

Fat-soluble and water-soluble vitamins

This table shows the differences in properties for fat-soluble and water-soluble vitamins.

Properties	
Fat-soluble vitamins	Water-soluble vitamins
Soluble in fat.	Soluble in water.
Require bile and lipids for absorption.	Easily absorbed by the intestine.
Can become toxic in excess amounts (likely to result from supplements and not diet) as these are not readily excreted and are stored for later use.	Excess amounts are readily excreted in the urine so toxicity resulting from overdosing is rare.
Stored in the liver and fatty tissues until the body needs them so it does not need to be supplied by the diet frequently.	Not stored in a considerable quantity (except vitamin B12), so needs to be supplied by the diet frequently.
Slow onset of deficiency symptoms e.g. months to more than a year.	Fast onset of deficiency symptoms e.g. weeks to months.

Below is a list of fat-soluble and water-soluble vitamins including the food sources they are found in.

Vitamin	Fat-soluble / Water-soluble	Food sources
Vitamin A (Retinol)	Fat-soluble	Liver, fish liver oils, eggs, milk, butter, cheese Leafy green vegetables, orange and yellow vegetables, tomatoes, fruits (these contain beta-carotene, a precursor of vitamin A)
Vitamin B1 (Thiamin)	Water-soluble	Liver, pork, wholegrains, legumes, nuts, sunflower seeds, fruits, vegetables
Vitamin B2 (Riboflavin)	Water-soluble	Liver, kidney, eggs, milk, rice, legumes, wholegrains, green vegetables
Vitamin B3 (Niacin)	Water-soluble	Fish, poultry, meat, milk, wholegrains
Vitamin B5 (Pantothenic acid)	Water-soluble	Liver, kidney, eggs, wholegrains, fortified

		breakfast cereals
Vitamin B6 (Pyridoxine)	Water-soluble	Meat, fish, wholegrains, vegetables
Vitamin B9 (Folic Acid)	Water-soluble	Liver, legumes, leafy green vegetables, wholegrains, yeast extract
Vitamin B12 (Cobalamin)	Water-soluble	Meat, poultry, liver, kidney, fish, eggs, dairy products
Vitamin C (Ascorbic Acid)	Water-soluble	Citrus fruits, bell peppers, strawberries, broccoli
Vitamin D (Calciferol)	Fat-soluble	Oily fish, fish liver oils, egg yolk, dairy products
Vitamin E (Alpha-Tocopherol)	Fat-soluble	Nuts, seeds, vegetable oils, wheat germ
Vitamin H (Biotin)	Water-soluble	Egg yolk, liver, kidney, milk, yeast
Vitamin K (Occurs naturally in two forms - Vitamin K1: Phytomenadione; Vitamin K2: Menaquinones)	Fat-soluble	Leafy green vegetables, rapeseed and soya bean oil, natto, wholegrain cereals