



Whole food, food state or synthetic nutrients – which is best?



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anhinternational.org



@anhcampaign
ANHInternational



Domesticated
humans?

What next?

Ideal v Real World

"Most people should be able to get all the nutrients they need by eating a varied and balanced diet.

- Food Standards Agency, NHS Direct, NIDirect, etc.

Most people should be able to get all the nutrients they need for healthy bones by eating a healthy balanced diet.

- NHS Choices, Bone Health

"If consumers do choose to take supplements, it is important they are informed and they may also wish to consult with their GP."

- Food Standards Agency

What is a balanced and varied diet?

The eatwell plate shows how foods can be classified into five groups shown as wedges of different size. These illustrate the proportions in which we should eat foods from these groups to provide a healthy diet that supplies all the nutrients our bodies need to work efficiently. You will notice that the foods in the two largest groups are all derived from plants.

- British Nutrition Foundation

<http://www.nutrition.org.uk/healthyliving/healthyeating/healthyvarieddiet.html>



<http://www.nhs.uk/Livewell/Goodfood/Pages/eatwell-plate.aspx>

1990+

F&V + diversity = ↓ all-cause mortality, CVD, cancer

Dietary diversity and subsequent mortality in the First National Health and Nutrition Examination Survey Epidemiologic Follow-up Study¹⁻³

Ashima K Kant, Arthur Schatzkin, Tamara B Harris, Regina G Ziegler, and Gladys Block

ABSTRACT We examined the relation of dietary diversity to subsequent all-cause mortality by using data from the First National Health and Nutrition Examination Survey (NHANES I) Epidemiologic Follow-up Study, 1982–1987. The analytic cohort consisted of 4160 men and 6264 women (including 2556 deaths), 25–74 y at baseline (1971–1975). Twenty-four-hour dietary recalls were evaluated for variety among the five major food groups: dairy, meat, grain, fruit, and vegetable, with a dietary diversity score (DDS); consumption of each food group contributed 1 point to a maximum possible DDS of 5. Age-adjusted risk of mortality was inversely related to DDS ($P \leq 0.0009$) in men and women. The inverse diversity-mortality association was adjusted for potential confounders: education, race, smoking status, and dietary fiber intake; the relative risk of mortality in men and women consuming two or fewer food groups was 1.5 (95% CI 1.2–1.8) and 1.4 (95% CI 1.1–1.9), respectively. In conclusion, diets that omitted several food groups were associated with an increased risk of mortality. *Am J Clin Nutr* 1993;57: 434–40.

KEY WORDS Diet and all-cause mortality, dietary diversity, mortality, diet quality and mortality, NHANES I Epidemiologic Follow-up Study, First National Health and Nutrition

mental concept of dietary guidance given to the US public (9–11). Although the goal of early dietary guidance was meeting nutrient requirements, in recent years a number of recommendations intended for reducing the risk of various chronic diseases have also advocated a varied diet (1, 12, 13). Whether consumption of a diet with greater variety confers long-term health advantages, however, has not been examined.

In this report we use a measure of variety among the major food groups to evaluate the total diet and examine its relation to all-cause mortality, by using data from the First National Health and Nutrition Examination Survey (NHANES I) Epidemiologic Follow-up Study (NHEFS).

Methods

NHANES I was conducted from 1971 to 1975 by the National Center on Health Statistics (NCHS) (14). NHEFS was initiated in 1982 by NCHS and other Public Health Service agencies, including the National Institutes of Health (15). The aim of NHEFS is to relate mortality and morbidity at follow-up to nutritional, health, and other information collected in NHANES I (15). Respondents who were 25–74 y of age at the time of initial survey ($n = 14\,407$) were considered eligible for follow-

Demographic and psychosocial characteristics of middle-aged women and men who use dietary supplements

Results from the Malmö Diet and Cancer Study

PETER WALLSTRÖM, SÖLVE ELMSTÅHL, BERTIL S. HANSON, PER-OLOF ÖSTERGREN, ULLA JOHANSSON, LARS JANZON, S. ANDERS LARSSON *

In the Western world, huge amounts of money are being spent on dietary supplements, although this usage may be useless and possibly harmful. Factors that influence supplement consumption have not been well defined. This paper aims to describe relations between supplement usage and various sociodemographic and psychosocial factors. The study cohort consisted of 6,545 men and women, aged 45–65 years, who during 1991 and 1992 participated in the Malmö Diet and Cancer Study, a large-scale prospective cohort study. Data on supplement consumption were recorded during 7 consecutive days. Each participant also completed a questionnaire, covering education, work history, alcohol, smoking, perceived health and psychosocial factors such as social network, social support, job strain, etc. Total body fat was also measured. The prevalence of supplement consumption was 43% among women and 29% among men. The most important sociodemographic factors were education, ethnicity and age. Female users tended to be slim, have worse perceived health and to drink more alcohol than other women, none of which applied to male users. No differences in smoking habits between users and non-users were noted. None of the psychosocial factors appeared to influence supplement consumption. Those who used vitamins and/or minerals only were more similar to non-users than those who used all kinds of dietary supplements. There was a substantial variation in consumption prevalence with season. The prevalence of supplement consumption is influenced by a number of demographic factors and also by season. To claim that supplement users are health-conscious is an over-simplification. The psychosocial factors behind supplement usage call for further analyses.

Key words: vitamins, diet surveys, cohort studies, social environment

Malmö Diet and Cancer Study

The prevalence of anaemia and mineral supplement use in a Swedish middle-aged population. Results from the Malmö Diet and Cancer Study.

CONCLUSION:

A substantial number had mineral intake below present recommendations despite supplement use. The nutrient content of some supplements could be improved, especially calcium. Iron supplementation among postmenopausal women and men are questionable.

Vitamin and Mineral Supplement Use and Mortality in a US Cohort

ABSTRACT

Objectives. Vitamin and mineral supplementation is a common practice in the United States, yet little is known about the long-term health effects of regular supplement use.

Methods. To examine the relationship between reported use of supplements and mortality, we analyzed data from US adults 25 to 74 years of age who were examined in the First National Health and Nutrition Examination Survey (1971 to 1975), with vital status determined through 1987.

Results. At baseline, 22.5% of the cohort reported using supplements regularly and 10.0% reported irregular use. The risk of mortality for

Insun Kim, DrPH, David F. Williamson, PhD, Tim Byers, MD, MPH, and Jeffrey P. Koplan, MD, MPH

Introduction

Vitamin and mineral supplements are widely used among persons in the United States. According to a recent national survey, 32% of men and 45% of women reported having taken nutritional supplements in the 2-week period prior to interview.¹ This amounts to an annual expenditure of about \$3.3 billion per year.²

Persons who take nutritional supplements report doing so for a number of reasons, including to compensate for perceived dietary deficiencies, improve their sense of health and well-being, and promote longevity.³ But despite the wide use

The NHANES I, which was conducted by the National Center for Health Statistics from 1971 through 1975, was designed to represent the noninstitutionalized civilian US population from 1 to 74 years of age.⁸ A total of 14 407 participants of NHANES I who were aged 25 to 74 years and were examined at the baseline were included in the NHEFS. Vital status information through 1987 was available for 96% of the cohort; we used the final release version of the public use 1987 NHEFS mortality data tapes maintained by the National Center for Health Statistics. Between 1982 and 1984, surviving members of the cohort (n = 10 523) were reinterviewed.

Nail in coffin: beta-carotene

1150

THE NEW ENGLAND JOURNAL OF MEDICINE

May 2, 1996

EFFECTS OF A COMBINATION OF BETA CAROTENE AND VITAMIN A ON LUNG CANCER AND CARDIOVASCULAR DISEASE

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Abstract Background. Lung cancer and cardiovascular disease are major causes of death in the United States. It has been proposed that carotenoids and retinoids are agents that may prevent these disorders.

Methods. We conducted a multicenter, randomized, double-blind, placebo-controlled primary prevention trial — the Beta-Carotene and Retinol Efficacy Trial — involving a total of 18,314 smokers, former smokers, and workers exposed to asbestos. The effects of a combination of 30 mg of beta carotene per day and 25,000 IU of retinol (vitamin A) in the form of retinyl palmitate per day on the primary end point, the incidence of lung cancer, were compared with those of placebo.

Results. A total of 388 new cases of lung cancer were diagnosed during the 73,135 person-years of follow-up (mean length of follow-up, 4.0 years). The active-treatment group had a relative risk of lung cancer of 1.28 (95 percent confidence interval, 1.04 to 1.57; $P=0.02$), as

compared with the placebo group. There were no statistically significant differences in the risks of other types of cancer. In the active-treatment group, the relative risk of death from any cause was 1.17 (95 percent confidence interval, 1.03 to 1.33); of death from lung cancer, 1.46 (95 percent confidence interval, 1.07 to 2.00); and of death from cardiovascular disease, 1.26 (95 percent confidence interval, 0.99 to 1.61). On the basis of these findings, the randomized trial was stopped 21 months earlier than planned; follow-up will continue for another 5 years.

Conclusions. After an average of four years of supplementation, the combination of beta carotene and vitamin A had no benefit and may have had an adverse effect on the incidence of lung cancer and on the risk of death from lung cancer, cardiovascular disease, and any cause in smokers and workers exposed to asbestos. (N Engl J Med 1996;334:1150-5.)

©1996, Massachusetts Medical Society.

LUNG cancer is the leading cause of death from cancer in the United States, accounting for approximately 29 percent of deaths from cancer and 6 percent of all deaths.¹ New approaches are essential to prevent lung cancer in persons who have smoked cigarettes or who have had occupational exposure to asbestos. Twenty-nine percent of men and 25 percent of women who are 45 to 64 years of age currently smoke,² and at least 40 percent of men and 20 percent of women in this age group are former smokers.³ An estimated 4000 to 6000 deaths from lung cancer per year are attributed to exposure to asbestos.^{4,5}

chemopreventive efficacy and safety of beta carotene and related agents.¹⁰⁻¹²

This report presents interim efficacy results of the CARET study, which coincided with the announcement of the steering committee's decision on January 11, 1996, to stop the trial's active intervention. Follow-up for additional end points is expected to continue for another five years.

METHODS

Study Design

The study's objectives, design, detailed methods, eligibility criteria,

Nail in coffin: vitamin E

REVIEW

Meta-Analysis: High-Dosage Vitamin E Supplementation May Increase All-Cause Mortality

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Background: Experimental models and observational studies suggest that vitamin E supplementation may prevent cardiovascular disease and cancer. However, several trials of high-dosage vitamin E supplementation showed non-statistically significant increases in total mortality.

Purpose: To perform a meta-analysis of the dose-response relationship between vitamin E supplementation and total mortality by using data from randomized, controlled trials.

Patients: 135 967 participants in 19 clinical trials. Of these trials, 9 tested vitamin E alone and 10 tested vitamin E combined with other vitamins or minerals. The dosages of vitamin E ranged from 16.5 to 2000 IU/d (median, 400 IU/d).

Data Sources: PubMed search from 1966 through August 2004, complemented by a search of the Cochrane Clinical Trials Database and review of citations of published reviews and meta-analyses. No language restrictions were applied.

Data Extraction: 3 investigators independently abstracted study reports. The investigators of the original publications were contacted if required information was not available.

Data Synthesis: 9 of 11 trials testing high-dosage vitamin E (≥ 400 IU/d) showed increased risk (risk difference > 0) for all-cause mortality in comparisons of vitamin E versus control. The pooled all-cause mortality risk difference in high-dosage vitamin E trials was 39 per 10 000 persons (95% CI, 3 to 74 per 10 000 persons; $P = 0.035$). For low-dosage vitamin E trials, the risk difference was -16 per 10 000 persons (CI, -41 to 10 per 10 000 persons; $P > 0.2$). A dose-response analysis showed a statistically significant relationship between vitamin E dosage and all-cause mortality, with increased risk of dosages greater than 150 IU/d.

Limitations: High-dosage (≥ 400 IU/d) trials were often small and were performed in patients with chronic diseases. The generalizability of the findings to healthy adults is uncertain. Precise estimation of the threshold at which risk increases is difficult.

Conclusion: High-dosage (≥ 400 IU/d) vitamin E supplements may increase all-cause mortality and should be avoided.

Ann Intern Med. 2004;142:●●●-●●●.

www.annals.org

For author affiliations, see end of text.

See editorial comment on pp ●●●-●●●.

The Daily Telegraph



STYLE WHY CAN WOMEN SHOP LIKE

www.telegraph.co.uk FINAL

BRITAIN'S BEST-SELLING QUALITY

Vitamin pills 'can increase the risk of early death'

By Kate Devlin
Medical Correspondent

POPULAR vitamin supplements taken by millions of people in the hope of improving their health may do no good and could increase the risk of a premature death, researchers report today.

They warn healthy people who take antioxidant supplements, including vitamins A and E, to try to keep diseases such as cancer at bay that they are interfering with their natural body defences and may be increasing their risk of an early

WHAT IS THE GOOD OF SUPPLEMENTS?

Vitamin A Thought to boost the immune system, it is said to be important for bone and tooth development and is found in milk, eggs and liver.

Vitamin C Supposed to boost the immune system and help the body to absorb iron. It is found in citrus fruit, blackcurrants, strawberries, tomatoes, potatoes, peppers and brussels sprouts.

ments increased the risk of an early death by four per cent.

Although the review found no significant detrimental effect caused by vitamin C, it found no evidence that it helped ward off disease. Millions take it in the hope of avoiding a common cold.

Goran Bjelakovic, who led the review, said: "We could find no evidence to support taking antioxidant supplements to reduce the risk of dying earlier in healthy people or patients with various diseases.

"If anything, people in trial groups given the antioxidants

Pope tells of his sha



But on what basis?

Nail in coffin: folic acid?

Lancet. 2013 Mar 23;381(9871):1029-36.

Effects of folic acid supplementation on overall and site-specific cancer incidence during the randomised trials: meta-analyses of data on 50,000 individuals.

Vollset SE, Clarke R, et al + B-Vitamin Treatment Trialists' Collaboration.

"Both the hopes for rapid cancer prevention and the fears about rapidly increased cancer risk from folic acid supplementation were not confirmed by this meta-analysis. It remains to be seen whether any beneficial or harmful effects on cancer incidence will eventually emerge with even longer treatment or follow up."

A High Diet Quality Is Associated with Lower Incidence of Cardiovascular Events in the Malmö Diet and Cancer Cohort

Joanna Hlebowicz^{1,2,3}, Isabel Drake^{2*}, Bo Gullberg², Emily Sonestedt², Peter Wallström², Margaretha Persson^{1,2}, Jan Nilsson^{1,2}, Bo Hedblad^{1,2}, Elisabet Wirfält²

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Abstract

Aims: To investigate if diet quality is related to incidence of cardiovascular (CV) events.

Subjects and Methods: A diet quality index based on the 2005 Swedish Nutrition Recommendations and the Swedish Dietary Guidelines was created and included six dietary components: saturated fatty acids, polyunsaturated fatty acids, fish and shellfish, dietary fiber, fruit and vegetables, and sucrose. The index ranked 17126 participants (59% women) of the population-based Malmö Diet and Cancer cohort (Sweden) on their dietary intakes. Total index score was categorized as low, medium or high. Cox proportional hazard regression was used to model associations between index score categories and index components with risk of incident CV events, with adjustment for potential confounders. The incidence of first CV events (non-fatal or fatal myocardial infarction or ischemic stroke or death from ischemic heart disease) was monitored from baseline (1991–1996) until December 31, 2008; 703 CV events occurred in women and 1093 in men.

Results: A high diet quality was associated with decreased risk of CV events when compared to a low diet quality. In multivariate analysis, the risk reduction was 32% (hazard ratio = 0.68, 95% confidence interval: 0.49–0.73) in men and 27% (hazard ratio = 0.73, 95% confidence interval: 0.59–0.91) in women. When examined separately and mutually adjusted for each other, the individual components were either not associated with CV risk or marginally decreased risks were seen.

Conclusion: High quality diets in line with current recommendations may reduce the risk of CV events. This study illustrates the importance of considering a combination of dietary factors when evaluating diet-disease associations.

Citation: Hlebowicz J, Drake I, Gullberg B, Sonestedt E, Wallström P, et al. (2013) A High Diet Quality Is Associated with Lower Incidence of Cardiovascular Events in the Malmö Diet and Cancer Cohort. PLoS ONE 8(8): e71095. doi:10.1371/journal.pone.0071095

Robust finding: fruit & veg



BMJ 2014;349:g4490 doi: 10.1136/bmj.g4490 (Published 29 July 2014)

Page 1 of 14

RESEARCH

Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: systematic review and dose-response meta-analysis of prospective cohort studies

 OPEN ACCESS

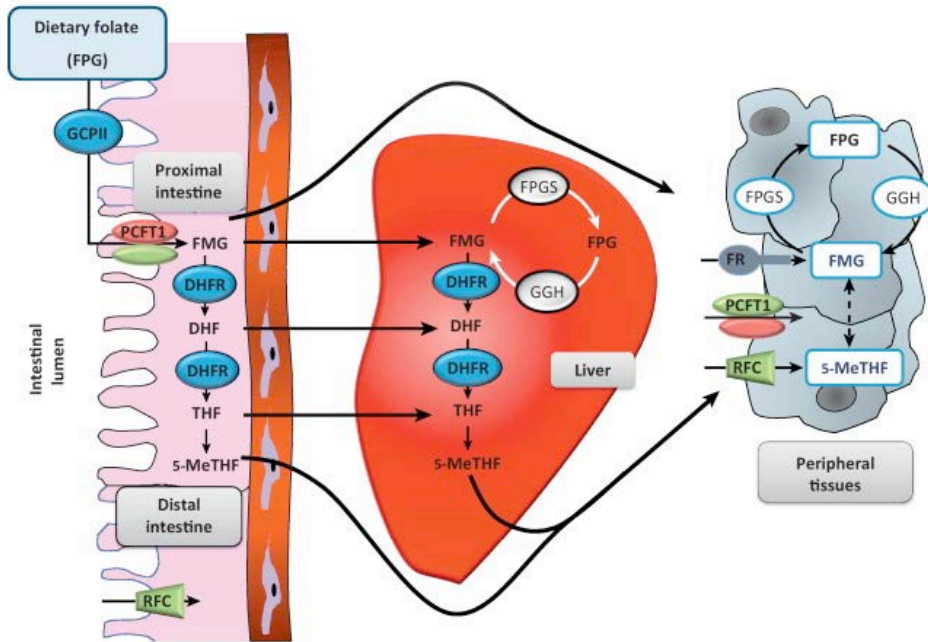
Xia Wang *instructor in nutrition*^{1,2}, Yingying Ouyang *research fellow*², Jun Liu *research fellow*², Minmin Zhu *instructor in biostatistics*³, Gang Zhao *instructor in medicine*⁴, Wei Bao *postdoctoral fellow*⁵, Frank B Hu *professor*⁶

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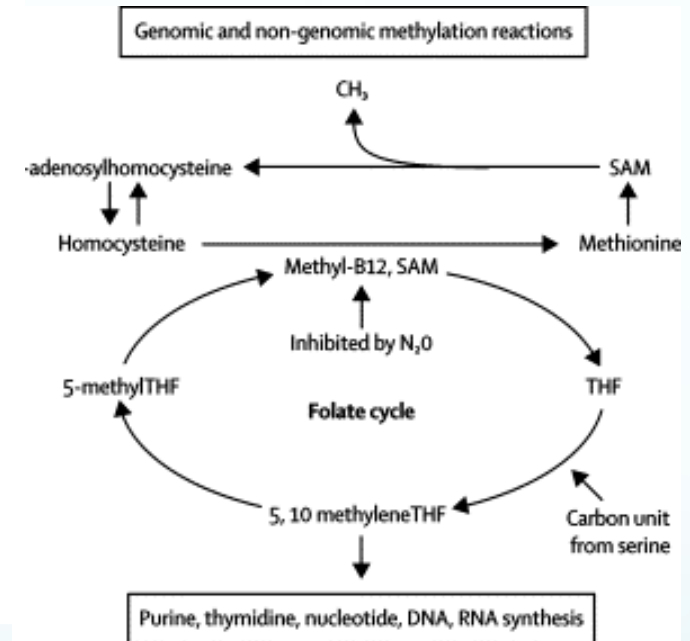
Nature's treasure trove

- 10,000 spp grasses (wheat, rice, maize, barley, sorghum, rye and oats)
- 3,000 spp tropical fruits (banana, mango, pineapple and papaya)
- 18,000 spp legumes (peas, beans, soybeans, peanuts, alfalfa and clover)
- 1,500 spp edible nuts
- 1,500 spp edible mushrooms
- 60,000 spp medicinal plants

Folate: master controller



TRENDS in Endocrinology & Metabolism



Guéant JL, et al. *Trends Endocrinol Metab.* 2013 Jun; 24(6): 279-89

Reynolds EH, *Lancet Neurol.* 2006 Nov; 5(11):949-60. Review.

Full spectrum vitamin E



4 tocopherols

+

4 tocotrienols

=

8 Vitamin E
isomers

Retinol + carotenoids

- Retinol: intestine to lymph: f(bile salts, pancreatic lipase and chylomicrons)
- Carotenoids: ~600; 60 = pro-vitamin A; others include AO function
- IOM conversions:
 - 1 IU retinol = 0.3 mcg RAE
 - 1 IU beta-carotene from dietary supplements = 0.15 mcg RAE
 - 1 IU beta-carotene from food = 0.05 mcg RAE
 - 1 IU alpha-carotene or beta-cryptoxanthin = 0.025 mcg RAE

Food form, precursor, (bio)synthetic

B1: Thiamin pyrophosphate (TPP) CAS 154-87-0

B2: Flavin mononucleotide (FMN) CAS 130-40-5

B3: Nicotinic acid CAS 59-67-6 and niacinamide CAS 98-92-0 (1:3 ratio)

B5: Pantethine CAS 16816-67-4

B6: Pyridoxine HCl CAS 58-56-0

B7: D-biotin CAS 58-85-5

B9: Orgen-FA or Quadrefolic (orgenetics.com; quadrefolic.com)

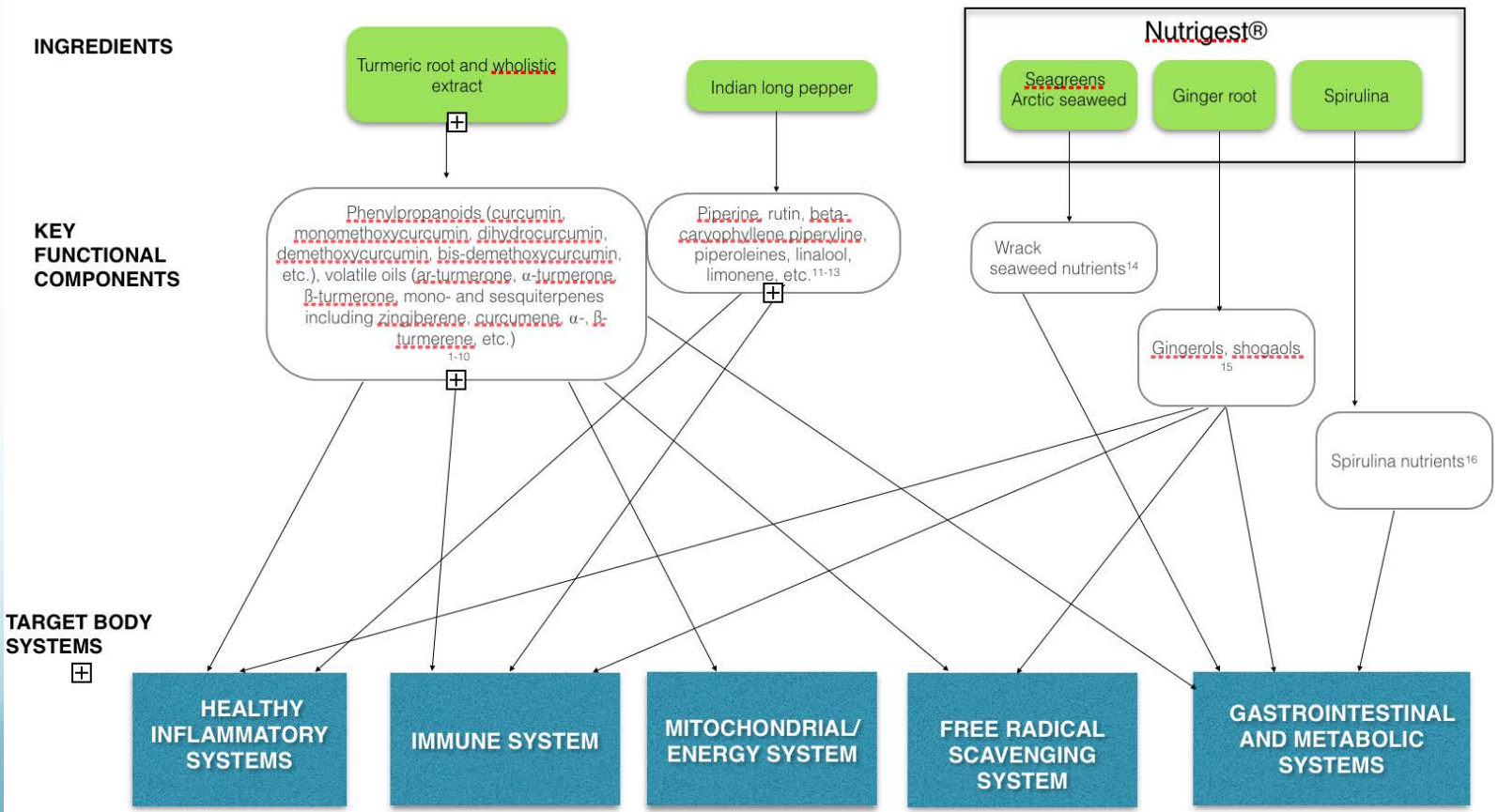
B12: Hydroxocobalamin (acetate) CAS 22465-48-1, methylcobalamin CAS 13422-55-4, 5'-deoxyadenosylcobalamin CAS 13870-90-1 (2:1:1 ratio)

Multi-target botanicals



Wholistic Turmeric

= herbal ingredient
 = food ingredient



“Full spectrum” botanicals

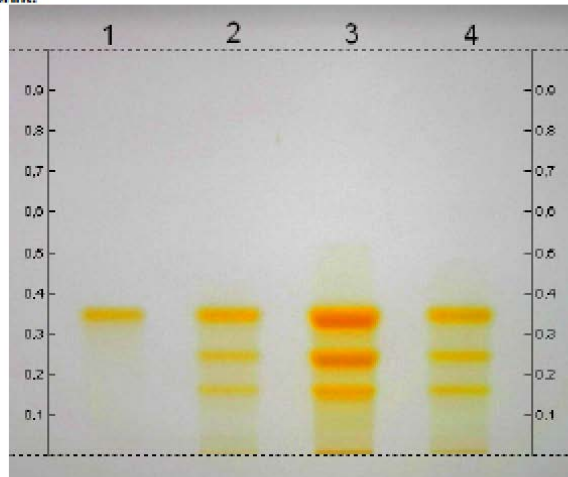


PhytoLab

Identification per TLC

Name/Method: **Turmeric, Curcuma longa / PV 990002**

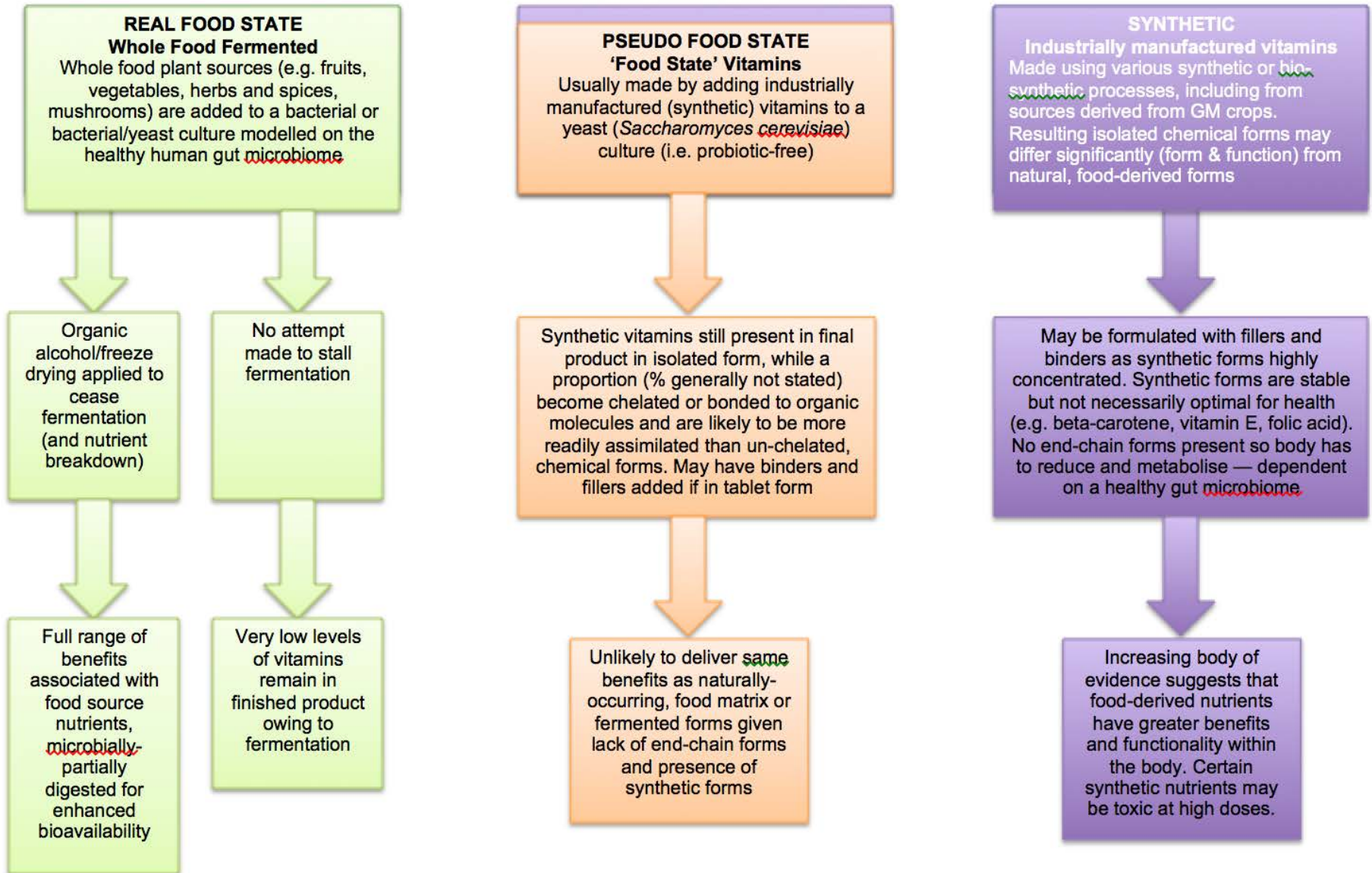
TLC-Fingerprint:



Lane	Sample name	Batch No.	Examination ID	Application Volume (µl/cm)
1.	Curcumin			4'1
2.	Turmeric whole	NBORM140402	1876628.0	2'1
3.	Turmeric wholistic extract	NBPHHE150321	1876643.4	2'1
4.	Turmeric whole	03/15/116	1876645.0	2'1



'Manufacturing' vitamins



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 e-Mail: dolly@orgenetics.com
 Orgenetics, Inc.
 3061 E. La Jolla Street, Unit H, Anaheim, CA 92806

Specification Sheet

Product Name: **Orgen-B's™**
 (Blend of Certified Organic guava, Holy basil and Lemon Extracts)

Com Free : Yes Item Code : OBS 130
 GMO Status : Non GMO Exemptic: None
 Country of Origin : India Solvent Used : Water

Test	Specification	Method of Analysis
Physical Parameters		
Appearance	Grayish Brown to Brown Powder	Visual
Identification	Positive to standards	HPTLC
Taste	Strong vitamin taste	Organoleptic
Odor	Characteristic	Organoleptic
Solubility	Soluble in water	USP XXIII
Mesh size	Pass 98% thru 20 mesh	USP XXIII
Moisture contents	< 6.0 %	USP XXIII (IR Balance)

Assay of Actives

Each 1000 mg contains :		
Vitamin B1 (Thiamine HCl)	N L T 22 mg (2.2%)	By HPLC
Vitamin B2 (Riboflavin)	N L T 20 mg (2%)	By HPLC
Vitamin B3 (Niacin)	N L T 34 mg (3.4 %)	By HPLC
Vitamin B5 (Pantothenic Acid)	N L T 38 mg (3.8 %)	By HPLC
Vitamin B6 (Pyridoxine HCl)	N L T 22 mg (2.2%)	By HPLC
Vitamin B9 (Folic Acid)	N L T 700 mcg(0.07 %)	By HPLC

Micro-biological Control

Total Plate Count	< 1,000cfu/g	USP XXIII
Yeast and Mold	< 100 cfu /g	USP XXIII
Coil forms	Absent	USP XXIII
Salmonella	Absent	USP XXIII
E. Coli	Absent	USP XXIII
Pseudomonas Aeruginosa	Absent	USP XXIII
Staphylococcus Aureus	Absent	USP XXIII

Chemical Impurities.

Heavy Metals	< 10 ppm	USP XXIII
Arsenic as As	< 1 PPM	USP XXIII
Mercury as Hg	< 1 PPM	USP XXIII
Cadmium as Cd	< 1 PPM	USP XXIII
Lead as Pb	< 0.5 PPM	USP XXIII
Pesticides residue	Negative	USP XXIII
Organic Volatile Impurities	Nil	USP XXIII



Storage Condition :

Tightly closed container should be kept at less than 80 F and away from sunlight and moisture.

Quality Control Department
 Orgenetics, Inc.

The above information is a direct translation of information provided to Orgenetics from the Manufacturer of this product. Evaluation of this product is suggested as per mentioned procedure. No liability is offered to any unreasonable and unlawful health or patent claims. No guarantee on Microbiological results after 10 days of opening of our sealed container.

Tri-En-All 400

Contains Natural Unesterified Mixed Tocopherols and Tocotrienols

FORMULA (#98738)

Each Softgel Contains:

Vitamin E.....	400 IU
(as d-alpha tocopherol)	
with mixed tocopherols	
Gamma-tocopherol	280 mg
Beta and Delta-tocopherols	40 mg
Mixed Tocotrienols (from palm)	25 mg

SUGGESTED USE

Adults take one softgel daily or as directed by physician.



Food matrix base + synergy

nuzest[®]
nutrition for life

WHAT'S IN GOOD GREEN STUFF?

Superblend of all your Essential Nutrients (per 10 g serve)

PLANT FOODS

Organic spirulina	1000 mg	Pineapple juice (9:1)	250 mg
European pea protein isolate	904 mg	Broccoli sprout	250 mg
Ledthin (sunflower)	750 mg	Beetroot	170 mg
Apple pectin	550 mg	Carrot	90 mg
Red marine algae	485 mg	Ginger root	75 mg
Flaxseed	400 mg	Licorice root	70 mg
Organic wheatgrass leaf	340 mg	Spinach	70 mg
Organic chlorella	340 mg	Whole kelp	60 mg
Organic barley leaf	300 mg	Shiitake mushroom	30 mg
Acerola fruit	270 mg	Slippery elm bark	25 mg
Papaya	250 mg		

PLANT EXTRACTS

Citrus bioflavonoids	500 mg	Ashwagandha root (5:1)	75 mg
Globe artichoke leaf (15:1)	500 mg	Astragalus root (4:1)	75 mg
Bilberry (100:1)	200 mg	Turmeric root (4:1)	70 mg
Blackcurrant (200:1)	200 mg	Cocoa polyphenols	70 mg
Rosehip (4:1)	175 mg	Rhodiola rosea root (15:1)	50 mg
Grape seed (120:1)	100 mg	Goji berry (4:1)	40 mg
Panax ginseng (4:1)	100 mg	Dandelion (4:1)	40 mg
Milk thistle seed (70:1)	80 mg	Hawthorn berry (10:1)	35 mg
Gotu kola (10:1)	75 mg	Burdock root (10:1)	25 mg
Green tea (10:1)	75 mg	Resveratrol	15 mg
Rosemary leaf (4:1)	75 mg		

BIOAVAILABLE VITAMINS

Vitamin A (retinyl palmitate & mixed carotenoids)	600 µgRE (75% NRV)	Vitamin B3 (inositol hexanicotinate)	15 mg a-TE (125% NRV)
Vitamin D3 (from lichen)	10 µg (200% NRV)	Pantothenate (pantothenic acid)	70 µg (93% NRV)
Vitamin E (d-alpha & mixed tocopherols)	15 mg a-TE (125% NRV)	Vitamin B6 (pyridoxine HCl)	360 mg (450% NRV)
Vitamin K2 (menaquinone-7)	70 µg (93% NRV)	Folate (calcium methylfolate)	360 mg (450% NRV)
Vitamin C (ascorbic acid and acerola cherry)	360 mg (450% NRV)	Vitamin B12 (methylcobalamin)	100 µg (4000% NRV)
Vitamin B1 (thiamine HCl)	600 µgRE (75% NRV)	Biotin (D-biotin)	330 mcg (660% NRV)
Vitamin B2 (riboflavin)	10 µg (200% NRV)		

BIOAVAILABLE MINERALS

Potassium (phosphate)	300 mg (15% NRV)	Manganese (gluconate)	1.5 mg (75% NRV)
Calcium (from red marine algae)	165 mg (21% NRV)	Silica (orthosilicic acid & marine algae)	14.5 mg
Magnesium (citrate & glycinate)	100 mg (27% NRV)	Selenium (L-selenomethionine)	35 µg (64% NRV)
Zinc (gluconate)	12 mg (120% NRV)	Chromium (picolinate)	35 µg (88% NRV)
Copper (gluconate)	250 µg (25% NRV)	Iodine (kelp & marine algae)	150 µg (100% NRV)

OTHER

Lactobacillus acidophilus	3 billion cfu	1,3/1,6 beta glucans	8 mg
Bifidobacterium bifidum	3 billion cfu	Ubiquinone (CoQ10)	8 mg
R-/S-alpha lipoic acid	75 mg	Ubiquinol (reduced CoQ10)	8 mg
Bromelain (2000 GDU/g)	65 mg		

Notes

All weights are average
*Extracts and concentrates are listed as equivalent values.
Food supplement



Conclusions

- Isolated vitamins are low cost and very useful in dealing with gross deficiencies, selective malabsorption, SNPs, etc
- Food represents most well proven optimal delivery system for nutrients
- Naturally-occurring/foodmatrix: generalised benefits, science is emerging
- Biosynthetic and fermentation processes may deliver equivalent benefits of food forms, with options for higher doses and lower cost





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