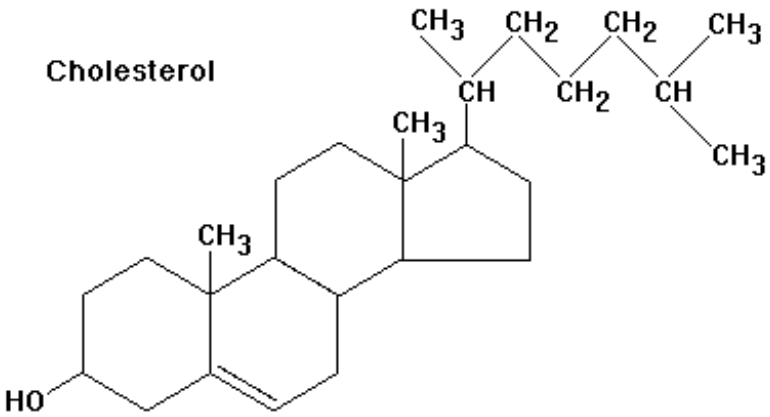
# The Cholesterol Primer



Understanding cholesterol and its various roles in whole, raw milk, other foods, and our bodies, is not an easy task. Entire books (including a great one I'll tell you about later) are devoted to explaining this complex and controversial topic. My Primer will just scratch the surface, but hopefully pique your interest to learn more about why its presence should be welcomed, not feared.




Cholesterol is an unusual substance. Waxy and fat-like, it's classed as a *steroid*, a *lipid* (lipids are water insoluble hydrocarbons, like fat) and as an *alcohol* (normally water soluble). Curiously, it's almost completely resistant to water's solvent charms.

This moisture-proof characteristic is one of the many properties that make it such an important component of our cellular environment. Let's look at a few of the roles it plays in our bodies before we examine how it got such a bad rap.

It's present in all of our cell walls, providing watertight integrity and structural support, and is especially essential to electrically conductive nerve and brain cells- we can't have moisture and wayward ions seeping in and short-circuiting things.

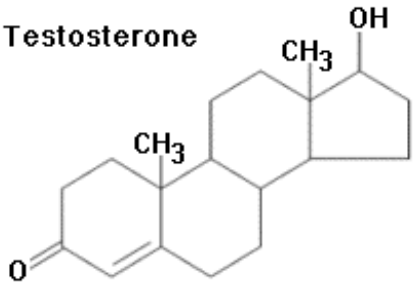
This might explain why the nervous system is such a large repository of cholesterol, and why a diet that includes adequate amounts of it is a must for infants and small children with growing brains. Luckily, both human and bovine (cow's) milk contain plenty of it for just this purpose.

Mood and behavior are also apparently linked to proper blood levels. Studies have shown a decrease in the number of serotonin receptors as cholesterol levels lower. Serotonin is a key neurotransmitter which figures heavily in depression, among other things.

Our digestive system relies heavily on bile salts to help emulsify and digest fats. The liver makes about a quart of these a day (just under a liter) with cholesterol as a major ingredient, storing a concentrated version in the gall bladder for controlled release as foods (especially fatty ones) enter the small intestine.

Through a complex system of hormonal checks and balances, our bodies know when to make more cholesterol, and when to back off as dietary supply meets daily needs.

Forming the backbone for numerous steroid hormones manufactured in the ovaries, testicles and adrenal glands, cholesterol plays a critical role in controlling the body's stress response, defense system, sexual development, and numerous other metabolic functions. (**At right**, sex hormone *testosterone*. Notice four ring structure typical of all steroids).




It's also a major component of cholecalciferol (also known as Vitamin D3, made in skin exposed to sunlight), which assures proper absorption of calcium and phosphorus, maintains normal muscle tone and takes part in several immune and reproductive processes.

Other studies have shown that cholesterol can bind to and inactivate a broad array of toxic substances. This ties in nicely with the observation that low blood levels are associated with higher incidence of cancers. Makes sense that if you remove a substance which can neutralize carcinogenic substances, you're likely to see increases in tumor formation.

I could go on and on about other key things cholesterol does, but I think I've made the point. It's crucial to our existence. Even if we totally eliminated it from our diet, our bodies would just crank up production to supply demand. If we got rid of all of it, we'd die.

So that's the 'good' cholesterol. What about the 'bad?' Well, like so many other molecules, when heated and exposed to oxygen, cholesterol is oxidized (damaged, essentially) and takes on the unwanted ability to harm arterial linings and pile up in flow-clogging plaques.

If you've ever had powdered eggs, powdered or skim milk, crispy bacon, grilled meat, even french fries cooked in beef tallow, you've consumed 'bad' or oxidized cholesterol. It's present wherever animal products have been overheated in the cooking process, and the American diet is loaded with it. But is this the only reason circulatory disease is so high in our country today? Far from it.


In the early 1950's, Dr. Ancel Keys (1904-2004, **at right**) a PhD oceanographer and physiologist, inventor of the K-ration military meal, and pioneer heart-health guru, reported on what he felt was a strong correlation between cardiovascular disease, blood cholesterol levels and dietary saturated fat intake.

Although controversial, the theory gave cholesterol a bad name, and opened the door for food processors, medical professionals and pharmaceutical manufacturers to begin profiting from the fear surrounding this misunderstood substance.

It's now known that cholesterol is one of the body's repair substances- an anti-oxidant band-aid of sorts. When we eat artery damaging foods like hydrogenated and trans-fat laden vegetable oils, excess refined sugar, white flour, and, of course, over-cooked animal products, 'good' cholesterol levels will rise in response to the assault, attempting to moderate the damage.

The modern day tendency to address the symptom (rather than the problem) by taking drugs to lower blood levels of cholesterol is just another misguided, but high profit, approach in our nation's unsatisfactory 'sick care' system.

When it comes to the cholesterol in fresh, clean, raw milk, you have nothing to worry about. Your body will have to make that much less, freeing it up to take care of more pressing metabolic needs.

So that's my nutshell look at our body's most famous good cop/ bad cop. To get the complete story- probably the most thorough analysis of cholesterol science available, Dr. Uffe Ravnskov's book, *The Cholesterol Myths* lays out the entire picture in an informative, well-written manner.

It's a must read that blows the mist away, leaving a clearer understanding of this much-maligned steroid, the multi-billion dollar cholesterol-lowering industry and its impact on your health. I highly recommend it. Click on Selected Books to check it out.

The clip below from Tom Naughton's amusingly educational documentary, 'Fat Head,' gives a bit more insight into how Dr. Keys gave cholesterol a bad name:

If you're hungry for *still* more cholesterol science, check out nutrition scientist Chris Masterjohn's superb site here.