

Ferris wheels, helium balloons, airplanes, and prices...they all go up. It's been five years since our last price increase. As of October 1, the cost of a regular sample will be \$28.00. Our bulk prices will remain the same for now, so if your wallet is crying, feel free to order yourself some discount kits ASAP: <http://www.blackstone-labs.com/order-now.php>

Problem or Not?

Trends can tell the difference

by Ryan Stark

A while back I went to our family doctor for a checkup. For most of my life I'd never been one for getting check-ups, but now my insurance company pays for a yearly visit, so I decided to start. After all the basics, the doctor suggested I do a blood test, because I'm "getting old" (almost 40!?). So after fasting for 24 hours to make sure nothing I ate would skew the results, I headed to their lab to get my blood drawn. You can imagine my dismay when the nurse called a few days later with my test results -- high cholesterol! My initial reaction was shock, followed by a realization that maybe I am indeed getting older. The nurse said my total cholesterol read 203 and that the doctor wanted me to change my diet and start taking the drug Lipitor. Again more shock followed by a little confusion as to what exactly 203 meant, and then a wave of depression at the idea of having to take a drug for the rest of my life, along with quitting eggs, butter, and bacon. "Fortunately," the nurse continued, they offer free Lipitor at the local supermarket pharmacy, like that was supposed to make everything all better.

After a few days of letting this all sink in, I decided that I was not indeed getting older. In fact, I'd wager that I was the healthiest SOB my doctor had seen all month (based on the state of the patients in her waiting room). Also, given the fact that I look at data all day long, I began to wonder about the 203 reading. What's average, what are the units on that, and what was my average cholesterol reading? Maybe I've always read high. After a little more thought, I



decided to just ignore my doctor and get retested to see if I can get a trend going. My thinking was, maybe high cholesterol is kind of like high iron in your oil. We normally say that just one high reading isn't much of a concern. Maybe it was higher before but it's headed down now, or maybe this level is just normal for you and the way you operate your engine. A trend gives you far more information than just one bad reading. We usually wouldn't suggest any major changes after one just one high reading, so I was a little disheartened that my doctor would prescribe a lot of life-changing measures based on one test. My course of action would be to get more information about it and check back to see if the high reading was a one-time occurrence or not. So I had my blood tested again about a month later to see if the first test was accurate. Unfortunately it was, but still, that made me feel a little better about the repeatability of the lab and that test itself.

The Vitamin D Cure

As luck would have it, that same month I attended a lab training session in Columbus, Ohio at Mettler Toledo (they make an awesome auto-titrator if you're even in need). During dinner one night with the other class attendees, we got to talking about Vitamin D and its relationship to cholesterol. My classmate was in the business of testing for Vitamin D levels in food and said that there is a direct relationship between the two. As it turns out, the more Vitamin D you get, the lower your cholesterol goes. And what's more, Vitamin D is free to us all, being produced naturally by your skin when it's exposed to sunlight. This really got me thinking -- my first and second blood tests were taken in during the height of winter in the Midwest. A person doesn't get much sunlight in the winter (at least in Indiana). So maybe if I checked my cholesterol again in summer, it would improve. This started me on a quest to get my blood tested again that summer to see if I could indeed confirm that there was a relationship between Vitamin D and cholesterol.

At the start of September, I called my doctor and requested another blood test, and this time I wanted Vitamin D added as well. After a few days the nurse called with my results. It turns out my Vitamin D level was low at 30, and she wanted me to start taking a supplement to see if I can bring that up (again with the knee-jerk reaction to one reading). "How about my total cholesterol?" I asked. "Oh, that's fine at 156." she stated. This was an eye-opening test because it proved that my cholesterol level did indeed change significantly and I didn't have to change my diet or take any drugs to artificially lower it. This also brought up a mildly chilling realization. Suppose I started taking a drug to lower my cholesterol back in February and then had it tested again in September. My cholesterol would have read lower, but everyone would have pointed to the drug as the reason and I'd be stuck taking it for life. After-market oil additives are a parallel to this in the oil analysis world. A lot of people start to use an additive and after several years start to think it's the reason their engine is running well. When in reality, chances are very good the engine would still be running fine had they not used the additive.

Trends are key

All of this started back in 2013 and I have accumulated a lot of data since then on my cholesterol and Vitamin D levels. Being in the lab business, I wanted more data before I made any hard and fast statements and I'm still not ready to say one way or the other that the Vitamin D and cholesterol are related. I'm not advocating that you ignore your doctor's advice (that's a Stark family virtue), but I am saying that as far as testing goes, it's not very often that you need to take action just on one bad reading. Trends are important when analyzing data, so be sure to get them even if it takes a little pain.

By the way, during all of this blood testing, I found myself longing for a lab where you could walk in and easily get blood work done without a doctor's order, one that would send you your results in a nice, easy-to-read format, with an explanation of the data in plain English. Also, the report would show you an average so you could get an idea about how high or low a reading might be. Whoever could come up with this type of medical lab in real life would be sitting on a gold mine. Now, you may ask, "Why don't you start one, Blackstone?" and the answer to that is easy -- we're too busy testing your oil.

Ryan's Cholesterol Levels

Date	Normal Range	Ryan's Average	2/15/13	4/25/13	9/9/13	11/13/13	3/6/14	4/23/14	2/2/15	4/22/15
Total	0-200	195	203	236	156	203	188	183	197	162
LDL (Bad)	0-150	118	129	148	93	131	118	110	116	80
HDL (Good)	40-60	46	45	49	40	45	48	44	50	48
Triglyceride	63-130	153	145	197	113	136	108	144	155	171
Vitamin D	30-100	25		19	30	22	28	23	24	30

Here you go, no need to hack into my doctor's computer to see some of my "valuable" medical history.

2/15/13: This first test at my annual checkup started it all. No Vitamin D levels checked then, I wasn't interested. After this test, my doctor ordered me on Lipitor – I declined.

4/25/13: I did two April 2013 tests close together to see how repeatable the readings were. They were very close, so I left one of out of the chart for space. I was glad to know the tests' repeatability was not too bad, though the numbers do change some from day to day. These were also done at a "Focus On Health" event a local hospital puts on in Fort Wayne every year. No doctor's orders required to get your blood tested.

9/9/13: This test was done towards the end of summer. The day before I had gone fishing and nearly overdosed on Vitamin D (via sunshine). Note the increase in Vitamin D and the drop in total cholesterol. This test got me really interested in the Vitamin D/cholesterol correlation. Ever the kill-joy, my doctor ordered me on Vitamin D at 3000 IU's – again I declined. How about a little praise for the drop in cholesterol, doc!

4/23/14: Another Focus On Health Test to get more data.

Sorry, no summer 2014 test. Did I mention that getting your blood tested is a pain in the butt!

2/2/15: My annual checkup. Cholesterol was okay here for some reason – must be all my clean livin'. Still my doctor recommended I take a Vitamin D supplement (3000 IU). I decided to give it a try and see what would change, but I could only find a 2000 IU pill at the store.

4/22/15: It looks like the supplement helped. And my cholesterol was nice and low. Vitamin D was as high as it's ever been. But what's up with all those triglycerides? There's always something to worry about in this life.

Report of the Month

Something went wrong in this F350's 6.4L V-8 engine. Can you figure out what?

To learn more about where the elements are coming from, [click here](#).

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	5,000	UNIT/ LOCATION AVERAGES	5,000	5,000	5,000	5,000	UNIVERSAL AVERAGES
	MI/HR on Unit	145,000		140,000	135,000	130,000	125,000	
	Sample Date	04/01/15		12/07/14	09/06/14	07/04/14	03/22/14	
ALUMINUM	277	53	128	79	110	162	15	
CHROME	5	3	3	3	4	4	1	
IRON	157	93	81	89	106	80	31	
COPPER	2	2	1	1	1	1	1	
LEAD	2	3	0	1	0	2	2	
TIN	0	1	0	4	0	3	1	
MOLYBDENUM	66	56	53	73	81	70	25	
NICKEL	3	2	1	2	4	3	1	
POTASSIUM	4	8	1	0	3	2	10	
BORON	53	97	82	40	56	118	56	
SILICON	17	11	9	8	9	10	7	
SODIUM	5	4	5	5	6	6	5	
CALCIUM	849	1173	838	953	939	937	1722	
MAGNESIUM	1188	766	1203	1414	1386	983	395	
PHOSPHORUS	1031	993	1079	1237	1206	1013	992	
ZINC	1324	1189	1289	1450	1467	1105	1151	
BARIUM	0	0	0	0	0	0	2	

Values
Should Be*

PROPERTIES	SUS Viscosity @210°F	75.8	66-78	71.2	73.6	74.7	73.2
	cSt Viscosity @ 100°C	14.45	11.9-15.3	13.27	13.89	14.17	13.80
	Flashpoint in °F	420	>410	425	425	455	440
	Fuel %	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	0.0	0.0	0.0	0.0	0.0	0.0
	Water %	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.8	0.2	0.3	0.1	0.3
	TBN						

A pattern of poor wear wasn't new for this engine, but trends show that aluminum and iron were getting progressively worse. As it turns out, the engine had several issues. Two injectors were bad, which caused piston damage. Also, all the rocker arms were severely worn. With the rocker arms not seating the valves well, the cylinders were losing compression. The #8 cylinder was particularly worn -- the owner could see the hash marks (which help hold oil on the cylinder walls) were getting worn off. His only notice that there was a problem was a slight knock when the truck was warmed up -- and, of course, the analysis.