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# V-Discover

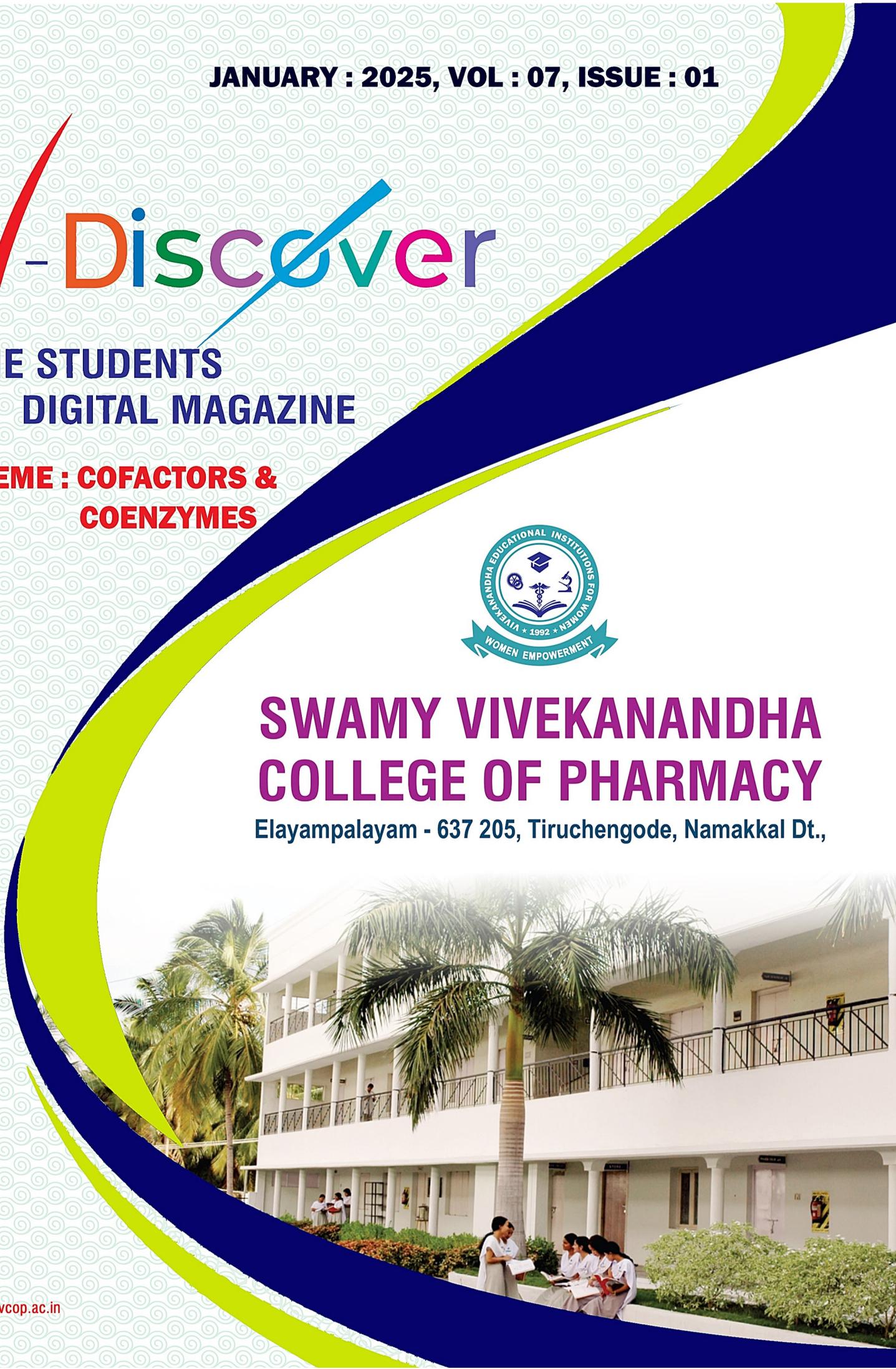
**THE STUDENTS  
DIGITAL MAGAZINE**

**THEME : COFACTORS &  
COENZYMES**



## **SWAMY VIVEKANANDHA COLLEGE OF PHARMACY**

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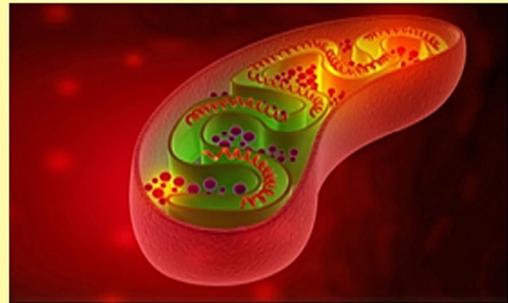
## COFACTORS & COENZYMES

**THE WORD VITAMIN COMES FROM THE GREEK WORD "VITAMINE" WHICH MEANS "VITAL FOR LIFE"**

Vitamins are organic compounds required in the diet in small amounts to perform specific biologic functions for normal maintenance of optimum growth and health.



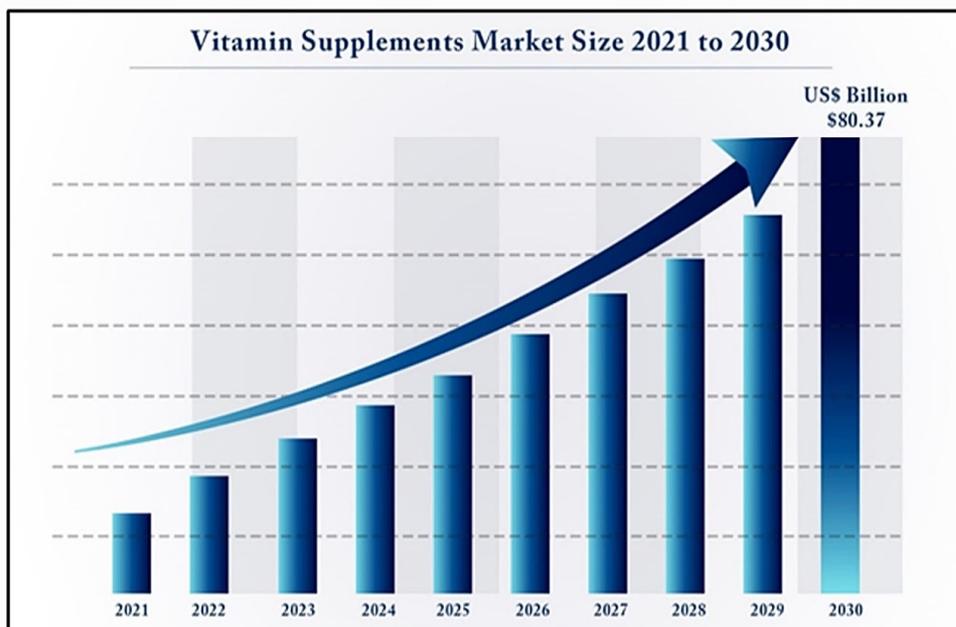
### COENZYMES:



**CO-ENZYMES:** A coenzyme is an organic molecule that enhances the function of an enzyme. An enzyme is a protein that helps biochemical reactions occur.

Cofactors are inorganic or small organic molecules that bind enzymes to enable or enhance their activity.

### MARKET SIZE



Report Scope	Details
Market Size	US\$ 80.37 Billion by 2030
Growth Rate	CAGR of 7.2% From 2021 to 2030
Base Year	2021
Forecast Period	2021 to 2030
Segments Covered	Type, Form, Distribution Channel
Regional Scope	North America, Europe, Asia Pacific, Latin America, Middle East & Africa
Companies Mentioned	Dabur India; NBTY Inc.; Ricola AG.; Mondelez International; Procter and Gamble; Nutraceutical International Company; BASF SE; The Himalaya Drug Company; Glanbia Nutritionals; Botanicalife International of America, Inc.; Blackmores Limited

## CLASSIFICATION OF VITAMINS

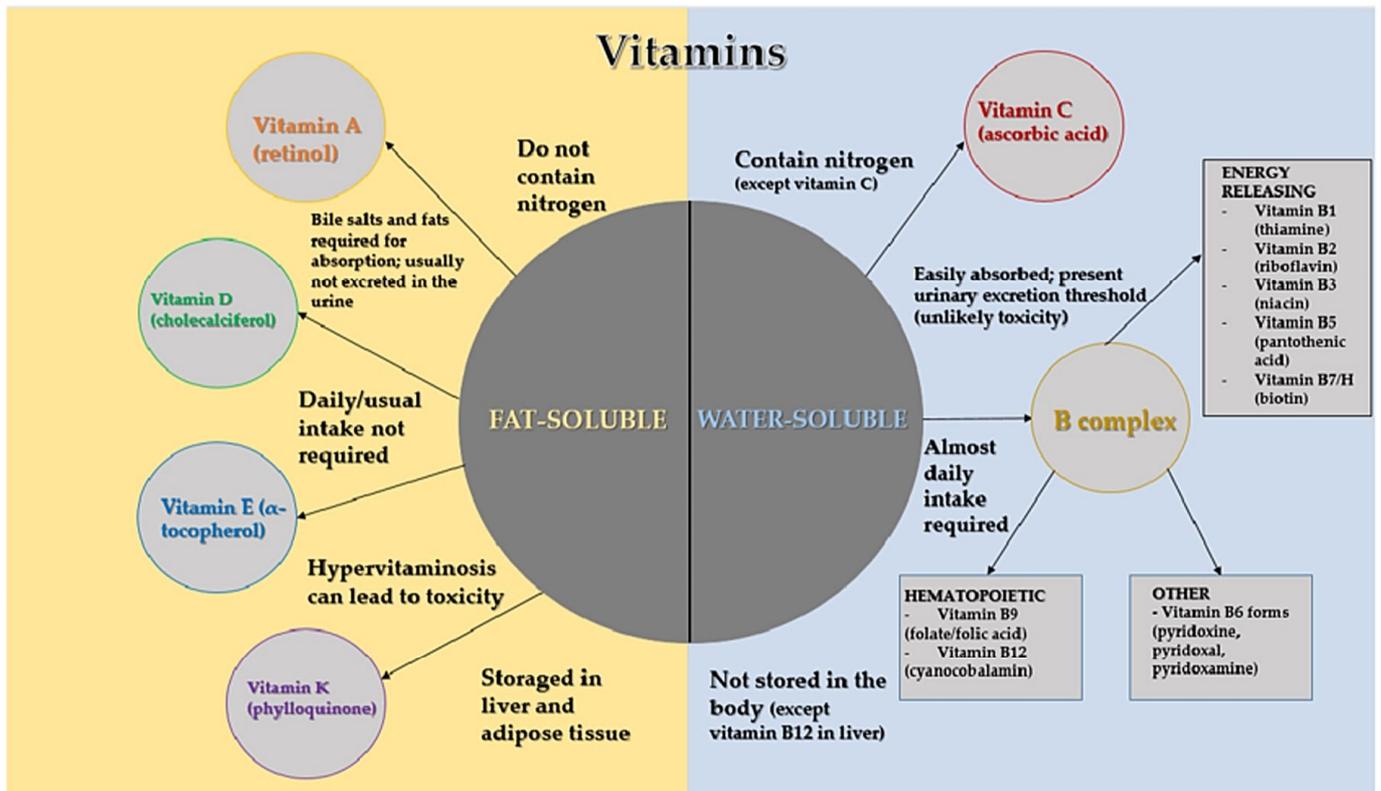


## VITAMINS: FUNCTIONS AND THEIR SOURCES

Vitamins are important for their regularity and protective functions. Unlike most other nutrients, they are required in very small amounts. But it is necessary to provide these in diet because many of them cannot be synthesized in our body. Excess intake of any vitamin however is harmful. Vitamins are generally classified on the basis of their solubility.

Water soluble vitamin: vitamin C, B complex

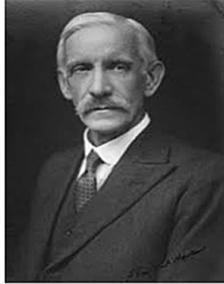
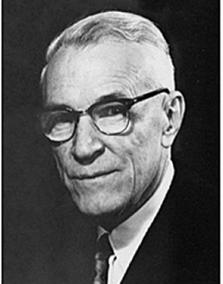
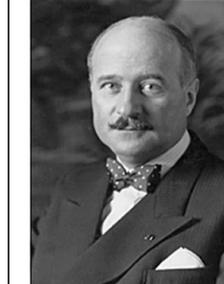
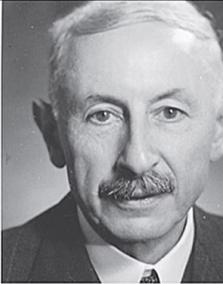
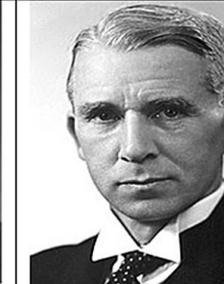
Fat soluble vitamin: vitamin A, D, E and K



## VITAMINS RELATED COENZYMES

Coenzyme	Derived from Vitamin	Atom (or) group transferred (function)	Dependent enzyme
Thiamine pyrophosphate (TPP)	Thiamine (B <sub>1</sub> )	Aldehyde	Transketolase
Flavin mono nucleotide (FMN)	Riboflavin (B <sub>2</sub> )	Hydrogen and electrons	L-amino acid oxidase
Flavin adenine dinucleotide (FAD)	Riboflavin (B <sub>2</sub> )	Hydrogen and electrons	D-amino acid oxidase
Nicotinamide adenine dinucleotide (NAD) (or) Diphospho pyridine nucleotide (DPN)	Niacin (B <sub>3</sub> )	Hydrogen and electrons	Lactate dehydrogenase
Pyridoxal phosphate (PLP)	Pyridoxine (B <sub>6</sub> )	Amino	Alanine transaminase
Biotin	Biotin (B <sub>7</sub> ) or (H)	CO <sub>2</sub>	Pyruvate carboxylase
Coenzyme A	Pantothenic acid (B <sub>5</sub> )	Acyl	Thiokinase
Tetrahydrofolate	Folic acid	one carbon unit (formyl transferase)	----

## NOBEL LAUREATES AND THEIR WORK WITH VITAMINS

 <p><b>Christiaan Eijkman</b> (1929)</p> <p><b>Vitamin B<sub>1</sub></b></p>	 <p><b>Sir Frederick Gowland Hopkins</b> (1929)</p> <p><b>Growth Stimulating Vitamins</b></p>	 <p><b>William Parry Murphy</b> (1934)</p> <p><b>Vitamin B<sub>12</sub></b></p>	 <p><b>Henrik Carl peter dam</b> (1943)</p> <p><b>Vitamin K</b></p>	 <p><b>Adolf Otto Reinhold Windaus</b> (1928)</p> <p><b>Vitamin D</b></p>
 <p><b>Albert von Szent-Györgyi</b>(1937)</p> <p><b>Vitamin C</b></p>	 <p><b>Richard Kuhn</b> (1938)</p> <p><b>Vitamin B<sub>2</sub> and B<sub>6</sub></b></p>	 <p><b>Edward Adelbert Doisy</b> (1943)</p> <p><b>Vitamin K</b></p>	 <p><b>Paul Karrer</b> (1937)</p> <p><b>Vitamin A,B and E</b></p>	 <p><b>Walter Norman Haworth</b> (1937)</p> <p><b>Vitamin C</b></p>

**VITAMINS AND MINERALS FOR OLDER ADULTS**

**VITAMIN A (XEROPHTHALMIA)**

<p><b>Food Sources:</b> Vitamin A can be found in products such as eggs and milk. It can also be found in vegetables and fruits, like carrots and mangoes</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 900 mcg RAE.  <b>Women Age 51+:</b> Most women 51 and older should aim for 700 mcg RAE each day.</p>	
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**VITAMIN B1 (BERIBERI)**

<p><b>Food Sources:</b> You can find vitamin B1 in meat – especially pork – and fish. It’s also in whole grains and some fortified breads, cereals, and pastas.</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 1.2 mg each day.  <b>Women Age 51+:</b> Most women 51 and older should aim for 1.1 mg each day.</p>	
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**VITAMIN B2 (GLOSSITIS)**

<p><b>Food Sources:</b> You can find vitamin B2 in eggs and organ meat, such as liver and kidneys, and lean meat. You can also find it in green vegetables, like asparagus and broccoli.</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 1.3 mg each day.  <b>Women Age 51+:</b> Most women 51 and older should aim for 1.1 mg each day.</p>	
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**VITAMIN B3 (PELLAGRA)**

<p><b>Food Sources:</b> Vitamin B3 can be found in some types of nuts, legumes, and grains. It can also be found in poultry, beef, and fish.</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 16 mg each day.-  <b>Women Age 51+:</b> Most women 51 and older should aim for 14 mg each day.</p>	
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**VITAMINS AND MINERALS FOR OLDER ADULTS**

**VITAMIN B6 (PERIPHERAL NEUROPATHY)**

<p><b>Food Sources:</b> Vitamin B6 is found in a wide variety of foods. The richest sources of vitamin B6 include fish, beef liver, potatoes and other starchy vegetables, and fruit (other than citrus).</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 1.7 mg each day.  <b>Women Age 51+:</b> Most women 51 and older should aim for 1.5 mg each day.</p>	
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**VITAMIN B12 (PERNICIOUS ANEMIA)**

<p><b>Food Sources:</b> You can get this vitamin from meat, fish, poultry, milk, and fortified breakfast cereals.</p>	<p><b>Men Age 51+:</b> 2.4 mcg every day.  <b>Women Age 51+:</b> 2.4 mcg every day</p>	
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**VITAMIN C (SCURVY)**

<p><b>Food Sources:</b> Fruits and vegetables are some of the best sources of vitamin C. Citrus fruits, tomatoes, and potatoes can be a large source of vitamin C.</p>	<p><b>Men Age 51+:</b> Most men 51 and older should aim for 90 mg each day  <b>Women Age 51+:</b> Most women 51 and older should aim for 75 mg each day.</p>	
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**VITAMIN D (RICKETS)**

<p><b>Food Sources:</b> You can get vitamin D from fatty fish, fish liver oils, fortified milk and milk products, and fortified cereals.</p>	<p><b>Men Age 51+:</b> If you are age 51–70, you need at least 15 mcg (600 IU) each day, but not more than 100 mcg (4,000 IU).  <b>Women Age 51+:</b> If you are age 51–70, you need at least 15 mcg (600 IU) each day, but not more than 100 mcg (4,000 IU).</p>	
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**VITAMINS AND MINERALS FOR OLDER ADULTS**

**VITAMIN E (STERILITY)**

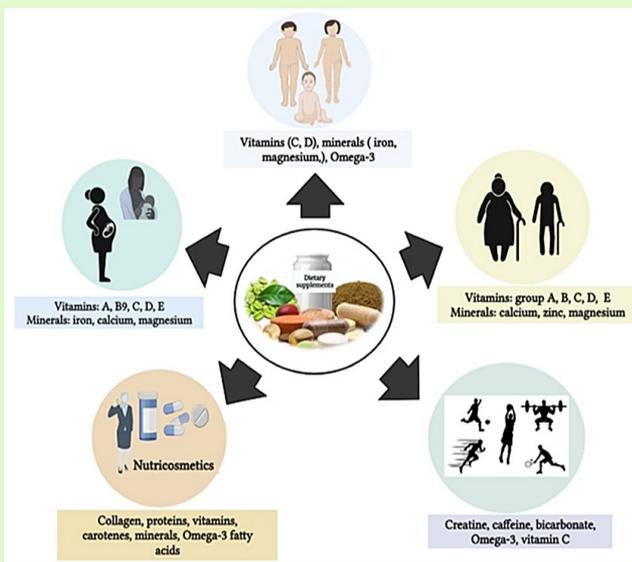
<p><b>Food Sources:</b> Vitamin E can be found in nuts like peanuts and almonds and can be found in vegetable oils, too. It can also be found in green vegetables, like broccoli and spinach.</p>	<p><b>Men Age 51+:</b> Most men age 51 and older should aim for 15 mg each day.  <b>Women Age 51+:</b> Most women age 51 and older should aim for 15 mg each day.</p>	
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**VITAMIN K (BLEEDING DIATHESIS)**

<p><b>Food Sources:</b> Vitamin K can be found in many foods including green leafy vegetables, like spinach and kale and in some fruits, such as blueberries and figs. It can also be found in cheese, eggs, and different meats.</p>	<p><b>Men Age 51+:</b> 2.4 mcg every day.  <b>Women Age 51+:</b> 2.4 mcg every day</p>	
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**CONSUMER PROFILE OF VITAMINS**

**Food Sources:** Vitamin K can be found in many foods including green leafy vegetables, like spinach and kale and in some fruits, such as blueberries and figs. It can also be found in cheese, eggs, and different meats.



**AT A GLANCE FACTS**

Recent published analysis of prenatal multivitamins found labeling discrepancies and heavy metal contamination that the authors said put mother and their unborn children at risk. The Council for Responsible Nutrition said the study has a major methodological flaw that was confirmed by USP.



The recent research was published in the American Journal of Clinical Nutrition. It was the work of experts associated with the medical and pharmacy schools at the University of Colorado Anschutz Medical Campus. The researchers purchased 47 different examples of what they classified as prenatal multivitamin and mineral (PMVM) products. Of these, 15 were prescription products. They then had the products chemically analysed.

**PUBLIC WARNING**

**FDA ADVISORY NO. 2020-128 || PUBLIC HEALTH WARNING AGAINST THE PURCHASE AND CONSUMPTION OF THE FOLLOWING UNREGISTERED FOOD SUPPLEMENTS:**

The FDA verified through post-marketing surveillance that the abovementioned food supplements are not registered and the Certificate of Product Registration (CPR) have not yet been issued. Pursuant to the Republic Act No. 9711, otherwise known as the “Food and Drug Administration Act of 2009”, the manufacture, importation, exportation, sale, offering for sale, distribution, transfer, non-consumer use, promotion, advertising or sponsorship of health products without the proper authorization is prohibited.

Since these unregistered food supplements have not gone through evaluation process of the FDA, the agency cannot guarantee their quality and safety. The consumption of such violative products. Since these unregistered food supplements have not gone through evaluation process of the FDA, the agency cannot guarantee their quality and safety. The consumption of such violative products may pose health risk to consumers.



All concerned establishments are warned not to distribute violative food products or food supplements until they have been issued the appropriate authorization, a License to Operate (LTO) for the establishment, and a CPR for the food product or food supplement.

All FDA Field Officers and Regulatory Enforcement Unit (REU) in coordination with the law enforcement agencies and Local Government Units (LGUs) are requested to ensure that violative products are not sold or made available in their localities or areas of jurisdiction.

MYTHS AND FACTS...

### Fun Facts About Vitamins You Should Know

**VITAMIN C**  
Helps produce collagen, which is like the glue that keeps cells together

**VITAMIN D**  
Plays the main role in activating your body's ability to absorb calcium

**OMEGA 3**  
Cannot be produced by our body, but it is as essential as some vitamins

**VITAMIN B**  
Is actually a complex of 8 different vitamins usually found together

Every Life Matters

**Myth**  
Taking a daily supplement of vitamin C will protect you from catching a common cold.

**Fact**  
There's no conclusive evidence that taking vitamins will prevent colds. Vitamin C is essential for protecting cells and absorbing iron from food but it cannot cure or prevent a cold.

v/s

**Vitamin E**

is not one nutrient but the collective name for a set of 8 fat-soluble vitamins with antioxidant properties.

**Most Vitamins**

degrade due to exposure to light and heat, so make sure you keep your vitamin supplements in a cool, shady place.

**In Vitamin K**

the "K" stands for "koagulation," the German word for (blood) coagulation.

**If You Break A Bone**

or get a scrape, Vitamin C goes into action, helping you heal properly.

**"Vitamin F"**

is the original name for Omega-3 and Omega-6 Fatty Acids.

**Water-soluble Vitamins**

such as Vitamin C and the B vitamins, are excreted through urine and have to be replaced daily.

**Lack**

of Vitamin A can cause night blindness.

**Because**

of its bright yellow-orange colour Vitamin B2 (Riboflavin) is also used as a food coloring.

**Vitamin A**

plays an important role in gene transcription.

**Vitamin C**

helps produce collagen, which works like super-glue that keeps cells together.

**Once Absorbed**

Vitamin C has an astonishingly short 30 minute biological half life in your bloodstream.

**The Other Name**

of Vitamin B1 is Thiamin, which means "sulfur-containing vitamin".

**The B Vitamins**

help your body produce energy.

**Sunscreen**

reduces your skin's ability to produce Vitamin D by up to 95%, which may lead to Vitamin D deficiency.

**Vitamin K**

is found in highest amounts in green leafy vegetables because it is directly involved in photosynthesis.

**Your Body**

can produce all the 10,000 IU of Vitamin D it needs in just 20 minutes on a sunny day.



# KRISHNAA INSTITUTE OF SKILL DEVELOPMENT & ENTREPRENEURSHIP

(A Unit of VIEMS)

(Affiliated to National Council for Vocational Research Training, New Delhi)

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- Japanese Language
- French Language
- German Language
- Functional English
- Spoken Hindi

## COMPUTER COURSES

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- SPSS
- Tally with GST
- Computer hardware & Troubleshooting

## ART & DESIGN COURSES

- Photography & Editing
- Photoshop & CorelDRAW
- Fine Arts & Craft
- Aari Work & Hand Embroidery

## VOCATIONAL COURSES

- Beautician
- Food Processing & Preservation
- Fashion Designing
- Typewriting
- Tailoring & Dress making



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- Android App Development
- Data Science with Python
- Augmented Reality & Virtual Reality
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- Data Analytics
- Cyber Security & Ethical Hacking
- Internet of Things (IoT)
- Neural Networks
- Natural Language Processing (NLP)
- Machine Learning with R Programming
- Project Management Professional (PMP)
- Lean Six Sigma
- PMI Agile Certification
- Design Thinking
- Digital Marketing
- Robotics
- Embedded System
- Animation & Graphics



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