

BAKING UPDATE

Vitamin D: The Revolution



Practical technology from Lallemand Inc., parent of American Yeast, producers and distributors of Eagle® yeast, fresh and instant.

Vitamin D Requirements Tripled in the 2010 DGA

ON January 31 2011, the USDA and the Department of Health and Human Services released the new 2010 Dietary Guidelines for Americans (DGA).

The evidence-based nutritional guide includes 23 key recommendations, one of them specifying to “Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D”. These nutrients are a concern in American diets because consumption of vegetables, fruits, whole grains, milk and milk products, and seafood is lower than recommended.

Following the release of the updated nutrient reference values by the Institute of Medicine on Nov. 30th 2010, the Recommended Daily Allowances for vitamin D for Americans, which assumes minimal sun exposure, were increased from 200 to 600 IU (15 mcg) per day for children and most adults, and from 400 to 800 IU (20 mcg) for adults older than 70 years.

THE OPPORTUNITY - BREAD A DAILY SOURCE OF VITAMIN D

A fundamental premise of the Dietary Guidelines is that nutrients should come primarily from foods. Since there are few natural sources of vitamin D (fatty fish and egg yolks) and they are not consumed on a daily basis, fortification is used as a food-based means for increasing vitamin D intake. In the United States, most dietary vitamin D is obtained from fortified foods, especially fluid milk and some yogurts. Other foods and beverages, such as breakfast cereals, margarine, orange juice, and soy beverages, are commonly fortified with this nutrient.

With these new recommendations, it is now three times more difficult to meet the vitamin D requirements with food alone. This presents a great opportunity for bakers that use Lallemand yeasts (Eagle®, Lallemand®, Instaferm®, Vita D®) which are vegetarian sources of vitamin D to make their bread and baked goods become an additional daily source of vitamin D. ●

The Vitamin D Revolution

WHEN reading the August 2010 edition of the journal *Molecular Nutrition and Food Research*, it is obvious that we are currently in the midst of the vitamin D revolution.

Emerging scientific research has linked low serum 25-hydroxyvitamin D levels to increased risk of many types of chronic diseases including many types of cancer, cardiovascular disease, diabetes, autoimmune diseases, as well as several types of bacterial and viral infections.

Despite the large body of scientific literature and widespread media coverage during the past decade, few of the world's health agencies and disease organizations have embraced the vitamin D revolution. Both Canadian and American governments have recently raised their Recommended Daily Allowance following the 2010 recommendations from the Institute of Medicine, but many experts believe the increase was too conservative. Reasons given generally include distrust of ecological and observational studies, concerns about high doses of the supplements, and lack of randomized clinical trials to demonstrate efficacy and lack of adverse effects.

THE BURDEN RELATED TO VITAMIN D DEFICIENCY

A daily intake of 3000–4000 IU (75–100 mcg) of vitamin D would be an inexpensive way to reduce the economic burden of disease by about 10% in Western developed countries.

According to a study estimating the economic burden and premature death rate in Canada, increasing vitamin D levels from 25 to 75 nmol/L can result in a 60% improvement in insulin sensitivity in people suffering from type 2 diabetes mellitus. From this study, it is estimated that increasing serum 25-hydroxyvitamin D from about 75 to 105 nmol/L, all-cancer incidence rates would decrease by 15–35%. Increasing serum 25-hydroxyvitamin D concentration from 62.5 to 105nmol/L reduces risk of cardiovascular

disease by 25% (15–35%). The risk of fracture could be reduced by 5–15% by increasing serum 25-hydroxyvitamin D from about 50 to 100 nmol/L. Since bacterial pneumonia is often a consequence of influenza infection in older people and all people in the case of H1N1 influenza, higher serum 25-hydroxyvitamin D levels could reduce the risk of influenza and pneumonia by 20–40%. Septicemia is bacterial infection of the blood and is generally associated with infections contracted in hospitals, especially after operations. It was estimated that if all people undergoing operations in hospital with serum levels below 100 nmol/L were given vitamin D supplement, there would be a 15–35% reduction in the risk of septicemia. Moreover, the costs of pregnancy could be reduced by 10% (5–15%) with higher serum 25-hydroxyvitamin D levels.

This overall systematic review (meta-analyses) of the observational studies indicate that by increasing serum 25-hydroxyvitamin D levels from 50–60 to 100–110nmol/L, mortality rates for cancer, cardiovascular disease and infectious diseases decrease by about 25%, leading to an all-cause mortality rate reduction of 15–20%.

VITAMIN D FORTIFIED BREAD FOR NURSING HOME RESIDENTS

It is recognized that as we age, there is a lessened ability to make vitamin D₃ in skin due to lack of the precursor 7-dehydrocholesterol. Combined with a limited sun exposure, this explains why elderly persons and nursing home residents in particular, are commonly deficient in vitamin D and have osteomalacia (softening of the bones due to defective bone mineralization).

A group of experts concluded that, to prevent fractures, the serum 25-hydroxyvitamin D concentration should be monitored to make sure it exceeds 75 nmol/L. According to Mocanu and colleagues (2009), this objective can be achieved by giving a daily ration of bread

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giving a daily ration of bread fortified with 5000 IU (120 mcg) vitamin D3 and 320 mg calcium. Their study showed that this level of bread fortification did not have evident adverse effects on the 45 sun-deprived nursing home residents and improved their bone density measures.

Two other studies sponsored by Lallemand also confirm that bakers can respond to the growing consumer awareness of vitamin D's benefits, and allow bread to naturally become the primary dietary source of vitamin D (perhaps ahead of milk) and strengthen bread's healthy attributes. The 4 weeks trial study led by Professor Christel Lamberg-Allardt

from University of Helsinki showed that bread baked with Lallemand VitaD bakers yeast (yeast with high vitamin D2 content) had an equal effect on vitamin D serum level as vitamin D2 supplement. The other study led by Connie M. Weaver, distinguished Professor, Head of the Department of Foods and Nutrition at Purdue University, and a newly appointed member of the Institute of Medicine of the National Academies, showed that bread made with Lallemand VitaD yeast can help maintain vitamin D status, and can improve trabecular and cortical bone health as well as a vitamin D3 supplement. ●

Father of the Theory Linking Vitamin D Deficiency to Cancer Dies

FRANK C. Garland, an epidemiologist whose work helped establish a link between vitamin D deficiency and some cancers, including colon and breast cancer, died on Aug. 17 2010 in San Diego.

In 1980, Dr. Garland and his brother, Cedric F. Garland, also an epidemiologist, published an influential paper, "Do Sunlight and Vitamin D Reduce the Likelihood of Colon Cancer?" The article, which appeared in the International Journal of Epidemiology, hypothesized that vitamin D combined with calcium could help reduce the risk of colon cancer. Their research, first reported in 1980, led them to propose a correlation between geographic areas with low sunlight levels and colon cancer deaths.

In other works, the Garland brothers and colleagues reported a connection between vitamin D deficiency and breast cancer, noting that American cities like New York, Boston, Cleveland and Chicago located in the northern hemisphere showed higher mortality rates for the disease than ones like Honolulu, Miami and Tampa in the southern hemisphere.

Later, the Garlands and their colleagues also demonstrated links between vitamin D deficiency and kidney, bladder, ovarian and endometrial cancers, as well as Type 1 diabetes. ●

ON THE CANADIAN SIDE OF THE BORDER

Vitamin D Yeast in Bread and Baked Foods Allowed in Canada

THE amendment to the Food and Drug Regulations to provide for the use of vitamin D in yeast-leavened baked foods at a maximum level of use at 2.25 mcg (90 IU) vitamin D per 100g food as consumed proposed by Lallemand Inc. recently received a favourable response from Health Canada's Food Directorate of Health Products and Food Branch.

On February 19th 2011, an Interim Marketing Authorization (IMA) was published in the *Canada Gazette, Part 1*, which officially confirms the permission to use Lallemand vitamin D2- yeast to increase the vitamin D content of yeast-leavened baked foods.

Dietary Reference Intake for Vitamin D for Canadians Tripled

Following the release of the U.S. Institute of Medicine recommendations on Nov. 30th 2010, the Dietary Reference Intake for vitamin D for Canadians was increased from 200 to 600 IU (15 mcg) per day for children and most adults and from 400 to 800 IU (20 mcg) for adults older than 70 years, assuming minimal sun exposure.

Considering these new recommendations for vitamin D, the IMA will provide bakers of Canada the opportunity to claim their products as daily "source of" vitamin D. In order to make that claim, the baked good is required to contain a minimum of 5% of the Recommended Daily Intake of vitamin D per serving of stated size. Also, the % Daily Value of the added vitamin D would have to be declared in the Nutrition Facts table. ●

Seminar on Innovations in Baking

THE seventh annual Innovations in Baking Seminar organized by Lallemand Baking Solutions will be held on March 5 at the Kendall College School of Culinary Arts in Chicago. Preceding the start of the

American Society of Baking 2011 BakingTech meeting, the seminar provides an update on product, market, and ingredient trends for North American bakeries. ●

Lallemand Vita D Yeast

HELPING to satisfy consumers' quest for more natural and vitamin D rich ingredients, during the regular production process Lallemand's yeast is exposed to a source of light that naturally transforms the sterols present in yeast into vitamin D. In this way, all Lallemand North American bakers yeasts (Eagle®, Lallemand®, Instaferm®) are natural and vegetarian sources of vitamin D that can enhance the vitamin D content of baked goods, and of bread in particular:

Lallemand yeast cream (liquid) naturally contains 680 IU Vitamin D/100g of bakers yeast, based on 18% solids.

Lallemand yeast packaged in bags (crumbled) or blocks (compressed) naturally contains 1135 IU Vitamin D/100g of bakers yeast, based on 30% solids.

Instaferm® naturally contains 3590 IU Vitamin D/100g of instant dried yeast, based on 95% solids.

Instaferm® Vita D® Plus naturally contains 2,000,000 ±15% IU vitamin D/ 100 g of instant dried yeast, based on 95% solids

For more information, please visit our website: vitamind.lallemand.com

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Lallemand Baking Update is produced by Lallemand Inc. to provide bakers with a source of practical technology for solving problems. If you would like to be on our mailing list to receive future copies, or if you have questions or comments, please contact us at:

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