De belofte van vitamines: voedingsonderzoek tussen universiteit, industrie en overheid 1918-1945

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Summary
The promise of vitamins
Nutrition research between university, industry and state – 1918-1945

Introduction: What purposes does science serve?

Between the two world wars, academic nutrition researchers in the Netherlands were confronted with radical changes. Just before the First World War the substances that would soon be known as vitamins had been discovered. This discovery gave rise to new insights in nutrition that enormously stimulated the research in this field. At the same time, this period witnessed severe political upheavals and major social developments that had a serious impact on Dutch food supply, on public nutrition and on the scientific attitude towards nourishment. Perhaps even more significant for academic scientists was the discovery by the domestic and foreign industry of the commercial potential of vitamins as drugs or as food supplements. Relatively soon after industrial companies began experimenting with vitamins and ‘health food’ in the nineteen twenties, they started to dominate nutrition research. This had, above all, to do with the very large costs of this kind of research. All these developments had a major impact on the way science dealt with nutrition. They not only strongly influenced the direction of nutrition research, but they also changed the way scientists regarded their own role in society. No less importantly, they also challenged academic independence. Together, these factors make clear why nutrition research is a rich and interesting field for a case study into the role of universities in society in general.

The aim of this study is to analyze the changes, difficulties and developments within the academic disciplines involved in nutrition research during the inter war period. To do so in a systematic way, it is divided into three separate parts. The first part is devoted to the pharmacologist Evert van Leersum and in particular to his initiative to establish a national institute for nutrition research. This part shows how university scientists initially had to convince both the government and industry of the important promise of the new field of vitamin research for national health. Central to the second part is a discussion of the radical change in the relationship between industry and science brought about by the breakthrough of vitamin research in the mid-nineteen twenties. From then on it would be the industrial companies, which almost immediately recognized the commercial value of vitamins, that would set the pace in nutrition research. By cooperating with the industry, scientists had to accept the risk of losing their academic independence. The risk of getting into conflicts of interests did not decrease after the Dutch government took nutrition research in its own hand in the middle of the nineteen thirties. This is shown in the third part. As the threat of a new war grew stronger, different research institutions, advisory boards and information agencies were created to prevent the same unpreparedness that had led to the food shortages and undernourishment of the last years of the First World War. In
these institutions, academic scientists, cooperating with colleagues and government officials, devoted themselves to the furthering of public health and the wellbeing of the people. At the same time, however, several of them tried to defend the interests of the companies they worked for.

By analyzing the dynamics of vitamin research, this study intends to contribute to the historiographical debate of the concepts of ‘pure’ versus ‘applied’ science in the Netherlands in the inter war period. This debate has its historical roots in the end of the nineteenth century, at a time when scientists in the Netherlands were used to operate quite independently from society—probably more so than in any other European country. The five Nobel Prizes Dutch physicists and chemists were awarded during the first decade of the century confirm this picture. Popular consensus has it that these Dutch scientists were so successful because they did not have to worry about any practical use of their research. In fact, a new law on higher education that came into effect in 1876 had cleared the way for the transformation of the Dutch universities into autonomous research institutions. One of the most important consequences of the law was the drastic increase of the state’s financial support of the universities. This enabled the three state universities—Leiden, Groningen, and Utrecht—to expand their research facilities. Professors were given the time and the funds to engage in research besides their teaching obligations. At the same time, this process of professionalization as researchers meant that professors had to start producing knowledge—as opposed to merely disseminating it. To a large extent this scientific production took place in specially built laboratories. This development coincided with a process of scientific specialization. The study of the sciences was split up in several disciplines: astronomy, mathematics and physics, chemistry, geostudies, biology and pharmacy. The chairs were separated accordingly and were being split up further within these fields of study.

The new academic professionals started to establish themselves as a distinct professional community. Backed by a sizeable salary increase, provided by the law of 1876, this community developed its own functions, customs and norms, its own schooling system and admission rules. Hand in hand with these changes came a notable increase of status. Around 1900, the position of professor was a very prestigious one in society. The growing circulation of the results of scientific research through newspapers and popular periodicals contributed even more to this status. These developments made academic researchers into generally acknowledged authorities and experts. This new role, however, became less and less compatible with an inward-looking view of the function and responsibility of academic science. Particularly after the First World War, more and more academic scientists responded to the increasing demands from politics, society and industry for more useful science.

Academic nutrition research was no exception, as this study shows. Many scientists in this field of research chose to devote themselves to a kind of science that could be made beneficial to society and/or industry. This study tries to give an answer to the questions of how and why Dutch nutrition research became increasingly intertwined with government and industry and of what consequences this development had for the position of the academy in society.
The newer knowledge of nutrition in the Netherlands

The whole concept of nutrition being made up not only of proteins, fat and carbohydrates, but also of new nutritive elements called vitamins only dated from around the First World War. Vitamins were the name given to an at the time highly abstract group of nutrients, whose deficiency would cause specific diseases like scurvy. Vitamins turned out to be practical conceptual tools to link the appearance of specific diseases to inadequate nutrition. Academic scientists only gradually identified certain ailments as deficiency diseases. It also took time for them to find out what types of vitamins existed, how they worked in the body, what the consequences of deficiencies or overdoses were, and finally what vitamins chemically looked like. Nevertheless, the existence of vitamins could less and less be denied. These elements were at the core of a ‘newer knowledge of nutrition’ (McCollum), as the traditional understanding of nutrition failed to explain the occurrence of diseases like rickets or scurvy. After all, the levels of proteins, fat and carbohydrates in the food supply of most European countries had in general remained adequate throughout the war.

The newer knowledge of nutrition further stimulated the scientific search for vitamins. The pharmacologist Evert van Leersum undoubtedly provides the best example of a Dutch scientist inspired by the discovery of vitamins. Immediately after the end of the First World War, he argued for the establishment of an institute for nutrition research, in particular for vitamin research. In his view, the apparent importance of vitamins for public nutrition and public health justified the funding of this type of research. In addition, the new knowledge of nutrition emphasized the significance of nutrition education that rendered account of the existence of vitamins. Ideally, nutrition education would be an important task of the institute.

The eventual founding in 1919 of what would be called the Dutch Institute for Nutrition Research (Nederlands Instituut voor Volksvoeding, NIVV) did not only illustrate the scientific need for practical usefulness. It also exemplified the ambiguous relations between science and the Dutch state in the first decades of the twentieth century: the Dutch government did provide financial supported to the institute, but at the same time it did not feel responsible for practical matters of nutrition. This would not change until the nineteen thirties, when the state became aware of the importance of nutrition research and education against the background of the economic crisis and the threat of a new war in Europe. For the NIVV, that insight came too late. Confronted with a permanent budget deficit and having to cope with ever decreasing state funding, the institute had gone into liquidation in 1933.

The demise of the NIVV also illustrates the changing relations between university science and industry in the interwar period. When vitamin producing companies became interested in vitamin research for experimental and standardization reasons at the end of the nineteen twenties, they often created their own research laboratories. Thus the NIVV lost its potential clients and, as a consequence, its most important source of income.
Vitamins between laboratory and market

Not only Van Leersum and his institute were confronted with the growing influence of the pharmaceutical and food industry. The introduction of industrial vitamin preparations also had a lasting effect on academic vitamin research. Hendrik Westenbrink, during the nineteen thirties manager of the chemical-physiological laboratory in Amsterdam, clearly characterized the changing relations between universities and the industry during these years in an article in 1937:

Before the Great War the university laboratories were the only places where scientific activities took place and where with the help of modest resources work could be done on the most topical subjects. Nowadays, different branches of the industry are so much interested in the development of biochemistry in certain directions, that the mighty industrial research laboratories as well as the university laboratories that are funded by the industry have taken the lead. All because of the large sums of money they dispose of for human resources and instruments.

Pharmaceutical companies in Europe – including the Netherlands – and the United States had recognized the commercial potential of vitamins almost from the moment they were classified as a separate group of nutritive substances. As a result, the industrial production of vitamins started in an experimental way in the mid nineteen twenties. No more than ten years later, as Westenbrink complained, commercial companies had firmly overtaken the universities in vitamin research. They determined the direction of vitamin research; they had control over the outcome. To a large extent, this commercial ‘revolution’ had financial roots. Due to the fact that vitamins were such a complex group of nutritive substances, the exact structure of many of which remained unidentified during the nineteen twenties and thirties, vitamin research became a very expensive type of research. Thus, in Westenbrink’s words: ‘The expenses needed for the rapid purification [of vitamins], are commonly only invested by those, who expect to make it profitable on the short or long run.’

In the Netherlands, before the Second World War the production of vitamins was primarily headed by two companies: the pharmaceutical company Organon from Oss and the Philips branch Philips-Van Houten from Weesp. The introduction of its vitamin A and D preparation Davitamon in 1928 made Organon the first Dutch vitamin producing company. The company – ‘for the production of organic preparations on a scientific basis’ – had been co-founded by the Amsterdam pharmacologist Ernst Laqueur in 1923. The position Laqueur claimed for himself at Organon can hardly be overestimated. He had a decisive influence on the products the company prepared, on the research it did and on the employees it hired. No preparations would enter the market without his consent: he had all batches tested and supervised in his Amsterdam laboratory. While Laqueur concentrated on hormone research and production, he made his assistant Lodewijk Karel Wolff responsible for setting up a vitamin branch. After the launch of Davitamon, Wolff was given control of its production; he applied the same strict methods as Laqueur did. In 1929, Wolff left his position at Laqueur’s lab to occupy the chair for hygienics at the University of Utrecht. With his strong interest in vitamin research, Wolff continued the academic tradition of his famous predecessor Christiaan Eijkman. Coincidentally, Eijkman received the Nobel Prize for his share in discovering the antineuritic vitamin B1 the same year Wolff was installed as his successor.
Despite the thorough scientific control of its products, the introduction on the Dutch market of Philips-Van Houten’s competing vitamin preparations made Organon quite nervous. The Philips branch had developed a production method for vitamin D that exceeded Organon’s by far in efficiency. Two Philips researchers had developed a method of producing vitamin D by ultraviolet irradiation. Together with the chocolate producer Van Houten they then began production of vitamin chocolates, labeled Dohyfral, starting in the fall of 1930. Even more so than Organon’s vitamin preparations, these chocolates were a tasteful alternative to cod-liver oil. Moreover, they contained a high and stable level of vitamins – contrary to the undetermined and fluctuating vitamin level of cod-liver oil. Philips-Van Houten also involved several academic scientists in the calibration and clinical testing of its products.

Starting their vitamin production thus quite specifically with this antirachitic medicine – rickets was by far the most common deficiency disease in Western Europe – both Organon and Philips-Van Houten expanded considerably in the next decade. Not only did they experiment with the production of most of the other types of vitamin, they also made a lasting name for themselves amongst the public and in the Dutch health care system. Their research facilities improved significantly and their number of employees increased steadily.

Most Dutch university laboratories that specialized in vitamin research were not quite as thriving as their commercial counterparts. Although Westenbrink’s complaint referred in the first place to the situation at his own workplace, nutrition scientist B.C.P. Jansen’s renowned laboratory at the University of Amsterdam, the situation he sketched was no exception in the Dutch academic world. All universities encountered financial setbacks in the early nineteen thirties. They had to cut back on wages, had to hold off the expansion of laboratories or the building of new ones, and had to deny the appointment of new assistants. Professors became stuck in an increasing teaching workload and in outdated and insufficiently equipped work places. This is one of the reasons why the balance, as far as vitamin research was concerned, had gradually shifted towards the industry around the end of the nineteen thirties.

Nonetheless, university scientists remained ahead of commercial research laboratories in at least one sense. In general, they still could lay claim to an authority based on the best and latest knowledge of vitamins. Wolff’s role at Organon illustrates this very well. Most companies starting the production of vitamins as food supplements or medicine did not have this fundamental knowledge at all. The promise of vitamins for the prevention or treatment of certain diseases often sounded profitable enough. But these companies needed academic scientists to back up their claims – to guarantee consumers that their vitamin products worked like they were supposed to. Their mutual dependency – knowledge versus financial capacities – laid the foundation under the extensive cooperation between universities and the industry during the interwar period. Calibration and standardization were central to their cooperation. After all, only by creating standards and by calibrating preparations using such standards, could scientists distinguish the products they supervised on behalf of certain companies from the ones produced without scientific approval. Naturally, this quality control had great marketing potential. Companies started using the names of their academic advisors and their standards more and more in advertising campaigns.

Organon and Philips-Van Houten sold their products in part through the medical
system. Commercial agents approached family doctors with brochures written in scientific language and explicitly authorized by the researchers themselves. Also, stressing the claim of scientific supervision was a popular approach for other promotional uses as well, especially after the number of domestic and foreign competing vitamin products increased in the Netherlands in the nineteen thirties. Most of the handful of pharmaceutical or food companies active in the Netherlands before the Second World War began putting vitamin preparations on the relatively small Dutch market. This was as much the case for Unilever, for example, as it was for Brocades or Nourypharma. At the same time, magazine and newspaper advertisements became a more widespread phenomenon in the Netherlands. Slogans and strategic branding of products became serious business.

As was the case in other western countries, vitamins entered the public sphere in the Netherlands with a promise of indispensable, life-saving qualities. New ideas about vitamins were mainly incorporated into common knowledge through women’s magazines, cook books and informative books for a popular audience. Although incomparable with the vitamin hype in the US, in the Netherlands the growing number of advertisements for food and pharmaceutical products from the mid-nineteen twenties onward reflected (and stimulated) the growing public preoccupation with health and food. Vitamin content levels were explicitly used in advertisements to emphasize the healthiness of products or preparations. Again, scientific supervision had to justify these claims. This is why Organon consistently used the claim ‘on scientific basis’ in its letterhead, and why Philips-Van Houten always mentioned its ‘supervision by a biological laboratory’.

It should be emphasized, however, that apart from their commercial activities, the medical researchers were also strongly motivated to inform the public and create awareness of health issues in an objective way. The same holds for their research and their scientific supervision of commercial preparations. University scientists offered their help to a large extent because so many aspects of vitamin production remained unclear for the industry. What effects should specific vitamins have? In what dosage? What influence did the addition of a certain kind of vitamin have on the product and its other nutritionals? It could not be excluded that the wrong way of making vitamin preparations would do more harm than good.

The combination of motivations for scientists to cooperate with the industry mentioned in the above paragraphs also applied to B.C.P. Jansen. At the same time, his career nicely illustrates the different views of the function of science in society that existed within the academic sphere. Jansen had been the first in the world to actually present the chemical form of a vitamin when he successfully crystallized vitamin B1 in 1926. This was the high point of his research on beriberi at the medical research institute in Batavia, where he had been working since 1917. Having made a name for himself as a vitamin researcher, he was offered the new chair for chemical physiology at the University of Amsterdam in 1928. Accepting this prestigious position in his homeland did not mean that he was ready to give up his practice of doing research explicitly in the service of public health. After his return to the Dutch capital, one of the first things he did was to contact the city health department and offer research assistance. This initiative, however, clashed with what the university authorities saw as Jansen’s primary responsibilities. C.C. Delprat, a member of the university board of directors, made this perfectly clear in a private note to his fellow directors:
I find it undesirable that city departments like the health department commission a university laboratory, which has exclusively been established for scientific research, to do research for them. I also find it undesirable that a professor asks for these commissions. He should find the questions he wants to work on in his field of study, [...] but he neither gets nor asks for orders. Things are done differently here than in the East-Indies.

This had been made clear, in a more subtle way, to Jansen himself as well. As a consequence, Jansen began to accept the restrictions on cooperation with others in the field of research. In a request of four years later he wrote ‘I do not generally believe a university laboratory to be the appropriate place to do research in favor of trade or industry,’ showing the university authorities that he had learned to live by their rules.

A few years later, however, he had found a way to evade the restrictions on cooperating with the industry within his university laboratory. In 1938 he took on the administration of the Dutch Institute for Nutrition Research, closed in 1933, with which he had been involved as an advisor in its heydays. The foundation under which the institute had legally acted still possessed a reserve account worth about 170,000 guilders. Besides, according to Jansen’s plans the NIVV would to a large extent only exist on paper. Jansen wanted to assign two assistants to work for the institute, but other than that the NIVV would in no way be distinguishable from his university laboratory: it was to be housed in the same rooms, it would use the same equipment and it would be represented by the same researchers. In addition, much of the type of research Jansen would be doing on behalf of the NIVV he had already undertaken in his capacity as professor of chemical physiology. However, as the director of the NIVV, Jansen had the absolute freedom to undertake the type of research he had already had in mind since his arrival in Amsterdam: to determine the nutritional value of foodstuffs and commercial products, for example, or to improve foodstuffs in cooperation with third parties. In short, the institute enabled Jansen to be directly involved in the application of his scientific research. Unfortunately, before the institute could regain its position as a private research laboratory for the industry, the Second World War broke out in Holland in May 1940.

‘A so much better understanding’: matters of nutrition and the Dutch state

Vitamin science had come a long way since the First World War. Crucial was the insight that the idea of vitamins as either present in the body or not (of which certain specific diseases give evidence) was inadequate. During the nineteen twenties and thirties, it was gradually accepted that diseases like rickets or scurvy were the manifestation of an absolute vitamin deficiency. Between this extreme and the ideal of total health thanks to an optimum amount of vitamins in the body, a grey scale was assumed to exist. This framework enabled scientists and medical practitioners to ascribe a wider range of health complaints – from tiredness to bad teeth – to less extreme deficiencies of certain vitamins.

This shift in the conceptualization of vitamins was backed up by a range of food surveys that were conducted in the nineteen thirties. Nutrition scientists like Wolff and Jansen used these to assess the effects on public health in the Netherlands of the unprecedented rise of unemployment due to the international economic crisis. Therefore, these surveys mostly concentrated on the diet of underprivileged rural or...
urban populations. In this way, it could be shown systematically that a quantitative-
ly sufficient diet did not necessarily guarantee good health. The nutrition scientists,
who mainly conducted these surveys, thus learned a great deal about the pernicious
long-term effects of unbalanced diets for public health.

Scientists used these conclusions to urge the Dutch state to formulate a policy on
public nutrition. Traditionally, the Dutch government did not feel compelled to get
involved in policy matters like these – except in the case of protecting the domestic
population from undernourishment. Jansen clearly hoped that this would change. As
late as in 1942, he wrote that ‘[n]ow that we have learned the qualitative composition
of nutrition, we feel that the state should get more deeply involved in this matter’.
At that time, the Dutch government had already taken some steps in this direction.
However, the first initiatives on a national food policy did not stem from the eco-
nomic crisis, but from the fear of an armed conflict in Europe. The establishment of a
national food supply became part of the ‘economic defense preparations’ the govern-
ment started in 1936. A year later, a ‘preparatory committee for the food supply in
war time’ was created. Besides in the issue of food supply, the state became also more
and more involved in matters of nutrition research. At the outbreak of the Second
World War, this involvement was institutionalized by the establishment of the Food
Organization as part of the state-funded Netherlands Organization for Applied Sci-
entific Research. In 1940 the Dutch government also set up the Food Council, a sci-
entific advisory board for matters of nutrition.

Within these and other organizations, a relatively small network of governmental
policy makers, civil servants, scientists and medical practitioners came into existence.
In close cooperation, they dedicated themselves to the food supply and wellbeing
of the Dutch population during the war. Jansen was the leading scientist in this net-
work, in particular after Wolff had suddenly died in 1938. He epitomized the strong
ties between university, industry and state that had developed within nutrition sci-
ence during the nineteen thirties. He worked as an advisor for several of these state
organizations, in which he represented the academic world as a university profes-
sor. At the same time, as the director of the private NIVV he had strong connections
with the food and pharmaceutical industries. The conduct of some of his colleagues,
whose work linked academic science, industry and the state in the same way, showed
that it was not always easy to deal with all those different interests. More than once
Hendrik Willem Julius, Wolff’s successor as the Utrecht hygienics professor as well
as Organon’s chief vitamin advisor, explicitly tried to promote Organon’s commer-
cial interests in his work for the Food Council. The Leiden pediatrician Evert Gort-
er showed the same kind of commitment to Philips-Van Houten – the company he
worked for – in his work for the Food Council and other state advisory committees.
Both Julius and Gorter, for example, encouraged the distribution of vitamins among
children or other high-risk groups during the war. At the same time, they made sure
the companies they worked for served as suppliers for these vitamins.

In short, through the Dutch network of nutrition experts, public and private in-
terests often overlapped in the nineteen thirties and forties. This practice only ended
when Dutch public life, the economy and the domestic industry as a whole ceased func-
tioning in the last year of the war.
Conclusion: scientists between public and private interests

This short account shows that the interests in vitamin research fundamentally changed during the interwar period. At the beginning of the interwar period the nutrition scientist Evert van Leersum had to convince the Dutch state of the promising qualities of vitamins for public health. The domestic food and pharmaceutical industries were initially equally unaware of their potential, but they took the lead in vitamin research after the second part of the nineteen twenties. Its financial capacities and commercial drive to find new uses for vitamins as drugs or food supplements were increasingly unequalled. Only in the nineteen thirties, against the background of the economic crisis and the threat of a new European armed conflict did the Dutch state develop an interest in matters of nutrition. The combined academic, state and industrial involvement in vitamin research manifested itself in a small network of vitamin experts that closely cooperated in several committees and organizations during the Second World War.

Obviously, the changing interests had great consequences for the role and self-image of academic nutrition scientists. Although during the late nineteenth century the universities had transformed into autonomous, sometimes even isolated research institutions, the scientists central to this study increasingly left the confines of their laboratories to engage in matters of public interest. After all, they were confronted with unemployment, poverty, poor hygiene, medical complaints and even sometimes scarcity as consequences of the economic depression during the nineteen thirties. At the same time, optimism reigned about the extent to which science could play a positive role in social change. The hope and expectations of the new knowledge of vitamins – in short: the promise of vitamins – for public health, increasingly stimulated forms of university-industry collaborations. Scientists had to accept the growing influence of the prospering pharmaceutical and food industry in matters of vitamin research. The existence of this industry, on the other hand, guaranteed the continuation and expansion of this type of research in the Netherlands, at a time when the universities were less able to do so. Thus the careers in nutrition and vitamin research of scientists like Jansen or Wolff can serve as clarifying illustrations of the developments in the self-image of academic science in the Netherlands between the two world wars. Neither Jansen nor Wolff made a clear distinction between pure and applied science in a self-restricting way and both increasingly recognized the advantages of opening up their laboratories to the industry, which in its turn profited from both the calibrations and tests and the fundamental research carried out by Jansen and Wolff. From their perspective as university professors—and this also holds for their colleagues who play a role in this study— they primarily tried to create a workable situation for themselves. In short, they were engaged in securing their own positions — and those of their co-workers and students — at the university while at the same time making themselves useful for the sake of public health.