



## VITAMINS in FOOD and FEED

### I. INTRODUCTION

**Vitamins** are nutrients required in very small amounts for essential metabolic reactions in the body. Until the 1900s, vitamins were obtained solely through food intake. Many food sources contain different ratios of vitamins. Therefore, if the only source of vitamins is food, a seasonal, yearly or even daily change in diet also alters the ratio of ingested vitamins. Many vitamins can be stored by the body over a range of dosages and short term deficiencies (e.g. during a particular food growing season), do not always result in disease.

Vitamins have been produced as commodity chemicals and made widely available as inexpensive pills for several decades allowing for consistent **supplementation to dietary intake**.

Recently also the Food/Feed business is providing numerous **products supplemented or enriched** with a whole variety of water- and fat soluble vitamins.

This **Functional food** or medicinal food is any fresh or processed food claimed to have a health-promoting and/or disease-preventing property beyond the basic nutritional function of supplying nutrients, although there is no consensus on an exact definition of the term. The general category includes processed food made from functional food ingredients, or fortified with health-promoting additives, like "vitamin-enriched" products, and also, fresh foods (e.g. vegetables) that have specific claims attached.

In table I a summary is given of the different water- and fat soluble vitamins.

Table I: summary of the different water- and fat soluble vitamins

Vitamin	Chemical name	solubility
A	Retinoids	fat
B1	Thiamine	water
B2	Riboflavin	water
B3	Niacin	water
B5	Pantothenic acid	water
B6	Pyridoxin	water
B7	Biotin	water
B9	Folic acid	water
B12	cyanocobalamin	water
C	Ascorbic acid	water
D2-D4	Lumisterol, ergocalciferol, cholecalciferol, dihydrotachysterol, 7-dehydrocholesterol	fat
E	Tocopherol, tocotrienol	fat
K	naphthoquinone	fat

<http://en.wikipedia.org/wiki/Vitamin>

[http://en.wikipedia.org/wiki/Functional\\_food](http://en.wikipedia.org/wiki/Functional_food)

### II. ANALYSIS

Our lab has accredited methods (ISO 17025) for the individual analysis of vitamin B1, B2, C, A.

Because we want to provide a more cost-effective way to perform vitamin-analysis our lab has developed a **multi-residu method for the following B-vitamins; B1, B2, B3, B5, B6**.

It is our final goal to provide 2 multiresidu methods, one for the watersoluble vitamins and one for the fat-soluble vitamins for food/feed. This research is still in development.

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