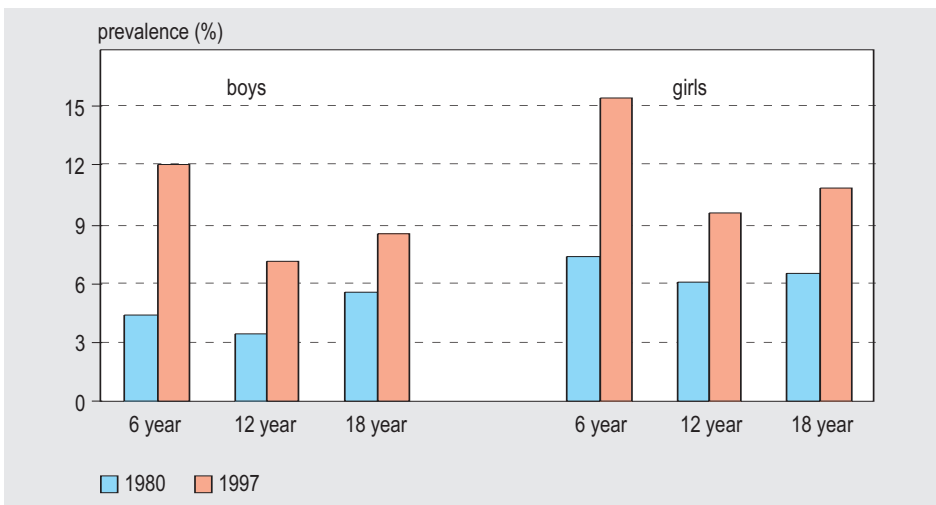


Figure 1: Prevalence of overweight among Dutch children by gender and age.

- Obesity is more prevalent among Turkish, Moroccan, Surinamese and Antillean men and women in the Netherlands than among the 'native Dutch' population. There are, however, no trend statistics available. There is less information relating to other ethnic groups.
- The food consumption of the average Dutch citizen has not increased in recent decades. In fact, between 1988 and 1998, energy intake fell by 5%. The cause of the increase of overweight is rather the over-consumption of food relative to the amount of physical activity undertaken. It is therefore clear that the degree of physical activity has decreased even more, although good statistics relating to trends in energy expenditure by physical activity are not available.
- It is expected that the incidence of overweight, and in particular obesity, will continue to rise strongly in the Netherlands. Given the current trend, the number of Dutch persons who are obese is likely to increase by 50% before the year 2020. Merely to maintain the current level will require significant efforts.

***c. The composition of the Dutch diet is still far removed from the recommended healthy diet***

In recent decades significant changes have occurred in the Dutch dietary pattern with regard to several important dietary factors. In the case of some factors, the diet has clearly become more healthy; for others, the reverse is true (see *table 1*).

- The main improvements are the decrease in the content of saturated and *trans* fatty acids in foods, and the increase in the consumption of fish. Between 1988 and 1998, the consumption of *trans* fatty acids decreased by over 60% as the result of modifications to the composition of margarines and cooking fats. The consumption of saturated fatty acids decreased by 5%, largely due to the successful introduction of lower-fat dairy and meat products. Fish consumption appears to have increased: in 2001, the quantity of fish purchased for consumption at home had increased by 17% compared to the 1995 figure.
- However, fewer than 25% of people follow the recommendations with regard to the consumption of fruit, vegetables and dietary fibre. Over the course of 10 years (1988-1998), consumption of fruit and vegetables actually declined by between 15% and 20%. Despite the improvements in terms of the fatty acid content of products, only 5% of the Dutch population follow the recommendations with regard to the intake of all fatty acids (saturated, *trans* fatty acids and fish).

*Table 1: Actual dietary consumption compared to recommended intake in the Netherlands.*

| Dietary factor           | Recommended intake          | Average consumption 1998 | Trend        |
|--------------------------|-----------------------------|--------------------------|--------------|
| Saturated fatty acids    | < 10 energy per cent        | 14.5 energy per cent     | Favourable   |
| <i>Trans</i> fatty acids | < 1 energy per cent         | 1.8 energy per cent      | Favourable   |
| Fish                     | 1 or 2 times per week       | 2 to 3 times per month   | Favourable   |
| Fruit                    | 2 pieces per day (200 gram) | 102 gram                 | Unfavourable |
| Vegetables               | 150-200 gram                | 120 gram                 | Unfavourable |

In addition, many groups in the population have specific dietary problems which require certain additional recommendations.

- Mothers should be encouraged to breastfeed young infants.
- The eating habits of young people are showing a less favourable trend than those of the population as a whole. In particular, there has been a more stronger decline in the consumption of bread and vegetables.
- Malnutrition may be observed among some of the oldest citizens, which may lead to vitamin and mineral deficiencies.
- The dietary composition of persons with a lower socio-economic status is, on average, less likely to be in accordance with the recommendations than that of people in the higher socio-economic groups.
- Few statistics are available with regard to the food consumption of ethnic minority groups. There is no uniform picture covering all groups. The fatty acid content of the diet of some groups is actually better than that of the native Dutch population, but the average content of vitamins and minerals is somewhat lower.

***d. Overweight and unfavourable dietary composition cause considerable health loss***

For the purposes of this document, 'health loss' is expressed in terms of the additional incidence of disease and mortality (e.g. through type 2 diabetes mellitus, cardiovascular diseases and various types of cancer) which can be attributed to overweight or unfavourable dietary composition.

- Adults who are severely overweight are five to twelve times more likely to develop diabetes, and two to three times more likely to develop cardiovascular diseases or certain types of cancer.
- An excessive intake of the 'wrong' type of fats, such as saturated and *trans* fatty acids, increases the likelihood of developing cardiovascular disease by 25%, while eating fish once or twice a week will *reduce* this risk by 25%.
- The consumption of an adequate quantity of fruit will reduce the risk of developing coronary heart disease, stroke, lung cancer, breast cancer<sup>2</sup> and stomach cancer by between 20% and 30%, while a sufficient intake of vegetables will reduce the risk of coronary disease and lung cancer to approximately the same degree.
- Each year, 38,000 cases of cardiovascular disease among adults aged 20 and above can be attributed to the unfavourable composition of the diet (calculated according to the five factors), as can 2,700 cases of cancer (see *figure 2*).
- Overweight is responsible for 22,000 cases of diabetes, 16,000 cases of cardiovascular disease and 2,200 cases of cancer each year (see *figure 2*). Other consequences of overweight, such as impaired mobility, have not been included.
- Approximate 10% of the total number of deaths in the Netherlands each year can be attributed to the unfavourable dietary composition, while overweight is directly responsible for 5% of deaths.

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<sup>2</sup> According to a recent report published by the Dutch Cancer Society, the relationship between diet and breast cancer is debatable.



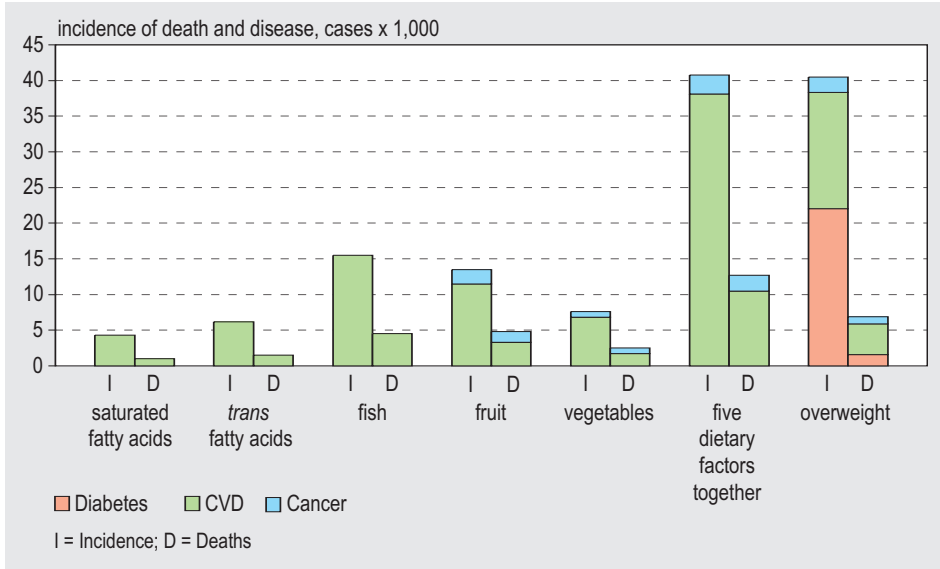


Figure 2: Calculated health loss due to the fact that the consumption of various fatty acids, fruit and vegetables (separate or in combination), as well as body weight (BMI), fails to meet the recommendations.

- When these statistics are combined and expressed in DALYs<sup>3</sup> per year (Disability Adjusted Life Years), approximately 215,000 DALYs lost by the three diseases cited (cardiovascular disease, cancer and diabetes mellitus) can be ascribed to overweight, and 245,000 DALYs to the unfavourable dietary composition.
- The average decrease in life expectancy resulting from the unfavourable dietary composition is 1.2 years (for the entire Dutch population aged 40 and above). In the case of overweight, the decrease in life expectancy is 0.8 years. The health loss will clearly be much greater for those who consistently eat too much or eat the wrong types of food.

In calculating the overall health loss due to an unhealthy diet, it is not allowed to merely add the figures for overweight and unfavourable composition of the diet together. Overweight is caused in part by the combination of insufficient physical activity and an energy-dense diet, which partially overlaps with the dietary composition consideration, although the exact degree of this overlap is unknown. Of the five dietary factors considered, fruit and vegetables can help to reduce weight due to their high fibre content and low energy density. However, over-consumption of energy-dense foods has not been included in the food consumption scenarios modelled.

<sup>3</sup> For several years, the health gain or loss due to disease or risk factors have been expressed as DALYs. Mortality and years lived with disease (weighed according to the seriousness of the disease) are combined in this figure.

### e. Improved dietary patterns can lead to considerable health gains

The health loss presented above has been calculated by means of a comparison with the situation in which *all* Dutch people follow the dietary and weight recommendations. It should therefore be regarded as the *maximum* theoretical health gain.

However, because it would be overly optimistic to assume that everyone will adopt a healthy diet overnight, a calculation has also been made on the basis of dietary patterns which are *partially* improved in the direction of the recommendations. Experience with small-scale dietary interventions suggests that such an improvement is feasible. In these ‘mid-range’ scenarios we assume the following changes in the dietary patterns of persons who do not yet meet the recommendations in full:

- consumption of saturated fatty acids to be reduced by 2.5 energy per cent
- consumption of *trans* fatty acids to be reduced by 0.5 energy per cent
- consumption of fish to be increased by one or two portions per month
- consumption of vegetables to be increased by 50 gram per day
- consumption of fruit to be increased by 50 gram per day

These dietary interventions will reduce the maximum annual incidence of disease and death attributable to the dietary composition (with regard to the five factors stated) by approximately 50 per cent (see *figure 3*).

A significant assumption in these calculations is that the success of the small-scale interventions can be extrapolated to the level of the entire population. The improvements cited have varying relationships to the current trends. In the case of *trans* fatty acids, target consumption under the mid-range scenario is in line with the rapid

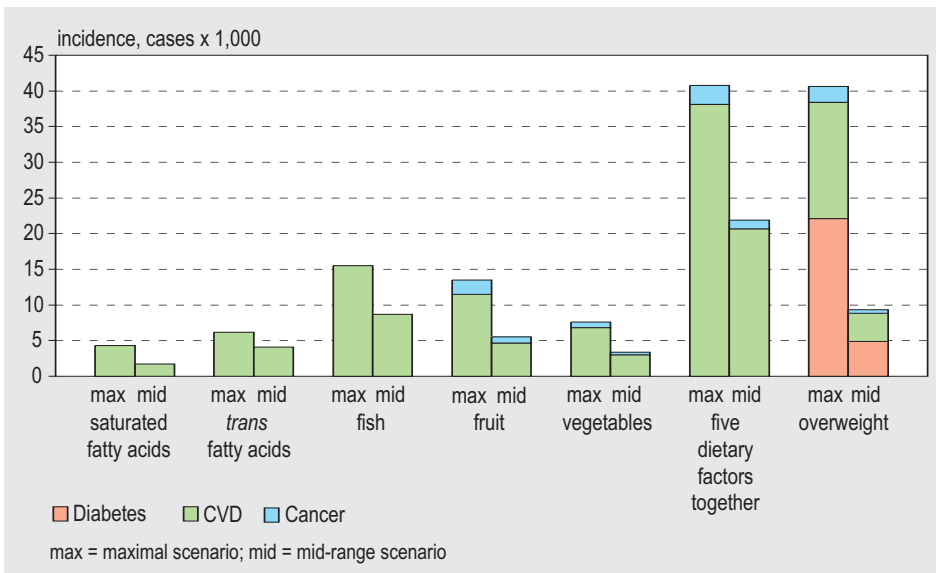


Figure 3: Reduction in annual incidence of disease in the Netherlands: maximum and mid-range scenarios.

decline seen in recent years. By contrast, the mid-range target for fruit and vegetable consumption is at odds with the trend of recent years. The targets for saturated fatty acids and fish consumption are somewhere in the middle.

Concerning the fatty acid intake, the mid-range scenarios are somewhat less ambitious than the objectives stated in the Dutch government's policy document "*Langer Gezond Leven*" (Living longer in good health). The policy's target for saturated fatty acids is a reduction to 10 energy per cent by the year 2010, while that for *trans* fatty acids is a reduction to 1 energy per cent. These figures are in line with the dietary recommendations. The policy does not state any specific target for fish consumption, and while it does seek to increase consumption of fruit and vegetables, no firm figures are stated.

***f. Only through firm action to tackle overweight substantial health gains can be made***

The results of small-scale experiments suggest that an average weight loss of three kilograms per person (1 BMI unit) is possible. The health gain that such a weight reduction would yield is in the order of *one quarter* of the maximum incidence of death and disease attributable to overweight (see *figure 3*). However, the current trend runs in the opposite direction: over the past 15 years, average body weight has actually *increased* by three kilograms and it may be expected that in particular the number of persons with obesity will continue to rise. The policy objective is to at least stabilize the current level of overweight, thus curbing the trend. The health loss that will be avoided in this manner is also in the order of *one quarter* of the current maximum incidence of death and disease attributable to overweight.

Compared to the health gains to be achieved under the mid-range scenario for dietary composition, that achieved by reducing overweight will be less marked. Overweight is therefore a more difficult problem to counter than an unfavourable dietary composition.

***g. Without interventions it is unlikely that the Dutch will eat more healthily in the future***

Experts predict that the current trends in eating habits and in the types of food available on the market will continue for the coming 5 to 10 years (see *textbox 1*). Despite a growing number of new foods which are appropriate to a healthy diet, the overall range of products available will not become any healthier due to the even greater increase in unhealthy products. Consumers will buy more 'convenience foods' and the consumption of snacks, larger portions and products which are energy-dense will continue to rise.

Expectations are that the unfavourable effects will dominate. Children, teenagers and people with a lower socio-economic status will form a high-risk group in view of the over-consumption of energy-dense products which contain few other nutrients and are made particularly attractive by their strong sweet or salt flavour. Moreover, healthy food is generally more expensive. Without active social pressure to reverse these

**Textbox 1: Likely developments which will influence healthy and unhealthy dietary patterns in the Netherlands.**

*Greater availability of*

- Products with improved nutritional quality, including healthy convenience foods (+)
- Energy-dense products (-)
- Unhealthy convenience foods (-)
- Larger portions (-)
- Functional foods and dietary supplements (?)

*Eating habits*

- Shift towards convenience foods (overall balance: -)
- Shift towards larger portions and energy-dense products (-)
- More people who fail to eat breakfast (-)
- More snacks and other forms of ‘grazing’ (?)

+ : expected effect is favourable to public health; - : expected effect is unfavourable to public health; ? : nature of effect is currently unknown

trends, a negative effect on public health may be expected, especially in terms of the number of people suffering from overweight and various chronic diseases.

## 2.2 How safe is Dutch food?

### a. The Dutch food has become safer in several respects, due to a high level of consumer protection

Over the last decades, national and international governments have introduced an extensive system of legislation, standardization and control in the field of food safety.

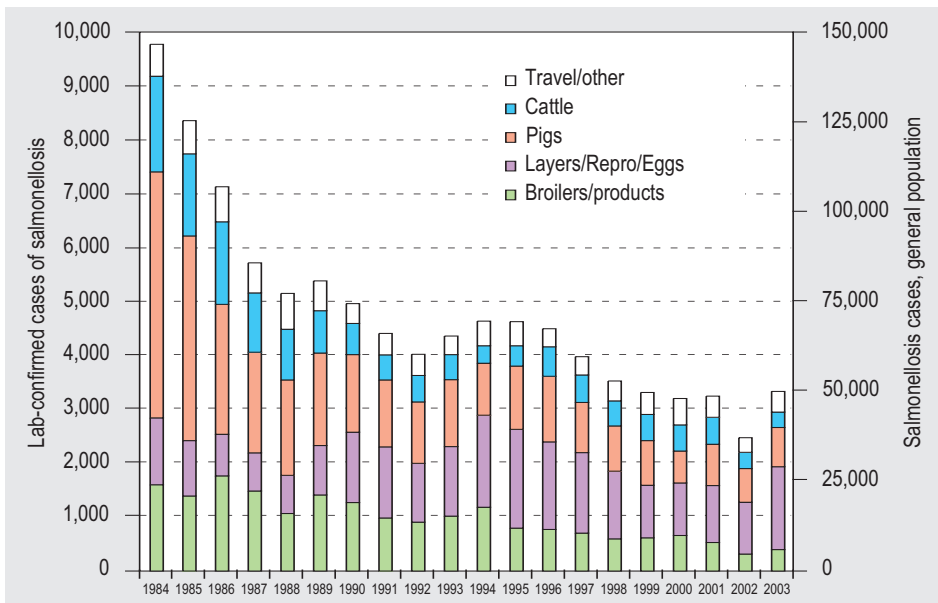


Figure 4: Trends in salmonellosis in the Netherlands.

Producers have also introduced many more measures designed to enhance food safety. The food consumed in the Netherlands is therefore safer in many respects than it was in the past. This is clearly demonstrable in the case of a number of microbiological and chemical contaminants. For example:

- In the Netherlands, the incidence of food poisoning caused by *Salmonella* bacteria fell from approximately 150,000 cases in 1984 to approximately 50,000 in 2003 (see figure 4).
- The concentration of dioxins and PCBs in human milk in the Netherlands has halved over the past 10 to 15 years due to the reduction in exposure through foods.

The food-related incidents that have occurred in the Netherlands in recent years have had little or no effect on health. However, they do erode consumer confidence and serve to highlight shortcomings which still exist within the current food safety system.

#### ***b. And yet food infections remain an obstinate and persistent problem***

Based on population surveys, it is estimated that there are approximately 4.5 million cases of gastro-enteritis (inflammation of the stomach and small and large intestines) each year. Of these, one third (i.e. 1.3 to 1.7 million) are thought to be due to a food infection (see text box 2). Between them, four types of bacteria and viruses are responsible for approximately half of all identifiable food infections: *Campylobacter* spp., *Salmonella* spp., *Clostridium perfringens* and the noroviruses.

#### **Textbox 2: Estimated annual incidence of gastro-enteritis due to food infections in the Netherlands.**

|  |                        |
|--|------------------------|
| Total number of gastro-enteritis cases | 4.5 million            |
| Number with known causative agent      | 1.6 million            |
| Number due to food infection           | 0.3-0.7 million        |
| Number not due to food infection       | 0.8-1.3 million        |
| Number with unknown causative agent    | 3 million              |
| Number possibly due to food infection  | 1 million <sup>1</sup> |
| Number not due to food infection       | 2 million <sup>1</sup> |

<sup>1</sup> These figures have not been empirically tested but are based on the ratio of 1:2 among the cases of gastro-enteritis with a known pathogen.

Alongside the acute and usually mild health effects of gastro-enteritis, there are also a few hundred cases of serious illness which can be attributed to food infections involving a known pathogen. They include cases of toxoplasmosis, Guillain-Barré syndrome, Haemolytic-Uraemic Syndrome and listeriosis. Between 20 and 200 persons die as the result of food poisoning each year.

Expressed in DALYs, the estimated health loss due to food infections with known causative agents is approximately 1,000 to 4,000 per annum. This is comparable to the health loss due to AIDS or bacterial meningitis. However, this figure is probably an underestimate given the unquantifiable contribution of food to the large number of gastro-enteritis cases due to (as yet) unknown causative agents.

*c. There are also chemical food constituents and contaminants responsible for some degree of demonstrable health loss*

The health loss due to the presence of chemical food constituents or contaminants is more difficult to quantify than that due to microbiological contamination. A distinction is drawn between chemical *contaminants* and those chemical components which are naturally present in certain foods, such as nitrates, natural toxins and allergens.

In the case of chemical contamination, there are usually no acute effects but there can be chronic health effects, such as cancer, which become apparent only after a long period. Because of the delay involved, such effects can rarely be directly attributed to exposure to anyone chemical substance. Estimates of safe (and unsafe) intake levels are usually based on experiments involving animals. The safe intake levels for many chemical food contaminants have been established in this way. In general, the intake of such substances in the Netherlands is well below the identified safe levels.

*Table 2* provides an overview of the chemical substances found in food and posing some health risk, together with an estimate of the possible health gain (in DALYs) if exposure to these substances is avoided outright.

- In the case of allergens and certain natural toxins (phycotoxins and phytotoxins) there can indeed be an immediate and observable health effect. It is estimated that food allergies account for an annual health loss in the order of 1,000 DALYs. However, allergens form a separate category since the effects are partly due to genetic susceptibility and therefore vary from one person to another. They can also be avoided by a careful choice of food. The overall health loss due to the presence of natural toxins is smaller than that due to allergens.
- In the case of nitrates and nitrites, as well as a number of chemical substances which do not occur naturally in food (PAHs, acrylamide), estimates suggest that long-term health effects can arise in the form of cancer. Here, the estimated theoretical annual health loss is in the order of 500 to 1,000 DALYs.

Although information concerning developments over time is not available for some aspects, the general impression to be gained from the current information is that the Dutch food is now safer than it used to be. However, given the nature of the estimation methods used, it seems likely that the *microbiological* contamination levels (based as they are solely on information concerning proven food contamination by known agents) have been *underestimated*. Conversely, the health risks posed by *chemical* contamination of food are more likely to have been *overestimated*, since these often concern incidental measurements in excess of the identified safe levels, and because of the safety factors used and/or the conservative method of risk assessment applied (particularly with regard to genotoxic carcinogens).

To summarize, the main food safety problems are currently represented by microbial food infections and allergens, and by the (unavoidable) occurrence of food-related incidents. It remains unclear whether the number of people suffering some form of

Table 2: Chemical substances in food, with health risks and the possible health gains if exposure is avoided in the Netherlands.

| Substance category  | DALYs to be gained | Comments  |
|---|--------------------|---|
| Allergenic proteins etc.  | 1,000              | Figure gives rough estimate for allergens in foods, such as shellfish, fish, milk, nuts, wheat, etc.                |
| Mycotoxins (aflatoxins, etc.)   | < 1                | Figure relates specifically to aflatoxin B1   |
| Phycotoxins (DSP, ASP)  | 10-70              |   |
| Phytotoxins (anisatin)  | < 1                |   |
| Nitrates/nitrites   | 100-500            | Figure relates specifically to nitrosamines formed  |
| Growth agents (non-natural analogues such as clenbuterol)                 | 1                  |   |
| Process contaminants (Polycyclic aromatic hydrocarbons[PAHs], acrylamide) | 300-700            | Figure relates mainly to acrylamide. The number of DALYs to be gained through avoidance of PAHs is between 5 and 10 |

food allergy is increasing. The Dutch Health Council is currently collating the available scientific knowledge in this respect.

***e. Food safety will continue to improve but new threats are likely to emerge***

According to the experts, the measures taken by the government and food producers will ensure that our food becomes even more safe than it already is (see *textbox 3*). This will largely be due to better control systems and the use of decontamination methods for microorganisms on products of animal origin. However, no reduction in the incidence of microbiological contamination may be expected where this is due to incorrect storage and preparation on the part of the consumer. In fact, it is thought that the consumer's knowledge of food preparation and the necessary standards of hygiene is declining. In addition, new threats due to the globalization of food production and the food market will continue to demand attention. It may be expected that the favourable effects will outweigh the unfavourable effects, but only if the current level of protection is maintained and due attention is devoted to new threats.

**Textbox 3: Likely developments in food supply and consumer conduct which will determine whether food becomes more or less safe in the Netherlands.**

*Food supply*

Better control systems due to extensive implementation of the Hazards Analysis Critical Control Points (HACCP) system (+)

More industrially prepared products in combination with better control systems (+)

More use of decontamination methods (+)

More products from other countries

- Longer turnaround time of products (-)
- Less adequate control systems and inspections in some countries (-)
- Import of new bacteria and viruses, or re-emergence of known bacteria and parasites which were previously eradicated (-)

New products with new potential problems, such as the storage of pre-prepared products in shops (-)

More products with the same additions, e.g. many products having the same bio-active ingredients or natural flavourings (accumulation effect) (-)

More products with higher levels of contaminants due to the harmonization of international legislation favouring those countries in which less stringent rules apply (-)

More contaminated products due to reduced government involvement and supervision (?)

Lower priority of food safety in times of economic recession (?)

Less effective mild preservation techniques (?)

Second generation of genetically modified crops (?)

*Food preparation by consumer and catering establishments*

More information provided to the consumer, but less knowledge on the part of the consumer with regard to hygiene in food preparation (-)

+: expected effect is favourable to public health;

- : expected effect is unfavourable to public health;

? : nature of effect is currently unknown

## 2.3 Healthy diet and safe food in balance

Many people and organizations make choices with regard to food, based on their own perspectives, in which health and safety play a role: consumers, food producers, the catering industry, organizations which produce the guidelines for a healthy diet, and the government which must make decisions on the collective efforts to be directed towards the promotion of a healthy diet and the improvement of food safety. Sometimes those decisions will relate to a single ingredient, food or product, while on other occasions they will relate to entire groups or batches of products. Interests other than those of health alone are also part of these decision making processes.

In this report, the positive and negative effects on public health are considered by bringing these aspects into balance by means of three questions:

1. What is the relationship between health loss due to an unhealthy diet on the one hand and unsafe food on the other?
2. What is the relationship between 'healthy' and 'safe' with regard to four common food items for which specific recommendations exist?
3. How is this relationship with regard to new developments such as the use of functional foods and dietary supplements?

In all comparisons, once again the concept of DALYs is used.



***a. The health loss due to unhealthy diet is many times greater than that attributable to unsafe food***

When set against the health loss due solely to unfavourable dietary composition (245,000 DALYs), i.e. leaving the loss due to overweight aside, the estimated annual health loss due to microbiological food infection involving known pathogens (1,000-4,000 DALYs) and chemical constituents (1,500-2,000 DALYs) is rather limited. The health loss due to unfavourable dietary composition is approximately 40 to 100 times greater than that due to unsafe food. Overweight also accounts for a far greater annual health loss (215,000 DALYs) than unsafe food.

***b. The health gains to be made through the consumption of more fruit and vegetables, whole grain products and fish, as well as through breastfeeding, are many times greater than the health risks involved***

Any food or group of foods may have both favourable and unfavourable health effects. This can be confusing for the consumer, particularly when the official dietary guidelines recommend increased consumption of fish, fruit and vegetables, while it is recognized that these products can also contain certain harmful contaminants. The balance between 'healthy' and 'safe' is therefore made up for four groups of common foods for which specific recommendations exist:

- Fruit and vegetables: leafy vegetables can contain relatively high levels of nitrates, while pathogenic microorganisms may be found on all raw fruit and vegetables. They may also contain phytotoxins.
- Fish can contain dioxins or PCBs.
- Whole grain cereal products (an important source of dietary fibre) can be contaminated with mycotoxins derived from fungi.
- Human breast milk can contain dioxins and PCBs, while it is possible for an HIV-positive mother to transfer the virus via the milk.

The annual health gains to be made by following the consumption levels currently recommended (the maximum scenario) vary from approximately 1,000 to 2,400 DALYs (breastfeeding) to almost 100,000 DALYs (fish, fruit). Compared to these figures, the risks attributable to known contaminants, insofar as they are quantifiable, are usually some 100 times lower. In some cases the risks are even negligible.

This does not mean that no further consideration needs to be given to contaminants. Rather, it highlights the success of the system of standard setting and control that has been developed in recent decades, as well as the necessity of ensuring that this system continues to adapt to new scientific insights and developments in both food supply and food consumption.

***c. The health claims of functional foods are often unproven and the over-consumption of bio-active ingredients can itself pose a risk***

The recommended diet will include all necessary nutrients. In recent years, however, a number of products have emerged for which the manufacturers make certain health claims. These are the so-called functional foods and dietary supplements.

Research into any positive or negative health effects of these products is still in its early stages. Because legislation as yet is inadequate (although developing rapidly) consumers can easily be misled by extravagant advertising claims.

For the vast majority of functional foods and dietary supplements now on the market, there is not only insufficient evidence for the *presence* of beneficial health effects, but also for the *absence* of detrimental effects. It is therefore not (yet) possible to make useful considerations of their contribution to public health. Only in the case of a few dietary supplements, such as folic acid and vitamin B6, can firm statements be made:

- It has been shown that expectant mothers who take supplements containing folic acid at an early stage of their pregnancy can reduce the likelihood of birth defects (such as spina bifida). It has also been established that no health risks are attached to the use of such supplements.
- In the case of vitamin B6, the risk of overdosing exists, while there are no demonstrable positive effects attached to the use of the supplement. Approximately 16% of the products containing vitamin B6 which are currently on the Dutch market, contain a dose which (far) exceeds the established safe upper level of intake. Moreover, the ordinary daily diet will contain sufficient vitamin B6 and no groups with any deficiency are known.

The dosage of vitamins and minerals in many 'enriched' foods remains relatively low. Often it is comparable to the quantity which will be found in an ordinary daily diet (the 'Recommended Daily Intake'). There are also generally no indications of health risks attaching to most of the vitamins and minerals contained in dietary supplements. Nevertheless, the dangers of overdosing are represented by the dietary supplements, since the concentrations of vitamins and minerals in such products are very much higher than in the enriched foods. However, no information is available concerning the consumer's *usage* of vitamin and mineral supplements with high dosages, nor about the trends in the use of supplements in general, since the most recent national Food Consumption Survey conducted in 1998.

***d. The consumer often considers risks in a different perspective to that of science***

Although the health loss due to an unhealthy diet is far greater than that due to unsafe food, consumers often view matters in a different perspective. They usually attach more weight to those risks which are beyond their sphere of influence, rather than to those which are due to their own choice of food and eating habits. Accordingly, food safety issues are often regarded as more serious (risk perception) and result in greater public disquiet than any unhealthy aspects of a diet which is not in line with the recommendations. The government and food producers must take this phenomenon seriously and must gain a better understanding of the underlying mechanisms. This is necessary not only to ensure adequate risk communication with the public, but also to maintain consumer confidence.

### 3 Significance of the findings

#### *a. What are the priorities?*

Priorities for policy are determined by several factors, such as the potential health gains, current trends and expectations, the feasibility of interventions, the balance between measures addressing a healthy diet and those directed at food safety, the costs of the measures, and so on. When these factors are taken into account, but leaving the question of costs aside, three important priorities in the field of healthy diet and safe food can be identified.

#### **Priority 1: The promotion of a healthy diet, which involves a two-pronged approach:**

- *Reduction of overweight and obesity*

The calculations presented show that the maximum health gains achievable through the reduction of overweight are no greater than those to be made through the improvement of dietary composition. Nevertheless, there are various reasons to tackle the problem of overweight as a matter of the greatest urgency. Firstly, we see an unfavourable trend: the prevalence of overweight and obesity continues to increase, the rise being greatest among children and young people which would suggest an even more acute problem in the future. Secondly, the seriousness of the obesity problem has long been underestimated, despite the scientific community having drawn attention to the upward trend in the 1980s. Only in the last few years has targeted attention been devoted to overweight at the national and international political level. Thirdly, it would appear that the health loss which can be obviated by means of feasible weight-related interventions is relatively small (approximately 25% of the total). A major societal effort will therefore be required to ensure that the prevalence of overweight in the Netherlands does not rise further, and to avoid reaching the situation that can already be seen in the United States and the United Kingdom.

- *Promotion of a healthy composition of the diet*

It would not be appropriate to base policy solely on the reduction of overweight. A proper composition of fatty acids in the diet, regular fish consumption, and an adequate intake of fruit and vegetables can do just as much in reducing the incidence of cardiovascular diseases and cancer, quite aside from the considerations of achieving a proper body weight. When we look at the health gain thought achievable on the basis of previous small-scale experiments, we see that the effect of a proper dietary composition (based on the five dietary factors) is more than double that of the reduction in overweight. The trend is currently positive with regard to some factors (saturated fatty acids, *trans* fatty acids and fish consumption) but the decreasing consumption of fruit and vegetables is still worrisome. There are also a number of vulnerable groups in the Netherlands, such as the very young and the very old, who face specific dietary problems which must be addressed separately. For example, very few babies under three months are now breastfed. And there is also some malnutrition with resulting vitamin and mineral deficiencies among the elderly.

**Priority 2: Maintenance and, where possible, improvement of the current high level of food safety**

In the current situation, it is clear that the health loss attributable to unsafe food is many times smaller than that due to an unhealthy diet. This is largely due to the fact that an effective system of food safety measures and control has been developed in recent decades. Clearly, this system must be maintained. However, it is appropriate to ask what maintenance level will be required in the future in the light of existing and newly emerging threats.

**Priority 3: Better risk assessment methods and improved risk communication with the consumer**

Food safety incidents, both large scale and small scale, will continue to occur. Human error, malfeasance and new 'surprises' can never be ruled out. The 'zero-risk' situation is therefore unattainable. In order to limit the impact of incidents, a more effective assessment of the actual health risks is required, together with a better risk communication with the consumer. As uncertainty regarding the extent to which risks are known and the social complexity (the number of stakeholders and conflicting interests) increase, so must a more open societal discussion be conducted.

***b. Investing in a healthy diet is just as important as investing in other healthy lifestyle factors***

In order to place the health loss attributable to an unhealthy diet and unsafe food in perspective, *table 3* presents a comparison of the health loss (in DALYs) due to these factors and that due to other lifestyle factors. The health loss for various environmental factors is shown in order to put in perspective the part played by food safety. Lastly, a comparison is made with the health loss due to a number of significant diseases, irrespective of the causes of those diseases. Because the calculations are particularly complex and the underlying data bear uncertainties, the comparison is broad, the health loss being presented in categories.

The comparison shows that the overall health loss due to an unhealthy diet is in the same order of magnitude as that caused by smoking. The theoretical health gains which could be achieved merely by adopting a proper dietary composition (based on all five factors studied) is in the second place and is of the same order as that of reducing obesity (shown here as 'energy balance') or of increasing physical activity. Moreover, it is shown that a proper dietary composition could provide health gains equivalent to the overall health loss due to the most common diseases in the Netherlands, including coronary disease and depression.

***c. Investing in food safety is just as important as investing in combating infectious diseases or in other environmental factors***

*Table 3* also shows that the demonstrable health loss due to microbiological contamination of food is comparable to that due to a number of significant infectious diseases such as AIDS. In the case of chemical contamination, the health loss is lower than that of a number of major environmental factors. However, the health loss due to allergens

Table 3: Annual health loss (in DALYs) due to dietary factors and energy balance, against other lifestyle factors, environmental factors and disease categories in the Netherlands.

| DALYs lost      | DIET   |   |                                      | OTHER   |                                  | DISEASES  |
|-----------------|--|---|--------------------------------------|---|----------------------------------|---|
|                 | Dietary factors  | Microbiological contamination                     | Chemical contamination               | Other lifestyle factors                                 | Environmental factors            | Selection from Public Health Status Forecasts report 2002                             |
| > 300,000       | Unhealthy diet total <sup>1</sup>  |   |                                      | Three lifestyle factors combined <sup>2</sup> , smoking |                                  | Cardiovascular diseases, all cancers  |
| 100,000-300,000 | 5 dietary factors together, energy balance <sup>3</sup>                  |   |                                      | Lack of physical activity                               |                                  | Coronary disease, depression, lung cancer, diabetes, alcohol-dependency               |
| 30,000-100,000  | Too much <i>trans</i> fatty acids, too little fruit, vegetables and fish |   |                                      | Alcohol consumption <sup>4</sup>                        |                                  | Road traffic accidents, breast cancer   |
| 10,000-30,000   | Too much saturated fatty acids   |   |                                      |   | Particulate matter in atmosphere | Schizophrenia, prostate cancer, influenza   |
| 3,000-10,000    |  | Gastro-enteritis caused by microorganisms in food |                                      |   | Passive smoking                  | Upper respiratory tract infections, HIV/AIDS <sup>5</sup> , stomach/intestinal ulcers |
| 1,000-3,000     |  |   |                                      |   | Radon (interior)                 | Bacterial meningitis, bacterial STDs <sup>5</sup> , tuberculosis                      |
| 300-1,000       |  | Campylobacter in food                             | Allergens, acrylamide                |   |                                  |   |
| < 300           |  | STEC 0157 <sup>5</sup>                            | PAHs <sup>5</sup> , other substances |   | Various substances               |   |

<sup>1</sup> Here, 'unhealthy diet' relates to the overall health loss due to the dietary composition (the five modelled dietary factors together, in relation to cardiovascular diseases and the relevant types of cancer) plus the proportion of the health loss attributable to overweight (due to a positive energy balance).

<sup>2</sup> This relates to the combined effects of smoking, lack of physical activity or excessive alcohol consumption on cardiovascular diseases, diabetes mellitus and the relevant types of cancer.

<sup>3</sup> The energy balance is the dietary factor which accounts for the development of overweight. The health loss due to overweight has been modelled using BMI as indicator. Overweight can also be caused by lack of physical activity, which falls under 'other lifestyle factors' in this table.

<sup>4</sup> It is assumed here that moderate alcohol consumption (one to three units per day for men and up to two for women) prevents cardiovascular diseases compared to total abstinence. The health loss due to alcohol dependency is shown in the seventh (right-hand) column.

<sup>5</sup> AIDS: Acquired Immune Deficiency Syndrome; STD: Sexually Transmitted Disease; STEC: Shiga-toxin-producing *Escherichia coli*; PAHs: Polycyclic Aromatic Hydrocarbons.

and acrylamide is greater than that caused by various substances found in the environment.

In the context of health protection, allergens must be considered separately since most are ordinary constituents of certain foods, that elicit greatly varying effects on different people. The most important form of protection is the avoidance by susceptible individuals of foods known to cause allergic reactions, and not the removal of allergens from the products concerned. Proper information concerning the presence of potential allergens in products is essential in order that the consumer can make well-informed choices.

## 4 Opportunities for prevention

What is required to address the three priorities successfully, and what part is to be played by the three parties most closely involved: the private sector, the consumer and the government? The answers to these questions will largely be determined by our knowledge of the factors which influence the dietary problems concerned, the points of policy action which can be derived from this knowledge, and the feasibility and returns of the proposed measures. It will be useful to review the successes and failures of the past, as well as scientific insights into the psychology of behavioural change and risk perception.

The key elements in ensuring a healthy diet are the supply side (the food available), social norms and customs, and the consumer's behaviour (purchasing and eating habits). In the case of food safety, the entire food chain is important: from production to storage and preparation in the kitchen. The private sector, the consumer and the government each have a specific role in promoting a healthy diet and food safety.

### *a. Approach and opportunities for the promotion of a healthy diet are not the same as those for smoking*

According to modern views on health promotion, prevention is particularly effective if the interventions rely on an integrated approach. Such an approach not only addresses people directly about their personal behaviour, but also modifies the physical and social environment in such a way as to encourage desirable behaviour and discourage undesirable behaviour. This form of integrated approach is probably the success factor in the United States' reduction of smoking, and is now being similarly used in the Netherlands. The approach entails a combination of health related information about stopping smoking, pricing measures, smoking bans in public places, other legislation and a shift in social norms. There is close cooperation between health institutes, the government, industry and the scientific field, and interventions are adapted to the 'settings' which are important to children and adults, such as school and the workplace.

Much can be learned from the interventions to discourage smoking. However, it must be realized that there are marked differences with regard to diet and eating habits. In the case of smoking, there is a clear and unequivocal message: it is bad for you and for the people around you. While a person's overweight may cause some concern or inconvenience to others – as in prolonged or regular sick leave, greater nursing requirements or in the surgical situation – our eating habits are largely based on the necessity of eating, and are unlikely to cause any real harm to others. Accordingly, the relationship between the government and the production industry is different. In the case of smoking, the government's health promotion activities are diametrically opposed to the financial interests of the tobacco industry. In the case of food, the government actually needs the industry to produce healthy products which are appropriate to a healthy diet, while at the same time, that government must contend with an industry which currently produces and promotes many unhealthy products. A further consideration is that the healthy diet message is more complex than the non-smoking message, because the consumer must choose from a large and very diverse range of foods, some of which can have both favourable and unfavourable effects on health. However, the comparison with smoking demonstrates that intensive and creative efforts are required if changes are to be brought about successfully.

***b. The private sector must devote greater attention to healthy and safe food***

There are many ways in which food producers, wholesalers and the catering industry can help to combat overweight, to promote a healthy diet and to improve food safety.

*Greater availability of healthy products, and less advertising for unhealthy products*

Alongside lack of physical activity, the cause of the rise in obesity is to be found in the overabundant supply of (energy-dense) foods in shops, workplace canteens and school dining halls. The advertising of unhealthy products is also a contributory factor. Convenience, flavour, price and acquired habits are the factors which determine the consumer's eating patterns. The private sector can use all these factors in promoting a healthier diet. The recently modified policy of the Dutch food producers federation (VAI), and its code of conduct for advertising and promotional activities, remains inadequate in this respect and can be improved.

*Improved product composition and innovative product modification*

There are many ways in which foods can be modified in order to render the 'healthy choice' the 'easy choice', without requiring consumers to alter their eating habits very much. In some cases, product modifications require no behavioural change at all on the part of the consumer. Examples from the past include the addition of iodine to table salt and the altered fatty acid composition of margarines. Moreover, such changes do not have to limit the consumer's choice. Rather, there are excellent opportunities whereby an extremely varied range of products can be offered: something to appeal to every taste.

*The maintenance and improvement of food safety in the light of new circumstances*

Safe food is a precondition of healthy eating. The maintenance and further improvement of food safety begins with the awareness of its importance. It does appear that there is indeed a high level of awareness in the Netherlands. Two aspects will be important in future: enhanced food safety in the animal (derivatives) food chain, by such means as ensuring good hygiene in the primary production phase and in the final phase of actually preparing the food, and by introducing more effective quality control for (new) ingredients and production chains.

*Improved consumer information*

Clear information, such as labelling to indicate the nutritional and safety aspects of a product, can help the consumer to make a sound choice with regard to both a healthy diet and safe food (avoidance of allergens). New and creative forms of information and labelling are required to enable the consumer to find the desired product information quickly and easily. The current labelling forms are not fully effective. The information must also take the consumer's perception of risk into account.

***c. Consumers should be more aware of the advantages of a healthy diet, the disadvantages of overweight and an unhealthy diet, and the importance of hygiene during food preparation***

*A cultural shift is required*

There will always be healthy and less healthy food products on the market. The most important requirement is a cultural shift on the part of the consumer and in the general social setting. There must be increased awareness that healthy food can also be enjoyable, while overweight and an unhealthy diet cause inconvenience, discomfort and disease. To date, the general public does not seem to be fully aware of the threat that an increase in the prevalence of overweight represents. However, it is important that this cultural shift is not based on any stigmatization of persons with overweight. The consumer is responsible for his or her own behaviour and, taking personal health interests into account, must take a personal decision to eat less or take more physical activity.

Consumers must also realize that there is no such thing as 100% safe food, and that they are the last link in the food safety chain. They themselves are responsible for observing the expiration dates on packages, ensuring good hygiene in the kitchen to prevent cross-infections, and for the thorough cooking of products, particularly those of animal origin.

*Awareness and information must be accompanied by practical skills*

There are many people who wish to eat more healthily or to lose weight. However, a large proportion of the population does not know which foods are healthy and which are not, and may be confused by complex or contradictory messages. The consumer can only assume his responsibility if he has adequate knowledge about a healthy diet and about safe food, and if he possesses the skills required to put that knowledge into practice. However, the influence of the sheer size of the product range available,



advertising and other (social) factors is so great that many people – particularly younger consumers – are not able to offer adequate resistance. This underscores the importance of the task awaiting consumer and educational organizations in providing good support.

***d. The government must provide a strong impulse to the collective interests of a healthy diet, reduction of overweight and enhanced food safety***

A healthy diet, the reduction of obesity rates and the promotion of food safety are all collective interests. Accordingly, the government has a part to play. In recent decades, the main emphasis of food policy has been on safety. The analysis offered by this report suggests that the reduction of overweight and the promotion of a healthy diet should be given higher priority than has hitherto been the case, without the current high level of food safety being adversely affected.

*The emphasis should now be on effective implementation of the food policy*

In the field of overweight (and the healthy diet) the government has opted to implement a preventive approach in partnership with a broad coalition of stakeholders. The approach, set out in the government's policy document 'Living longer in good health', addresses both lifestyle factors and environmental factors which encourage a healthy diet and sufficient physical activity. However, the emphasis should not be solely on overweight and energy balance, thereby masking the significant influence of a proper dietary composition on the prevalence of certain chronic diseases (both in association with and aside from overweight). In the parliamentary debate of the Dutch government policy, the emphasis is placed on the personal responsibility of the consumer and on the voluntary cooperation of the private sector. This is contradictory to the causal analysis made by experts, who call for the emphasis to be placed on the physical and social environment.

*Legislative measures may be useful in promoting a healthy diet*

For healthy diet and eating habits, the government seeks considerably less influence than for food safety, preferring to leave many aspects to societal forces. Food safety involves the use of legislation, sanctions, controls, inspections and supervision. It is felt that the interests of a healthy diet are better served by voluntary agreements and information. This difference in approach may be justified in terms of the principle of health protection that applies to food safety. However, as this report makes clear, the promotion of a healthy diet requires a strong push by the government and by society itself. If incentives and voluntary agreements do not have the desired effect, legislation may prove appropriate. For example, measures could be introduced to curb advertising which targets children, or to stipulate which products may and may not be offered in schools or public places. The approach adopted to counter smoking can serve as an example.

*New safety risks call for a new approach*

In the field of food safety, the government's focus is shifting towards the safety of the entire food chain, whereby all parties including the consumer have a certain responsi-

bility, and on crisis management. In addition, consumer confidence in food safety (and the restoration of that confidence) has been high on the political agenda for some years. A strategy which is solely geared towards increasing food safety by means of ever more stringent standards will not be enough. The government must also involve the consumer in the decisions that have to be made, and must render its policy more transparent in order to achieve broader public support. Measures should be introduced requiring manufacturers to substantiate the health claims they make on behalf of functional foods and dietary supplements, thereby protecting the consumer against false claims. European legislation is currently being drafted in this regard. The methodology for quantitative comparison of positive and negative health effects must also be developed further. Finally, in view of the ongoing globalization of food production chains, improved methods must be developed to trace the exact origins of products and their ingredients.

## 5 Monitoring and research

The original Dutch report answers many questions. It is able to do so because a large body of knowledge and information is available in the Netherlands. However, there are also some questions which have yet to be answered in full, either because they fall outside the scope of the report, because there are gaps in the knowledge, or because there are limitations in the continuity of the information flow. Moreover, new topics will emerge and will become important due to scientific and social developments. Four aspects especially demand further attention:

- The continuity of the national Food Consumption Surveys (VCP) and the supporting databases.
- Scientific research into the health and safety aspects of food and diet, and into better methodologies for the comparison of positive and negative health effects.
- Research into the determinants of consumer eating habits, and incentives whereby the private sector and other relevant parties can be encouraged to supply healthier and safer products.
- Research into the ways in which successful small-scale interventions can be implemented more widely. Here, the cost-effectiveness ratio must also be considered.

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**Measuring Dutch meals** Healthy and unhealthy diets receive a lot of attention nowadays, and there are good reasons for. Each year, overweight and unfavourable dietary composition account for thousands of new cases of illness and unnecessary deaths. The number of young people and adults which are overweight is increasing. Also food infections and allergic reactions to food constituents cause some health loss. This brochure addresses several questions. What is the health loss due to an unhealthy diet and unsafe food in the Netherlands? What are the causes? What can we expect in the future?

In the Netherlands, a substantial portion of the health loss can be prevented by a healthier diet and safer food. This requires an integrated strategy in which all parties involved become more active. The main opportunities are to be found on the supply side, i.e. in the hands of the private sector. But also the consumer has an important role to play by making the proper choices from a health perspective. The government must create the necessary conditions, and may be required to take enforcement actions where appropriate.

## Research for man and environment

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