




Vita D
A new source
of vitamin D

Especially during the dark days of winter, most of us are not getting adequate amounts of the sunshine vitamin.

To help increase the intake of the necessary vitamin D, we are using Lallemand bakers yeast, which is now a source of vitamin D, as part of its natural sterols have been converted to the sunshine vitamin through exposure to light.

*Bread is now a delicious,
nutritious daily source
of vitamin D.*

∞ *How much vitamin D is recommended?*

The Dietary Reference Intakes (DRIs) for healthy populations established by American and Canadian scientists overseen by the Institute of Medicine (IOM) are currently the following.*

Age 0-50	200 IU/day	(5 μ g)
Age 51-70	400 IU/day	(10 μ g)
Age 70 +	600 IU/day	(15 μ g)



∞ *Can I get enough in my healthy diet?*

Grain-based foods, especially whole grain, are an important part of a healthy, balanced diet.

If bread contains the highest allowed level of 90 IU/100 grams per serving, eating the 6-7 servings a day recommended by the U.S. and Canadian governments would provide enough vitamin D to meet the majority of the recommended daily allowance.**

Bread is the tasty way to get "sunshine in every slice."

*Vitamin D is listed in both international units (IUs) and micrograms (μ g). www.lallemmand.com

**See MyPyramid.gov, Canada's Food Guide (hc-sc.gc.ca) and gowiththegrain.org for more exciting information on the health benefits and nutrients from grain.

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



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Adequate levels of vitamin D may play a role in some forms of hypertension by reducing the risk of high blood pressure.



Vitamin D & Health

Overview

Vitamin D is a hormone precursor essential to maintaining normal levels of calcium and phosphorus in the blood. The body can produce vitamin D3 (cholecalciferol) from skin exposure to the UV rays from sunlight. Inadequate exposure to sunlight, either because of our lifestyle or a conscious avoidance, means availability through our diet is becoming increasingly important. Milk is the traditional source of Vitamin D fortification. However, lower per capita consumption of milk in recent years has resulted in insufficient levels of Vitamin D.

Vitamin D2 (ergocalciferol) is derived from yeast, while D3 is commonly derived from lanolin (sheep) or fish.

While the body can naturally produce vitamin D3, it also can be derived from lanolin (sheep) or fish. Another form of the vitamin, D2 (ergocalciferol), is derived from yeast.

How Vitamin D Works

Vitamin D is biologically inactive and must be metabolized into its active form by the body. Once it enters the blood, the vitamin is transported to the liver where it is hydroxylated into the active form 25-hydroxylated vitamin D. Once the vitamin is in this highly active form it is able to interact with more than 50 genes, also referred to as Vitamin D Receptors (VDR) in the body that are regulated by vitamin D. Early research identi-

fied vitamin D as an important regulator of serum calcium and phosphorus but more recent work is shedding light on many other health benefits associated with adequate levels of Vitamin D. These include:

- **Cell differentiation** – cells dividing rapidly are proliferating. Differentiation reduces proliferation and is critical to confer specific functions for different cells. Proliferation is necessary for growth and wound healing but if uncontrolled can lead to mutations and cancer. The active form of vitamin D inhibits proliferation and stimulates cell differentiation.
- **Immunity** – vitamin D is a potent immune system modulator and may inhibit autoimmunity.
- **Insulin Secretion** – the VDR is expressed by insulin secreting cells of the pancreas. Animal studies suggest that active Vitamin D plays a role in insulin secretion during conditions of high insulin demand. Limited data in humans suggests that vitamin D may have an effect on insulin secretion and glucose tolerance in type 2 diabetes.
- **Blood Pressure** – adequate levels of vitamin D may play a role in some forms of hypertension by reducing the risk of high blood pressure.

Vitamin D Deficiency

Vitamin D deficiency is known to cause several bone diseases due to insufficient cal-

Intake Chart

The Food and Nutrition Board of the Institute of Medicine created the ADEQUATE INTAKE LEVELS (AI) chart that assumes no vitamin D is being synthesized by the skin. These AI values, established in 1997, reflect vitamin D intakes that are likely to maintain serum levels of at least 37.5 nmol/liter, which many experts now feel is too low.

Adequate Intake (AI) for Vitamin D

LIFE STAGE	AGE	MALES (IU PER DAY)	FEMALES (IU PER DAY)
Infants	0 to 6 months	200	200
Infants	7 to 12 months	200	200
Children	1 to 3 years	200	200
Children	4 to 8 years	200	200
Children	9 to 13 years	200	200
Adolescents	14 to 18 years	200	200
Adults	19 to 50 years	200	200
Adults	51 to 70 years	400	400
Adults	71 years +	600	600
Pregnancy	All ages		200
Breastfeeding	All ages		200

Food Sources

Very few foods are a natural source of vitamin D. Foods containing vitamin D include some fatty fish (mackerel, salmon, and sardines), fish oils and eggs that were laid by hens fed vitamin D. Milk and infant formula are fortified with vitamin D. Other dairy products however are not always fortified. Some cereals and breads are fortified as is some branded orange juice. Accurate estimates of daily U.S. intake of vitamin D are very difficult because of the variability of vitamin D fortification.

While existing standards are shown here,

Food Sources Containing Vitamin D			
FOOD	SERVING SIZE	VITAMIN D (IU)	% OF DAILY VALUE
Fish Liver Oils	1 Tbs .	1360	340
Salmon (cooked)	3.5 oz	360	90
Mackerel (cooked)	3.5 oz	345	90
Sardines (canned in oil)	1.5 oz	250	70
Tuna (canned in oil)	3 oz	200	50
Eel (cooked)	3.5 oz	200	50
Whole Eggs	1	20	6

many researchers and medical experts believe that these values are too low considering current lifestyle and an ageing population.

cium or phosphorous. Severe conditions include:

- Rickets – a childhood disease resulting in the failure of bones to mineralize.
- Osteoporosis – a disease characterized by fragile bones.
- Osteomalacia – a bone thinning disease where the bone matrix is maintained but

bone mineral is lost resulting in bone pain and soft bones.

Vitamin D deficiencies may also be linked to other diseases such as cancer, chronic pain, chronic fatigue, autoimmune disorders (MS, type I diabetes, hypertension, seasonal affective disorder), heart disease, rheumatoid arthritis, psoriasis and inflammatory bowel disease.

Who is at Risk?

- Persons not consuming adequate quantities of vitamin D fortified milk.
- Older people (age 50 and over) have a greater risk of developing vitamin D deficiency. The ability of the skin is decreased and its ability to convert calcidiol to its active form is reduced.
- Newborns who are exclusively breastfed may require vitamin D supplementation.
- Dark skinned people living at high elevation may require vitamin D supplementation because their skin pigmentation generally retards the absorption of UV rays.
- Aging is of growing concern because the elderly cannot synthesize vitamin D as well as younger people. They also tend to avoid sunlight. This is even more pronounced in the elderly who are institutionalized.
- People who use clothing to block UV rays or sun block with an SPF factor of 8 are at greater risk to experience vitamin deficiency.
- People suffering from inflammatory bowel disease like Crohn's disease are at risk, especially those having undergone bowel resection.
- Obese people are at greater risk because the vitamin absorbed by the skin becomes deposited in body fat stores where it is less bioavailable.

Active Bakers' Yeast with High Levels of Vitamin D

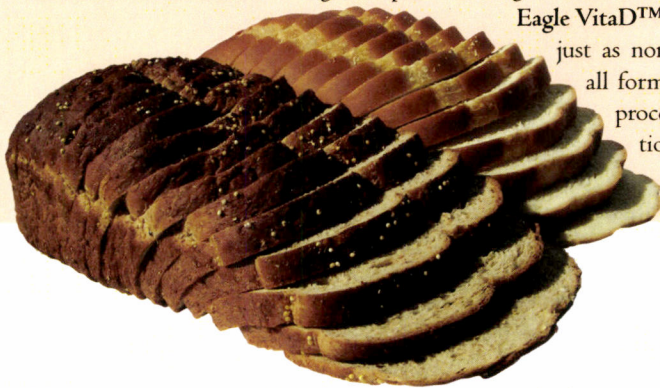
Recently, a patent pending process developed by Lallemand/American Yeast has created a unique yeast demonstrating all of the normal properties of commercial bakers' yeast, *Saccharomyces cerevisiae*, and the extra benefit of allowing the baker to achieve maximum vitamin D levels without the high cost and additional handling constraints of using a vitamin D supplement. Eagle VitaD™ is used in the baking process at normal dosage levels and contributes the vitamin in the D2 form allowing for rapid

activation in the body. Eagle VitaD™ yeast can produce bread with 10 to 100% of the RDI per 50 gram serving.

In addition to ease of use, Eagle VitaD™ can be added to bread and rolls targeting the vegetarian market, especially the Vegan fraction.

Tests conducted at our Technical Baking Center have consistently produced bread with high levels of vitamin D2 that remain stable in the baked product throughout the shelf life of the bread.

Eagle VitaD™ bakers yeast is used just as normal bakers yeast in all formulations and bakery processes and applications.



LALLEMAND

BAKING INNOVATIONS

Lallemand Baking Innovations is produced by Lallemand Inc. to provide bakers with a source of practical technology for solving problems.

To the best of our knowledge, the information in Lallemand Baking Update is true and accurate. However, any recommendations or suggestions are made without warranty or guarantee.



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VITAMIN D FACT SHEET



WHAT IS VITAMIN D?

Vitamins are nutrients that the body needs to function properly. Vitamin D, which strengthens bones, muscles and teeth, is a fat-soluble vitamin that can be stored in the body until needed. It exists in two forms D_2 and D_3 , which are equally effective.¹ D_2 occurs naturally in yeast, whereas D_3 is produced by lanolin and is synthesized in the skin upon exposure to UV rays. In other words, vitamin D can be obtained naturally in the human body through exposure to sunlight or through the ingestion of specific food sources.

WHY DO WE NEED VITAMIN D?

Scientists recognize that vitamin D does much more than build strong bones. Growing evidence suggests that vitamin D also helps boost our immune system, reduce inflammation, and maintain muscle strength. Furthermore some studies suggest that vitamin D may help in the prevention of several chronic diseases such as cancer (especially breast and colorectal cancer), diabetes, multiple sclerosis, hypertension, arthritis, heart diseases and even infectious diseases such as influenza.

VITAMIN D DEFICIENCY

Most vitamins can be obtained from a balanced diet, yet vitamin D, unlike other vitamins, can also be obtained from exposure to the sun. Several factors will however limit the amount of vitamin D that the body absorbs, such as the use of sun block with a SPF factor higher than 8, age, people with darker skin pigmentation, the distance from the equator, the time of day, the season, a person's weight etc. Due to the growing concern about the sunlight as well as the limited consumption of vitamin D rich food sources, vitamin D deficiency has been increasing in countries around the world. According to Scientists at the University of Tennessee Health Science Center in Memphis as much as 87.3% of the general population in the US may have inadequate levels of vitamin D. The Albert Einstein College of Medicine of Yeshiva University estimated that 7 out of 10 U.S. children have low levels of vitamin D.

DIETARY SOURCES OF VITAMIN D

Vitamin D is contained in a limited number of foods, either naturally or added. Natural food sources of vitamin D include fish oils, fatty fish (mackerel, salmon, sardines, tuna and herring) and egg yolks.

Dietary Source of Vitamin D	Quantity	IUs per Quantity	% DV (400 IU)
Cod liver oil	1 tablespoon	1,360	340
Salmon, cooked	3.5 ounces	360	90
Mackerel, cooked	3.5 ounces	345	86
Sardines, canned in oil, drained	1.75 ounces	250	70
Tuna fish, canned in oil	3 ounces	200	50
Milk, nonfat, reduced fat, and whole, vitamin D-fortified	1 cup (250 ml)	98	25
Margarine, fortified	1 tablespoon	60	15
Ready-to-eat cereal, fortified with 10% of the DV for vitamin D	0.75-1 cup	40	10
Bread made with 1% dry, 3% compressed or 5% cream yeast	100 g	25	6.25
Egg yolk	1 whole	20	5
Liver, beef, cooked	3.5 ounces	15	3.75
Swiss Cheese	1 ounce	12	3

Data derived from National Institutes of Health.

Bread and baked goods made with Lallemand baker's yeast is now also a natural and vegetarian source of vitamin D. Depending on the level of yeast usage in the recipe they can even become 'good' or 'excellent' sources. Adding Lallemand's 'VitaD Plus' baker's yeast, containing an especially high natural concentration of vitamin D, all breads and baked goods can become "good" and even "excellent" source of vitamin D.

FDA allows a claim, which deals with calcium, vitamin D and the reduction of risk of osteoporosis. For example a claim could be formulated in the following way: "Adequate calcium and vitamin D throughout life, as part of a well-balanced diet, may reduce the risk of osteoporosis". "Bread" is an excellent source of calcium and vitamin D". Foods providing 20% or more of the daily value (DV) can be considered as excellent sources of the nutrient and the maximum level in yeast-raised baked goods allowed by FDA is currently 90 IU/ Day.

RECOMMENDED DAILY INTAKE OF VITAMIN D

The vitamin D recommendations have increased over the years, yet both US and Canadian governments (US National Institutes of Health and Health Canada) are reviewing the current recommended dietary intakes of vitamin D, and are likely to increase them in spring 2010 due to the evolving research on the increasing benefits of vitamin D.

Age	1975-1983 IU/ Day	1990 IU/ Day	IOM 1997+ IU/ Day	IU/ Day
0-50 years	100	200	200	400*
51-70 years	100	200	400	400
>71 years	100	200	600	600

Data derived from Committee for the Revision of Dietary Standards in Canada, Scientific Review Committee and Institute of Medicine.

*recommended by the American Academy of Pediatrics (Oct. 2008)

+the current dietary recommendations for vitamin D, as set in 1997 by the Food and Nutrition Board of the Institute of Medicine (IOM)

Furthermore, the USDA Dietary Guidelines for Americans recommend to people exposed to insufficient ultraviolet light for the production of vitamin D substantially higher daily intakes of vitamin D, i.e. 1,000 IU of vitamin D per day.

CAN I HAVE TOO MUCH VITAMIN D?

Too much exposure to sunlight does not lead to higher vitamin D levels in the body. However, some studies suggest that the consistent ingestion of quantities greater than 80,000 IU per day may have a harmful effect on the body. The current upper safe limits set by IOM (Institute of Medicine) for vitamin D consumption for infants is 1,000 IU per day and 2000 IU per day for children and adults, yet this number is likely to increase as further research develops. Current estimate is that the upper limit could be increased to 10,000 IU/ day.

ⁱ Holick MF et al. Vitamin D2 is as effective as vitamin D3 in maintaining circulating concentrations of 25-hydroxyvitamin D, Dec. 2007.



Eagle® Baking Powder

Double Acting Baking Powder- 7906-46/59

DESCRIPTION

Eagle® Baking Powder is a specially formulated double acting chemical leavener designed to provide maximum bench tolerance and controlled leavening action

Eagle® Baking Powder provides leavening in the batter during mixing and continues to provide gas during baking to produce optimum quality for chemical leavened bakery products.

INGREDIENTS

Sodium Acid Pyrophosphate, Sodium Bicarbonate, Corn Starch, & Monocalcium Phosphate.

SUGGESTED APPLICATIONS

Eagle® Baking Powder can be used in all types of chemically leavened bakery products. I.e. cakes, cookies, pancakes, pizzas.

PACKAGING

50 lb. PE lined multi-wall bags or 10 lb pails, 4 units per case. All products is palletized and stretchwrapped.

STORAGE

Should be stored in a cool, dry area. Should not exceed 85°F. Minimum shelf life is 9 months can be easily obtained when kept under optimum conditions

USE LEVELS

Typical use levels for Baking Powder are un to 6% of flour weight depending on product 5% in cakes usually gives optimum conditions.

American Yeast Sales Corp
3A Street
Derry, NH 03038
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(603) 432-4006
FAX (603) 432-5283



GAS RELEASE

About 15% of the released gas are produced in mixing and on the bench. The remaining 85% of the gas released occur in the oven at 114 – 110 °F.

KOSHER STATUS

Manufactured under the direction of The Maguén-David community and certified Kosher

GENERAL APPEARANCE

White free-flowing, fine product

PRODUCT CODE

7906-46 4 x 10 lb. Pail
7906-59 50 lb. bags

PRODUCT SPECIFICATIONS

CO ₂ ↑ - % By weight	NLT 15.2 %
Color	White
Granulation thought US 100 mesh	NLT 96%
Moisture	NMT 5%

MICROLOGICAL STANDARDS

Total plate count	≤1000 c/g
Yeast & Molds	≤100
Coliforms	<10 max
Salmonella (25 g.)	NEGATIVE
E. coli	NEGATIVE

Rev.1- Rev. Date February '05 - Emission July 15th, '04

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Double Acting Baking Powder

Eagle® Baking Powders are specially formulated double acting chemical leaveners designed to provide maximum bench tolerance and controlled leavening action. They provide leavening in the batter during mixing and continue to provide gas during baking to produce optimum quality for chemically leavened bakery products.

They can be used in all types of chemically leavened bakery products: cakes, cookies, pizzas, tortillas, flat bread ... depending on the Double Acting Baking Powder formulation.

Pack sizes are 10 pounds, 5 kg and 50 pounds.

Single Acting Baking Powder

Eagle® Baking Powder is a specially formulated single acting chemical leavener designed for applications requiring slower gas release prior to actual baking. It provides more tolerance during periods of extended floor time.

It can be used in cakes, cookies, biscuits, crackers and other chemically leavened bakery products.

Customized Products

We design, develop and produce a leavening product meeting your needs according to your specifications and applications.

Lallemand / American Yeast Division
Memphis, TN : 800-432-1090 ; Montreal, QC : 800-687-6483 ; Toronto, ON : 800-387-3876

Revised 2004/08/09





*Lallemand Baker's Yeast
A natural source of vitamin D*

www.lallemand.com

LALLEMAND



☞ Making a big D-ifference

Lallemand now applies this new process* to its line of baker's yeasts (fresh cream, fresh compressed and instant dried yeasts) making them a natural and vegetarian source of vitamin D, this at no extra cost to you and without changing the ingredient statement on your label. We also offer a special instant dried yeast 'VitaD Plus', which, by exposing it to the light for an extended period, contains very high levels of vitamin D. With any Lallemand baker's yeast, bread products become dietary sources of vitamin D, depending on levels of yeast used. With 'VitaD Plus' yeast, your products can even become "excellent" sources of vitamin D. Using our yeasts will help improve your products' "healthy" appeal.



☞ Building together a brighter tomorrow

To support this effort we have developed a communication program targeting dieticians in each of our markets. Our aim is to inform them that all breads made with our yeasts are now dietary sources of vitamin D. We will be mentioning the names (with permission) of those bakers who are using our yeasts to help those dieticians use the information in a concrete way. In addition, as vitamin D has a wholesome association with the sun, we have created a 'sunshine logo' which we will use in our communications to the dieticians. You will be free to use this logo on your products as a way to link your communications efforts with ours and help the dieticians steer their audiences, including the popular press, to the right products.

As our founder Fred A. Lallemand once quoted nearly 100 years ago "Your success will be our success".



Growing consumer awareness of the evidence of widespread vitamin D deficiency will lead increasing number of buyers to search out products that contribute to alleviating this. The research community has come to a consensus that substantial numbers of people in the world have levels of vitamin D that are well below optimal concentrations for health.

Scientists recognize that vitamin D does much more than build strong bones. Growing evidence suggests that vitamin D also helps boost our immune system, reduce inflammation, maintain muscle strength and regulate blood sugars. Furthermore some studies suggest that vitamin D may protect against some cancers, multiple sclerosis, heart diseases and even infectious diseases such as influenza.

Read more about vitamin D on www.lallemand.com.

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