

Bioavailability of **Lallemand** Vitamin Rich Nutritional Yeast

*Inactive nutritional yeast is a suitable vehicle for B vitamins food fortification**

B vitamins, thiamine (B1), pyridoxine (B6) and folate (B9), in particular, are attracting considerable interest. Soluble in water, these B vitamins are structurally dissimilar yet equally essential for normal cellular functions, growth and development -



- ▷ **Thiamine** contributes to normal energy-yielding metabolism, functioning of the nervous system, psychological function and function of the heart.
- ▷ **Pyridoxine** contributes to normal cysteine synthesis, energy-yielding metabolism, functioning of the nervous system and homocysteine metabolism.
- ▷ **Folate** has a well established role in the prevention of neurotubular birth defect (spina bifida) through its contribution to maternal tissue growth during pregnancy. It also contributes to normal amino acid synthesis, blood formation, homocysteine metabolism, function of the immune system and psychological function.

Vitamin Rich Nutritional Yeast: The Optimal Source of B Vitamins

Yeast *Saccharomyces cerevisiae* is a renowned natural and rich source of B vitamins. Lallemand vitamin rich nutritional yeast products, including the **Engevita®** branded products, are inactive yeast used for their high concentrations of riboflavin, thiamine, niacin, biotin, folate, cobalamine, pyridoxine and pantothenic acid.



They can also be used for their additional nutritional and functional benefits. They contain high quality proteins with all essential amino acids and significant quantities of dietary fiber. They contribute a light umami flavor to the foods they are added to, while increasing the perceived salt flavor.

Bioavailability

Bioavailability can be defined as the proportion of the ingested nutrient that is utilized for physiological functions and storage including metabolic processes such as digestion, absorption, organ uptake and release, enzymatic transformation, secretion and excretion.

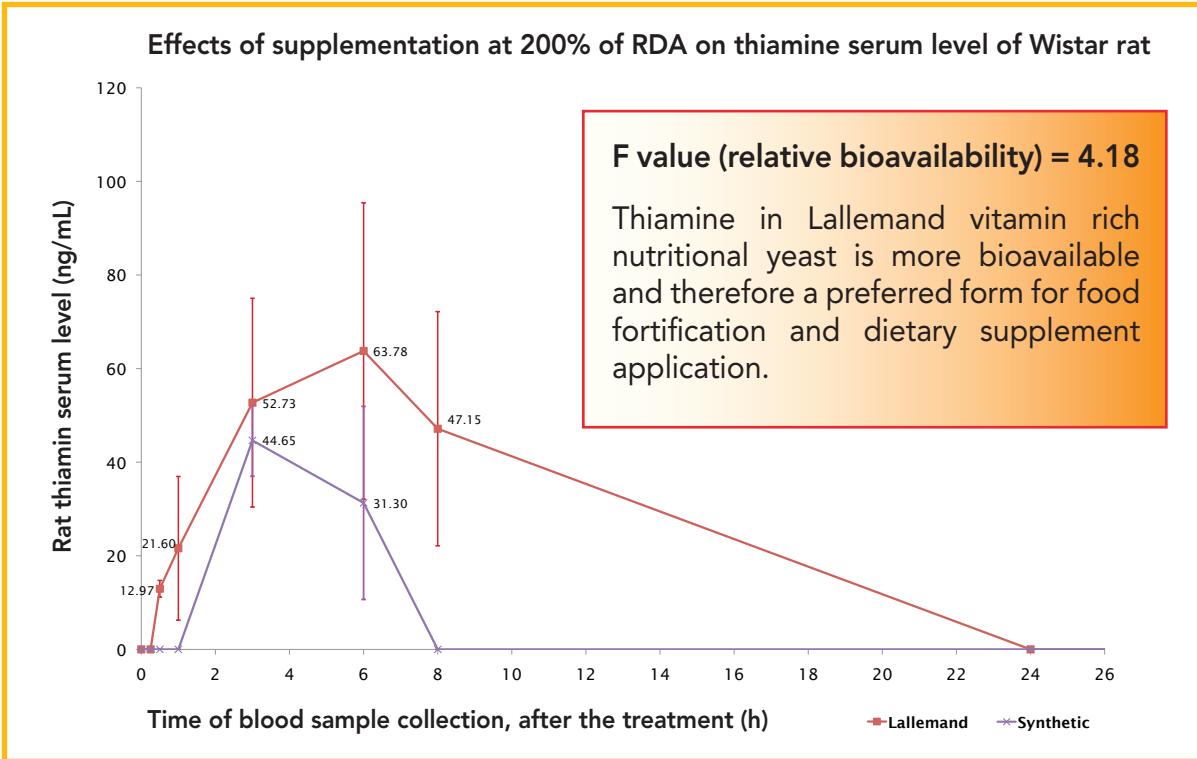
Although B vitamins are widely distributed in food, their content in most foods is relatively low. The availability or bioavailability of B vitamins is therefore an important factor to be considered when determining the source to use in food fortification.

*Vitamin or mineral rich yeast should be used in food fortification and dietary supplement applications in accordance with local regulatory authorities.

Vitamin Rich Nutritional Yeast: A Source of Highly Bioavailable B Vitamins

Bioavailability studies comparing yeast's B vitamins to a synthetic form are scarce. **Lallemand Bio-Ingredients** conducted a study* to compare the bioavailability of thiamine following acute oral administration of vitamin rich nutritional yeast and a synthetic blend containing this vitamin in Wistar rats.

Compared to the synthetic vitamin blend, Lallemand vitamin rich nutritional yeast was shown to be more efficient at raising the thiamine metabolites levels in serum of thiamine-deficient, growing Wistar rats.



* Bioavailability Study of Lallemand Vitamin Rich Nutritional Yeast in Wistar Rats. METABRAIN RESEARCH - Biology Department 4 avenue du Président F. Mitterrand | F 91380 Chilly Mazarin.



Engevitya® Key products

Vitamins	Bland / Toasted	Fortified B	Gold	Vegevita	Vege Regime	Complex B	GSH	D	D Plus	RDA*			Units
										Europe	USA	Canada	
Thiamin (B1)	2 †	30	2	45	3.6	133	2	2	2	1.4	1.5	1.3	mg/100g
Riboflavin (B2)	6	23	73.4	18	42	32	6	6	6	1.6	1.7	1.6	
Niacin (B3)	37	180	37	341	238	442	37	37	37	18	20	23	
Pantothenic acid (B5)	10	225	10	140	117	60	10	10	10	6	10	7.0	
Pyridoxine (B6)	1.4	1.8	1.4	34	22.7	1.6	1.4	1.4	1.4	2.0	2.0	1.8	
Biotin (B7)	30	250	30	196	30	480	30	30	30	150	300	30	µg/100g
Folic acid (B9)	1425	4000	1425	4400	3663	1500	1425	1425	1425	200	400	220	
Cobalamine (B12)	-	-	-	44	105.4	-	-	-	-	1.0	6.0	2.0	
Vitamin D	-	-	-	-	-	-	-	11000	2x10 ⁶	200	400	200	IU/100 g

* Recommended Daily Amounts or Allowances for nutritional labelling of food products.

† The vitamin concentrations in these Engevitya® products are provided for reference only, not guarantees.