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The Genetic Mutation That May Compromise Your Health - And What to Do About It

By Peter Rufa*

In 1998, the FDA required food manufacturers to fortify breads, cereals, pastas, rice and many other grain products with folic acid, the synthetic form of folate, aka vitamin B9. The FDA gave four main reasons for this decision.¹ It wanted to:

- Boost dietary levels of folic acid.
- Restore nutrient levels to processed foods.
- Provide a balanced nutrient to calorie ratio.
- Prevent a lack of nutrients in manufactured foods.

Like all vitamins, folate or vitamin B9 plays a vital role in health. It's especially important for pregnant women and children as they grow. A deficiency can lead to serious health problems later in life for children, increase the risk of losing a pregnancy and poor fetal development.

Unfortunately, adding folic acid may not help a sizable part of the population. Many people have a common genetic mutation that negates the effect of folic acid. As a result, many may unknowingly suffer from folate deficiency and the health conditions and diseases caused by it.

There is good news. Knowledge of what the genetic mutation does has led to the development of more bioavailable source of folate.

Explore the Benefits of Methylfolate

Why Folate is Important

To understand folate, it's necessary to start at the end and work our way back to the beginning.

The form of folate or vitamin B9 the body uses is called 5-methylfolate and it's really important. To start, every cell in your body needs it for DNA and RNA replication.

Vitamin B9 also plays a role in building red and white blood cells. It helps to make an enzyme needed to produce neurotransmitters, the chemicals that keep your brain working. It keeps levels of the inflammatory amino acid homocysteine stable.

Folate keeps homocysteine levels stable by converting it into SAMe, an important methyl-donor molecule. This makes folate a vital component of methylation.

What is Methylation?

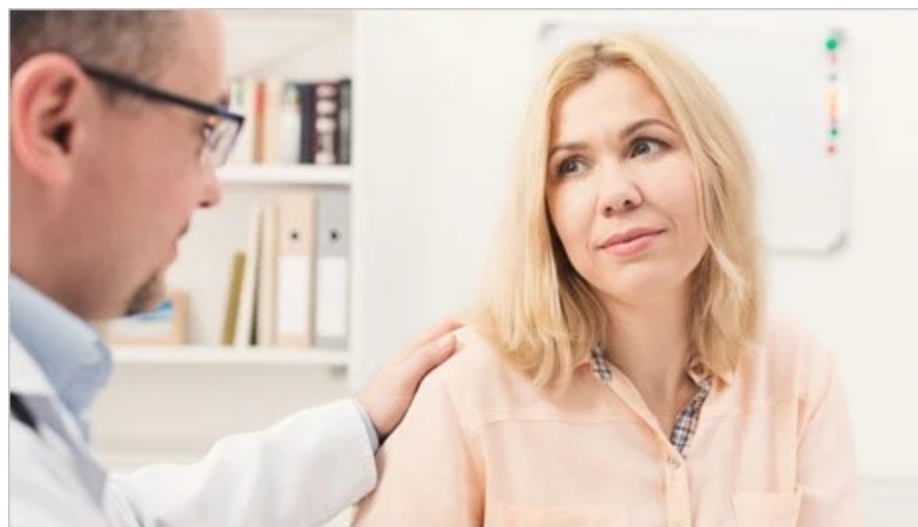
Methylation simply refers to the chemical process where one molecule with an attached methyl group (one carbon atom with 3 hydrogen atoms) gives it to another molecule. One use for methyl groups in the human body involves the starting of chemical reactions. Some of these include:

- Turning genes "on" and "off"
- Contributing to the building of important amino acids, especially those needed by the brain
- Influencing the body's response to inflammation
- Regulating immune response
- Supporting detoxification
- Repairing DNA

This makes methylation an important part of clear thinking, a strong immune system and longevity. This makes folate a vital part of the diet. Without enough folate, health problems can develop. Some symptoms of folate deficiency include:

- Frequent illness
- Chronic fatigue (that may include CFS)
- Anemia
- Changes in the mood and increased irritability
- Digestive problems

The importance of folate makes the FDA decision to require folic acid supplementation a good solution to prevent folate deficiency. Unfortunately, it turns out folic acid has one big problem.



Not Everyone Benefits from Folic Acid

Folic acid is a synthetic form of folate. As a synthetic vitamin, before it can be used, it must first be converted into methyl-folate. This requires an involved chemical process that looks like this:

Folic Acid -> DHF (dihydrofolate) -> THF (tetrahydrofolate) -> MTHFR enzyme -> 5 methyl folate

In the process above, the MTHFR represents a gene that must be active to produce the enzyme that completes the final conversion of folic acid into 5-methyl folate. That also happens to be the problem with folic acid. A significant part of the population has what's known as the MTHFR gene mutation.

Those with this genetic mutation do not produce the enzyme necessary to complete the conversion of folic acid into 5-methyl folate. This leaves what's known as UMFA, or unmetabolized folic acid, in the body. As of now the National Institutes of Health say it is

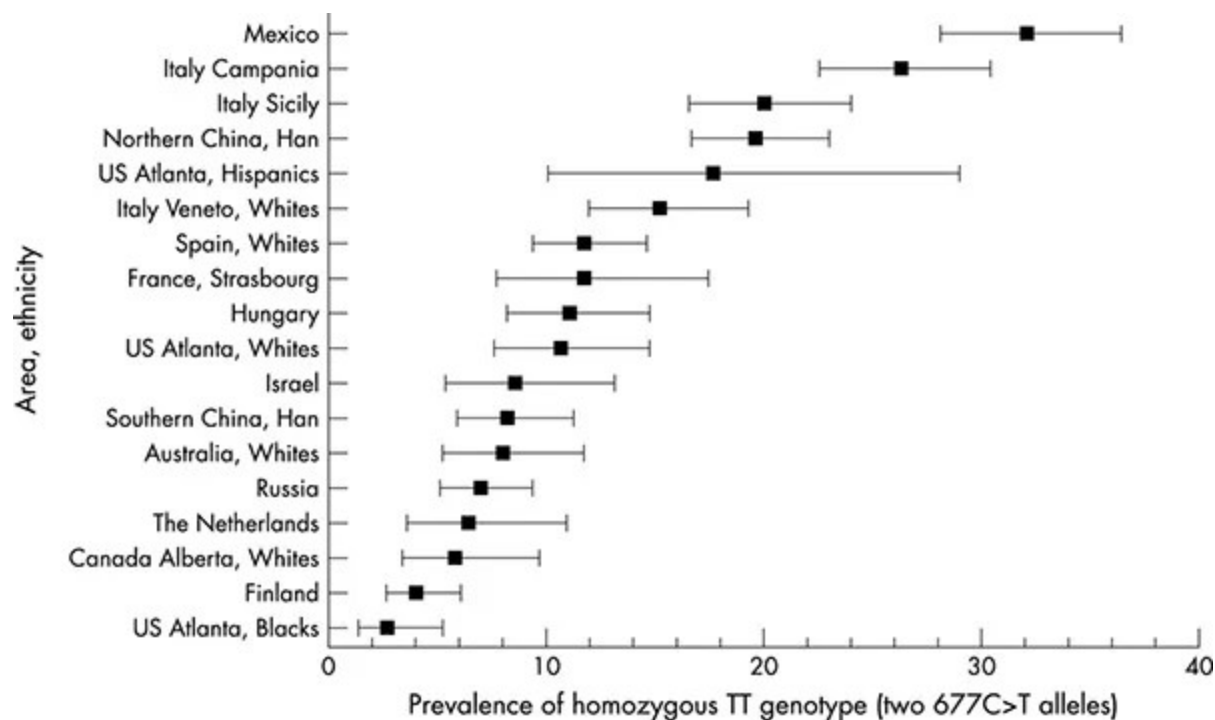
unknown what, if any, effect this unused form of folic acid has on the body.ⁱⁱ

However, a 2010 study performed by Tufts University researchers suggests UMFA may have detrimental effects on health, especially as we age. They looked at 1,858 seniors who had participated in the US National Health and Nutrition Examination Survey. Results of the study suggest UMFA may interfere with vitamin B12 metabolism as it circulates in the body.ⁱⁱⁱ

Without this final step of the conversion process, folic acid delivers no benefit to those who receive it. For those who rely on folic acid, folate deficiency could result. Younger women with this gene mutation who become pregnant could experience problems with their pregnancy.

Percentage of People With the MTHFR Mutation

The presence of an active MTHFR gene mutation that prevents the enzyme needed to convert folic acid varies between ethnic groups and regions of the world. For example, the chart below from a 2003 study shows over 30% of newborns born in Mexico City, Mexico, have it; African-Americans in Atlanta, GA on the other hand have the lowest rates.^{iv}



For these individuals, folic acid supplementation offers no benefit.

Should you get a genetic test to find out if you also have the MTHFR gene mutation?

If you suffer from any of the symptoms above it may be worth asking your doctor or healthcare practitioner for their recommendation.

Sources of Folic Acid

As a fully synthetic form of vitamin B9, folic acid only exists in dietary supplements and in processed foods that require fortification. Most B-complex supplements use folic acid.

Folic Acid Alternatives

Folic acid was first isolated from spinach by scientists in 1941. The first synthetic form was developed in 1943 by Lederle Laboratories.^V Not long after scientists observed naturally occurring folic acid contained additional components such as methyl compounds. Today, folic acid refers to the fully synthetic form of vitamin B9 while folate refers to the many different forms found in foods.

While folates occur naturally in green leafy vegetables, these too often require the MTHFR enzyme during digestion and absorption. Vegetables like spinach, chickpeas, broccoli, asparagus, cabbage, romaine lettuce, and kale may offer excellent dietary sources for anyone without the MTHFR gene mutation looking to boost folate levels naturally. For those with the MTHFR gene mutation or who do not want to consume large volumes of greens, new supplements may offer safe and simple alternatives.



Epigeneticist and MTHFR expert Dr. Ben Lynch has analyzed many of the supplemental forms of methylfolate. He notes methylfolate supplements go by many names that can be

confusing. He recommends supplements listed as^{vi}:

- Quatrefolic® Methylfolate
- L-5-MTHF
- L-5-Methyltetrahydrofolate
- 6(S)-L-MTHF
- 6(S)-L-Methyltetrahydrofolate

But says these forms should be avoided:

- D-5-MTHF
- D-5-Methyltetrahydrofoalte
- 6(R)-L-MTHF
- 6(R)-L-Methyltetrahydrofolate

Of the recommended supplements, one of the easiest to get is the Quatrefolic® Methylfolate.

Benefits of Quatrefolic® Methylfolate

Sometimes called simply Quatrefolic®, this methylfolate supplement supplies the same form of methylfolate used by the body, the 6(S)-L-Methyltetrahydrofolate. Unlike many folates and folic acid which must be converted prior to absorption into blood plasma, it uses a unique carrier that allows for immediate absorption. This allows it to avoid the conversion process that requires the MTHFR gene-regulated enzyme.

This makes Quatrefolic® ideal for anyone with the MTHFR gene mutation that prevents the conversion of folic acid into bioactive folate. Research on folic acid absorption suggests it may also be ideal for anyone seeking a folate supplement.

German researchers did a review of studies of folic acid and methylfolate. They reported methylfolate improves folate levels as well as folic acid (in individuals who can convert it),

absorbs better and appears to reduce vitamin B12 masking, which is a hiding of a B12 deficiency.^{vii}

Bioavailable forms of methylfolate like that found in Quatrefolic® also reduce the presence of the unmetabolized folic acid. This takes stress off of the liver, which according to additional research bears the burden of excess folic acid.^{viii}

It may offer pregnant women an excellent and reliable folate supplement, although expecting mothers should always speak with their doctors and obstetricians prior to taking any supplement.

Methylfolate supplements also offer children an excellent source of folate to support growth and development. (And it may be easier than getting them to eat their spinach...)

For adults, methylfolate supports heart health by keeping homocysteine levels low. It also provides the essential nutrients needed for the brain to support clarity, a positive mood and recall.

Quatrefolic® methylfolate offers a safe alternative to folic acid for everyone from those with the MTHFR gene mutation to those in need of a quality folate supplement. Of course, before taking any supplement, you should always check with your doctor or healthcare provider first.

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For more information about Methyfolate,
visit ProHealth.com or call us at (800) 366-6056.

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For references see original article at ProHealth.com

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