

A man and a woman, both wearing white lab coats, are looking at a small white box. The man is wearing glasses and has a slight smile. The woman is pointing at the box. They appear to be in a laboratory or clinical setting.

# VITCHECK<sup>®</sup>

**A SIMPLE, EASY WAY  
TO INTEGRATE  
PERSONALISED NUTRITION  
INTO YOUR BUSINESS**



# WHAT IS PERSONALISED NUTRITION?







In January 2020 The American Nutrition Association proposed a definition of personalized nutrition as a “field that leverages human individuality to drive nutrition strategies that prevent, manage, and treat disease and optimize health.”<sup>1</sup>

This offers an entry point that provides the individual with meaningful and personalised insights intended to deliver successful long-term behavioural changes and ultimately a healthier life

It recognises every person is different in their genetic profile, phenotypic characteristics, microbiome, medical conditions, lifestyle, exercise and diet.

Factors that all impact on individual nutritional status, giving rise to the need to provide tailored customised solutions. Hence, for the healthcare industry, personalised nutrition offers a unique opportunity to engage with consumers and build stronger relationships, in numerous ways. Whether this is simply the use of a mobile app every now and then, or more fully engaging with a comprehensively integrated service offering-personalised nutrition. The concept can mean different things to different people.

At Vitcheck®, we think of personalised nutrition as the ability to provide tailored

and meaningful long-term dietary and lifestyle recommendations that are grounded in science-effects that can be, and should be, measured and tracked over time. This feedback loop of quality information, data and insights is essential to make personalised nutrition work effectively. Hence, Vitcheck® provides personalised nutrition using modern digital technologies that deliver curated nutritional advice, based on the key unique needs of the individual.

1. Bush CL et al. “Toward the definition of personalized nutrition: a proposal by the American Nutrition Association.” *Journal of the American College of Nutrition*, vol. 39, issue 1 (January 2020): 5-15.

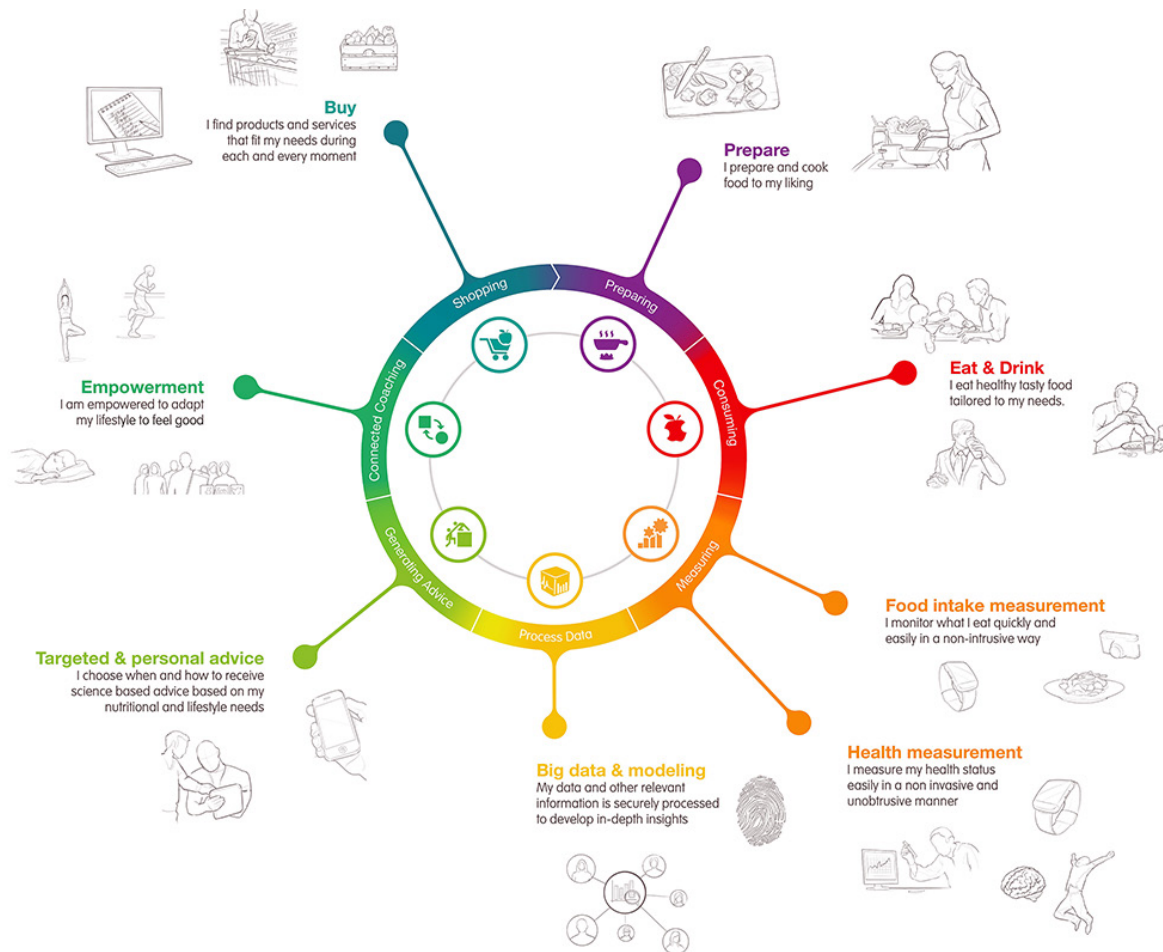


**IT'S ALL  
ABOUT ME**





# AND UNDERSTANDING ME





# CREATING OPPORTUNITIES FOR BUSINESS GROWTH

According to Nutrition Business Journal, the personalized supplement market is expected to grow from an estimated \$281 million in 2019 sales to a forecasted \$4.3 billion in 2023, representing 6.4% of U.S. supplement sales by the end of that period.<sup>1</sup> A recent analyst report estimated it could be worth as much as \$64 billion globally by 2040.<sup>2</sup>

The number-one driver for personalized nutrition unequivocally lies in changes that are now occurring within the healthcare paradigm. This is a result of the reluctant acknowledgement of late that we live in a world with well over a billion people afflicted with diet-related diseases and conditions, and a dramatic recognition that the cost of care is increasing exponentially as a result.

For diabetes alone, in 2015 researchers estimated the global economic burden from the disease was \$1.3 trillion per year and projected that figure to nearly double by 2030.<sup>3</sup> This is creating a long overdue impetus to reverse the healthcare system from being reactive to proactive, signalling a massive opportunity for nutritional intervention through foods, beverages, and supplements – all at a personalized level.

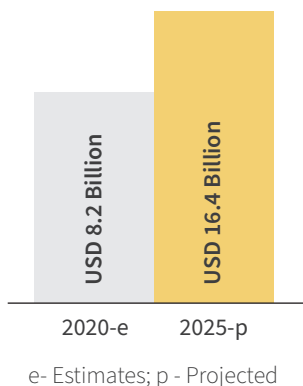
According to market researcher Euromonitor International's global Health and Nutrition consumer survey in 2020, just over 46% of consumers would be "extremely comfortable" (19.5%) or "very comfortable" (26.8%) using personalized nutrition online and app-based services.<sup>4</sup>

1. Nutrition Business Journal report. "Personalized Nutrition Special Report 2020." Accessed here.
2. Fitzgerald M. "Personalized Nutrition Could Be the Next Plant-Based Meat, Worth \$64 Billion by 2040, Says UBS." CNBC. Published January 19, 2020. Accessed here.
3. Bommer C et al. "Global economic burden of diabetes in adults: projections from 2015 to 2030." *Diabetes Care*, vol. 41, no. 5 (May 2018): 963-970
4. Euromonitor International Health and Nutrition Survey 2020. Fielded in February 2020.

*The personalised supplement market is expected to grow from an estimated \$281 million in 2019 sales to a forecasted \$4.3 billion in 2023.*



# ATTRACTIVE OPPORTUNITIES IN THE PERSONALISED NUTRITION MARKET

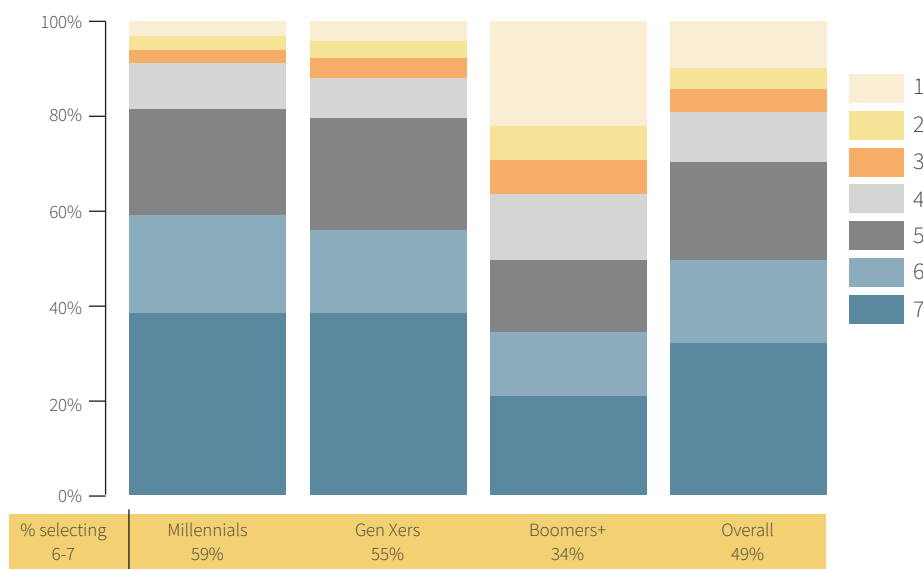


- The entire personalized nutrition market is estimated to be valued at USD 8.2 billion in 2020 and is projected to grow at a CAGR of 15.0% by 2025.
- Rising awareness of improving general health and wellbeing, along with the increasing availability of customized solutions are some of the major factors driving the growth of the personalized nutrition market.
- The growth of the geriatric population and high acceptance of digital health solutions are a few other factors that are projected to drive the growth of the personalized nutrition market globally.

Source: Secondary research, primary interviews, industry journals, related research publication, press releases, and Markets & Markets analysis.

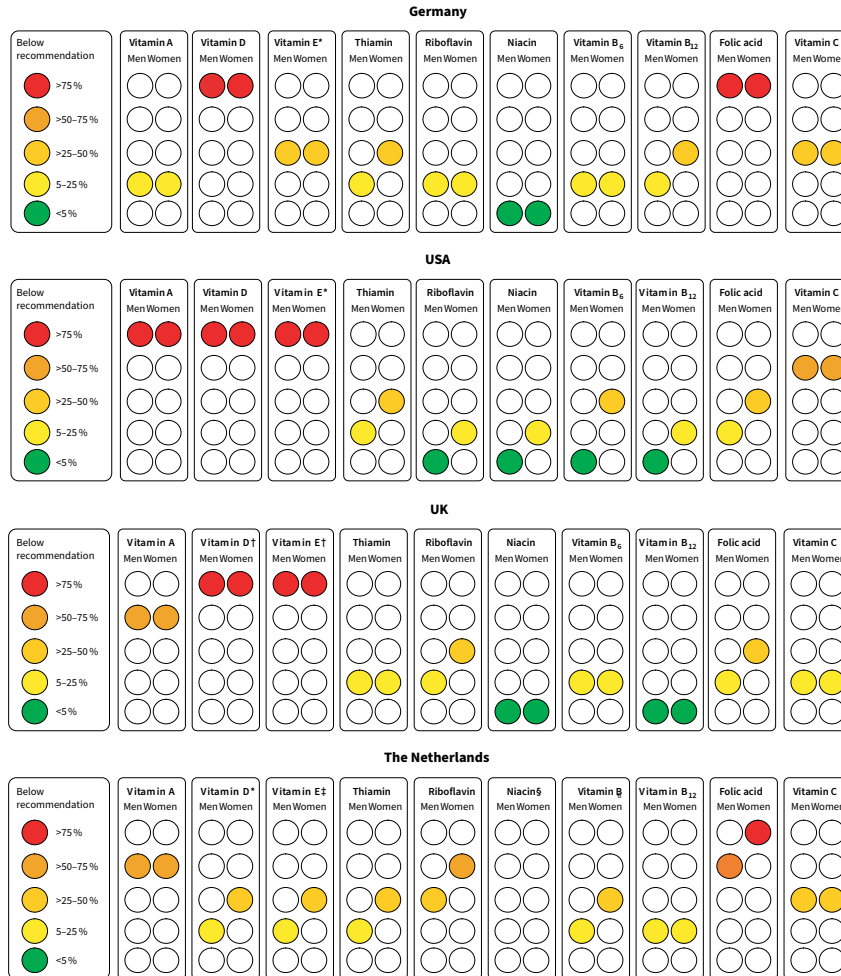
Percentage of respondents selecting 1-7\*  
 \*Where 1 is not interested at all and 7 is very interested. Source L.E.K Health & Wellness Consumer Survey (February 2018).

## Interest in a personalised nutrition program.





# ARE WE LACKING KEY MICRONUTRIENT INTAKES?



For many people despite the abundance of food, their intake is micronutrient poor.

Vast numbers of people are not eating their 5 a day or consuming the recommended oily fish intake and world-wide, many age groups are deficient in numerous important vitamins and minerals, so people need personalised help.

This situation is reflected in numerous surveys of wealthy countries where consumption of key vitamins is not simply below the typically recommended

daily amounts, but for significant numbers of people is less than the lowest reference nutrient intake..

1. Population with intakes below the specific recommended reference value for the country <sup>(16-26)</sup>. The level of recommendation covering the needs of 97.5% of the population was used where it existed. \* Average nutrient requirement/approximation. † No references exist, therefore, the Institute of medicine reference value was used. ‡ 25-50% for men aged 19-30 years. § Data not available.



A more detailed inspection of data from UK examining typical intakes of vitamins and minerals by age and sex, further highlights

the parlous micronutrient status of many within the population at large.

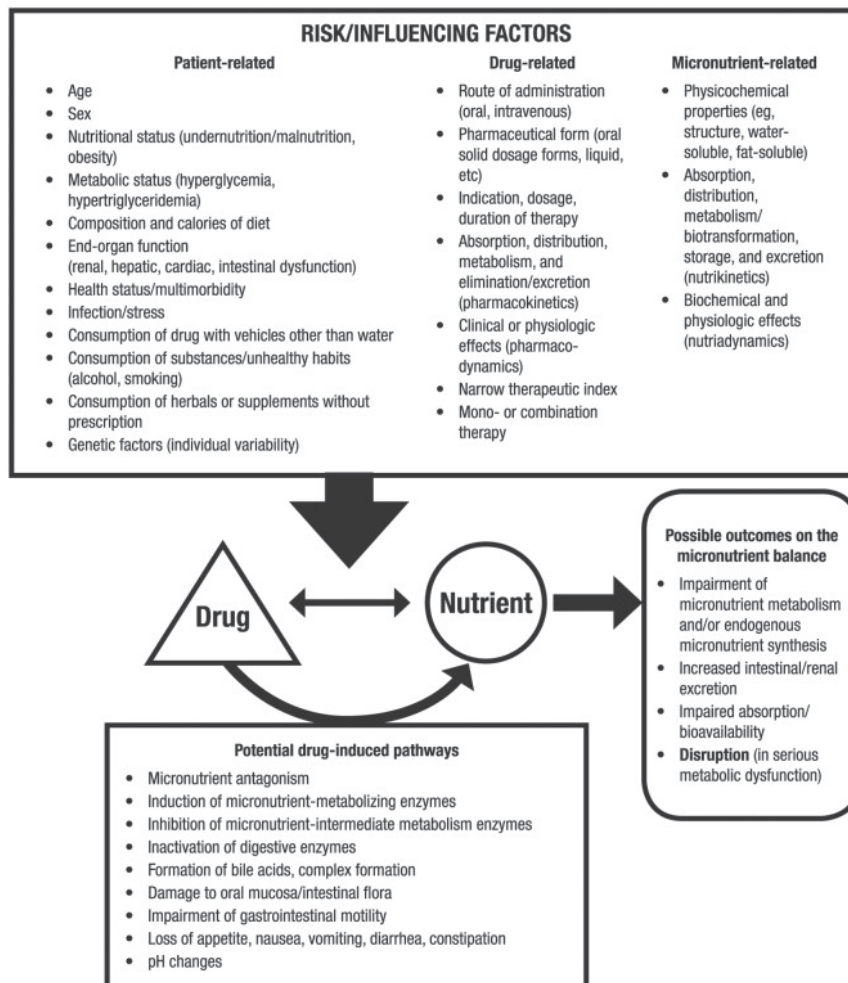
Somewhere amongst these statistic lies an individual-we need to find them and provide corrective action.

	"Gender % below LRNI		Age Group % below LRNI			
	Males	Females	20+	30+	40+	50+
<b>Vitamins</b>						
<b>Vitamin A</b>	11.3	6.75	13.3	7.06	9.41	5.62
<b>Vitamin C</b>	1	1.33	0.65	1.87	1.12	1.01
<b>Riboflavin</b>	3.87	12.6	10.1	8.72	7.24	6.82
<b>Vitamin B12</b>	1.15	2.14	2.69	1.27	1.06	1.58
<b>Folate</b>	1.77	4.36	3.25	3.79	3.06	2.1
<b>Minerals</b>						
<b>Calcium</b>	4.9	8.8	9.36	5.95	6.76	5.15
<b>Iron</b>	1.1	25.3	16.6	14.1	17.3	5.06
<b>Magnesium</b>	14.2	11.5	18.5	10.9	12.3	9.7
<b>Potassium</b>	10	24.3	24.7	15.6	17.8	9.79
<b>Zinc</b>	8.2	5.2	8.58	5.98	6.33	5.85
<b>Selenium</b>	25.8	50.3	39	36.5	41	35
<b>Iodine</b>	5.7	11.3	14.7	7.37	6.16	5.59





# HOW MEDICATIONS CAN IMPACT MICRONUTRIENT STATUS



The potential negative effects that foods and supplements exert upon medication/s are well elucidated with high levels of awareness amongst healthcare professionals. However, although, the converse effects that drugs might have on micronutrient status are also recognised, these occur in the literature as a more disparate and poorly collated body of evidence, meaning awareness is more limited. Nevertheless, the likely pathways are clearly understood, and the possible reasons are manyfold as shown left.



# MIGHT MEDICATION ACCELERATE MICRONUTRIENT MALNOURISHMENT?

In terms of the medications that impact on nutrient status to any extent, the numbers of prescriptions written for them are staggering-And these numbers are all rising! So, in England alone, for example, over 1.1 billion prescriptions are written each year, with 450 million for the top 20 medications.

Of the latter, as shown to the right, a staggering 84% have the potential to impact on micronutrient/microbiota status. This would be higher, but that 24 million prescriptions relate to vitamin D.

With 50% of the UK population taking at least one prescription medicine daily; 25%-at least three drugs, 15%-five or more and 7%-eight or more medications, the potential additive effects are important to consider. This becomes even more of a problem the older people get, as 70% of over 75s take more than 3 prescription medications. Added to this, increasing life expectancy combined with more multi-morbidities occurring with age, suggest individuals might experience decades of consuming numerous pharmaceuticals, and the unwanted effects they might induce on nutritional status.

Moreover, since our diet tends to deteriorate with age, as do some physiological systems such as immune function, effectively optimising nutritional intake to compensate for these potential problems can help support not only immunity but other aspects of health, such as bone strength, the nervous system function and energy levels.







# LIVING LONGER, LIVING WELL?

## **The likely impact of multiple medications on micronutrient status**

Although, we're all living longer, as we age our health is more likely to become compromised, often by non-communicable diseases such as cardiovascular disease, cancer, diabetes, mental illness and neurodegenerative conditions and their complications. Consider, for example, diabetes and its common comorbidity hypertension.

## **The increasing prevalence worldwide of Type II diabetes (T2D)**

The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and expected to rise to 4.4%

in 2030. This means the total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million by 2030. Whilst the prevalence of diabetes is higher in men than women and there are more women with diabetes than men, the most important demographic is the increase in incidence in the proportion of people over 65 years of age. In addition, patients with T2D experience specific deficiencies that are associated with the condition. So typically, the nutritional status of patients with type II diabetes are considered to be low in calcium, magnesium, chromium, iodine, selenium, manganese and zinc. And to make matters worse, many of these micronutrients are already low in the diet of the elderly.

## **Mirrored by a diagnosis of hypertension**

The estimated total number of adults with hypertension in 2000 was 972 million; the number of adults with hypertension in 2025 is predicted to increase by about 60% to a total of 1.56 billion. Again, a diagnosis of hypertension is more frequent in the elderly.



# NUTRITIONAL IMPACT OF MEDICATIONS FOR DIABETES AND HYPERTENSION

These comorbidities are likely to be treated with multiple medications, which as highlighted here will possibly impact on physiological systems such as those involved in immune response-something

that may be already compromised in T2D by the poor nutritional status highlighted above, Hence the undermining effects of commonly used medications to treat these common comorbidities can be

cumulative in terms of their impact on micronutrient status related to simply one critical physiological system.

Medication	B6	Folate	B12	C	D	E	Iron	Magnesium	Selenium	Zinc	Co-Enzyme Q10	Omega 3	Microbiota
<b>ACE inhibitors</b>					?					x			
<b>β blockers</b>											X		
<b>Calcium channel blockers</b>					x								
<b>Digoxin</b>								x					
<b>Diuretics</b>	?	x		?	?		x			x	?		
<b>H2 Antagonists</b>		x	xx		?		?	x					
<b>Metformin</b>		x	xx		x			x					x
<b>Proton Pump Inhibitors</b>		x	xx		?		?	XX		x			x
<b>Statins</b>					?	x			X	x	x	x	x
<b>Vitamin K antagonists</b>					?								x

Key:-? Possible negative impact; x probable negative impact; xx significant negative impact.  
Reference - see \* on P18



## VITCHECK PUTTING THE PIECES TOGETHER

Vitcheck enables the cumulative impacts that lifestyle, life stages, diet and medication might have upon nutrient status to be assessed by employing a complex, but easy to use algorithm-based technology. It interrogates data from over 1000 references relating to more than 3500 medicines that it indexes (by both brand and generic name) and has identified more than 4000 incidences where drugs potentially impact upon the status of one or more of 28 micronutrients and/or the microbiome.

This diagnostic also takes into consideration other important factors which might alone or together affect baseline nutritional status, such as food and lifestyle choices. Uniquely, Vitcheck allows this data to be used to quantitatively determine the single or cumulative impact medications might have on nutritional status to help further personalise dietary and supplement recommendations.

Our research is also delivered in a format which enables any user to access the relevant peer reviewed references used as data sources and validate the suggested corrective diet and supplement recommendations.

The numbers of interactions where medications impact on micronutrient status identified by our research as of Sept 2021 are:-

Nutrient	Interactions	Nutrient	Interactions
<b>Betacarotene</b>	61	<b>Selenium</b>	141
<b>Bifidobacteria</b>	107	<b>Vitamin A</b>	83
<b>Biotin</b>	74	<b>Vitamin B1</b>	148
<b>Calcium</b>	156	<b>Vitamin B2</b>	206
<b>Carnitine</b>	34	<b>Vitamin B3</b>	133
<b>Chromium</b>	94	<b>Vitamin B5</b>	36
<b>Co-Enzyme Q10</b>	54	<b>Vitamin B6</b>	52
<b>Inositol</b>	17	<b>Vitamin B12</b>	262
<b>Iodine</b>	4	<b>Vitamin C</b>	121
<b>Lactobacillus</b>	107	<b>Vitamin D</b>	372
<b>Magnesium</b>	286	<b>Vitamin E</b>	131
<b>Omega 3 fatty acids</b>	12	<b>Vitamin K</b>	17
<b>Potassium</b>	119	<b>Zinc</b>	362
		<b>Total</b>	<b>4073</b>

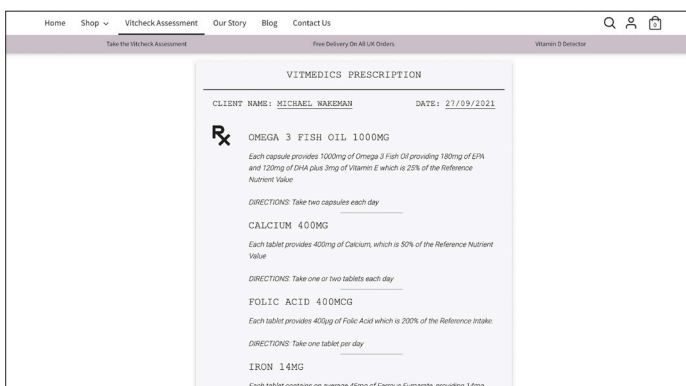
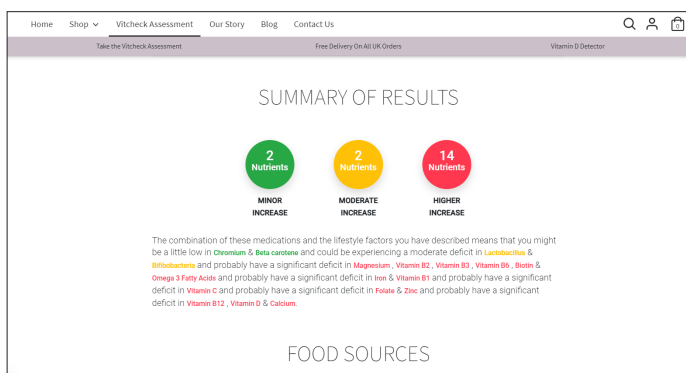
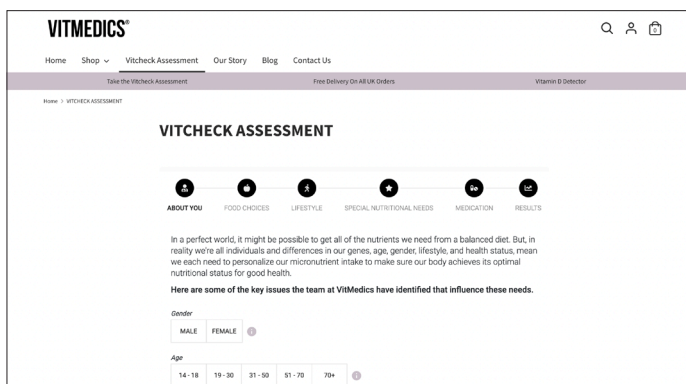


# VITCHECK HOW IT WORKS

First data is collected about the individual—sex, age, height and weight. Then inputs on food choices—intake of fruit and vegetables, calcium sources, oily fish, dietary preferences and food intolerances are collated. Finally, relevant lifestyle factors relating to exercise, smoking, alcohol intake, weight loss regimes, sunshine exposure, dietary genetic tests, and conditions requiring extra nutritional support are assessed.

User are then presented a drop-down menu from which to select as they enter their medication. Multiple medications and any consequences are added to any potential negative effects from the previous collected datapoints and the authenticated Vitcheck algorithm delivers a cumulative score of any impacts that have been identified. This summary is seen as a traffic light system with red as major concerns, amber as moderate and green as minor impacts. The user can then access the comprehensive details of which specific nutrients fall into each category.

Once these details are revealed, the first recommendation to correct any extra nutritional need is always to advise eating foods rich in the specific nutrient that is lacking. With every recommendation, a hyperlink to the peer reviewed reference source is available to verify the evidence. In circumstances where the impact of a drug or drugs upon micronutrients is major, and cannot be rectified by diet alone, a personalised corrective supplement prescription is recommended.





# OUR EXPERT TEAM PROVIDES TRUSTED, INDEPENDENT ADVICE



**CEO Mike**  
Wakeman



Dr Jill Jenkins



Dr Tim Bond



Dr Emma  
Derbyshire

## OUR AWARDS



Our Peer reviewed Publications related to vitcheck

- \* Wakeman M. The Impact Micronutrient Status in the Elderly Plays in Their Immune Response to Viral Respiratory Infections and the Potential Compromising Effects Medications Might Cause. Journal of Advances in Medicine and Medical Research 32(8): 59-85, 2020; Article no. JAMMR.57391.
- Wakeman M, Archer D. Metformin and micronutrient status in Type 2 diabetes: does polypharmacy involving acid-suppressing medications affect vitamin B12 levels? Diabetes, Metabolic Syndrome and obesity: Targets and Therapy. 2020
- Wakeman M. Micronutrient Status in the Elderly Plays in Their Immune Response to Viral Respiratory Infections and the Potential Compromising Effects Medications Might Cause. Journal of Advances in Medicine and Medical Research 32(8): 59-85, 2020; Article no. JAMMR.57391
- Wakeman M. An Interactive Database to Quantitatively Assess the Impact of Medication on Nutrient Status. International Journal of Sport Nutrition and Exercise Metabolism, 2019, 29, S12
- Wakeman M. Development of an evidence based, interactive database to quantitatively assess the impact of medication on the nutrient status of patients pre-and post-bariatric surgery Obesity Surgery (2019) 29. S13
- Wakeman, M. A Review of the Effects of Oral Contraceptives on Nutrient Status, with Especial Consideration to Folate in UK. Journal of Advances in Medicine and Medical Research, 2019, 30, 1-17.
- Wakeman M. Medicated Malnourishment. BPUK ISBN 978-1-913284-00-8

# SHIFTING THE PARADIGM IN SUPPLEMENTATION

Vitcheck can be seen as a vehicle to propel Personalised Nutrition to become a new disruptive agency in supplementation. It creates new opportunities in retail, and within the direct-to-consumer channel as well as delivering novel ways for companies to interact with their customers. It delivers the potential to longitudinally wrap data-based relationships with consumers around their daily vitamin routine, and to transform the corrective transactional nature of purchasing a supplement. It helps create a winning strategy based on price, product, people, and partnerships to provide a lasting value proposition.

Vitcheck offers a personalized nutrition solution that is affordable, easy-to-integrate, and actionable for each and every user-elements that are key to realizing success in a marketplace where affordability is typically seen to be at odds with holistic and accurate ways of delivering health.

Vitcheck is available as a stand-alone algorithm to integrate into any thirdparty platform to deliver personalised nutritional recommendations - as well as - where relevant, personalised supplement prescriptions aligned with the host's product portfolio.

It can be licensed to commercial users-pharmacies, health food stores, and supplement companies to recommend personalised product purchases from their chosen portfolio, curated from the consumers inputted data. Chronic medication consumption only enhances the subscription potential that the tool offers.

Using the same core algorithm driven technology, a validated stand-alone vitamin D diagnostic application-vitaminDetector assesses the intrinsic status of an individual and recommends a titrated dosing supplementation schedule of this important vitamin.





# VITCHECK

- A complex algorithm developed by highly experienced healthcare professionals
- Assesses Individual life stage, lifestyle, dietary habits and medication impacts on micronutrient status
- Easy to navigate database of over 3500 medications
- References over 1000 scientific studies highlighting interactions of medications on micronutrient status
- Authenticated algorithm delivers a cumulative score of any impacts from all submitted datapoints
- Validation of any recommendation via hyperlinks to peer reviewed scientific literature
- Total transparency to any user.
- Easy to understand traffic light system summary of key personalised recommendations
- Corrective dietary changes are always recommended as primary interventions
- A personalised supplement programme is constructed where necessary
- Constantly updated to reflect any changes in science
- Integration into third party platforms to provide personalised recommendations from client portfolio

