

Table S1. Selection of PDR-products

Method	Price
Innovative personalization methods	
Genome-based:	
DNA1	185 €
DNA2	189 €
DNA3	189 €
Microbiome-based	
MB1	150 €
MB2	150 €
Blood biomarker-based	
BM1	129 €
BM2	199 €
Blood glucose-based	
CGM	249 €
Traditional personalization methods	
Consultation of a dietitian	
DIET	90 €
Questionnaire-based	
QN1	50 €
QN2	21.99 € ¹
¹ : Monthly price via a subscription model.	

Table S2. Predefined health- and diet-related characteristics of the case person

Characteristic	Value
General information and anthropometrics	
Sex	Male
Age (in years)	24
Weight (in kg)	103
Height (in cm)	180
BMI (in kg/m2)	31.8
Waist circumference (in cm)	101
Hip circumference (in cm)	106
BMR (in kcal) ¹	2214
Lifestyle	
Stress level on a scale from 1 -10	2
Smoking	No
Alcohol consumption	3-5 times per week
Sleeping	8 hours per day; no problems sleeping
Physical activity level and sports	Sedentary/Rarely active in sports
Nutrition	
Diet type	No special diet
Food preference	No specific preferences
Food allergies/intolerances	None
Caffeine consumption	2-3 cups per day
Health	
Overall wellbeing	Good
Other allergies and intolerances	None
Diseases and preconditions	None

Medication	None
Goal setting	
Primary goal	Weight loss
Secondary goal	Weight control
Tertiary goal	Improve health or aspects of health
¹ : Based on the Harris-Benedict formula [8]	

Table S3. Uniquely analyzed blood biomarkers by BM1, including assessments and recommendations

Parameter	Value	Normal range ¹	Interpretation	Recommendation
Critical				
Dehydroepiandrosterone (in μmol/l)	18.3	5.7 – 13.4	High	<ul style="list-style-type: none"> Increase: Non-food: Physical activity
Normal				
Albumin (in g/l)	41.6	35 – 50	Normal	NR
Calcium (in mg/l)	96	86 – 100	Normal	NR
Cortisol (in μg/dl)	15.3	6 – 18.4	Normal	NR
CRP (in mg/l)	2.7	<5	Normal	NR
Magnesium (in mg/l)	22.9	17.0 – 24.3	Normal	NR
SHBG (in nmol/l)	28	18.3 – 54.1	Normal	NR
Testosterone (in ng/ml)	3.8	2.3 – 3.8	Normal	NR
Total/HDL-Cholesterol ratio	3.1	<4	Normal	NR
¹ : Normal range, as referred to by the company				

Table S4. Uniquely analyzed blood biomarkers by BM2, including assessments and recommendations

Parameter	Value	Normal range ¹	Interpretation	Recommendation
Critical				
Docosahexaenoic acid (in %)	4.59	6 – 15	Low	<ul style="list-style-type: none"> Increase: Fish and seafood: Tuna, shrimps, herring, salmon, mackerel Meat: Liver
Eicosanoid balance	5.7	15 – 50	Low	NA
Eicosapentaenoic acid (in %)	0.77	2 – 10	Low	<ul style="list-style-type: none"> Increase: Fish and seafood: Tuna, shrimps, herring, salmon, mackerel, sea trout Meat: Liver
Folate (in ng/ml)	3.9	4.4 – 31.0	Low	<ul style="list-style-type: none"> Increase: Fruit: Cherries, blackberries Legumes: Lentils Meat: Liver Mushrooms Nuts and seeds: Peanuts
Borderline				
Selenium (in μg/l)	91.24	74 – 139	Borderline low	<ul style="list-style-type: none"> Increase:

					Fish and seafood: Tuna, shrimp, mackerel Legumes: Lentils Mushrooms
Normal					
Arachidonic acid (in %)	13.44	10 – 14.3	Normal		NR
Copper (in mg/l)	103.18	68 – 169	Normal		NR
LDL/HDL-Cholesterol ratio	1.84	1 – 3.5	Normal		NR
¹ : Normal range, as referred to by the company					

Table S5. Excerpts of the dietary guidelines of Germany, the UK, and China as examples of GDR

<i>Germany (Nutrition Circle and recommendations) [17, 18]</i>	<i>UK (Eatwell guide) [19]</i>	<i>China (Dietary Guidelines for Chinese Residents) [20, 21]</i>
Grains, grain products, potatoes	Starchy foods	Cereals and potatoes (incl. legumes)
Daily: <ul style="list-style-type: none"> • 5 portions à 60 g of grains, bread, or pasta with at least 1/3 whole grains • 1 portion (250 g) of potatoes Choose whole grain products.	<ul style="list-style-type: none"> • E.g., potatoes, bread, rice, pasta, or other starchy carbohydrates. • Should make up just over 1/3 of the food. • Choose higher fiber or wholegrain varieties. 	<ul style="list-style-type: none"> • Cereal-centered dietary pattern • 250-400 g per day with 50-150 g of whole grains and mixed beans and 50-100 g of potatoes
Fruits and vegetables	Fruits and vegetables	Fruits and vegetables
Daily: <ul style="list-style-type: none"> • 5 portions à 110 g • Be mindful of the season 	<ul style="list-style-type: none"> • ≥5 portions of a variety of fruit and vegetables a day; fresh, frozen, tinned, dried, or juiced. • Should make up just over 1/3 of the food. • Fruit juice and smoothies should be limited to no more than a combined total of 150 ml a day. 	<ul style="list-style-type: none"> • 300-500 g vegetables per day • 200-350 g fruits (excluding fruit juice) per day
Dairy and dairy products	Milk and dairy foods	Milk, milk products, soybeans, and nuts
Daily: <ul style="list-style-type: none"> • 2 portions à 250 g of milk (equivalent) 	<ul style="list-style-type: none"> • Include some dairy (milk, cheese, yogurt, and fromage frais) or dairy alternatives (such as soya drinks and yogurts). 	<ul style="list-style-type: none"> • 300 g milk equivalents per day • 25-30 g soybeans and nuts per day; should be frequently eaten

	<ul style="list-style-type: none"> Choose lower-fat and lower-sugar products where possible. 	
Meat, sausage, fish, legumes, and eggs	Protein foods	Meat and poultry, aquatic products, and eggs
Weekly: <ul style="list-style-type: none"> 3 portions à 120 g meat (beef, poultry, pork) or fish (preferably fatty marine fish) 2 portions of sausage à 30 g Limit the consumption of meat and sausage 1 egg or 60 g of egg 1 portion (125 g) of fresh legumes (equals to approx. 70 g dried legumes) 	<ul style="list-style-type: none"> Include some beans, pulses, fish, eggs, meat, and other protein foods. Pulses, such as beans, peas, and lentils, are good alternatives to meat. Choose lean cuts of meat and mince, and eat less red and processed meat like bacon, ham, and sausages. Aim for at least 2 portions (2x 140 g) of fish every week, 1 of which should be oily, such as salmon, sardines, or mackerel. 	<ul style="list-style-type: none"> Moderate intake; in total, 120–200 g per day 40-75 g aquatic products per day or 280-525 g of fish per week 40-75 g of meat and poultry per day or 280-525 g of poultry per week 40-50 g eggs per day or 280-350 g per week; yolks should not be discarded Preferentially poultry and fish Lower fat and fewer smoked and cured meat products
Nuts, seeds, oils and fats	Fat	Oil
Daily: <ul style="list-style-type: none"> 25 g of nuts and seeds 10 g of plant oil 10 g margarine and butter Give preference to vegetable oils and fats. 	<ul style="list-style-type: none"> Choose unsaturated oils (e.g., rapeseed, olive, and sunflower oils) and spreads. Only in small amounts due to high energy density. 	<ul style="list-style-type: none"> ≤25-30g of cooking oil per day <2 g trans fatty acids per day
Drinks	Drinks and water	Water
Weekly: <ul style="list-style-type: none"> 2 portions of juice à 200 g Daily: <ul style="list-style-type: none"> Approx. 1.5 l of water or other calorie-free drinks (such as tea) 	<ul style="list-style-type: none"> 6 to 8 cups or glasses of fluid a day, e.g., water, lower-fat milk, lower-sugar or sugar-free drinks, and tea and coffee. Limit fruit juice and smoothies to a combined total of 150ml a day. 	<ul style="list-style-type: none"> 7–8 cups (1500–1700 ml) of fluid per day Plain boiled water or tea should be preferred, and sugar-sweetened beverages should be avoided.
Other	Other	Other
<ul style="list-style-type: none"> Be mindful of hidden sugar, salt, and fats Take your time eating Be active 	<ul style="list-style-type: none"> Limit foods high in fat, salt, and sugar, e.g., chocolate, cakes, biscuits, sugary soft drinks, butter, ghee, and ice cream. 	<ul style="list-style-type: none"> Reduce salt (<6g), and limit sugar (<50 g; preferably <25 g) and alcohol (<25 g for men, <15 g for women).

Table S6. Evaluated health and nutritional characteristics by two genome-based approaches

Parameter	Provider	Analyzed genes	SNPs (n)	Interpretation	Recommendation
Alcohol metabolism	DNA1	ADH1B, ADH1C	2	<ul style="list-style-type: none"> High sensitivity 	<ul style="list-style-type: none"> Max. 2 servings/d

				<ul style="list-style-type: none"> • Slow metabolism • Potential positive effect on HDL-cholesterol for moderate alcohol consumption 	<ul style="list-style-type: none"> • Max. 14 serving/w over 3-7 days
	DNA3	ALDH2	1	<ul style="list-style-type: none"> • Effective metabolism • No adverse effects due to accumulation of harmful metabolites • Alcohol consumption in moderation does not lead to acute side effects 	<ul style="list-style-type: none"> • Drink in moderation • Max. 100 ml of wine or 200 ml of beer/d to positively benefit HDL-cholesterol levels • Do not drink during and after physical activity
Caffeine metabolism	DNA1	CYP1A2	1	<ul style="list-style-type: none"> • Low sensitivity • Fast metabolism • Less prone to adverse effects 	<ul style="list-style-type: none"> • Max. 400 mg of caffeine or 3-4 cups of coffee/d • Avoid caffeine for 2-3 hours before bed • Potentially include caffeine before sports activity
	DNA3	CYP1A2	1	<ul style="list-style-type: none"> • Fast metabolism • Less prone to adverse effects, i.e., high blood pressure 	<ul style="list-style-type: none"> • Max. three cups/d • Replace coffee with black or green tea or decaffeinated coffee • Replace water lost due to diuretic capacity of caffeine
Coeliac predisposition/Gluten metabolism	DNA1	DQ8, DQ2.5, DQ7, DQ2.2 _a , DQ2.2 _b , DQ2.2 _c	6	<ul style="list-style-type: none"> • Low risk of developing coeliac disease • Favorable recognition of gluten by 	NA
	DNA3	DQA1, DQB1	2	<ul style="list-style-type: none"> • Low likelihood for 	<ul style="list-style-type: none"> • Eat a balanced diet without

				<ul style="list-style-type: none"> gluten intolerance (coeliac predisposition and non-coeliac sensitivity) Effective gluten metabolism 	excluding or increasing gluten <ul style="list-style-type: none"> Eat enough fiber Test results cannot entirely exclude non-coeliac sensitivity
Folate need	DNA1	MTHFR _a , MTHFR _b	2	<ul style="list-style-type: none"> Normal need 	<ul style="list-style-type: none"> At least 400 µg/d Include plant-based foods like dark green leafy vegetables, legumes, and whole grains
	DNA3	MTHFR _b	1	<ul style="list-style-type: none"> Lower need Higher level Favorable genetic makeup 	<ul style="list-style-type: none"> 300 µg/d Include green lettuce and other leafy greens, cauliflower, artichokes, and legumes No need for supplementation
Hunger and satiety	DNA2	APOA2, APOA5 _a , GHRL	3	<ul style="list-style-type: none"> Moderate hunger 	NA
	DNA3	FTO _b	1	<ul style="list-style-type: none"> Harder to reach satiety Decreased feeling of fullness 	<ul style="list-style-type: none"> Increase fiber-rich foods Drink water before meals
Iron need	DNA1	HFE, TFR2, TMPRSS6	3	<ul style="list-style-type: none"> Normal need 	<ul style="list-style-type: none"> 12 mg/d Include animal- and plant-based foods such as legumes, green leafy vegetables, fish, red meat, and poultry Prefer meats and seafood as iron sources Also choose plant-based iron sources Consider supplementation if advised by a doctor

	DNA3	HFE, TMPRSS6	2	<ul style="list-style-type: none"> • Higher need • Low iron level 	<ul style="list-style-type: none"> • 15 mg/d • Prefer meat, fish, and seafood as an iron source • Include cereals, legumes, and nuts • Combine iron-rich foods with sources of vitamin C and beta-carotene • Avoid drinking coffee, black tea, and mint tea around iron-rich meals
Lactose metabolism	DNA1	LCT ³	1	<ul style="list-style-type: none"> • Lactose tolerant 	NR
	DNA3	MCM6	1	<ul style="list-style-type: none"> • Lactose tolerant 	NR
Omega-3 need and metabolism	DNA1	IL6, TNF	2	<ul style="list-style-type: none"> • Normal need • Normal DHA metabolism • Normal production of inflammatory cytokines 	<ul style="list-style-type: none"> • 1.6 g omega-3/d • Include fatty fish (2-3x/w), nuts, and seeds
	DNA3	FADS1	1	<ul style="list-style-type: none"> • Higher need • Slightly increased risk of deficiency • Slightly less effective metabolism • Slightly less effective conversion of ALA to EPA and DHA 	<ul style="list-style-type: none"> • Include fatty fish in the diet, fish oil supplements, or algae • Avoid smoking, high alcohol consumption, stress, and high SFA
Salt sensitivity	DNA1	ACE _a , AGT	2	<ul style="list-style-type: none"> • Normal sensitivity • No increased risk of developing salt-sensitive hypertension 	<ul style="list-style-type: none"> • Limit salt intake to 5 g (2000 mg of sodium)/d • Limit salty snacks
	DNA3	AGT, CLCNKA	2	<ul style="list-style-type: none"> • Normal sensitivity 	<ul style="list-style-type: none"> • Limit sodium intake to no more than 1500 mg

				<ul style="list-style-type: none">• Avoid salt-rich foods• Avoid excessive salting of food• Drink at least 1.5 l unsweetened drinks	
Sport type ²	DNA1	ACE _a , ACE _b , ACTN3, ADRB2 _a , ADRB2 _b , AGT, AMPD1, BDKRB2, COL5A1, GABPB1 _a , GABPB1 _b , HIF1A, IL6, NOS3	14	<ul style="list-style-type: none">• Medium response to endurance and strength• Low response to power/speed• Bias towards endurance and strength sports	<ul style="list-style-type: none">• 80 % strength and endurance sports• Rest power/speed training
	DNA2	ACTN3, ACVR1B, ADRB2 _a , ADRB3, CKM, FTO _a , FTO _b , LPL _b , PPARD _b	10	<ul style="list-style-type: none">• Positive effects of strength sports (i.e., maximum force and power/speed) on body fat loss• Less beneficial effect of endurance sports	<ul style="list-style-type: none">• Sports several times a week for a moderate time• 75-80 % strength and power/speed sports• 20-25 % endurance sports
Vitamin B6 need	DNA1	MTHFR _b , NBPF3	2	<ul style="list-style-type: none">• Higher need• Less efficient vitamin B6 metabolism	<ul style="list-style-type: none">• Increase vitamin B6 uptake• 10-25 mg and less than 100 mg vitamin B6/d• Achievable by a balanced diet, but consider supplementation
	DNA3	ALPL	1	<ul style="list-style-type: none">• Higher need• Low level• Unfavorable absorption	<ul style="list-style-type: none">• 2.2 mg/d• Include chicken liver, (fatty) fish, legumes, whole grain products, potatoes, carrots, spinach, avocado, banana,

						prunes, nuts, and seeds in the diet
					<ul style="list-style-type: none">Consider supplementation	
Vitamin B12 need	DNA1	FUT2, MTHFR _b	2	<ul style="list-style-type: none">Normal need	<ul style="list-style-type: none">At least 2.4 µg/dInclude animal-based foods like fish, red meat, dairy products, eggs, and chickenConsider supplementation, especially as vegetarian	
	DNA3	FUT2	1	<ul style="list-style-type: none">Normal need	<ul style="list-style-type: none">4.5 µg/dNeed can be fulfilled by dietInclude fish, clams, meat, dairy, eggs, and possibly fortified productsAs vegetarian: Consider checking B12 levels and supplementationAs vegan: Supplement vitamin B12	
Vitamin D need	DNA1	CYP2R1, CYP24A2, DHCR7, GC _b , VDR _b , WNT16	6	<ul style="list-style-type: none">Higher need	<ul style="list-style-type: none">800 IU/dIncrease sun exposure and fatty fish and mushroom intakeConsider supplementation	
	DNA3	CYP2R1, DHCR7, GC _a	3	<ul style="list-style-type: none">Higher needLow levelLeast favorable genetic makeup	<ul style="list-style-type: none">1200 IU/dIncrease sun exposure and (fatty fish) intakeAs vegetarian and vegan: consider supplementation	
Vitamin E need	DNA1	CYP4F2, ZPR1	2	<ul style="list-style-type: none">Normal need	<ul style="list-style-type: none">At least 14 mg/dInclude dietary fat (i.e., PUFAs) in diet to ease absorption	

	DNA3	APOA5 _b	1	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • Increase intake of nuts and seeds • 17 mg/d • Need can be fulfilled by diet • Include plant oils, almonds, hazelnuts, broad beans and wheat sprouts
Weight loss regain	DNA2	ACVR1B, ADRB2 _a , ADRB2 _b , ADRB3, FTO _a , FTO _b , LEPR, MLXIPL	8	<ul style="list-style-type: none"> • Fast weight regain after weight loss 	NA
	DNA3	ADIPOQ	1	<ul style="list-style-type: none"> • High predisposition to regain weight after weight loss 	<ul style="list-style-type: none"> • Monitor weight once a week • Do not skip breakfast; eat regularly • Include fiber-rich foods • Avoid energy-rich foods, i.e., fast food, snacks, etc. • Drink at least 1.5 l unsweetened drinks • Develop healthy habits • Do not restrict energy intake excessively

¹: For DNA3, the report did not include a summarizing assessment of fat metabolism. The trait was composed of separately analyzed traits in the report (SFA, MUFA, and PUFA metabolism) and combined by the author for comparability.

²: For DNA1, a summarizing assessment of the sport type was only rudimentary included in the report. The author supplemented the trait with separately analyzed traits in the report (power, endurance, and strength sports response) for comparability.

³: LCT was wrongfully declared as the analyzed gene by DNA1. The analyzed SNP (rs4988235) is in MCM6 and matches with DNA3.

CH: Carbohydrate; EI: Energy intake; F: Fat; MUFA: Monounsaturated fatty acid; PUFA: Polyunsaturated fatty acid; P: Protein; SFA: Saturated fatty acid; SNP: Single nucleotide polymorphism; UFA: Unsaturated fatty acid

Table S7. Exclusively evaluated health and nutritional characteristics by DNA1

Parameter	Analyzed genes	SNPs (n)	Interpretation	Recommendation
Antioxidants need	CAT, GPX1, SLC23A1, SOD2, ZPR1	5	<ul style="list-style-type: none"> • Normal requirements 	<ul style="list-style-type: none"> • Include at least 30 g of nuts/d; eat fruits and vegetables • Reach the recommendations for vitamins A, C, and E and selenium
Bitter-taste perception	TAS2R38_1	1	<ul style="list-style-type: none"> • Normal bitter perception 	NA
Caffeine and sleep	ADORA2A	1	<ul style="list-style-type: none"> • Increased influence of caffeine on sleep quality 	<ul style="list-style-type: none"> • Limit caffeine intake after 4 p.m. • Reduce caffeinated drinks
Calcium need	GC _c , GC _d , VDR _b	3	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • Include dairy • Reach the recommendation for Vitamin D • Consider supplementation
Cruciferous vegetable need	GSTM1, GSTT1	2	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • Include 3-5 servings of cruciferous vegetables/w
Genetic chronotype	AK5, ALG10B, APH1A, CALB1, DLX5, ERC2	6	<ul style="list-style-type: none"> • Tendency towards a late chronotype • Higher hormonal activity slightly later in the day 	<ul style="list-style-type: none"> • Start your day later (whenever possible)
Performance under pressure	COMT	1	<ul style="list-style-type: none"> • Normal 	NA
Selenium need	GG	1	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • No more than 60 µg/d • Include Brazil nuts, fish, seafood, chicken, eggs, and wholegrains • Follow a balanced diet to satisfy selenium need
Sleep quality	ADA, MEIS1	2	<ul style="list-style-type: none"> • Average sleep quality and length 	NA
Sport-Achilles injury risk	CACNA1E (proximity), COL5A1, GDF5, MMP3, VEGFA	5	<ul style="list-style-type: none"> • Moderate risk for Achilles tendon injury 	<ul style="list-style-type: none"> • Combination of different training and exercises
Sport-ACL injury risk	COL12A1, COL12A1, COL5A1, GLT25D1, KDR, VEGFA	6	<ul style="list-style-type: none"> • Very high risk for ACL rupture 	<ul style="list-style-type: none"> • Combination of different training and exercises

Sport-Aerobic potential	ADRB2 _a , ADRB2 _b , CRP _a , PPARGC1A, VEGFA	6	<ul style="list-style-type: none"> • Raised VO2 max response 	<ul style="list-style-type: none"> • Include both endurance and power activities in your training
Sport-Endurance response	ACE _a , ADRB2 _b , BDKRB2, COL5A1, GABPB1 _a , GABPB1 _b	6	<ul style="list-style-type: none"> • Medium response to endurance training 	<ul style="list-style-type: none"> • Moderately prioritize endurance training
Sport-Injury predisposition	ACTN3, COL1A1, COL5A1, GDF5	4	<ul style="list-style-type: none"> • Increased injury risk 	<ul style="list-style-type: none"> • Include rehabilitative exercises regularly to decrease the risk for, i.e., tendinopathies and ligament tears
Sport-Lower back injury risk	COL11A1, GDF5, GSDMC (proximity), KIAA1217, PARK2, PSMB9 (proximity)	6	<ul style="list-style-type: none"> • Very low risk of lower back injury 	<ul style="list-style-type: none"> • Combination of different training and exercises
Sport-Muscle mass predisposition	ACE _b , ACTN3, HIF1A, TRHR	4	<ul style="list-style-type: none"> • Normal disposition to develop muscle mass • Normal response to diet and exercise to form muscle and lose fat 	<ul style="list-style-type: none"> • Sufficient protein consumption (at least 1 g/ kg body weight) • Sufficient sleep • Strength training
Sport-Power response	ACE _a , ACTN3, ADRB2 _a , ADRB2 _b , AGT, IL6, NOS3	7	<ul style="list-style-type: none"> • Low response to power/speed sports • Lower average power capacity • Not genetically suited for power sports 	NA
Sport-Recovery efficiency	ACTN3, AMPD1, CCR2, IL6, LILRB5, MCT1, MLCK	7	<ul style="list-style-type: none"> • Low recovery efficiency 	<ul style="list-style-type: none"> • At least 48-72 h rest between hard workouts • Reduce the frequency of hard workouts • Reach the recommendation for Omega-3
Sport-Strength response	ACTN3, ADRB2 _a , ADRB2 _b , AGT, AMPD1, HIF1A, IL6	7	<ul style="list-style-type: none"> • Medium response to strength training 	<ul style="list-style-type: none"> • Moderately prioritize strength training
Stress resilience	AC107218.3, BAIAP2, BDNF, CACNA1E, CELF4, COMT	6	<ul style="list-style-type: none"> • Reduced stress resilience • More intense stress response for a longer time 	<ul style="list-style-type: none"> • Combination of different techniques and exercises

Toxin generation speed	CYP1A2, EPHX1	2	<ul style="list-style-type: none"> • More prone to stress-induced negative effects • Increased risk of DNA damage from consumption of smoked or chargrilled animal protein 	<ul style="list-style-type: none"> • Reduce consumption of grilled/smoked meat to 1-2 serving/w • Include apiaceous vegetables (carrots, celery, parsnips) in the diet
Vitamin A need	BCO1	1	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • 800 µg/d • Include dark green, orange, and/or yellow fruit and vegetables • Choose animal-based vitamin A regularly (i.e., liver)
Vitamin B2 need	MTHFR _b	1	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • 1.3 mg/d • Follow a balanced diet to fulfill B2 need
Vitamin C need	SLC23A1	1	<ul style="list-style-type: none"> • Normal need 	<ul style="list-style-type: none"> • At least 100 mg/d • Include a variety of fruits • Consider supplementation

Table S8. Exclusively evaluated health and nutritional characteristics by DNA2

Parameter	Analyzed genes	SNPs (n)	Interpretation	Recommendation
Overweight predisposition	ACVR1B, ADRB3, APOA2, APOA5 _a , FTO _a , FTO _b , GHRL, LEPR	8	<ul style="list-style-type: none"> • High risk of developing overweight 	NA
Protein metabolism	FABP1, GHRL, LEPR, MLXIPL, PPARD _a	5	<ul style="list-style-type: none"> • Positive response • Low propensity to illicit weight/body fat gain 	<ul style="list-style-type: none"> • Eat 1.0 to 1.1 g protein/kg body weight or higher without risk of weight gain/body fat gain • 25 % of energy intake from protein

Table S9. Exclusively evaluated health and nutritional characteristics by DNA3

Parameter	Analyzed genes	SNPs (n)	Interpretation	Recommendation
Adiponectin level	ADIPOQ	1	<ul style="list-style-type: none"> • Average level 	<ul style="list-style-type: none"> • Normal body-mass-index • Include sweet potatoes in the diet
Biological ageing	TERC	1	<ul style="list-style-type: none"> • Slower ageing 	<ul style="list-style-type: none"> • Fresh air, avoiding stress, a positive attitude

Inflammatory sensitivity	CRP _b , IL6, IL6R, TNF	4	<ul style="list-style-type: none"> Lower sensitivity to inflammation 	<ul style="list-style-type: none"> Eat a balanced diet rich in antioxidants and anti-inflammatory nutrients Eat a fiber-rich diet, i.e. 25 g fiber/d Decrease stress
Insulin sensitivity	ADIPOQ, PCSK1, TCF7L2	3	<ul style="list-style-type: none"> Average insulin sensitivity 	<ul style="list-style-type: none"> Normal body-mass-index Eat a fiber-rich diet with legumes, whole grains, fruits and vegetables Include cinnamon in the diet Increase zinc-rich foods
Monounsaturated fat metabolism	ADIPOQ	1	<ul style="list-style-type: none"> Normal response Normal benefit of monounsaturated fat intake 	<ul style="list-style-type: none"> Include plant oils, oil fruits, and nuts and seeds in the diet
Omega-3 and triglycerides	FADS1	1	<ul style="list-style-type: none"> Beneficial effect of omega-3 fatty acids on lowering triglyceride levels 	<ul style="list-style-type: none"> Include fatty fish in your diet or fish oil supplements; as a vegetarian, include algae
Polyunsaturated fat metabolism	PPARA	1	<ul style="list-style-type: none"> Normal response 	<ul style="list-style-type: none"> Ratio of omega-3 to omega-6 intake should not exceed 1:5 Include nuts and seeds as well as fatty fish in the diet
Potassium need	WNK1	1	<ul style="list-style-type: none"> Higher need Lower level 	<ul style="list-style-type: none"> 4500 mg/d Include green leafy vegetables, potato, parsnip, pumpkin, tomato, apricots, avocado, banana, figs, kiwi, prunes, all bran cereals, milk, beans, lentils, almonds, pistachios, pumpkin seeds and brook trout or salmon Limit alcohol intake
Saturated fat metabolism	APOA2	1	<ul style="list-style-type: none"> Normal response Not additionally unfavorable 	<ul style="list-style-type: none"> No need to overly decrease saturated fat intake

Table S10. Exclusively evaluated health and nutritional characteristics by MB1

Parameter	Value (x/n)	Specifically assessed microorganisms	Interpretation	Recommendation
Allergies and food intolerances	50% (1/2)	<ul style="list-style-type: none"> Normal: Bifidobacterium Unfavorably low: Lactobacillus 	<ul style="list-style-type: none"> Improvable Low Lactobacillus 	<ul style="list-style-type: none"> Eat whole grains, kiwi, kefir, yogurt

Appetite and cholesterol levels	57% (4/7)	<ul style="list-style-type: none"> • Normal: Veillonella, Bifidobacterium, Alistipes, Dorea • Unfavorably low: Megasphaera, Coprococcus • Unfavorably high: Bacteroides 	<ul style="list-style-type: none"> • Improvable • Low Coprococcus 	<ul style="list-style-type: none"> • Eat legumes, oats, potatoes, green banana
Carbohydrate metabolism	57% (4/7)	<ul style="list-style-type: none"> • Normal: Faecalibacterium, Roseburia, Prevotella, Blautia • Unfavorably low: Eubacterium, Oscillospira • Unfavorably high: Phascolarctobacterium 	<ul style="list-style-type: none"> • Improvable • Low Eubacterium 	<ul style="list-style-type: none"> • Eat apples, chicory root, wheat bran, onion
Constipation indicators	100% (2/2)	<ul style="list-style-type: none"> • Beneficially low: Methanobacterium, Methanobrevibacter 	<ul style="list-style-type: none"> • Good 	NR
Cytotoxins	80% (4/5)	<ul style="list-style-type: none"> • Beneficially low: Desulfo bacter, Desulfovibrio, Desulfuromonas, Desulfosarcina • Unfavorably low: Bilophila 	<ul style="list-style-type: none"> • Improvable 	NA
Energy metabolism and hyperacidity	50% (2/4)	<ul style="list-style-type: none"> • Normal: Bifidobacterium, Streptococcus • Unfavorably low: Lactobacillus, Enterococcus 	<ul style="list-style-type: none"> • Improvable • Low Lactobacillus 	<ul style="list-style-type: none"> • Eat wholegrain, kiwi, kefir, yoghurt
Fiber	63% (5/8)	<ul style="list-style-type: none"> • Normal: Bifidobacterium, Ruminococcus, Butyricicoccus, Eggerthella, Lachnospira • Unfavorably low: Eubacterium, Peptostreptococcus, Clostridium 	<ul style="list-style-type: none"> • Improvable • Low Eubacterium 	<ul style="list-style-type: none"> • Eat apple, chicory root, wheat bran, onion
Intestinal mucosa and immunity	71% (5/7)	<ul style="list-style-type: none"> • Normal: Ruminococcus, Butyricicoccus, Faecalibacterium, Roseburia, Anaerostipes • Unfavorably low: Eubacterium, Butyrivibrio 	<ul style="list-style-type: none"> • Improvable • Low Eubacterium and Butyrivibrio 	<ul style="list-style-type: none"> • Eat chicory root, onion, garlic, banana

Proportion of harmful bacteria/Proteo-index	0.72% of all bacteria	NA	<ul style="list-style-type: none"> • Good • Below average 	NR
Regulation of the immune system	67% (2/3)	<ul style="list-style-type: none"> • Normal: Bifidobacterium, Faecalibacterium • Unfavorably low: Lactobacillus 	<ul style="list-style-type: none"> • Improvable • Low Lactobacillus 	<ul style="list-style-type: none"> • Eat whole grains, kiwi, kefir, yogurt
Sleep and mood	40% (2/5)	<ul style="list-style-type: none"> • Normal: Bifidobacterium, Streptococcus • Unfavorably low: Lactobacillus, Lactococcus • Unfavorably high: Bacteroides 	<ul style="list-style-type: none"> • Improvable • Low Lactococcus and Lactobacillus 	<ul style="list-style-type: none"> • Eat whole grains, kiwi, kefir, yogurt
Vitamin B12 production	33% (1/3)	<ul style="list-style-type: none"> • Normal: Bacillus • Unfavorably low: Lactobacillus, Propionibacterium 	<ul style="list-style-type: none"> • Improvable • Low Lactobacillus 	<ul style="list-style-type: none"> • Eat whole grains, kiwi, kefir, yogurt

Table S11. Exclusively evaluated health and nutritional characteristics by MB2

Parameter	Value (x/n)	Specifically assessed microorganisms	Interpretation	Recommendation
Amino sugar metabolism	112%	NA	<ul style="list-style-type: none"> • Above average 	NR
Arginine metabolism ¹	128%	NA	<ul style="list-style-type: none"> • Above average 	NR
Fatty acid metabolism ¹	66%	NA	<ul style="list-style-type: none"> • Below average 	NA
Folate production	96%	NA	<ul style="list-style-type: none"> • Below average 	NA
Glucose metabolism	101%	NA	<ul style="list-style-type: none"> • Above average 	NR
Hepatic health	100% (13/13)	<ul style="list-style-type: none"> • Normal: Prevotella, Enterococcus, Streptococcus, Blautia, Veillonellaceae, Enterobacteriaceae, Haemophilus, Odoribacter, Coprococcus, Oscillospira • Beneficially high: Oscillibacter, Ruminococcaceae, Faecalibacterium 	<ul style="list-style-type: none"> • Ideal 	NR
Insulin balance	82% (9/11)	<ul style="list-style-type: none"> • Normal: Eggerthella, Alistipes, Parabacteroides, Coprococcus, Ruminococcus, Veillonella, Lachnospiraceae 	<ul style="list-style-type: none"> • Improvable 	<ul style="list-style-type: none"> • Eat black beans 3x/week

		<ul style="list-style-type: none"> • Beneficially high: • Roseburia, Faecalibacterium Unfavorably low: Erysipelotrichaceae • Unfavorably high: Collinsella 		
Irritable bowel syndrome	100% (12/12)	<ul style="list-style-type: none"> • Normal: Blautia, Dorea, Ruminococcus, Dialister, Verillonella, Gammaproteobacteria, Enterobacteriaceae, Bifidobacterium, Bacteroides, Odoribacter, Akkermansia muciniphila • Beneficially high: Faecalibacterium prausnitzii 	• Ideal	NR
Joint health	90% (9/10)	<ul style="list-style-type: none"> • Normal: Eggerthella, Prevotella, Lactobacillus, Bifidobacterium, Bacteroidaceae, Bacteroides • Beneficially low: Bacilli • Beneficially high: Roseburia, Faecalibacterium prausnitzii • Unfavorably high: Collinsella 	• Excellent	NR
Mental health	92% (11/12)	<ul style="list-style-type: none"> • Normal: Eggerthella, Bacteroidaceae, Alistipes, Turicibacter, Lachnospiraceae, Anaerostipes, Bifidobacterium, Coprococcus, Ruminococcus, Dialister • Beneficially high: Faecalibacterium • Unfavorably high: Paraprevotella 	• Excellent	NR
Pentose metabolism	65%	NA	• Below average	NA
Phenylalanine metabolism ¹	147%	NA	• Above average	NR
Phospholipid metabolism ¹	101%	NA	• Above average	NR
Probiotic bacteria	100% (3/3)	<ul style="list-style-type: none"> • Normal: Bifidobacterium, Akkermansia muciniphila, Lactobacillus 	• Ideal	NR
Skin health	82% (9/11)	<ul style="list-style-type: none"> • Normal: Bacteroides, Parabacteroides, Lachnospiraceae, Blautia, Bacteroidaceae, Prevotellaceae, Prevotella, Rikenellaceae, Tannerellaceae 	• Improvable	<ul style="list-style-type: none"> • Replace sunflower and corn oil with rapeseed oil

		<ul style="list-style-type: none"> • Unfavorably high: Collinsella, Ruminococcaceae 		
Species evenness	0.76 (Pielou-Index)	NR	<ul style="list-style-type: none"> • Good • Within average 	NR
Species richness	128	NR	<ul style="list-style-type: none"> • Improvable • Below average 	NA
Sucrose metabolism	108%	NA	<ul style="list-style-type: none"> • Above average 	NR
Tryptophan metabolism ¹	200%	NA	<ul style="list-style-type: none"> • Above average 	NR
Tyrosine metabolism ¹	145%	NA	<ul style="list-style-type: none"> • Above average 	NR
Vitamin B6 production	38%	NA	<ul style="list-style-type: none"> • Below average 	NA
Vitamin B7 production	100%	NA	<ul style="list-style-type: none"> • Average 	NR

¹: Used to compose the characteristic “protein and fats” in **Error! Reference source not found.** by the author.

Table S12. Abundances microbial genera inconsistently assessed by the two selected microbiome-based PN companies

Genus	Company	Interpretation	Abundance (%)	Reference range (%) ¹
Akkermansia	MB1	Unfavorably low	0.061	0.1-5
	MB2	Normal	0.09	0-2.32
Bacteroides	MB1	Unfavorably high	39.288	5-32
	MB2	Normal	31.08	12.44-31.36
Bilophila	MB1	Unfavorably low	0	0.01-0.5
	MB2	Beneficially low	NA ²	NA ²
Coprococcus	MB1	Unfavorably low	0.133	0.2-6
	MB2	Normal	0.22	0.06-1.70
Desulfovibrio	MB1	Beneficially low	0.005	<0.5
	MB2	Normal	NA ²	NA ²
Enterococcus	MB1	Unfavorably low	0	0.01-0.15
	MB2	Normal	NA ²	NA ²
Faecalibacterium	MB1	Normal	7.1	0.2-10
	MB2	Beneficially high	24.29	4.44-12.86
Lachnospira	MB1	Normal	0.761	0.09-7
	MB2	Beneficially high	4.51	0.00-1.90
Lactobacillus	MB1	Unfavorably low	0	0.01-2.0
	MB2	Normal	NA ²	NA ²
Oscillospira	MB1	Unfavorably low	0.005	0.07-1.3
	MB2	Normal	NA ²	NA ²
Roseburia	MB1	Normal	2.031	0.5-3
	MB2	Beneficially high	0.19	0.00-0.14

¹: MB1: Average and reference value references were not described; MB2: Average and reference values were declared to be mainly based on the company’s surveys, the collected data, and, to a lesser extent, published studies.

²: Abundance and reference range were not disclosed. The genus list was incomplete.

Table S13. Abundances microbial genera consistently assessed by the two selected microbiome-based PN companies

Genus	Company	Interpretation	Abundance (%)	Reference range (%) ¹
Alistipes	MB1	Normal	0.34	0.01-5
	MB2	Normal	1.70	1.56-5.46
Anaerostipes	MB1	Normal	0.29	0.01-1
	MB2	Normal	0.09	0.02-0.30
Blautia	MB1	Normal	5.097	1.5-13
	MB2	Normal	NA ²	NA ²
Doria	MB1	Normal	0.964	0.02-1
	MB2	Normal	NA ²	NA ²
Eggerthella	MB1	Normal	0.002	0.001-0.15
	MB2	Normal	NA ²	NA ²
Prevotella	MB1	Normal	0.097	0.01-34
	MB2	Normal	NA ²	NA ²
Ruminococcus	MB1	Normal	7.988	1-9
	MB2	Normal	1.35	0.12-1.60
Streptococcus	MB1	Normal	0.135	0.01-2
	MB2	Normal	0.08	0.02-0.24
Veillonella	MB1	Normal	0.031	0.001-0.3
	MB2	Normal	0.08	0-0.10

¹: MB1: Average and reference value references were not described; MB2: Average and reference values were declared to be mainly based on the company's surveys, the collected data, and, to a lesser extent, published studies.

²: Abundance and reference range were not disclosed. The genus list was incomplete.

Table S14. Phylum abundances

Phylum	Company	Abundance (%)	Reference (%) ¹
Actinobacteria	MB1	2.53	0.83
	MB2	0.95	0.8
Armatimonadetes	MB1	0.005	0
	MB2	NA	NA
Bacteroidetes	MB1	40.88	30.1
	MB2	35.12	37.87
Cyanobacteria	MB1	0.005	0.008
	MB2	NA	NA
Firmicutes	MB1	55.08	56.9
	MB2	61.12	51.8
Nitrospirae	MB1	0.005	0
	MB2	NA	NA
Proteobacteria	MB1	0.72	2.01
	MB2	2.72	2.77
Verrucomicrobia	MB1	0.06	0.23
	MB2	0.09	1.69

¹: MB1: Average and reference value references were not described; MB2: Average and reference values were declared to be mainly based on the company's surveys, the collected data, and, to a lesser extent, published studies.

Table S15. Description of the dietary status quo by CGM and referenced recommendations

Energy/Nutrient	Daily average	Referenced recommendation
Energy intake (in kcal)	2398	2936
Carbohydrates (in E%)	59.4	50-55 ¹
Fats (in E%)	25.7	30-35
Protein (in E% [in g])	12.7 [75.9]	11.3-22.5 ² [82.6-165.3 ¹]
Fiber (in g)	16.3	≥30 ¹

¹: Based on the references by the German Nutrition Society according to CGM.

²: Protein intake in grams was calculated with a conversion factor of 4 kcal/g by the author.

Table S16. Blood sugar increases of the consumed foods and meals

Food/Meal	Energy content (in kcal)	Blood sugar increase (in mg/dl)
Highest tier		
Cherries	126	10.7
Layered salad and ice cream	664	7.9
Meat lasagna	662	12.3
Middle tier		
Bread with cheese	443	13.6
Cherries	63	22.9
Cooked potatoes ¹	270	19.1
Cooked rice ¹	254	28.1
Doner kebab	581	16.4
Fried egg and bread with cheese	432	19.1
Fruit juice and apple crumble	465	21.7
Pizza rolls with tuna	377	22.7
Potato chips/crisps and cookies	280	20.7
Spaghetti Bolognese	365	30.8
Spaghetti Carbonara with white bread	744	20.8
White bread ¹	294	20.7
White bread with butter ¹	405	13.6
Lowest tier		
Fried potatoes with bacon and ice cream	704	50.5
Garlic bread	305	35.7
Glucose/Oral glucose tolerance test ¹	219	86.4
Instant potato puree with fried onions and croutons	522	47.9
Meatloaf with rice and tomato sauce, white bread, and coffee with milk and sugar	701	43.5
Mixed salad with dressing, white bread, white wine, and chocolate ice cream	630	33.7
Noodles with minced meat and vegetables and bread with butter and cheese	1337	44.5
Pizza salami and nougat croissant	493	39.0
Sushi and white bread with cottage cheese and marmalade	722	55.5
White bread and coffee with milk and sugar	230	58.9
White bread and unsweetened coffee ¹	299	35.0

¹: Test meal/standard meal

Table S17. Excerpt of body composition analysis and measurements performed by DIET

Body measurement	Value	Reference range ¹
BMR (in kcal)	2259	NA
Body weight (in kg)	103.3	59.9-81.0
BMI (in kg/m ²)	31.9	18.5-25.0
Fat (in %)	28.0	8.0-20.0
Fat mass (in kg)	28.9	8.3-20.7
Visceral fat level	10	<13
Fat-free mass (in kg)	74.4	NA
Muscle mass (in kg)	70.7	54.9-69.5
Skeletal muscle mass (in kg)	40.9	NA
Bone mass (in kg)	3.7	NA
Sarcopenic index (in kg/m ²)	10.31	>7.25
Metabolic age	39	NA
Total body water (in kg)	52.3	51.7-67.1
Intracellular water (in kg)	30.5	NA
Extracellular water (in kg)	21.8	NA
Waist-to-hip-ratio	0.95	0.5-1.0
Waist circumference (in cm)	101	NA
Hip circumference (in cm)	106	NA

¹: As referred to by DIET.