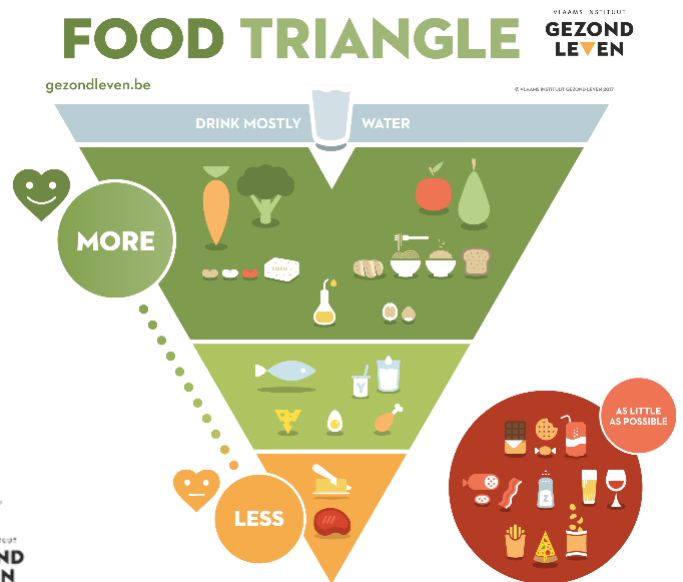


The food triangle and physical activity triangle: how and why?



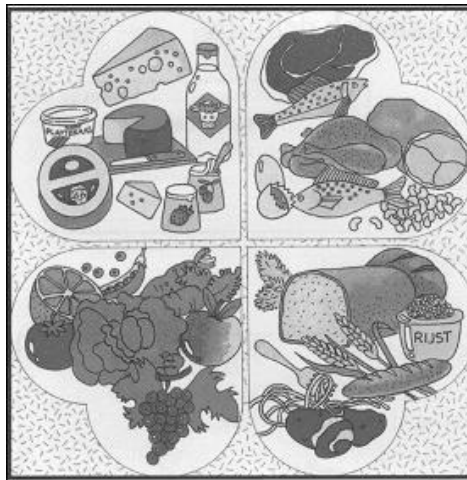
PHYSICAL ACTIVITY TRIANGLE VLAAMS INSTITUUT **GEZOND LEVEN**



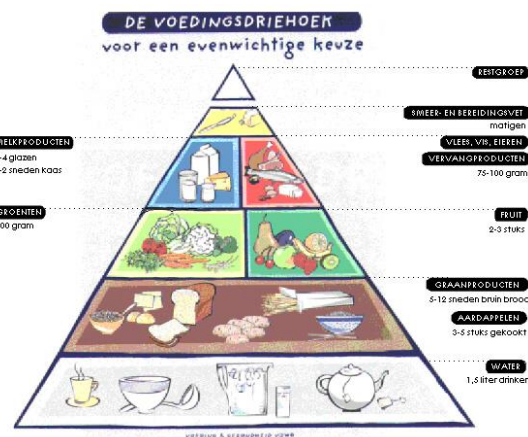
1.1 History

In Flanders, the first educational model focused on food was developed in 1967. It was known as the Four-Leaf Clover (*Het Klavertje Vier*). Thirty years later, in 1997, the Food Guide Pyramid (*De Voedingsdriehoek*) was published. In 2004, the Food Guide Pyramid was supplemented with a layer focused on exercise and movement. It was then renamed as the Active Food Guide Pyramid (*De Actieve Voedingsdriehoek*). In 2011, there was a limited content update. In 2017, the model was completely revised.

1967: The Four-Leaf Clover (*Het Klavertje Vier*).



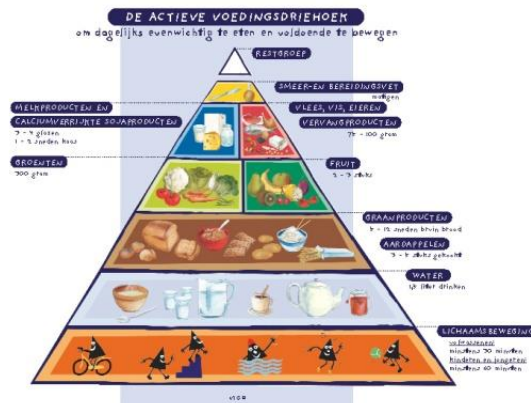
1997: The Food Guide Pyramid (*De Voedingsdriehoek*).



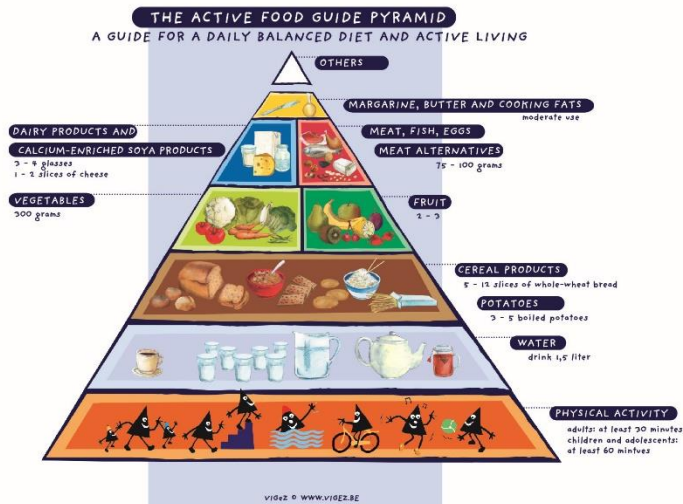
2000: Calcium-enriched soy products were added.



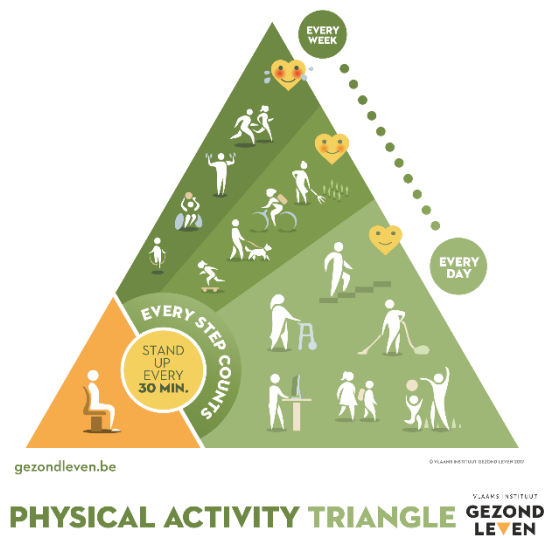
2004: The Food Guide Pyramid becomes the Active Food Guide Pyramid (*De Actieve Voedingsdriehoek*).



2011: Review of the Active Food Guide Pyramid. Adjustments to the recommendations and visual appearance: sedentary behaviour and sitting still for long periods were added to the 'Others' category on top of the pyramid and additional attention given to sodium (following advice from the Superior Health Council).



2017: The Active Food Guide Pyramid is replaced by two new models: the Physical Activity Triangle and the Food Triangle:



1.1 Why a new model?

From communication through professionals to direct communication with the public

The general public is constantly bombarded with information about health. Think about the internet and (social) media where there's advice from self-declared experts and experienced professionals, and irresponsible statements made by the media based on unreliable studies. Reliable information is often considerably more nuanced and as a result, sometimes seen as less interesting. It's difficult for the average citizen to know which information is correct. Reliable, scientifically supported information about nutrition, physical activity and sedentary behaviour (sitting still for long periods of time), and advice on how to convert this information into action is needed to help people lead healthier lives.

In 1997, the Food Guide Pyramid (*De Voedingsdriehoek* in Dutch) was developed with the following goals: giving professionals such as dieticians, doctors and teachers an instrument to provide targeted information and group explanations about a balanced eating pattern. Physical activity was added in 2004, resulting in the Active Food Guide Pyramid (*De Actieve Voedingsdriehoek*). Over the years, intermediaries and organisations have used the Active Food Guide Pyramid more and more frequently to communicate with the general public. In order to better fulfil these innovative goals, the Flemish Institute Healthy Living (*Vlaams Instituut Gezond Leven, formerly known as VIGeZ*) decided to redevelop the Active Food Guide Pyramid into two new models: one for healthy eating and the other focused on physical activity and avoiding sitting still for long periods of time.

The new models communicate clear and accessible messages about health. This corresponds with our ambition to communicate directly with **the general public**. The new models motivate people to take small steps to improve their health, and not to attempt major changes all at once; small changes are easier to achieve, increasing self-confidence. On its website at www.gezondleven.be, the Flemish Institute Healthy Living offers information and resources that motivate people to take the first step towards a healthier way of living.

The new model will form the outline for communicating with the general public, but also with **professionals**. To encourage people to eat more healthily, move more and sit still less, the distribution and implementation of this information and the offering of help through professionals such as dieticians, professionals in physical activity promotion, doctors and teachers is indispensable. Of course, for tailored advice, people are referred to these professionals.

The **environment** in which a person lives plays a part in determining (un)healthy choices. Making better choices is easier when healthier possibilities are accessible and encouraged. The content-based models will also be appeal to other influencers, such as producers, caterers, retailers and policymakers on local, regional (Flemish) and national (Belgian) levels.

New scientific insights

Over the past few years, the Active Food Guide Pyramid has undergone a number of small changes. When the Superior Health Council published a review of the nutritional recommendations for Belgium, or when scientifically supported recommendations on physical activity or sedentary behaviour were published, the Active Food Guide Pyramid was put under the microscope.

The recommendations of the Active Food Guide Pyramid were now reviewed once again after the update in 2011, taking into account the most recent scientific consensus, new starting points and recommendations were formulated, forming the foundation for the new models.

In the future, when new scientific insights emerge and a consensus on them is reached, it may serve as an introduction to once more adjust the models or the recommendations.

Lessons from the evaluation of the Active Food Guide Pyramid

In 2013, an external research bureau (TNS) made an evaluation of the Active Food Guide Pyramid to ascertain points for concrete improvement. The research gave insight into the way the Active Food Guide Pyramid is understood and used by the public and professionals. From the results, it appeared that some people had difficulties understanding the content. This was particularly the case for those who had not been introduced to the Pyramid at school.

For the general public, the model did not adequately encourage concrete action. It lacked a clear, explicit benefit (there was no reason to follow the recommendations), and strength in its applications and practical, tailored tips. Related materials that were available (derivative materials) remained too vague, there was sometimes too much jargon and it was not reader-friendly enough. Intermediaries found they did not know enough about the recommendations and there was a demand for more practical, tailored application possibilities.

With the new models, we want to offer solutions for the shortcomings of the previous Active Food Guide Pyramid.

1.2 Goals and target group

With the new models, Gezond Leven wants to make every Flemish person **aware** of the advantages of a healthy lifestyle, and **motivate** them to eat a more balanced diet, to exercise more and to limit sitting still for long periods.

A clear model with action-oriented messages is an important first step, but not sufficient for creating actual behavioural changes. The models **lead to** reliable information, including the website www.gezondleven.be and supporting materials and instruments about healthy eating, physical activity and sitting still for long periods. Furthermore, the models and the starting points are also the foundation for methods that aim to further stimulate behavioural changes in the general public or specific target groups, such as children, the elderly and disadvantaged groups.

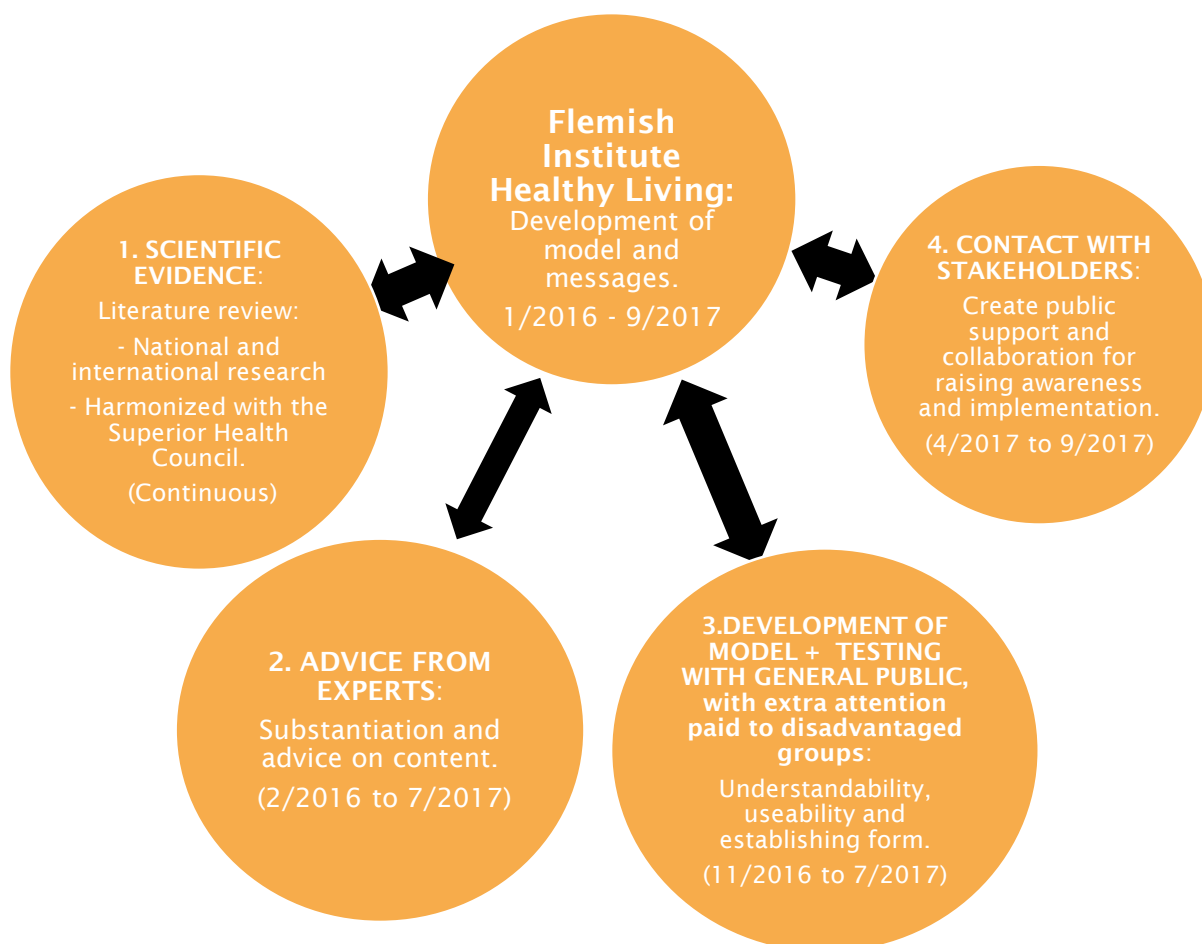
The following points have been used as a premise for the development of the new model:

- Accessibility for members of the general public.
- A low threshold and high motivation.
- Full recognition of both physical activity and sedentary behaviour (sitting still for long periods).
- A focus on changes that deliver the greatest health benefits on the level of the population as a whole.
- A broad view of healthy eating on the level of foods and eating patterns, sustainability, etc.
- In line with the Superior Health Council's scientific guidelines for nutrition and nutrient intake, recent high-quality research and international guidelines on nutrition, physical activity and sedentary behaviour (sitting still for long periods).

The target group for the models is the **general public, as from the age of one year**. The recommendations in the models are at the level of the population as a whole. For individual recommendations, e.g. for medical reasons, for losing weight, when pregnant or breastfeeding, intense sport, etc., it is advised to seek tailored advice from a professional. For this, the models can serve as a foundation.

1.3 Process development model

Schematic presentation of the process development for the Food Triangle and Physical Activity Triangle.



Based on scientific research

At the start of the development of the new models, diverse literature studies were conducted to gather the most recent information on certain subjects:

- Investigative evaluation of the Active Food Guide Pyramid with members of the general population and intermediaries (TNS, 2013).
- Scientific literature and grey literature on models for diet and nutrition, physical activity and sedentary behaviour: there was an overview made inside

and outside Belgium of the models on nutrition and physical activity /sedentary behaviour.

- Current behaviour of Flemish population in relation to diet, physical activity and sedentary behaviour: Health interview survey (*Gezondheidsenquête* by WIV, 2013) and Belgian national food consumption survey (*Belgische nationale voedselconsumptiepeiling* by WIV, 2014).
- Recommendations and points of attention for physical activity and sedentary behaviour:
 - Literature review of the international guidelines from leading countries and institutes (e.g. Canadian 24-hour guidelines and guidelines for other age groups, Australia's Physical Activity and Sedentary Behaviour Guidelines Australia, Global recommendations on physical activity for health (WHO), etc.).
 - In coordination with recognised Flemish expert groups (see below) the recommendations for Flanders were updated. See 3.2.
 - Supplementary international scientific literature connected to the relationship between physical activity and sedentary behaviour and health, and in connection to the attention points for behavioural change and communication relating to these themes.
- Recommendations and points of attention for healthy eating:
 - International recommendations: recent Food-based dietary guidelines including those from the Health Council (*Gezondheidsraad*) in the Netherlands, the Dietary Guidelines for Americans (United States), and ANSES (France).
 - Supplementary scientific literature in relation to foods and food groups, eating patterns and health (preferably systematic reviews and meta-analyses). ([Link](#), in Dutch)
 - Supplementary scientific literature in relation to sustainable eating. ([Link](#), in Dutch)
 - Advice from the Superior Health Council: the Superior Health Council is an independent body for scientific advice. In September 2016, the Superior Health Council published new dietary advice on the level of nutrients. ([Link](#), in Dutch) The guidelines were based on the most recent scientific studies and international consensus.
 - Coordination with the Superior Health Council for the development of Food Based Dietary Guidelines (FBDG) for Belgium (parallel project in 2016–2017).

Advice from experts

- The results of the literature reviews were discussed with a panel of experts. They were asked for advice and feedback from a scientific standpoint, and to define attention points for the healthy eating content on the one hand, and healthy physical activity and the limiting of sedentary behaviour (sitting still for long periods) on the other.

- The panel consists of independent experts on healthy eating, experts in physical activity and sedentary behaviour, and experts in behavioural change and communication. All members of the panel of experts are linked to non-profit organisations that conduct research activities (universities and tertiary education institutions) or are partnered with organisations of the Flemish government that are active in the areas of diet and nutrition, physical activity, sedentary behaviour, behavioural changes, healthy environments or communication. The members declared that there were no conflicts of interest.

Overview of panel members:

Organisation	Name
Agentschap Zorg en Gezondheid	Ellen De Smet
CEBAM - Gezondheid en Wetenschap	Nina Van Den Broecke
Eetexpert	Rozemarijn Jeannin/An Vandeputte
Expertisecentrum Valpreventie	Elise Janssens
Federal Public Service for Healthy, Food Chain Safety and Environment - NUBEL	Carine Seeuws
Kind en Gezin	Sigrid Quintelier and Johan Vancoillie
University of Leuven - Kinesiology and Rehabilitation Sciences	Professor Jan Seghers
KULeuven - Institute for Media Studies	Professor Tim Smits
Thomas More - Representative of Bachelor Programme in Physical Education	Frank Peeters
UCLL - Representative of Bachelor Programme in Nutrition and Dietary Studies	Erika Vanhauwaert
UGent - Social Health Sciences	An-Sophie Pinket
UGent - Movement and Sports Sciences	Marieke De Craemer
Ghent University - Developmental Psychology	Leentje Vervoort
Ghent University - Food Safety and Food Quality	Isabelle Sioen
Ghent University - Communication Management	Professor Verolien Cauberghe
University of Antwerp - Communication Sciences Department	Professor Charlotte De Backer
UZ Leuven - Clinical and Experimental Endocrinology	Christophe Matthys
Vlaamse overheid - Departement	Patrick Vandenberghe

Kanselarij en Bestuur (Team Communicatiebeleid)	
Vlaamse overheid - Departement Omgeving	Kristof Rubens
VUB - Physical Education and Physiotherapy	Dirk Aerenhouts
Scientific Institute of Public Health (ISP-WIV)	Karin De Ridder

- The panel of experts had four meetings. These were held on 23 February 2016, 3 May 2016, 17 January 2017 (only experts in nutrition) and 16 March 2017. The experts gave supplementary advice and feedback via email.

Development of the visual appearance of models

To develop the visual appearance of the models, we worked together with a communication strategist, Koen Thewissen.

- **Simplicity versus completeness – Points of attention**

A model with too many messages creates confusion. It was decided to limit the information in the content of the new models. As a result, the new model is easier to understand for the general public, including disadvantaged target groups.

Using the content starting points (see below), a number of messages were defined and are visualised through the models.

Further in-depth materials and methods are provided to respond to the need for explanation, inspiration and practical understanding. For example, information about less-healthy choices or practical advice for the composition and planning of meals is available on the website www.gezondleven.be and in various tools and brochures.

- **Separation of nutrition from physical activity and sedentary behaviour**

The Active Food Guide Pyramid combined recommendations for diet and nutrition, physical activity and sedentary behaviour. The impact of the layer of the pyramid focusing on physical activity was limited. The recommendations about physical activity were, until now, clearly subordinate to the nutrition recommendations. In the previous model, there was no visible attention paid to the recommendations about sedentary behaviour (as they were relegated to the ‘Others’ category on top of the pyramid without visual or textual information).

Expanding the messages relating to physical activity and integrating recommendations in relation to sedentary behaviour in the current model would only raise the level of complexity. From the evaluation in 2013, it appears that the layer focusing on exercise is inadequate for professionals

and the general public. This certainly applies to sedentary behaviour due to the 'invisibility' of this theme in the visual presentation.

With the development of the new model, we have chosen to create two models: one for nutrition, and one for physical activity and sedentary behaviour. On advice from communication experts, physical activity and sedentary behaviour are being combined in a separate model.

To make it clear that the model for nutrition and the model for physical activity and sedentary behaviour are both part of a single story (a healthy lifestyle), both models are visually linked to each other.

- **Shape**

73% of Flemish people recognised or knew the Active Food Guide Pyramid (TNS, 2013).

We also know that there are many online searches for the (Active) Food Guide Pyramid, or more accurately, for the Dutch term: (*Actieve*) *Voedingsdriehoek*. In October 2016, the monthly average was 5,400 Google searches for the Food Guide Pyramid (or *Voedingsdriehoek* in Dutch). By comparison: there was an average of only 2,400 searches for 'healthy nutrition' (*gezonde voeding*) and 3,600 for 'healthy food' or 'healthy eating' (*gezond eten*). Only 'healthy recipes' (*gezonde recepten*) scored better: 8,100 searches.

The awareness is therefore quite substantial. Creating equally great awareness with a model that is not a pyramid is possible, but would cost considerable time and money.

Furthermore, countless organisations today have included and integrated the (Active) Food Guide Pyramid into their own materials. From our Health Policy Survey in schools in 2016 (VIGeZ), it appeared that for nutrition, 54% of primary schools and 37% of secondary schools use the model. For physical activity, this is 30% and 24% respectively.

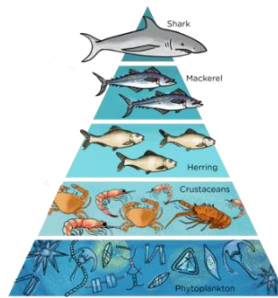
With a new model in a different shape (for example, a circle or a plate) there is a risk that the model would be used alongside the Active Food Guide Pyramid. This would only increase the confusion about healthy eating.

This is why the 'Pyramid' or 'triangle' name and shape—and the awareness linked to it—has been kept. The best manner of presenting the points of action within the pyramid for optimal clarity and impact is being investigated.

- **Nutrition: the problems of using a pyramid**

The Active Food Guide Pyramid was a pyramid, but could also be interpreted as a triangle. A pyramid is subconsciously read from top to

bottom. As a result, the top is interpreted to mean 'less, but exclusive and more important' and the lowest layer as 'more, but less exclusive and less important'. This also happens with trophic pyramids in biology.



For the Active Food Guide Pyramid, this meant that the top ('Others' category) was assigned a more important place than it should have had. It gave the impression that these products are 'normal' or 'necessary'. This also appeared to be the case from research TNS performed with the general population in 2013.

To solve the problem of the pyramid shape, the triangle for food was turned around. As a result, the largest layer was given more attention at the top and it became clear that the bottom (which used to be the top) was less important.

Furthermore, it's clear that certain foods should only be eaten as little as possible. What was formerly the 'Others' group was even removed from the triangle and given a place outside the triangle. This was in response to the general public and professionals who asked for the 'Others' category to be clarified and better presented.

This way, the message is clear: the healthier choices are in the Food Triangle. A balanced diet consists of only the foods pictured within the triangle.

- **Physical activity and less sedentary behaviour: looking for attention**

The messages relating to sedentary behaviour and physical activity are linked to each other (e.g. on the continuum of energy use, communicatory links between sitting and light intensive physical activity), but also have their own specific focus. We have chosen to bring both together in one model, and to start by focusing on spending long periods of time sitting still.

In doing so, we ensure that the recommendations for sitting still are the first to be read:

- We chose a triangle that we divided in an atypical manner (not with horizontal lines). This breaks through traditional reading habits (of reading from top to bottom).

- Sedentary behaviour is given the left-most place in the new model and has a different shape and colour, drawing attention to it.

- **Timeless symbols**

The Active Food Guide Pyramid tried to give an expanded overview of different sorts of foods and forms of exercise, divided into different groups. As a result, the model became more of an overview and was still not complete. The new model brings the various groups of foods or movement and sedentary behaviour back into one or at most, a small number, of symbols. The icons pictured are intended as examples of foods, of sedentary behaviour and of types of physical activity in different contexts. We have tested whether these symbols are recognisable for the general public and whether such foods or forms of physical activity are being assigned their correct places (See 3.4).

As the entire Flemish population (including diverse age groups and disadvantaged groups) needs to be able to recognise the symbols in the model, the symbols are as universal as possible.

- **Language use**

The use of language in the model is as limited as possible. If it appears that a short explanation is required, simple, motivating language is used. This is because recommendations have the greatest impact when they are given in a neutral or positive manner. An approach that is too 'schoolmarmish' will result in resistance, especially from disadvantaged target groups. One exception was made with the 'Others' category and the sedentary behaviour group. This decision was based on evaluations from research (TNS, 2013) among the general population and professionals.

- **Addition of implicit elements**

To give these points of attention extra prominence, a number of implicit elements were added:

1. The following were used to demonstrate the effect on health:
 - Colour coding for the different categories: green/orange/red (red: only for consumption of unnecessary foods).
 - A heart icon with a face to show the effect on physical and mental health.
2. To show the recommendations in proportion:
 - The volume of the layers is in relation to the recommendations (foods: plant-based versus foods originating from animals; exercise: based on the intensity of the physical activity).
 - The size of the icons from the different foods within a layer.

Tested on the general public

Both new models were designed with full focus on the general public. At various points, surveys were conducted to ascertain their opinions and establish whether the new models on food and physical activity and sedentary behaviour were being **correctly understood and interpreted** by people from various target groups. The ability to identify the **messages** of the models by the target group was used as a reference for testing whether the goals of the model were being achieved. Each of the two models had their own points of attention that the end-consumer needed to be able to identify from the model without any extra explanation.

From the principle of proportional universalism ([Link](#), in Dutch) the following **priority target groups** were chosen for testing the model:

- Teenagers: 13–15 years old, focus on students undergoing education at vocational secondary schools and technical secondary schools.
- Adults: Focus on blue-collar workers or people with limited education, with or without children.
- Senior citizens: 60–80 years old.
- People with an impoverished background and/or migrants¹.

There were **three series of focus groups** conducted to test the subjects (December 2016 to January 2017). In total, the design of the models was tested on 237 people. The first two series of focus discussions were performed by staff members from Gezond Leven. The third series was performed by the TNS research agency in a strict protocol with 46 people, guaranteeing independence.

During the testing by TNS, there was a **distinction** made between respondents who ate balanced diets and those who didn't, as well as between respondents who exercised sufficiently and didn't sit still for long periods and those who exercised too little and sat still for too long.

After each series, the results were used to **adapt the design of the models**. The weaknesses were removed and the models were optimised to better respond to the realities of the lives of people in the target groups.

Each time, the design (draft model) was tested following the same **protocol**.

- The new (draft) model was shown for 45 seconds, after which the respondents were individually asked to write down everything they remembered from the model. This meant we could evaluate the individual answers without influencing other respondents in the group. Based on these answers, it was possible to see whether the points of attention on the models were being observed and retained.
- After the individual phase, the findings were discussed in groups and feedback was gathered with which the model could be optimised.

¹ As socially at-risk target groups are more difficult to incorporate into market research, it was not possible to recruit the desired number of respondents for every target group. Primarily, the ethnic cultural minorities were not represented.

- Afterwards, the new models were compared with the earlier ones:
 - o For nutrition, with the 'Active Food Guide Pyramid'.
 - o For physical activity and sedentary behaviour, with an international gold standard, namely a traditional physical activity model (i.e. the Physical Activity Pyramid) that was chosen on the basis of a literature review of international models.



Dutch translation of the Physical Activity Pyramid

In order to eliminate sequencing effects in the assessment, both models were presented in rotation within each target group.

- On top of this, variations of the new models were tested (e.g. with different colours for the parts, symbols, etc.) to determine which variant was best understood and most appreciated.
- The participants were also asked to point out certain foods and forms of exercise and sedentary behaviour in the model groups.

From the conclusions from the third testing, it appears that most of the feedback from the general public was related to details of the visual presentation (e.g. clear icons). As such, it was decided to progress to the elaboration of the true design of the final models. In May and June 2017, the models were drafted with a definitive look and feel. During the drafting of the design, the models were presented to members of the general public to test the clarity of the appearance of the icons.

Collaboration with intermediaries and stakeholders

- **Preparing the development of a new model**

Research evaluations of the Active Food Guide Pyramid by teachers, School Health Services (Centra voor Leerlingenbegeleiding in Dutch), and doctors (TNS, 2013) and the results of a needs analysis by dietitians and physical activity professionals (VIGeZ, 2016) gave a clear indication of the needs and wishes of diverse intermediary groups. Furthermore, in August and September 2016, conversations were held with a limited selection of stakeholders, to get to know their needs for the start of the development.

- **Support and collaboration for raising awareness and implementation**

From April to August 2017, talks were held with a broad group of stakeholders. The process of developing the new models was explained, with the goal of raising support. Difficulties in making and implementing new models were addressed.

These stakeholders had no influence on content or the visual presentation of the model.