DTU National Food Institute
DTU Fødevareinstituttet

Nutrition and dietary habits

Nutrient Content in Selected Plant-Based Foods

Næringsstofindhold i udvalgte plantebaseret fødevarer

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Ernæring og kostvaner

Næringsstofindhold i udvalgte plantebaseret fødevarer

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Report by:
Marija Langwagen
Anders Poulsen
Jette Jakobsen

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Preface

On behalf of the Danish Veterinary and Food Administration, the DTU National Food Institute conducted a study on the nutrient content of plant-based foods collected from Danish supermarkets over three periods from 2020 to 2024.

The report includes samples of single-ingredient, minimally processed plant-based foods such as Brazil nuts, hemp seeds, and mushrooms; processed plant-based foods including coconut milk and tahini; and more composite and processed plant-based foods such as hummus and sandwich spreads.

The analytical data from this project will be included in the Danish Food Composition Database, version 6.2 (www.fcdb.fooddata.dk).

The project was planned by Marija Langwagen together with Anders Poulsen and Jette Jakobsen. Samples were collected by Marija Langwagen, while the analyses were performed by Eurofins Steins Laboratorium A/S in Vejen, Denmark.

The report was produced in collaboration between Marija Langwagen, Anders Poulsen, and Jette Jakobsen.

Kongens Lyngby, August 2026

Marija Langwagen

Project Manager

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Summary

This report presents analytical data on the nutrient composition of selected plant-based foods available on the Danish retail market. The study was conducted on behalf of the Danish Veterinary and Food Administration as part of the ongoing work to expand and update nutrient data for plant-based foods in the Danish Food Composition Database (FCDB). The analysed foods were selected because nutrient data were missing, insufficient, outdated, or based on foreign data sources.

The study included minimally processed single-ingredient foods, namely Brazil nuts, hulled hemp seeds, and seven mushroom species, as well as processed plant-based foods, including coconut milk, tahini, hummus, and plant-based sandwich spreads. Samples were collected between 2020 and 2024. Processed foods were analysed as composite samples representing products available on the Danish market, whereas mushrooms and hemp seeds were analysed as independent samples.

The analytical programme included macronutrients, dietary fibre, sugars, starch, vitamins, minerals, amino acids, fatty acids, and cholesterol. Analyses were performed by Eurofins Steins Laboratorium A/S using primarily accredited analytical methods.

The analysed foods differed considerably in nutrient composition. Brazil nuts, tahini, and hulled hemp seeds had the highest fat contents, whereas mushrooms contained very little fat. The regular and light coconut milk products differed in fat and dry matter content, reflecting differences in product formulation. Fatty acid profiles generally reflected the major lipid-containing ingredients of the foods analysed.

Among the micronutrients, Brazil nuts were characterised by a high selenium content of 220 µg/100 g. Hulled hemp seeds contained relatively high concentrations of several minerals, including potassium, magnesium, phosphorus, zinc, and molybdenum. Vitamin B12 was detected at low concentrations in mushrooms; however, interpretation of these results is limited by the analytical methodology applied.

The results illustrate the nutritional diversity of plant-based foods and show that nutrient composition may differ considerably between product categories, formulations, and species. The analytical data generated in this project will be included in version 6.2 of the Danish Food Composition Database.

Resumé (Danish)

Denne rapport præsenterer analyser af næringsstofindholdet i udvalgte plantebaserede fødevarer på det danske detailmarked. Undersøgelsen er gennemført for Fødevarestyrelsen som led i det løbende arbejde med at udvide og opdatere næringsstofdata for plantebaserede fødevarer i den danske fødevaredatabase. De analyserede fødevarer blev udvalgt, fordi eksisterende data manglede, var utilstrækkelige, forældede eller baseret på udenlandske datakilder.

Undersøgelsen omfattede minimalt forarbejdede fødevarer bestående af én ingrediens, herunder paranødder, afskallede hampefrø og syv svampearter, samt forarbejdede plantebaserede fødevarer som kokosmælk, tahin, hummus og plantebaserede smørepålæg. Prøverne blev indsamlet i perioden 2020 til 2024. Forarbejdede fødevarer blev analyseret som poolprøver, mens svampe og hampefrø blev analyseret som individuelle prøver.

Analyserne omfattede makronæringsstoffer, kostfibre, sukkerarter, stivelse, vitaminer, mineraler, aminosyrer, fedtsyrer og kolesterol. Analyserne blev udført af Eurofins Steins Laboratorium A/S ved anvendelse af primært akkrediterede analysemetoder.

De analyserede fødevarer viste store forskelle i næringsstofsammensætning. Paranødder, tahin og afskallede hampefrø havde det højeste fedtindhold, mens svampe havde et meget lavt fedtindhold. Kokosmælk med normalt fedtindhold og kokosmælk med reduceret fedtindhold adskilte sig i både fedt- og tørstofindhold, hvilket er i overensstemmelse med forskelle i produkternes formulering. Fedtsyresammensætningen afspejlede generelt de vigtigste fedtholdige ingredienser i de analyserede fødevarer.

Blandt mikronæringsstofferne var paranødder karakteriseret ved et højt indhold af selen på 220 µg/100 g. Afskallede hampefrø havde et relativt højt indhold af flere mineraler, herunder kalium, magnesium, fosfor, zink og molybdæn. Vitamin B12 blev fundet i lave koncentrationer i svampe, men fortolkningen af resultaterne er begrænset af den anvendte analysemetode.

Resultaterne illustrerer den ernæringsmæssige variation blandt plantebaserede fødevarer og viser, at næringsstofindholdet kan variere betydeligt mellem fødevarekategorier, produktformuleringer og arter. De genererede analysedata vil indgå i version 6.2 af den danske fødevaredatabase.

1. Introduction

In the present report, the term “plant-based foods” is used as an umbrella term for foods derived from plant and fungal sources such as fruits, vegetables, legumes, nuts, seeds, cereals, and mushrooms.

Due to increasing consumer interest in plant-based foods, nutrient analysis of these product types has been a focus in recent years. DTU National Food Institute has completed several projects in which the nutrient content of plant-based drinks, plant-based protein products, and pulses has been determined and reported.

This report includes samples of single-ingredient, minimally processed plant-based foods, such as Brazil nuts, hemp seeds, and a selection of mushroom species available in Danish supermarkets. In addition, the report includes processed plant-based foods, such as coconut milk with varying fat contents and dark tahini, as well as more complex products such as hummus and vegan sandwich spreads based on legumes, seeds, or nuts.

The selected plant-based foods have been analysed because existing nutrient data are missing or insufficient, as is the case for coconut milk, hemp seeds, hummus, and plant-based sandwich spreads. In addition, some nutrient data in the Danish Food Composition Database (FCDB) are borrowed from other countries, which may not accurately represent products available on the Danish market.

In 2018 and 2019, the Danish FCDB was updated with nutrient data for white button mushrooms and chanterelles. Mushrooms are well suited to plant-based diets as they are low-energy foods that contribute nutrients, satiety, and a natural umami flavour (Ernæringsfokus, 2026). As the range of edible mushrooms available in Danish supermarkets has expanded in recent years, seven additional species have been included: brown button mushrooms, king oyster mushrooms, enoki, field mushrooms, oyster mushrooms, portobello, and shiitake.

Brazil nuts have previously been analysed for selected nutrients, but existing data may be incomplete or outdated. As Brazil nuts are a rich source of selenium, updated data were requested, with selenium being the primary nutrient of interest.

This report presents the sampling strategy, sample preparation, analytical methods, and results based on data collected in 2020, 2021, and 2024 and used to update nutrient composition data for 14 plant-based foods in the Danish Food Composition Database (version 6.2; www.fcdb.fooddata.dk).

2. Sample Materials

2.1 Market Analysis and Sampling Plan

Different sampling approaches were applied to the plant-based foods included in this study. For all samples, it was not possible to obtain market share data from Euromonitor International, as none of the products were specified in their database. Consequently, the sampling plan was based solely on online product surveys, supplemented by physical store visits to retailers not represented online. Product surveys were conducted in grocery retailers located in the Copenhagen area. Available products were identified through systematic recording of product name, brand, store availability, nutrition declaration, and ingredient list for all foods meeting the predefined inclusion criteria. The sampling plan was designed to represent products available on the Danish market at the time of sampling.

In 2020 and 2021, sampling comprised the collection of six composite samples, including Brazil nuts, coconut milk (regular and light), dark tahini without added salt, plant-based sandwich spreads, and hummus. In 2024, sampling consisted of 22 independent samples covering eight plant-based food types: seven types of mushrooms and hulled hemp seeds (see Table 1).

For processed plant-based food products, further description of the included items was necessary to clarify how the analysed samples represent the generic food categories. Plant-based sandwich spreads were defined as products composed exclusively of ingredients of plant origin. According to Euromonitor, Urtekram is one of the leading brands within the category “Nut and Seed Based Spread” and the only brand mentioned in the category “Vegan nut and seed based spread” (Euromonitor International, 2020). Urtekram sandwich spread products were used as the reference point for defining the category, as seeds or kernels were listed as the second ingredient and water, tomato, or beetroot as the first ingredient. Products from other brands with a comparable ingredient composition were also included, provided that seeds, kernels, or nuts were listed as the second ingredient and water or vegetables as the first ingredient. Sandwich spreads based on pulses were excluded, as pulses differ in nutrient composition compared with seeds, nuts, kernels, and vegetables. To reduce variation in fatty acid composition, sandwich spreads were further restricted to products containing sunflower oil.

For coconut milk, both a regular and a light version were included, as a wide range of both types was available on the Danish market.

For tahini, the dark variant was selected for analysis, as it was the most widely available in retail stores and corresponds to the version marketed by Urtekram. Products without added salt were selected to allow assessment of the natural sodium content and to facilitate calculation of values for salted variants.

Table 1. Overview of plant-based foods included in the study, along with corresponding ID numbers and English and Danish product descriptions.

ID Number	Plant-based foods	Plantebaserede fødevarer
2006-POOL-04	Brazil nuts	Paranødder
2401-03*	Hemp seeds, hulled	Hampefrø, afskallede
2401-04*	Mushrooms, brown button	Svampe, brune
2401-09*	Mushrooms, king oyster	Svampe, kejserhatte
2401-06*	Mushrooms, enoki	Svampe, enoki
2401-10*	Mushrooms, field	Svampe, mark
2401-08*	Mushrooms, oyster	Svampe, østershatte
2401-05*	Mushrooms, portobello	Svampe, portobello
2401-07*	Mushrooms, shiitake	Svampe, shiitake
2006-POOL-01	Coconut milk, 17–19% fat	Kokosmælk, 17-19% fedt
2006-POOL-02	Coconut milk, light, 7–9% fat	Kokosmælk, light 7-9% fedt
2006-POOL-05	Tahini, dark	Tahin, mørk
2103-POOL-09	Hummus	Hummus
2006-POOL-03	Sandwich spread, plant-based	Smørepålæg, plantebaseret

* For these foods, each analytical value is based on analyses of 2–6 samples.

2.2 Collection of Samples

The foods included in the study were collected during three sampling periods. Brazil nuts, coconut milk (regular and light), dark tahini, and plant-based sandwich spreads were collected in December 2020. Hummus was collected in September 2021, while mushrooms and hulled hemp seeds were collected in May and June 2024. All samples were collected in the Copenhagen area.

Composite samples

Composite samples were prepared for six food categories: Brazil nuts, regular coconut milk, light coconut milk, dark tahini, plant-based sandwich spreads, and hummus. Each composite sample consisted of 3–14 subsamples representing products available on the Danish market, as shown in Table 2. A minimum total sample weight of 2,000 g was collected for each food category to ensure sufficient material for analysis.

Subsamples were generally equally weighted within each composite sample. The exception was tahini, where Urtekram contributed 50% of the composite sample in consideration of brand popularity, while the remaining 50% was equally distributed between two other brands.

Table 2 provides an overview of the composite samples, including the number of subsamples and their contribution to the final sample.

All composite samples were visually documented through photographs showing both the individual subsamples and the final composite sample. In addition, documentation specifying the exact weight contribution of each subsample was recorded. Examples of the documentation are shown in Figures 1–4.

Table 2. Composite samples of plant-based foods, including the number of subsamples and weight contributions

ID number	Plant-based food	Number of subsamples	Subsample distribution in composite sample
2006-POOL-04	Brazil nuts	3	Equal weight per subsample
2006-POOL-01	Coconut milk	10	Equal weight per subsample
2006-POOL-02	Coconut milk, light	4	Equal weight per subsample
2006-POOL-05	Tahini, dark	3	Unequal distribution: Baktat 25%, Metin 25%, Urtekram 50%
2103-POOL-09	Hummus	14	Equal weight per subsample
2006-POOL-03	Sandwich spread	4	Equal weight per subsample

Figure 1. *Composite sample of Brazil nuts (2006-POOL-04) including three subsamples, equally weighted.* ***Figure 2****. Composite sample of tahini (2006-POOL-05), including three subsamples, weighted in consideration of brand popularity.*

Figure 3. *Composite sample of plant-based sandwich spread (2006-POOL-03), including five subsamples, equally weighted.*

***Figure 4**. Composite sample of hummus (2103-POOL-09), including 14 subsamples, equally weighted.*

Independent samples

In total, 22 independent samples representing eight plant-based food types were analysed (see Tables 3 and 4). These included seven mushroom species and hulled hemp seeds.

Mushroom samples were collected to represent the products available on the Danish market at the time of sampling. Each independent sample represented one mushroom species from a single producer. For some species, products marketed under different brands but originating from the same producer were included in the sample. The sampling strategy was designed to ensure that each sample was representative of the food as marketed at the time of collection.

Priority was given to mushrooms produced in Denmark, primarily from Danish growers such as Tvedemose. However, imported mushrooms, particularly from Poland, were also included as they represented a substantial part of the products available in Danish supermarkets.

Hulled hemp seeds were sampled as independent products representing different brands and countries of origin available on the Danish market. Six products originating from four countries were included in the study (see Table 4).

More detailed information on all samples, including product names, brands, countries of origin, sampling dates, best-before dates, and ingredient information, is provided in Appendix A.

Table 3. Mushroom samples (seven types), including producer and country of origin. Product images are shown as examples of the mushroom types included in the study.

ID Number	Number of units	Producer	Country of origin	Product image
Brown button				
2401-04-01	15	Tvedemose	Denmark	
2401-04-02	9	BIEGPOL GPG Sp. z o.o.	Poland	
2401-04-03	10	Limax Spolska z o.o.	Poland	
King oyster				
2401-09-01	19	Enoki I/S	Denmark	
2401-09-02	14	Bygaard svampe ApS	Denmark	
Enoki				
2401-06-01	21	Tvedemose	Denmark	
2401-06-02	21	Enoki I/S	Denmark	
Field				
2401-10-01	9	Tvedemose	Denmark	
2401-10-02	5	Banken Polska	Poland	
Oyster				
2401-08-01	14	Banken Polska	Poland	
2401-08-02	8	BIEGPOL GPG Sp. z o.o.	Poland	
Portobello				
2401-05-01	14	Tvedemose	Denmark	
2401-05-02	10	Vejen Økologi	Denmark	
2401-05-03	8	BIEGPOL GPG Sp. z o.o.	Poland	
Shiitake				
2401-07-01	23	Enoki I/S	Denmark	
2401-07-02	21	Banken Polska	Poland	

Table 4. Hemp seed samples, including brand names and country of origin.

ID number	Number of units	Brand	Country of origin
Hemp seeds, hulled			
2401-03-01	20	VALSEMØLLEN	Denmark
2401-03-02	9	DAVA Foods	Denmark
2401-03-03	7	Änglamark	Denmark
2401-03-04	13	Urtekram	China
2401-03-05	5	Biogan	Rumania
2401-03-06	7	Naturdrogeriet	France

Figure 5. The six hemp seed samples included in the analysis.

2.3 Sample preparation

After collection, samples were stored under conditions reflecting their retail storage requirements. Chilled products were stored under refrigeration (approximately 4 °C), whereas ambient products were stored at room temperature (approximately 18 °C). All units remained in their original packaging and were labelled with information specifying the weight contribution of each subsample where applicable. Examples are shown in Figures 1–4.

All samples were transported to Eurofins Steins Laboratorium A/S in Vejen, Denmark, within 72 hours of collection.

Prior to analysis, mushroom samples were brushed clean and trimmed to obtain the edible portion. Composite samples were prepared by pooling the relevant subsamples according to the predefined sampling plan. All samples were subsequently homogenised using appropriate laboratory equipment (e.g. Grindomix GM 200, Robot Coupe, hand blender, or Ultra Turrax), depending on sample type and quantity. Homogenisation was performed in short intervals at high speed, with manual mixing between steps when required, to obtain a homogeneous sample while minimising heat generation.

Following homogenisation, samples were transferred to suitable containers and stored at a maximum of −18 °C until analysis.

3. Analytical Methods

Table 5 provides an overview of the analyses performed for each plant-based food, while Appendix B contains a brief description of the analytical methods.

All composite samples were analysed in duplicate. Independent samples were analysed once, after which mean values were calculated for each food category where relevant.

All analyses were performed by Eurofins Steins Laboratorium A/S. Most analyses were conducted as accredited tests under ISO 17025:2017 (DANAK TEST Reg. No. 222). For analyses not covered by accreditation, equivalent quality assurance procedures were applied.

Table 5. Overview of the analyses performed.

Plant-based food	Macro[1]	Vitamins[2]	Retinol	Vitamin D	Vitamin B12	Vitamin C	Choline[3]	Minerals[4]	AA[5]	FA[6]	Chol.[7]
Brazil nuts	x	na	na	na	na	na	na	x	x	na	na
Hemp Seed	x	x	na	na	x	na	x	x	x	x	na
Mushrooms	x	x	x	x	x	x	x	x	x	na	na
Coconut milk	x	x	na	na	na	na	na	x	x	x	x
Tahini, dark	x	x	na	na	na	na	na	x	x	x	x
Hummus	x	x	na	na	na	x	na	x	x	x	x
Sandwich spread, plant-based	x	x	na	na	na	na	na	x	x	x	x

na = not analysed

[1] Macronutrients, including dietary fibre, sugars, and starch.

[2] Vitamins: β-carotene, α-tocopherol, phylloquinone, thiamine, riboflavin, niacin, pyridoxine, pantothenic acid, biotin, and folate.

[3] Choline (free and total).

[4] Minerals: sodium, potassium, calcium, magnesium, phosphorus, iron, copper, zinc, iodine, manganese, chromium, selenium, and molybdenum.

[5] AA = Amino acids: isoleucine, leucine, lysine, methionine, cysteine, phenylalanine, tyrosine, threonine, tryptophan, valine, arginine, histidine, alanine, aspartic acid, glutamic acid, glycine, proline, and serine.

[6] FA = Fatty acids: saturated, monounsaturated, and polyunsaturated fatty acids.

[7] Chol. = Cholesterol.

4. Results

Analytical results are presented in Appendices C–G:

- Appendix C: Macronutrients, dietary fibre, sugars, and starch
- Appendix D: Vitamins, including vitamers and provitamins
- Appendix E: Minerals
- Appendix F: Amino acids
- Appendix G: Fatty acids and cholesterol

Results are presented as analytical values for composite samples and as individual sample values, together with calculated mean values, for foods analysed as independent samples.

5. Discussion

5.1 Sampling and Representativeness

The sampling strategy was designed to represent plant-based foods available on the Danish retail market at the time of collection, with a particular focus on foods for which nutrient data were missing, insufficient, or not specific to Danish products. As product-specific market share data were unavailable, sampling was based on systematic product surveys across major grocery retailers in the Capital Region of Denmark. This approach ensured coverage of products commonly available to consumers.

For processed plant-based foods, composite sampling was applied to obtain representative average nutrient values within a realistic analytical budget. Subsamples reflected product diversity within each category and were primarily equally weighted, with adjusted weighting applied where the market dominance of specific brands was known. While this approach provides robust generic nutrient estimates, it does not allow assessment of variability between brands or products.

An example where analysis of independent products might have been relevant is Brazil nuts, for which selenium concentrations are known to vary according to geographical origin (E.C. Silva Junior et al., 2017). From a nutritional monitoring perspective, samples should reflect products available on the Danish market. However, Brazil nuts sold in Denmark may originate from different countries, and information on market shares by origin is not available. A more detailed assessment of the effect of geographical origin would therefore require sampling and analysing products according to declared country of origin. Within the scope of the present study, the composite sample provides an average selenium concentration representing mixed-source products available on the Danish market. While this supports estimation of typical selenium intake, it introduces uncertainty and should be considered when interpreting the results, particularly in exposure assessments.

For coconut milk, both regular and light variants were included, as a wide variety of both types was available on the Danish market. This approach also reflects the diversity of products available to consumers.

Minimally processed single-ingredient foods, such as mushrooms and hulled hemp seeds, were analysed as independent samples, allowing differences between species and products to be retained in the analytical data.

All samples were collected in the Copenhagen area of Denmark. As this area includes all major national supermarket chains, the sampling is considered broadly representative of the Danish retail market, although products sold primarily through smaller or regional retailers may not be fully represented.

5.2 Macronutrients

The analysed foods differed markedly in macronutrient composition, reflecting differences in raw materials and product type. Brazil nuts, tahini, and hulled hemp seeds had the highest fat contents, whereas mushrooms contained very little fat.

The six independent hemp seed samples originated from four different countries. While some variation was observed in fat content between samples, the overall macronutrient composition was relatively similar. Among the analysed fatty acids, C18:1,n-9 and C18:4,n-3 showed the greatest variation between samples, at 32% and 40%, respectively. However, no clear association with country of origin was apparent (Appendix G).

The regular and light coconut milk products differed in composition, with the light variant containing lower levels of fat and dry matter than the regular variant. These differences are consistent with the product formulations and marketing of reduced-fat coconut milk products.

Mushrooms were characterised by low fat content across all analysed species. Some differences were observed in dietary fibre content, particularly for insoluble dietary fibre, whereas sugar and starch contents were generally low.

The fatty acid profiles of tahini and plant-based sandwich spreads largely reflected their principal lipid-containing ingredients. Tahini showed a fatty acid distribution consistent with sesame seeds, while the plant-based sandwich spreads were characterised by high proportions of C18:1,n-9 and C18:2,n-6 fatty acids, consistent with the presence of sunflower oil in all six products included in the composite sample (Appendices A and G).

5.3 Micronutrients

The analysed foods showed substantial differences in micronutrient composition, reflecting both differences in raw materials and product formulation. Sodium contents were generally low, typically below 100 mg/100 g, except for hummus and plant-based sandwich spreads, which contained 435 and 520 mg/100 g, respectively. These higher concentrations are likely related to the addition of salt during processing.

The rationale for including Brazil nuts was their known high selenium content, currently reported in the Danish Food Composition Database at 103 µg/100 g (www.fcdb.fooddata.dk). The analysed composite sample contained 220 µg selenium per 100 g, while the concentrations of the remaining minerals were generally comparable to current FCDB values. The adequate intake for selenium is 75 µg/day for women and 90 µg/day for men, whereas the tolerable upper intake level is 255 µg/day (NNR, 2023). Consequently, regular consumption of Brazil nuts may contribute substantially to selenium intake, although the actual intake will depend on both serving size and the selenium content of individual nuts.

Hulled hemp seeds were characterised by relatively high concentrations of several minerals, including potassium, magnesium, phosphorus, zinc, and molybdenum compared with the other analysed foods (Appendix E). In contrast, the mushroom samples generally contained lower concentrations of most minerals, although some variation between species was observed.

For vitamin B12, special consideration should be given to the analytical methodology. Vitamin B12 concentrations in mushrooms ranged from 0.017 to 0.077 µg/100 g and were therefore nutritionally negligible in relation to the recommended intake of 4 µg/day for adults (NNR 2023). The values were determined using a microbiological assay, which may detect biologically inactive cobalamin analogues in addition to active vitamin B12. At the time of analysis, the available chemical method had a limit of quantification of 0.25 µg/100 g, which would have resulted in all mushroom samples being reported below the limit of quantification. The concentrations reported here should therefore be interpreted with caution. Reanalysis using a more sensitive and selective chemical method would be valuable when such methodology becomes available.

5.4 Strengths and Limitations

A major strength of the project is the combination of accredited analytical methods and a systematic sampling strategy. The sampled products were selected to reflect foods available on the Danish retail market, and the analytical programme included a broad range of macronutrients, vitamins, minerals, amino acids, and fatty acids.

The main limitations relate to representativeness and data granularity. Composite sampling provides representative average values for food categories but does not capture variability between products, brands, or countries of origin. This is particularly relevant for Brazil nuts, for which selenium concentrations are known to vary according to geographical origin. Consequently, the reported selenium concentration represents the analysed mixture of products included in the composite sample rather than the full range of values that may occur on the market.

For minimally processed single-ingredient foods analysed as independent samples, such as mushrooms and hulled hemp seeds, the results represent the sampled products at the time of collection. Potential variation associated with cultivar, producer, growing conditions, and seasonal effects was not assessed within the scope of the study.

6. Perspectives

The analysed plant-based foods illustrate that plant-based foods cannot be considered a nutritionally uniform group. Instead, the foods examined in this study represent a broad spectrum of products with differing contributions to macronutrients and micronutrients. Differences were observed both between product categories and, for some foods, between closely related product types and species.

Future updates of the Danish Food Composition Database may therefore benefit from continued focus on specific product types and formulations rather than relying solely on generic values for broad food categories. This is particularly relevant for processed plant-based foods, where formulation and ingredient composition strongly influence nutrient content, and for minimally processed foods such as mushrooms, where species differences may be more important than country of origin.

Brazil nuts remain of particular interest because of their high selenium content and the well-documented variation associated with geographical origin. Additional analyses of independent products would therefore provide valuable information on the range of selenium concentrations available on the Danish market. For mushrooms, reanalysis of vitamin B12 would be relevant when sufficiently sensitive chemical methods become available.

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Appendix A – Sample Information

Name	Brand	GTIN	Ingrediensliste (Danish)	Ingredients	BBD	Sampling Date
Hummus (2103-POOL-09)						
Klassisk hummus	Zelected Foods	5708229113437	Kikærter 40%, vand, solsikkeolie, citronsaft, tahin (SESAM) 4%, modificeret majsstivelse, tapiokastivelse, vegetabilsk fiber (fra citrusfrugt), salt, sukker, hvidløg, surhedsregulerende middel: citronsyre, naturlig aroma, spidskommen.	Chickpeas 40%, water, sunflower oil, lemon juice, tahini (SESAME) 4%, modified corn starch, tapioca starch, vegetable fiber (from citrus fruit), salt, sugar, garlic, acidity regulator: citric acid, natural aroma, cumin.	28-04-2024	10-09-2021
Hummus	Princip	5710328000273	45% kogte kikærter, rapsolie, citronsaft, 10% sesampasta, vand, salt, hvidløg, citronskal, spidskommen, sort peber, konserveringsmiddel (E 202).	45% boiled chickpeas, rapeseed oil, lemon juice, 10% sesame paste, water, salt, garlic, lemon zest, cumin, black pepper, preservative (E 202).	14-10-2021	20-09-2021
Øko hummus	Salling	5902973785623	55% kogte kikærter (kikærter, vand, salt), vand, rapsolie, sesampuré, eddike, salt, surhedsregulerende middel (E 330), tørret hvidløg, spidskommen.	55% cooked chickpeas (chickpeas, water, salt), water, rapeseed oil, sesame puree, vinegar, salt, acidity regulator (E 330), dried garlic, cumin.	27-09-2021	20-09-2021
Hummus classic	Salling	5902973788303	53% kogte kikærter (kikærter, vand, salt), vand, rapsolie, 10% sesampuré, eddike, salt, tørret hvidløg, spidskommen, surhedsregulerende middel (E 330).	53% cooked chickpeas (chickpeas, water, salt), water, rapeseed oil, 10% sesame puree, vinegar, salt, dried garlic, cumin, acidity regulator (E 330).	05-10-2021	20-09-2021
Klassisk hummus	Gestus	5701410378585	48% kogte kikærter (kikærter, vand), sesampasta, solsikkeolie, vand, salt, sukker, 1% tørret hvidløg, peber, surhedsregulerende middel (E330).	48% cooked chickpeas (chickpeas, water), sesame paste, sunflower oil, water, salt, sugar, 1% dried garlic, pepper, acidity regulator (E330).	26-11-2021	20-09-2021
Grov hummus	Coop smag forskellen	5700381224952	Kikærter 58% (EU), solsikkeolie, tahin 11% (sesampasta), vand, salt, hvidløgspulver, surhedsregulerende middel (E 330).	Chickpeas 58% (EU), sunflower oil, tahini 11% (sesame paste), water, salt, garlic powder, acidity regulator (E 330).	05-01-2021	20-09-2021
Hummus	Coop smag forskellen	5700381996217	Kikærter 46% (EU), vand, solsikkeolie, tahin 14% (sesampasta), salt, hvidløgspulver, surhedsregulerende middel (E 330), spidskommen, fortykningsmiddel (E 466), konserveringsmiddel (E 202), cayennepeber.	Chickpeas 46% (EU), water, sunflower oil, tahini 14% (sesame paste), salt, garlic powder, acidity regulator (E 330), cumin, thickener (E 466), preservative (E 202), cayenne pepper.	04-10-2021	20-09-2021
Økologisk hummus	Coop smag forskellen	5700382970643	Kikærter 46% (EU), vand, solsikkeolie, tahin 14% (sesampasta), eddike, salt, hvidløgspulver, surhedsregulerende middel (E 330, E 270), spidskommen, cayennepeber.	Chickpeas 46% (EU), water, sunflower oil, tahini 14% (sesame paste), vinegar, salt, garlic powder, acidity regulator (E 330, E 270), cumin, cayenne pepper.	04-10-2021	20-09-2021
Hummus af kikærter	Rema 1000	5705830605436	74% kogte kikærter (heraf 60% kikærter, vand), 9% sesampasta, 7% vand, 6% rapsolie, salt, 1% hvidløgspulver, surhedsregulerende middel (E 330), konserveringsmiddel (E 202).	74% cooked chickpeas (of which 60% chickpeas, water), 9% sesame paste, 7% water, 6% rapeseed oil, salt, 1% garlic powder, acidity regulator (E 330), preservative (E 202).	20-10-2021	20-09-2021
Hummus med citron og spidskommen	Løgimose	5701924365217	50% kogte kikærter, rapsolie, 10% citronsaft, tahin (sesampasta), vand, salt, hvidløg, surhedsregulerende middel: citronsyre, spidskommen, citronskal, peber, konserveringsmiddel: kaliumsorbat.	50% cooked chickpeas, rapeseed oil, 10% lemon juice, tahini (sesame paste), water, salt, garlic, acidity regulator: citric acid, cumin, lemon peel, pepper, preservative: potassium sorbate.	10-10-2021	20-09-2021
Hummus classic	La Campagna	5712873674534	53% kogte kikærter (kikærter, vand, salt), vand, rapsolie, 10% sesampuré, eddike, salt, tørret hvidløg, spidskommen, surhedsregulerende middel (E 330).	53% cooked chickpeas (chickpeas, water, salt), water, rapeseed oil, 10% sesame puree, vinegar, salt, dried garlic, cumin, acidity regulator (E 330).	N/A	20-09-2021
Økologisk hummus	ØGO	590297378609	55% kogte kikærter (kikærter, vand, salt), vand, rapsolie, sesampuré, eddike, salt, surhedsregulerende middel (E 330), tørret hvidløg, spidskommen.	55% cooked chickpeas (chickpeas, water, salt), water, rapeseed oil, sesame puree, vinegar, salt, acidity regulator (E 330), dried garlic, cumin.	27-09-2021	20-09-2021
Hummus	Delikatessen	5701410387617	56% kogte kikærter (kikærter, vand), solsikkeolie, vand, sesamfrøpasta, citronsaft, sukker, salt, hvidløg, peber, spidskommen, surhedsregulerende middel (E 330), konserveringsmidler (E 202, E 211)	56% cooked chickpeas (chickpeas, water), sunflower oil, water, sesame seed paste, lemon juice, sugar, salt, garlic, pepper, cumin, acidity regulator (E 330), preservatives (E 202, E 211)	25-10-2021	20-09-2021
Øko hummus	Delikatessen	5701410406820	65% kikærter, solsikkeolie, 9% sesamfrøpasta, vand, citronsaft, salt, hvidløg, spidskommen, peber, surhedsregulerende middel (mælkesyre)	65% chickpeas, sunflower oil, 9% sesame seed paste, water, lemon juice, salt, garlic, cumin, pepper, acidity regulator (lactic acid)	10-10-2021	20-09-2021

Name	Brand	GTIN	Country of origin	Ingrediensliste (Danish)	Ingredients	BBD	Sampling Date
Coconut milk, 17-19% fat (2006-POOL-01)							
Kokosmælk	Inspiring Food	5705830005045	TH	60% kokosekstrakt, 40% vand	60% coconut extract, 40% water	29-05-2022	14-12-2020
Kokosmælk	Coop	7340011354208	VN	76% Kokosekstrakt (kokosnød: Vietnam), vand, fortykningsmiddel (E 415)	76% coconut extract (coconut: Vietnam), water, thickener (E 415)	21-03-2022	14-12-2020
Økologisk kokosmælk	ØGO	5712871885635	LK	68% kokosnøddeekstrakt*, vand, fortykningsmiddel (E 412*)	68% coconut extract*, water, thickener (E 412*)	16-09-2022	14-12-2020
Coconut milk creamy	Urtekram	5765228397046	N/A	Kokosnødekstrakt* (60%), vand	Coconut extract* (60%), water	04-06-2022	14-12-2020
Kokosmælk	Coop 365	7340011457046	VN	76% Kokosekstrakt (kokosnød: Vietnam), vand, fortykningsmiddel (E 415)	76% coconut extract (coconut: Vietnam), water, thickener (E 415)	05-03-2022	14-12-2020
Kokosmilch	Allfair	4026363213426	LK	Kokosnød* (50%), vand, stabilisator: guargummi	Coconut* (50%), water, stabilizer: guar gum	30-09-2022	14-12-2020
Kokosmælk	Asian Kitchen	5710405090951	TH	75% kokosextrakt, vand, emulgator (E435), stabilisator (E466)	75% coconut extract, water, emulsifier (E435), stabilizer (E466)	28-02-2022	14-12-2020
Kokosmælk økologisk	Levevis	5712871885659	LK	68% kokosnøddeekstrakt*, vand, fortykningsmiddel (E 412)*	68% coconut extract*, water, thickener (E 412)*	24-07-2022	14-12-2020
Økologisk kokos mælk	Änglamark	7340011497080	LK	Økologisk kokosekstrakt 73% (kokosnød: Sri Lanka), vand, fortykningsmiddel (E 415)	Organic coconut extract 73% (coconut: Sri Lanka), water, thickener (E 415)	17-02-2022	14-12-2020
Coconut milk	Go tan	8710605096170	LK	99,96% kokosmælk (kokosekstrakt, vand), emulgator (xantangummi, guar gum)	99.96% coconut milk (coconut extract, water), emulsifier (xanthan gum, guar gum)	01-07-2021	14-12-2020
Coconut milk, light, 7-9% fat (2006-POOL-02)							
Kokosmælk light	Asian Kitchen	5712871891414	TH	Vand, kokosnøddeekstrakt, stabilisator (E412), emulgator (E 435)	Water, coconut extract, stabilizer (E412), emulsifier (E 435)	30-07-2022	14-12-2020
Coconut milk light	Blue Dragon	5010338013363	TH	Vand, Kokosnødekstrakt (25%), stabiliseringsmoddel (E 466), antioxidantmiddel (citronsyre)	Water, coconut extract (25%), stabilizer (E 466), antioxidant (citric acid)	01-04-2023	14-12-2020
Kokosmælk light	Inspiring Food	5705830005038	TH	55% kokosekstrakt, 45% vand	55% coconut extract, 45% water	21-05-2022	14-12-2020
Økologisk kokosmælk light	Inspiring Food	5711988000757	LK	72% vand, 28% økologisk kokosekstrakt	72% water, 28% organic coconut extract	12-06-2022	14-12-2020
Brazil nuts (2006-POOL-04)							
Natural brazil nuts	Earth Control	5706779057010	BR	Paranødder	Brazil nuts	24-08-2021	14-12-2020
Paranødder naturel	Coop	7340011494973	BO	Paranødder	Brazil nuts	28-02-2021	14-12-2020
Paranødde kerner	Svansø	5760932014067	BR/BO/PE	100% paranøddekerner	100% Brazil nut kernels	09-05-2022	14-12-2020

ID Number	Name	Brand	GTIN	Country of origin	Ingrediensliste (Danish)	Ingredients	BBD	Sampling Date
Hemp seeds, hulled								
2401-03-01	Øko hampefrø	VALSEMØLLEN	5701075203413	DK	Afskallede økologiske hampefrø	Organic hulled hemp seeds	19-02-2025	24-05-2024
2401-03-02	Danske økologiske hampefrø afskallede	DAVA Foods	5701607591421	DK	Økologiske hampefrø, afskallede (100%)	Organic hemp seeds, hulled (100%)	16-04-2025	24-05-2024
2401-03-03	Økologiske hampefrø afskallede	Änglamark	5750002502990	DK	Afskallede økologiske hampefrø (Danmark)	Organic hulled hemp seeds (Denmark)	07-05-2025	06-06-2024
2401-03-04	Hampefrø organic afskallede	Urtekram	5765228707753	CN	Økologiske glutenfrie afskallede hampefrø	Organic gluten-free hulled hemp seeds	11-03-2025	24-05-2024
2401-03-05	Hampefrø økologiske og afskallede	Biogan	5704297154600	RO	Økologiske afskallede hampefrø	Organic hulled hemp seeds	01-06-2025	24-05-2024
2401-03-06	Økologiske hampefrø - afskallede	Naturdrogeriet	5703137030425	FR	Afskallede økolgiske hampefrø	Organic hulled hemp seeds	01-08-2025	24-05-2024

Name (ID Number)	Brand	GTIN	Ingrediensliste (Danish)	Ingredients	BBD	Sampling Date
Sandwich spread, plant-based (2006-POOL-03)						
Sandwich spread - rødbede & peberrod	Urtekram	5765228391907	Rødbede* (42%), solsikkekerner*, vand, solsikkeolie*, peberrodscreme* (9%) [peberrod (78%)], rødbedesaftkonc.* (3%), majsstivelse*, citronsaftkonc.*, havsalt, peberrodspulver* (1%), æblesaftkonc.*, eddike*	Beetroot* (42%), sunflower seeds*, water, sunflower oil*, horseradish cream* (9%) [horseradish (78%)], beetroot juice concentrate* (3%), corn starch*, lemon juice concentrate*, sea salt, horseradish powder* (1%), apple juice concentrate*, vinegar*	12-03-2022	07-12-2020
Sandwich spread - tomat & urter	Urtekram	5765228391921	Tomatkoncentrat* (39%), solsikkekerner*, solsikkeolie*, tomat* (9%), vand, løg*, sojasauce* [sojabønner*], rørsukker*, havsalt, citronsaftkonc.*, krydderurter* (0,3%), gurkemeje*	Tomato concentrate* (39%), sunflower seeds*, sunflower oil*, tomato* (9%), water, onion*, soy sauce* [soybeans*], cane sugar*, sea salt, lemon juice concentrate*, herbs* (0.3%), turmeric*	25-10-2021	07-12-2020
Sandwich spread - basilikum	Urtekram	5765228391938	Vand, solsikkekerner*, solsikkeolie*, basilikum* (8%), citronsaftkonc.*, havsalt, peber*	Water, sunflower seeds*, sunflower oil*, basil* (8%), lemon juice concentrate*, sea salt, pepper*	04-12-2021 (1) 09-03-2022 (2)	07-12-2020
Solsikke og oliven smørepålæg vegansk Økologisk vegansk spread solsikke og oliven	Levevis & Salling	5712870942568 5712873668854	Vand, 23% solsikkefrø*, solsikkeolie*, 9% sorte oliven*, havsalt, eddike*, peber*, hvidløg*, paprika*	Water, 23% sunflower seeds*, sunflower oil*, 9% black olives*, sea salt, vinegar*, pepper*, garlic*, paprika*	10-04-2021 (2) & 13-02-2022 (2)	07-12-2020
Cashew cream with paprika	Urtekram	5765228184134	Tomatpuré*, peberfrugt* (30%), cashewnødder* (8%), solsikkeolie*, løg*, rismel*, kartoffelmel*, sesam*, æblejuice* (koncentrat), havsalt, majsmel*, citronsaft* (koncentrat), paprika*, peber*	Tomato purée*, bell pepper* (30%), cashew nuts* (8%), sunflower oil*, onion*, rice flour*, potato starch*, sesame*, apple juice* (concentrate), sea salt, corn flour*, lemon juice* (concentrate), paprika*, pepper*	02-12-2021 (1) 18-06-2022 (2)	07-12-2020
Tahini, dark (2006-POOL-05)						
Tahin sesampasta	Baktat	8690804682902	100% sesam	100% sesame	24-04-2022	14-12-2020
Tahin sesame paste	Metin	8690799001030	Sesam paste	Sesame paste	01-05-2022	14-12-2020
Tahin sesamsmør unsalted	Urtekram	5765228374504	Ristede uafskallede sesamfrø	Roasted unhulled sesame seeds	26-08-2021	14-12-2020

ID Number	Name	Brand	Manufacturer	GTIN	Country of origin	Ingrediensliste (Danish)	Ingredients	Sampling Date
Mushrooms, brown button								
2401-04-01	Danske, økologiske champignon brune	Tvedemose	Tvedemose	5701243994815	DK	Økologiske danske brune champignoner	Organic Danish brown mushrooms	10-06-2024
	Danske brune champignon	Salling ØKO	Tvedemose Økologi	5701243994815	DK	Økologiske danske brune champignoner	Organic Danish brown mushrooms	11-06-2024
	Økologiske brune champignon	ØGO	Tvedemose Økologi	5701243997731	DK	Økologiske brune champignon	Organic brown mushrooms	10-06-2024
	Økologiske danske brune champignon	ØGO	Tvedemose Økologi	5701243994815	DK	Økologiske danske brune champignon	Organic Danish brown mushrooms	11-06-2024
	Økologiske brune champignoner	Änglamark	Tvedemose	5701243994815	DK	Økologiske danske brune champignoner	Organic Danish brown mushrooms	11-06-2024
2401-04-02	BRUNE CHAMPIGNONER	Coop	BIEGPOL GPG Sp. Z o.o.	5700383269562	PL	Brune champignoner	Brown mushrooms	16-06-2024
2401-04-03	BRUNE CHAMPIGNON	Salling	Limax Spolska z o.o.	5712876494252	PL	Brune champignoner	Brown mushrooms	17-06-2024
Mushrooms, portobello								
2401-05-01	Danske, økologiske portobello	Tvedemose	Tvedemose	5701243012007	DK	Økologiske danske portobello svampe	Organic Danish portobello mushrooms	10-06-2024
	Danske portobello	Salling ØKO	Tvedemose	5701243994839	DK	Økologiske danske portobello svampe	Organic Danish portobello mushrooms	10-06-2024
	Økologiske danske portobello	ØGO	Tvedemose	5701243994839	DK	Økologiske danske portobello svampe	Organic Danish portobello mushrooms	11-06-2024
2401-05-02	Portobello champignoner	Vejen Champignon	Vejen Økologi	5700002218247	DK	Økologiske danske portobello svampe	Organic Danish portobello mushrooms	17-06-2024
2401-05-03	Portobello champignoner	Coop	Coop Danmark A/S	5700383908812	PL	Portobello champignoner	Portobello mushrooms	16-06-2024
Mushrooms, enoki								
2401-06-01	Danske enoki svampe	Grøn Balance Øko	Tvedemose	5701410390426	DK	Økologiske danske enoki svampe	Organic Danish enoki mushrooms	16-06-2024
	Økologiske enoki svampe	Änglamark	Tvedemose	5701677005101	DK	Økologiske danske enoki svampe	Organic Danish enoki mushrooms	16-06-2024
2401-06-02	Danske enoki	Salling ØKO	Enoki I/S	5701243994518	DK	Økologiske danske enoki svampe	Organic Danish enoki mushrooms	10-06-2024
Mushrooms, shiitake								
2401-07-01	Danske shii take	Salling ØKO	Enoki I/S	5701243994860	DK	Økologiske danske shiitake svampe	Organic Danish shiitake mushrooms	10-06-2024
2401-07-02	Shiitake	Gestus	Banken Polska	5701410380069	PL	Polske shiitake svampe	Polish shiitake mushrooms	17-06-2024
Mushrooms, oyster								
2401-08-01	Østershatte	Gestus	Banken Polska	5701410380038	PL	Østershatte svampe	Oyster mushrooms	10-06-2024
2401-08-02	Østershatte	Coop	BIEGPOL GPG Sp. Z o.o.	5750006330971	PL	Østershatte svampe	Oyster mushrooms	16-06-2024
Mushrooms, king oyster								
2401-09-01	Danske Kesjerhatte	Salling ØKO	Enoki I/S	5706461100192	DK	Økologiske danske kejserhatte	Organic Danish king oyster mushrooms	17-06-2024
2401-09-02	Økologiske Kejserhatte	Bygaard	Bygaard Svampe ApS	5715348076475	DK	Økologiske danske kejserhatte	Organic Danish king oyster mushrooms	16-06-2024
Mushrooms, field								
2401-10-01	Marksvampe	Gestus	Tvedemose	5701410408626	DK	Danske marksvampe	Danish field mushrooms	17-06-2024
2401-10-02	Marksvampe	Gestus	Banken Polska	5908281993651	PL	Polske marksvampe	Polish field mushrooms	17-06-2024

Appendix B – Analytical Methods

Nitrogen: NMKL 6:2003. The total amount of organic nitrogen is measured according to the Kjeldahl principle. Expanded uncertainty: 5%.

Amino acids: ISO 13903:2005; EU 152/2009. Tryptophan: Alkaline hydrolysis, quantification by HPLC. Methionine and cysteine: Oxidized with hydrogen peroxide and formic acid at cold temperature, followed by acid hydrolysis using aqueous hydrochloric acid. Amino acids are separated in an amino acid analyzer and the detection is carried out using post-column derivatisation with ninhydrin reagent at 440 and 570 nm. All other amino acids: Hydrolyzed in aqueous hydrochloric acid and separated in an amino acid analyzer. The spectrophotometric detection is carried out using post-column derivatisation with ninhydrin reagent at 440 nm and 570 nm. Expanded uncertainty: 14%, but 10% for tryptophan.

Fat: ISO 11085:2015. The sample is boiled in hydrochloric acid. The washed and dried residue is extracted with petroleum ether. The solvent is evaporated, and the residue is dried and weighed. Expanded uncertainty: 6%.

Fatty acids: AOCS 1f-96 (2009). The sample is boiled in hydrochloric acid and the fat is extracted using a mixture of diethyl- and petroleum ether. Treated with sodium hydroxide and boron trifluoride in methanol to form fatty acid methyl esters (FAMEs), measured by GC-FID. C17:0 internal standard. Expanded uncertainty: 10%.

Cholesterol: After saponification, the cholesterol is extracted with butyl-methyl-ether followed by silylation for determination by GC-FID. Expanded uncertainty: 15%.

Dry matter: NMKL 23:1991. The total dry matter content is determined by evaporating all water from the sample by means of heating it at a constant temperature. Expanded uncertainty: 5%.

Ash: NMKL 173:2005. The sample is ashed at 525-550°C, and the ash weighed. Expanded uncertainty: 4%.

Retinol (Vitamin A): EN 12823-1:2000. Alkaline hydrolysis using ethanolic potassium hydroxide solution. Extracted with hexane:ethylacetate. Separated and quantified by NP-HPLC-UV (325 nm). External standard. Limit of quantification: 21 µg/100 g.

β-carotene (Vitamin A): Adaption of method based on EN 12823-2:2000. All-trans-β-carotene and 13-cis-β-carotene are extracted and separated by RP-HPLC and quantified by UV/DAD detection (450 nm). External standard. Limit of quantification: 5 µg/100 g.

Vitamin D (Vitamin D3, 25-hydroxy vitamin D3, vitamin D2, 25-hydroxy vitamin D2): Alkaline hydrolysis, liquid-liquid extraction, clean-up by solid-phase-extraction. RP-LC-ESI-MS/MS. 13C-labelled internal standard. Ložnjak Švarc P, Barnkob LL, Jakobsen J (2021): Quantification of vitamin D_3 and 25-hydroxyvitamin D_3 in food – The impact of eluent additives and labelled internal standards on matrix effects in LC-MS/MS analysis. Food Chemistry, 357, pp. 129588.

α-tocopherol (Vitamin E): EN 12822:2014. Alkaline hydrolysis, NP-HPLC with fluorescence detection (Ex/Em 290 nm/327 nm). External standard. Expanded uncertainty: 16%. For coconut, sandwich spread and tahin beta-, delta- and gamma-tocopherol were also quantified (not accredited).

Vitamin K1 (phylloquinone): EN 14148:2003. Vitamin K1 is enzymatically treated to remove fat and extracted by n-hexane. The determination is carried out using RP-HPLC with post-column reduction and fluorimetric detection (Ex.: 243 nm, Em.: 430 nm).

Thiamin incl. hydroxyl-2-ethythiamin: EN 14122-2014. Acid hydrolysis, separation by RP-HPLC and quantified by fluorescence detection (Ex/Em: 368 nm/440 nm) after post-column oxidation to thiochrome. External standard. Expanded uncertainty: 16%.

Riboflavin: EN 14152:2003. Acid hydrolysis, enzymatic treatment, separation by RP-HPLC, quantified by fluorescence detection (Ex/Em: 468 nm/520 nm). External standard. Adapted to quantify riboflavin-5-phosphate and riboflavin separately. Expanded uncertainty: 16%.

Pyridoxine: EN 14164. Acid extraction, followed by treatment with phosphatase. By reaction with glyoxylic acid in the presence of Fe2+ as catalyst, pyridoxamine is transformed into pyridoxal, which is then reduced to pyridoxine by the action of sodium borohydride in alkaline medium. Pyridoxine is finally quantified by RP-HPLC with fluorescence detection (Ex/EM: 290 nm/395 nm). External standard. Expanded uncertainty: 14%.

Niacin: EN 15652:2009. Nicotinic acid and nicotinamide are extracted from samples in a weak hydrochloride acid solution at 100 °C, separated by RP-HPLC, detected and quantified by fluorescence detection (Ex/Em: 322 nm/380 nm) after a post-column reaction with hydrogen peroxide catalyzed by Cu(II) ions under UV-radiation (365 nm). External standard. Niacin is calculated as the sum of nicotinic acid and nicotinamide. Expanded uncertainty: 14%.

Biotin: LST AB 266.1, 1995. Biotin is extracted from the sample in an autoclave using acid hydrolysis. After dilution with basal medium containing all required growth nutrients except biotin, the growth response of *Lactobacillus plantarum* (ATCC 8014) to extracted biotin is measured turbidimetrically and is compared to calibration solutions with known concentrations. Expanded uncertainty: 24%.

Pantothenic acid: AOAC 2012.16. LC/MS/MS with isotope dilution. Expanded uncertainty: 20%.

Folates: NMKL 111:1985. Folate is extracted from the sample in an autoclave using a buffer solution, followed by an enzymatic digestion with human plasma and pancreas V. After dilution with basal medium containing all required growth nutrients except folic acid, the growth response of *Lactobacillus rhamnosus* (ATCC 7469) to extracted folate is measured turbidimetrically and is compared to calibration solutions with known concentrations. Limit of quantification: 5 µg/100 g.

Cobalamin (vitamin B12): Microbiological quantification using growth in *Lactobacillus delbrueckii*, and measurement of turbidity.

Vitamin C (ascorbic acid and dehydroascorbic acid): The sample is extracted in an aqueous solution containing trichloroacetic acid and the antioxidant tris(2-carboxyethyl)phosphine (TCEP). TCEP reduces dehydroascorbic acid to ascorbic acid. The final extract is analysed by HPLC with UV detection at 265 nm.

Choline (free and total): AOAC Vol 91,1 2008. Choline and esters of these are extracted by methanol and water. Free carnitine and free choline are determined directly in the extract. Total choline is obtained by alkaline hydrolysis at elevated temperature of the extract, thereby converting the bound forms into free carnitine and free choline. The resulting free choline is quantified by isotope dilution LC-MSMS. Total choline: Expanded uncertainty: 10%.

Sodium, potassium, calcium, magnesium, phosphorus, iron, copper, zinc: EN 13805:2014/EN ISO 11885. Pressure digestion. Analysis of liquid samples by inductively coupled plasma optical emission spectroscopy (ICP-OES). For hummus, hemp seed and mushrooms the quantification was performed by ICP-MS.

Selenium, chromium, manganese: EN 13805:2014/EN ISO 17294:2016. Pressure digestion. Analysis of liquid samples by inductively coupled plasma mass spectroscopy (ICP-MS).

Molybdenum: EN 13805:2014/EN 15763:2010. ICP-MS/MS. Pressure digestion. Analysis of liquid samples by inductively coupled plasma mass spectrometry (ICP-MS).

Iodine: DS EN ISO 15111:2007. Determination of iodine by ICP-MS. Limit of quantification for Brazil nuts: 5 µg/100 g; for the other matrices: 0.3 µg/100 g.

Appendix C – Macronutrients, dietary fibre, sugars, and starch

Plant-based food	Sample number	Nitrogen g/100 g	Fat g/100 g	Dry matter g/100 g	Ash g/100 g	SDFS g/100 g	SDFP g/100 g	IDF g/100 g	Fructose g/100 g	Glucose g/100 g	Maltose g/100 g	Sucrose g/100 g	Lactose g/100 g	Starch g/100 g
Brazil nuts	2006-POOL-04	2.65	67.3	97.1	3.93	<0.6	1.2	5.6	na	na	na	na	na	na
Hemp seeds	Average*	5.16	51.4	95.0	5.72	<0.6	1.7	2.6	<0.2	<0.2	<0.2	1.9	<0.2	<0.5
Hemp seeds 01	2401-03-01	5.11	55.1	97.0	4.82	<0.6	1.6	2.0	<0.2	0.2	<0.2	2.4	<0.2	<0.5
Hemp seeds 02	2401-03-02	5.08	50.6	93.4	6.11	0.8	1.9	3.0	0.2	0.5	<0.2	1.4	<0.2	<0.5
Hemp seeds 03	2401-03-03	5.14	51.5	93.7	6.41	0.9	1.7	2.2	<0.2	<0.2	<0.2	1.0	<0.2	<0.5
Hemp seeds 04	2401-03-04	5.13	55.9	96.7	4.80	<0.6	2.1	2.2	<0.2	<0.2	<0.2	2.6	<0.2	<0.5
Hemp seeds 05	2401-03-05	5.09	51.2	94.8	6.42	<0.6	1.4	3.4	<0.2	<0.2	<0.2	2.0	<0.2	<0.5
Hemp seeds 06	2401-03-06	5.38	44.2	94.7	5.73	<0.6	1.6	2.5	<0.2	<0.2	<0.2	1.8	<0.2	<0.5

na: not analysed.

* Values <LOQ were estimated as 0 in the calculation.

Continued

Plant-based food	Sample number	Nitrogen g/100 g	Fat g/100 g	Dry matter g/100 g	Ash g/100 g	SDFS g/100 g	SDFP g/100 g	IDF g/100 g	Fructose g/100 g	Glucose g/100 g	Maltose g/100 g	Sucrose g/100 g	Lactose g/100 g	Starch g/100 g
Mushrooms, brown	Average*	0.50	<0.3	7.0	0.82	<0.3	0.2	1.0	0.4	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, brown 1	2401-04-01	0.48	0.3	6.3	0.78	<0.3	0.3	1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, brown 2	2401-04-02	0.56	<0.3	8.0	0.87	<0.3	0.2	1.2	0.7	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, brown 3	2401-04-03	0.46	0.3	6.6	0.80	<0.3	<0.2	0.9	0.6	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, portobello	Average*	0.43	<0.3	6.8	0.77	<0.3	0.2	0.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, portobello 1	2401-05-01	0.38	<0.3	6.3	0.72	<0.3	0.2	0.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, portobello 2	2401-05-02	0.43	<0.3	6.3	0.77	<0.3	<0.2	0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, portobello 3	2401-05-03	0.49	0.3	7.6	0.82	<0.3	0.2	1.1	0.5	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, enoki	Average*	0.39	<0.3	9.0	0.68	<0.3	0.6	1.9	0.4	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, enoki 1	2401-06-01	0.38	0.4	8.7	0.69	<0.3	0.5	1.9	0.4	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, enoki 2	2401-06-02	0.40	0.3	9.4	0.66	<0.3	0.7	1.8	0.4	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, shiitake	Average*	0.47	0.4	8.4	0.59	<0.3	0.7	1.8	0.5	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, shiitake 1	2401-07-01	0.44	0.4	7.9	0.55	0.3	0.6	1.5	0.3	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, shiitake 2	2401-07-02	0.49	0.3	8.8	0.62	<0.3	0.8	2.1	0.7	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, oyster	Average*	0.41	<0.3	8.9	0.73	<0.3	0.8	2.0	0.8	<0.2	<0.2	<0.2	<0.2	1.0
Mushrooms, oyster 1	2401-08-01	0.38	<0.3	8.3	0.77	<0.3	0.8	2.3	0.7	<0.2	<0.2	<0.2	<0.2	0.7
Mushrooms, oyster 2	2401-08-02	0.43	<0.3	9.5	0.68	<0.3	0.7	1.7	0.8	<0.2	<0.2	<0.2	<0.2	1.2
Mushrooms, king oyster	Average*	0.44	<0.3	9.9	0.74	<0.3	0.5	1.6	1.3	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, king oyster 1	2401-09-01	0.41	0.5	10.0	0.73	<0.3	0.5	1.5	1.6	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, king oyster 2	2401-09-02	0.47	<0.3	9.8	0.75	<0.3	0.4	1.6	1.0	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, field	Average*	0.49	0.3	6.5	0.80	<0.3	0.3	1.0	0.3	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, field 1	2401-10-01	0.44	<0.3	5.7	0.77	<0.3	0.2	0.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Mushrooms, field 2	2401-10-02	0.53	<0.3	7.3	0.82	<0.3	0.3	1.1	0.5	<0.2	<0.2	<0.2	<0.2	<0.5
Coconut milk, 17-19% fat	2006-POOL-01	0.33	16.4	21.7	0.43	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Coconut milk, light 7-9% fat	2006-POOL-02	0.14	10.7	13.6	0.25	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	1.1	<0.2	<0.5
Tahini, dark	2006-POOL-05	3.66	60.3	99.2	3.73	1.9	1.55	8.4	<0.2	<0.2	<0.2	0.6	<0.2	0.5
Hummus	2103-POOL-09	1.17	23.8	48.6	1.85	1.3	0.8	4.4	<0.2	<0.2	<0.2	0.3	<0.2	<0.5
Sandwich spread, plant-based	2006-POOL-03	0.66	24.9	39.6	2.38	<0.6	0.8	2.4	1.5	1.3	<0.2	1.1	<0.2	1.1

na: not analysed.

* Values <LOQ were estimated as 0 in the calculation.

Appendix D – Vitamins, including vitamers and provitamins

Plant-based food	Sample number	beta-carotene, trans	alpha-tocopherol	Phyllo-quinone	Thiamin	Riboflavin	Niacin	Pyridoxin	Pantothenic acid	Biotin	Folate	Cobalamin	Vitamin C	Choline, free	Choline, total
		µg/100 g	mg/100 g	µg/100 g	mg/100 g	mg/100 g	mg/100 g	mg/100 g	mg/100 g	µg/100 g	µg/100 g	µg/100 g	mg/100 g	mg/100 g	mg/100 g
Brazil nuts	2006-POOL-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hemp seeds	Average*	10.1	1.48	37.6	1.15	0.090	3.36	0.524	1.01	39.1	66.5	0.013	<0.5	40.5	91
Hemp seeds 01	2401-03-01	6.4	0.92	24.9	0.67	0.039	2.87	0.512	1.10	48.4	60.2	<0.01	<0.5	15.7	48
Hemp seeds 02	2401-03-02	12.4	1.63	36.6	1.10	0.064	3.18	0.459	0.80	42.2	81.7	<0.01	<0.5	44.8	68
Hemp seeds 03	2401-03-03	8.9	1.37	43.6	1.17	0.122	3.45	0.466	0.82	35.4	44.6	0.035	<0.5	57.5	97
Hemp seeds 04	2401-03-04	5.3	0.81	26.0	1.17	0.084	3.24	0.689	1.06	35.3	72.4	0.012	<0.5	26.0	97
Hemp seeds 05	2401-03-05	12.6	2.22	46.7	1.53	0.111	3.72	0.486	1.14	35.5	53.4	0.019	<0.5	54.1	132
Hemp seeds 06	2401-03-06	14.7	1.95	47.9	1.29	0.122	3.71	0.529	1.16	37.9	86.6	0.013	<0.5	45.1	104

na: not analysed.

* Values <LOQ were estimated as 0 in the calculation.

Continued

Plant-based food	Sample number	beta-carotene, trans	alpha-tocopherol	Phyllo-quinone	Thiamin	Riboflavin	Niacin	Pyridoxin	Pantothenic acid	Biotin	Folate	Cobalamin	Vitamin C	Choline, free	Choline, total
		µg/100 g	mg/100 g	µg/100 g	mg/100 g	mg/100 g	mg/100 g	mg/100 g	mg/100 g	µg/100 g	µg/100 g	µg/100 g	mg/100 g	mg/100 g	mg/100 g
Mushrooms, brown	Average*	<5	<0.08	<0.8	0.067	0.320	3.15	0.102	1.06	12.4	25.5	0.067	<0.5	6	21
Mushrooms, brown1	2401-04-01	<5	<0.08	<0.8	0.056	0.322	3.77	0.126	1.18	11.7	26.8	0.069	<0.5	8	21
Mushrooms, brown2	2401-04-02	<5	<0.08	<0.8	0.076	0.380	3.21	0.077	1.12	13.5	24.4	0.058	<0.5	7	24
Mushrooms, brown3	2401-04-03	<5	<0.08	<0.8	0.070	0.257	2.47	0.102	0.89	12.1	25.2	0.073	<0.5	5	17
Mushrooms, portobello	Average*	<5	<0.08	<0.8	0.046	0.280	2.89	0.081	0.97	10.7	28.7	0.054	<0.5	8	15
Mushrooms, portobello1	2401-05-01	<5	<0.08	<0.8	0.037	0.279	3.43	0.083	0.87	9.7	27.9	0.077	<0.5	6	16
Mushrooms, portobello2	2401-05-02	<5	<0.08	<0.8	0.044	0.177	1.50	0.075	1.11	10.7	34.2	0.026	<0.5	9	11
Mushrooms, portobello3	2401-05-03	<5	<0.08	<0.8	0.057	0.384	3.74	0.087	0.92	11.6	23.9	0.059	<0.5	10	18
Mushrooms, enoki	Average*	<5	<0.08	<0.8	0.086	0.162	5.40	0.182	0.99	11.4	47.9	0.033	<0.5	12	39
Mushrooms, enoki1	2401-06-01	<5	<0.08	<0.8	0.085	0.156	5.79	0.191	1.00	11.5	45.1	0.040	<0.5	12	40
Mushrooms, enoki2	2401-06-02	<5	<0.08	<0.8	0.087	0.168	5.01	0.173	0.98	11.2	50.6	0.025	<0.5	12	37
Mushrooms, shiitake	Average*	<5	<0.08	<0.8	<0.015	0.184	2.35	0.166	0.82	8.1	30.4	0.026	<0.5	15	34
Mushrooms, shiitake1	2401-07-01	<5	<0.08	<0.8	<0.015	0.181	1.93	0.198	0.77	7.4	36.3	0.017	<0.5	13	34
Mushrooms, shiitake2	2401-07-02	<5	<0.08	<0.8	<0.015	0.187	2.77	0.133	0.87	8.8	24.4	0.035	<0.5	17	35
Mushrooms, oyster	Average*	<5	<0.08	<0.8	0.057	0.247	2.56	0.115	0.85	7.4	53.7	0.065	<0.5	14	24
Mushrooms, oyster1	2401-08-01	<5	<0.08	<0.8	0.057	0.229	3.01	0.078	0.94	6.4	48.7	0.064	<0.5	7	27
Mushrooms, oyster2	2401-08-02	<5	<0.08	<0.8	0.057	0.264	2.11	0.152	0.77	8.5	58.7	0.067	<0.5	22	21
Mushrooms, king oyster	Average*	<5	<0.08	<0.8	0.022	0.216	6.47	0.190	1.10	9.8	38.0	0.045	<0.5	43	48
Mushrooms, king oyster1	2401-09-01	<5	<0.08	<0.8	0.044	0.223	7.91	0.120	1.32	10.0	40.2	0.045	<0.5	43	47
Mushrooms, king oyster2	2401-09-02	<5	<0.08	<0.8	<0.015	0.209	5.02	0.259	0.88	9.6	35.7	0.044	<0.5	43	49
Mushrooms, field	Average*	<5	<0.08	<0.8	0.041	0.394	3.78	0.093	1.07	13.2	27.6	0.045	<0.5	7	16
Mushrooms, field1	2401-10-01	<5	<0.08	<0.8	0.026	0.285	3.32	0.091	1.25	11.6	26.5	0.048	<0.5	5	10
Mushrooms, field2	2401-10-02	<5	<0.08	<0.8	0.056	0.503	4.23	0.095	0.89	14.7	28.7	0.041	<0.5	8	22
Coconut milk, 17-19% fat	2006-POOL-01	na	<0.08	<0.8	<0.015	<0.01	<0.1	0.014	0.23	3.4	<5	na	na	na	na
Coconut milk, light 7-9% fat	2006-POOL-02	na	<0.08	<0.8	<0.015	<0.01	<0.1	<0.01	0.13	2.2	<5	na	na	na	na
Tahini, dark	2006-POOL-05	6.7	<0.08	3.1	0.447	0.076	4.65	0.581	1.79	20.9	72.1	na	na	na	na
Hummus	2103-POOL-09	8.7	7.2	8.5	0.126	0.034	0.53	0.089	0.12	6.6	14.4	na	<0.5	na	na
Sandwich spread, plant-based	2006-POOL-03	233	15.5	13.3	0.154	0.074	0.74	0.125	1.05	13.8	16.9	na	na	na	na

na: not analysed.

* Values <LOQ were estimated as 0 in the calculation.

For mushrooms, the following contents were also determined but found to be below the limit of quantification: retinol (<21 µg/100 g); vitamin D3, 25-hydroxyvitamin D3, and 25-hydroxyvitamin D2 (<0.05 µg/100 g); and vitamin D2 (<0.05 µg/100 g in brown, portobello, and field mushrooms, and <0.5 µg/100 g in enoki, shiitake, oyster, and king oyster mushrooms).

Appendix E – Minerals

Plant-based food	Sample number	Sodium mg/100 g	Potassium mg/100 g	Calcium mg/100 g	Magnesium mg/100 g	Phosphorus mg/100 g	Iron mg/100 g	Copper mg/100 g	Zinc mg/100 g	Iodine µg/100 g	Manganese mg/100 g	Chromium µg/100 g	Selenium µg/100 g	Molybdenum µg/100 g
Brazil nuts	2006-POOL-04	<0.3	660	170	410	705	2.5	1.95	4.0	<5	0.94	<5	220	1.4
Hemp seeds	Average*	<1.8	1012	73	613	1467	11	1.38	8.6	6.4	8.2	<7.2	4.7	113
Hemp seeds 01	2401-03-01	<0.5	870	43	510	1200	10	0.95	6.2	11.0	6.2	3.4	5.0	88
Hemp seeds 02	2401-03-02	0.5	1000	70	600	1600	12	1.60	9.8	4.2	8.3	4.7	7.4	120
Hemp seeds 03	2401-03-03	<1.8	1200	71	700	1700	12	1.50	9.3	7.2	9.0	<7.2	3.9	130
Hemp seeds 04	2401-03-04	<0.5	900	46	520	1200	11	1.00	6.4	4.0	6.7	<6.6	4.8	88
Hemp seeds 05	2401-03-05	<1.8	1100	110	690	1600	11	1.70	9.8	7.4	9.3	<7.1	3.0	140
Hemp seeds 06	2401-03-06	<1.5	1000	95	660	1500	11	1.50	10	4.3	9.4	<6.1	4.0	110
Mushrooms, brown	Average*	3.6	377	2.2	10	98	0.4	0.20	0.56	2.2	0.055	<2	20	1.8
Mushrooms, brown 1	2401-04-01	4.1	360	3.6	10	94	0.2	0.20	0.45	2.6	0.050	<2	20	1.6
Mushrooms, brown 2	2401-04-02	3.2	400	1.4	11	110	0.8	0.25	0.76	2.2	0.066	<2	20	1.9
Mushrooms, brown 3	2401-04-03	3.4	370	1.5	9	89	0.3	0.15	0.47	1.8	0.050	<2	20	1.9
Mushrooms, portobello	Average*	3.4	367	1.0	10	93	0.3	0.19	0.59	2.3	0.054	<2	16	2.1
Mushrooms, portobello 1	2401-05-01	3.6	350	1.0	9	87	0.2	0.18	0.42	2.6	0.042	<2	15	1.3
Mushrooms, portobello 2	2401-05-02	3.6	370	1.3	10	93	0.3	0.18	0.71	2.8	0.059	<2	12	2.2
Mushrooms, portobello 3	2401-05-03	2.9	380	0.6	10	100	0.5	0.20	0.65	1.6	0.060	<2	21	2.7
Mushrooms, enoki	Average*	3.1	315	1.3	15	88	0.8	0.08	0.49	1.8	0.085	<2	2.2	<1
Mushrooms, enoki 1	2401-06-01	2.8	320	1.1	16	93	0.9	0.08	0.47	2.4	0.082	<2	1.9	<1
Mushrooms, enoki 2	2401-06-02	3.4	310	1.4	14	83	0.8	0.09	0.51	1.1	0.087	<2	2.4	<1
Mushrooms, shiitake	Average*	1.3	260	1.2	13	68	0.3	0.05	0.71	1.2	0.210	<2	1.1	3.0
Mushrooms, shiitake 1	2401-07-01	1.4	240	0.7	12	61	0.3	0.04	0.61	1.9	0.180	<2	<1	2.4
Mushrooms, shiitake 2	2401-07-02	1.2	280	1.7	14	74	0.4	0.06	0.81	0.5	0.240	<2	1.1	3.5
Mushrooms, oyster	Average*	2.7	340	<0.5	14	75	0.8	0.11	0.65	0.3	0.063	<2	<1	<1
Mushrooms, oyster 1	2401-08-01	<0.5	360	0.5	14	89	0.7	0.10	0.64	0.3	0.067	<2	<1	1.4
Mushrooms, oyster 2	2401-08-02	5.3	320	<0.5	13	61	1.0	0.11	0.66	0.3	0.059	<2	<1	<1
Mushrooms, king oyster	Average*	2.4	325	<0.5	14	97	0.3	0.06	0.69	1.0	0.091	<2	1.6	<1
Mushrooms, king oyster 1	2401-09-01	2.4	330	0.5	15	110	0.4	0.08	0.66	0.5	0.090	<2	2	<1
Mushrooms, king oyster 2	2401-09-02	2.4	320	<0.5	13	84	0.3	0.04	0.72	1.6	0.092	<2	1.2	<1
Mushrooms, field	Average*	4.3	380	1.9	10	99	0.4	0.25	0.58	1.6	0.057	<2	22	2.2
Mushrooms, field 1	2401-10-01	4.1	370	2.5	10	97	0.3	0.31	0.50	1.0	0.051	<2	13	1.8
Mushrooms, field 2	2401-10-02	4.5	390	1.2	11	100	0.5	0.19	0.66	2.3	0.063	<2	30	2.5

na: not analysed.
* Values <LOQ were estimated as 0 in the calculation.

Continued

Plant-based food	Sample number	Sodium mg/100 g	Potassium mg/100 g	Calcium mg/100 g	Magnesium mg/100 g	Phosphorus mg/100 g	Iron mg/100 g	Copper mg/100 g	Zinc mg/100 g	Iodine µg/100 g	Manganese mg/100 g	Chromium µg/100 g	Selenium µg/100 g	Molybdenum µg/100 g
Coconut milk, 17-19% fat	2006-POOL-01	90	825	27.8	110	203	2.85	0.83	1.40	<5	1.93	<2	<4	3.7
Coconut milk, light 7-9% fat	2006-POOL-02	19	84	3.7	12	20	0.36	0.12	0.15	<5	0.21	<8	<4	2.5
Tahini, dark	2006-POOL-05	69	330	380	240	490	4.75	1.15	3.80	<5	1.45	<8	15	110
Hummus	2103-POOL-09	435	195	49	61.0	145	1.80	0.31	1.30	<5	0.80	<8	4.4	41.0
Sandwich spread, plant-based	2006-POOL-03	520	305	40	62.5	145	1.05	0.32	0.96	<5	0.74	3.3	<4	13.5

na: not analysed.

Appendix F – Amino acids

Plant-based food	Sample number	Iso g/100 g	Leu g/100 g	Lys g/100 g	Met g/100 g	Cys g/100 g	Phe g/100 g	Tyr g/100 g	Thr g/100 g	Trp g/100 g	Val g/100 g	Arg g/100 g	His g/100 g	Ala g/100 g	Asp g/100 g	Glu g/100 g	Gly g/100 g	Pro g/100 g	Ser g/100 g
Brazil nuts	2006-POOL-04	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hemp seeds	Average*	1.21	2.01	1.08	0.592	0.363	1.36	0.998	1.01	0.403	1.49	3.94	0.844	1.28	3.23	5.46	1.32	1.12	1.54
Hemp seeds 01	2401-03-01	1.21	2.02	1.03	0.680	0.417	1.38	1.010	1.01	0.377	1.49	3.97	0.833	1.28	3.27	5.55	1.30	1.12	1.54
Hemp seeds 02	2401-03-02	1.17	1.96	1.08	0.665	0.414	1.33	0.978	0.99	0.412	1.47	3.84	0.804	1.26	3.13	5.41	1.29	1.10	1.50
Hemp seeds 03	2401-03-03	1.20	1.98	1.07	0.511	0.317	1.34	0.974	1.03	0.398	1.49	3.91	0.837	1.28	3.21	5.42	1.31	1.05	1.54
Hemp seeds 04	2401-03-04	1.22	2.00	1.05	0.561	0.358	1.36	0.989	0.99	0.406	1.49	3.94	0.856	1.27	3.22	5.43	1.32	1.13	1.51
Hemp seeds 05	2401-03-05	1.21	1.99	1.08	0.526	0.311	1.34	0.988	1.00	0.405	1.47	3.86	0.842	1.27	3.18	5.29	1.30	1.12	1.52
Hemp seeds 06	2401-03-06	1.26	2.08	1.14	0.606	0.360	1.41	1.050	1.05	0.419	1.55	4.10	0.890	1.34	3.36	5.64	1.38	1.18	1.60
Mushrooms, brown	Average*	0.080	0.127	0.079	<0.024	0.011	0.078	0.041	0.106	0.041	0.101	0.056	0.055	0.198	0.176	0.371	0.097	0.188	0.084
Mushrooms, brown 1	2401-04-01	0.082	0.133	0.102	<0.024	0.010	0.073	0.025	0.101	0.036	0.107	0.062	0.051	0.236	0.153	0.302	0.088	0.144	0.075
Mushrooms, brown 2	2401-04-02	0.084	0.132	0.054	0.026	0.012	0.088	0.062	0.117	0.048	0.106	0.075	0.065	0.204	0.204	0.446	0.108	0.215	0.095
Mushrooms, brown 3	2401-04-03	0.075	0.117	0.080	0.024	0.012	0.075	0.038	0.099	0.040	0.089	0.031	0.049	0.154	0.170	0.365	0.096	0.206	0.083
Mushrooms, portobello	Average*	0.067	0.105	0.062	<0.024	0.009	0.065	0.042	0.085	0.033	0.081	0.043	0.044	0.146	0.139	0.308	0.081	0.193	0.067
Mushrooms, portobello 1	2401-05-01	0.063	0.101	0.080	<0.024	0.006	0.058	0.024	0.080	0.029	0.076	0.047	0.037	0.141	0.134	0.246	0.073	0.131	0.064
Mushrooms, portobello 2	2401-05-02	0.068	0.103	0.035	<0.024	0.011	0.063	0.049	0.078	0.031	0.081	0.024	0.045	0.151	0.119	0.328	0.082	0.229	0.051
Mushrooms, portobello 3	2401-05-03	0.071	0.110	0.071	<0.024	0.011	0.073	0.053	0.098	0.039	0.085	0.058	0.050	0.145	0.165	0.349	0.089	0.218	0.086
Mushrooms, enoki	Average*	0.077	0.126	0.118	<0.024	0.016	0.124	0.127	0.094	0.046	0.098	0.087	0.046	0.142	0.128	0.269	0.091	0.137	0.092
Mushrooms, enoki 1	2401-06-01	0.075	0.123	0.119	<0.024	0.017	0.120	0.125	0.091	0.055	0.097	0.084	0.045	0.137	0.125	0.255	0.088	0.144	0.087
Mushrooms, enoki 2	2401-06-02	0.079	0.128	0.117	<0.024	0.015	0.127	0.129	0.096	0.036	0.100	0.091	0.047	0.146	0.131	0.282	0.094	0.130	0.097
Mushrooms, shiitake	Average*	0.071	0.113	0.099	<0.024	0.014	0.071	0.042	0.099	0.028	0.096	0.105	0.044	0.109	0.162	0.505	0.105	0.153	0.095
Mushrooms, shiitake 1	2401-07-01	0.072	0.115	0.111	<0.024	0.013	0.073	0.049	0.094	0.028	0.096	0.101	0.043	0.112	0.145	0.399	0.105	0.141	0.088
Mushrooms, shiitake 2	2401-07-02	0.069	0.110	0.088	<0.024	0.014	0.070	0.035	0.105	0.027	0.096	0.108	0.044	0.106	0.179	0.610	0.104	0.165	0.101
Mushrooms, oyster	Average*	0.057	0.088	0.051	<0.024	0.017	0.054	0.047	0.082	0.015	0.070	0.014	0.045	0.119	0.144	0.677	0.071	0.106	0.055
Mushrooms, oyster 1	2401-08-01	0.049	0.076	0.021	<0.024	0.016	0.046	0.040	0.075	0.019	0.060	0.013	0.041	0.111	0.119	0.689	0.062	0.102	0.053
Mushrooms, oyster 2	2401-08-02	0.065	0.099	0.082	<0.024	0.017	0.062	0.053	0.089	0.012	0.079	0.014	0.050	0.127	0.168	0.665	0.081	0.110	0.057
Mushrooms, king oyster	Average*	0.086	0.138	0.130	0.029	0.017	0.093	0.076	0.105	0.037	0.111	0.170	0.050	0.168	0.171	0.285	0.105	0.141	0.108
Mushrooms, king oyster 1	2401-09-01	0.083	0.133	0.115	0.028	0.015	0.084	0.067	0.097	0.036	0.106	0.151	0.046	0.151	0.157	0.231	0.101	0.131	0.101
Mushrooms, king oyster 2	2401-09-02	0.090	0.143	0.145	0.029	0.019	0.101	0.085	0.113	0.039	0.116	0.189	0.055	0.185	0.185	0.338	0.108	0.150	0.114
Mushrooms, field	Average*	0.084	0.130	0.103	<0.024	0.011	0.079	0.053	0.102	0.041	0.102	0.054	0.054	0.180	0.161	0.366	0.095	0.203	0.080
Mushrooms, field 1	2401-10-01	0.079	0.122	0.085	<0.024	0.011	0.069	0.039	0.090	0.036	0.095	0.037	0.047	0.196	0.149	0.347	0.086	0.196	0.066
Mushrooms, field 2	2401-10-02	0.089	0.138	0.121	0.026	0.011	0.089	0.067	0.114	0.046	0.110	0.071	0.060	0.163	0.172	0.384	0.104	0.209	0.094
Coconut milk, 17-19% fat	2006-POOL-01	0.048	0.096	0.066	<0.024	0.024	0.066	0.038	0.049	0.012	0.078	0.219	0.032	0.074	0.129	0.304	0.068	0.056	0.071
Coconut milk, light 7-9% fat	2006-POOL-02	<0.035	0.047	0.033	<0.024	0.015	0.033	<0.023	0.022	<0.01	0.039	0.109	<0.02	0.036	0.061	0.147	0.033	0.029	0.033
Tahini, dark	2006-POOL-05	0.790	1.470	0.602	0.682	0.428	0.966	0.732	0.803	0.363	1.025	2.710	0.556	1.040	1.820	4.225	1.095	0.778	1.025
Hummus	2103-POOL-09	0.280	0.515	0.378	0.102	0.099	0.385	0.222	0.266	0.091	0.322	0.704	0.184	0.316	0.768	1.270	0.311	0.277	0.372
Sandwich spread, plant-based	2006-POOL-03	0.151	0.245	0.157	0.056	0.056	0.171	0.101	0.149	0.052	0.197	0.326	0.094	0.179	0.398	0.831	0.211	0.168	0.179

na: not analysed

* Values <LOQ were estimated as 0 in the calculation.

Abbreviations: isoleucine (Iso), leucine (Leu), lysine (Lys), methionine (Met), cysteine (Cys), phenylalanine (Phe), tyrosine (Tyr), threonine (Thr), tryptophan (Trp), valine (Val), arginine (Arg), histidine (His), alanine (Ala), aspartic acid (Asp), glutamic acid (Glu), glycine (Gly), proline (Pro), and serine (Ser).

Appendix G – Fatty acids and cholesterol

Plant-based food	Sample number	C6:0 g/100 g	C8:0 g/100 g	C10:0 g/100 g	C12:0 g/100 g	C14:0 g/100 g	C16:0 g/100 g	C18:0 g/100 g	C20:0 g/100 g	C22:0 g/100 g	C18:1,n-9 g/100 g	C18:1,n-7 g/100 g	C20:1,n-9 g/100 g	C18:2,n-6 g/100 g	C18:3,n-3 g/100 g	C18:4,n-3 g/100 g	Cholesterol mg/100 g
Hemp seeds	Average						2.79	1.36	0.37	0.13	5.95	0.33		25.2	7.03	0.37	na
Hemp seeds 01	2401-03-01	.	.	.	.	.	3.03	1.69	0.34	0.11	8.48	0.31	.	27.6	6.67	.	na
Hemp seeds 02	2401-03-02	.	.	.	.	.	2.64	1.20	0.40	0.15	4.52	0.34	.	24.5	7.92	0.68	na
Hemp seeds 03	2401-03-03	.	.	.	.	.	2.52	1.17	0.39	0.15	4.40	0.33	.	24.1	7.80	0.68	na
Hemp seeds 04	2401-03-04	.	.	.	.	.	2.97	1.68	0.33	0.11	8.28	0.31	.	27.4	6.63	.	na
Hemp seeds 05	2401-03-05	.	.	.	.	.	3.02	1.32	0.40	0.15	5.31	0.37	.	25.2	6.96	0.46	na
Hemp seeds 06	2401-03-06	.	.	.	.	.	2.57	1.09	0.33	0.12	4.71	0.33	.	22.3	6.21	0.40	na
Coconut milk, 17-19% fat	2006-POOL-01	0.12	1.34	0.95	7.14	2.70	1.11	0.42	.	.	0.74	.	.	0.13	.	.	<1
Coconut milk, light 7-9% fat	2006-POOL-02	.	0.87	0.63	4.76	1.78	0.78	0.28	.	.	0.55	.	.		.	.	<1
Tahini, dark	2006-POOL-05	.	.	.	.	.	4.68	3.02	0.33	.	20.8	0.43	.	24.9	0.20	.	<1
Hummus	2103-POOL-09	.	.	.	.	.	1.42	0.74	.	.	9.28	0.33	0.11	8.3	0.58	.	na
Sandwich spread, plant-based	2006-POOL-03	.	.	.	.	.	1.42	0.82	.	0.15	7.05	0.15	.	12.6	.	.	<1

na: not analysed

. indicates that the result is below the LOQ of 0.1 g/100 g.

Fatty acid composition was not analysed for mushrooms and Brazil nuts. These products were therefore excluded from the table.

In addition to the fatty acids listed in the table, the following fatty acids were also analysed but found to be below the quantification limit of 0.1 g/100 g: C4:0, C13:0, C15:0, C17:0, C21:0, C23:0, C24:0, C12:1,n-1, C14:1,n-5, C15:1,n-5, C17:1,n-7, C20:1,n-11, C20:1,n-9, C22:1,n-11, C22:1,n-9, C24:1,n-9, C18:4,n-3, C20:2,n-6, C20:3,n-3, C20:4,n-6, C20:5,n-3, C22:2,n-6, C22:4,n-6, C22:5,n-6, C14:1 trans, C16:1 trans, C18:1 trans 1, C18:1 trans 2, C20:1 trans, C22:1 trans, C18:2 trans 1, C18:3 trans 1, and other fatty acids.

DTU National Food Institute
DTU Fødevareinstituttet

Henrik Dams Allé
2800 Kgs Lyngby

+45 35 88 70 00

food.dtu.dk