

## Liquid D and K Supports Optimal Bone Health

### DESCRIPTION

Liquid D and K, provided by Douglas Laboratories is a unique, great tasting liquid supplying significant amounts of vitamins K1 and K2 as well as vitamin D3 to support optimal bone health.

### FUNCTIONS

#### Vitamin K

A growing body of literature supports the concept that increased intake of vitamin K both from food as well as supplements can have a beneficial impact on bone health. While the term “vitamin K” may imply a single molecule, vitamin K is actually a group of similar molecular forms including K1 (phylloquinone) and K2 (menaquinone). Liquid D and K has been specially formulated to include the most important molecular forms of vitamin K for optimal health.

Vitamin K1 is the most abundant form of vitamin K in the diet and is most often found in green vegetables such as spinach, lettuce and broccoli. Often this source of vitamin K is difficult to obtain in sufficient amounts from the diet, as the molecule can be bound tightly to the chloroplast membrane in the plant. Vitamin K1 is well regarded for the important roles it plays in the body’s normal blood clotting mechanisms

Vitamin K2 is not commonly found in the diet; as only a few products including meats and certain fermented foods provide this relatively rare form of the vitamin. Vitamin K2 is actually comprised of a group of several different molecules, abbreviated as MK-n, where n represents a number. MK-4, found in some animal meats and liver, and MK-7, found in fermented cheeses and soy products (Natto) are two of the most studied forms of vitamin K2. Supplementation with this vitamin is important as most people do not receive enough vitamin K2 from diet alone.

Human studies show that vitamin K plays important roles in bone health. Vitamin K has been shown to decrease calcium excretion and is involved in gamma-carboxylation of osteocalcin. Osteocalcin is important for healthy bone formation, as it facilitates the binding of calcium to hydroxyapatite (bone matrix).

Additional studies also indicate that vitamin K2 may play important roles in supporting cardiovascular health and normal arterial elasticity.

While Vitamin K1 has shown to be useful in some studies, vitamin K2 is thought to have additional, beneficial effects, as the body has a natural preference to accumulate this vitamin in tissues such as bone. MK-7, a natural form of vitamin K2, in particular has shown to have rapid bioavailability in the body and the low dosages required (45 mcg) can be effective for supporting bone health.

#### Vitamin D3

Vitamin D is well known for the role it plays in helping to regulate calcium and bone metabolism. As we age, vitamin D status declines. If given the same amount of light, a younger person can produce more vitamin D compared with an older individual. When advancing age is combined with northern latitudes one can quickly become deficient in vitamin D. Vitamin D can increase the expression of osteocalcin and other important compounds from osteoblasts to help support bone formation or it can help to breakdown bone and mobilize calcium when it is needed elsewhere in the body. Numerous scientists now feel that supplementation with vitamin D at levels greater than previously thought necessary is critical to helping maintain healthy bone remodeling as we age.

### INDICATIONS

Liquid D and K may be a useful dietary supplement for those who wish to increase their daily intake of the nutritionally important vitamins D and K.

## Liquid D and K

### Supports Optimal Bone Health

#### FORMULA (#57302)

1 Dropper (1ml) Contains:

Vitamin D3 ..... 1,000 IU

Vitamin K-1 ..... 500 mcg

Vitamin K-2(as MK-4) ..... 1 mg

Vitamin K-2(as MK-7, from soy) ..... 45 mcg

Other Ingredients: Water, medium chain triglycerides, sunflower oil, cellulose, natural vanilla flavor, xanthan gum, potassium sorbate, and stevia.

#### SUGGESTED USE

Adults take 1 dropper (1 ml) daily or as directed by physician.

#### SIDE EFFECTS

No adverse side effects have been reported.

#### STORAGE

Store in a cool, dry place, away from direct light. Keep out of reach of children.

#### REFERENCES

Backstrom MC, Maki R, Kuusela AL, Sievanen H, Koivisto AM, Ikonen RS, Kouri T, Maki M. Randomised controlled trial of vitamin D supplementation on bone density and biochemical indices in preterm infants. Arch Dis Child Fetal Neonatal Ed. 1999 May;80(3):F161-6

Gillespie WJ, Henry DA, O'Connell DL, Robertson J. Vitamin D and vitamin D analogues for preventing fractures associated with involutional and post-menopausal osteoporosis. Cochrane Database Syst Rev. 2000;(2):CD000227

Knapen MH, Schurgers LJ, Vermeer C.

Vitamin K(2) supplementation improves hip bone geometry and bone strength indices in postmenopausal women. Osteoporos Int. 2007 Feb 8;

Swaminathan R. Nutritional factors in osteoporosis. Int J Clin Pract. 1999 Oct-Nov;53(7):540-8. 22.

Tsugawa N, Shiraki M, Suhara Y, Kamao M, Tanaka K, Okano T. Vitamin K status of healthy Japanese women: age-related vitamin K requirement for gamma-carboxylation of osteocalcin. Am J Clin Nutr. 2006 Feb;83(2):380-6

Johnson K, Kligman EW. Preventive nutrition: an 'optimal' diet for older adults. Geriatrics 1992;47:56-60.

Oldham KM, Bowen PE. Oxidative stress in critical care: is antioxidant supplementation beneficial? J Am Diet Assoc 1998;98:1001-8.

Seekamp A, Hultquist DE, Till GO. Protection by vitamin B2 against oxidant-mediated acute lung injury. Inflammation 1999;23:449-60.

#### For more information visit [douglaslabs.com](http://douglaslabs.com)

† These statements have not been evaluated by the Food and Drug Administration.  
This product is not intended to diagnose, treat, cure, or prevent any disease.

Manufactured by  
Douglas Laboratories  
600 Boyce Road  
Pittsburgh, PA 15205  
800-245-4440  
[douglaslabs.com](http://douglaslabs.com)



You trust Douglas Laboratories.  
Your patients trust you.