

The Dynamic Influence of a High Fat Diet on Cholesterol Variability

Dave Feldman

CholesterolCode.com • Twitter: @DaveKeto

Conflicts of Interest:

None

Background

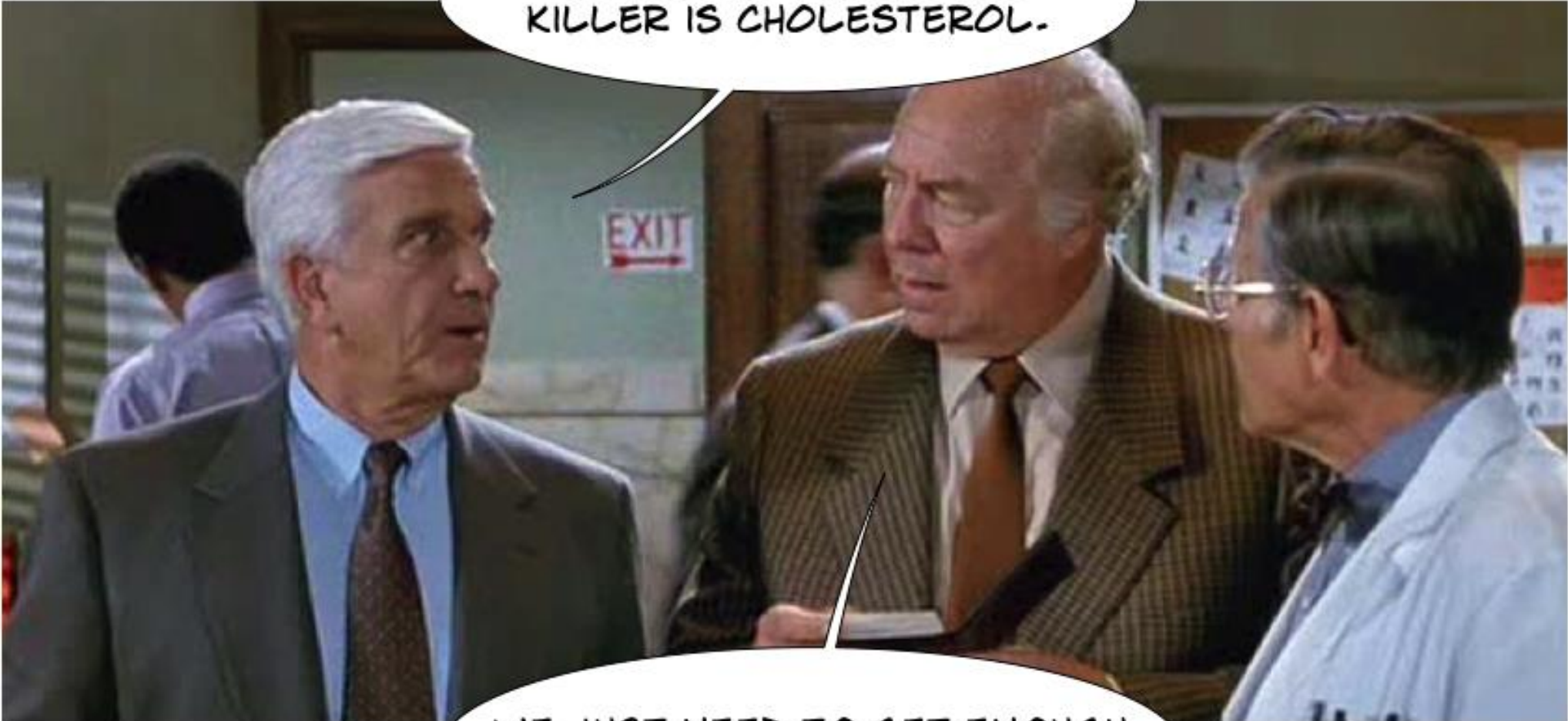


- Software Engineer (30 Years)
- Business Developer
- Entrepreneur

Backstory

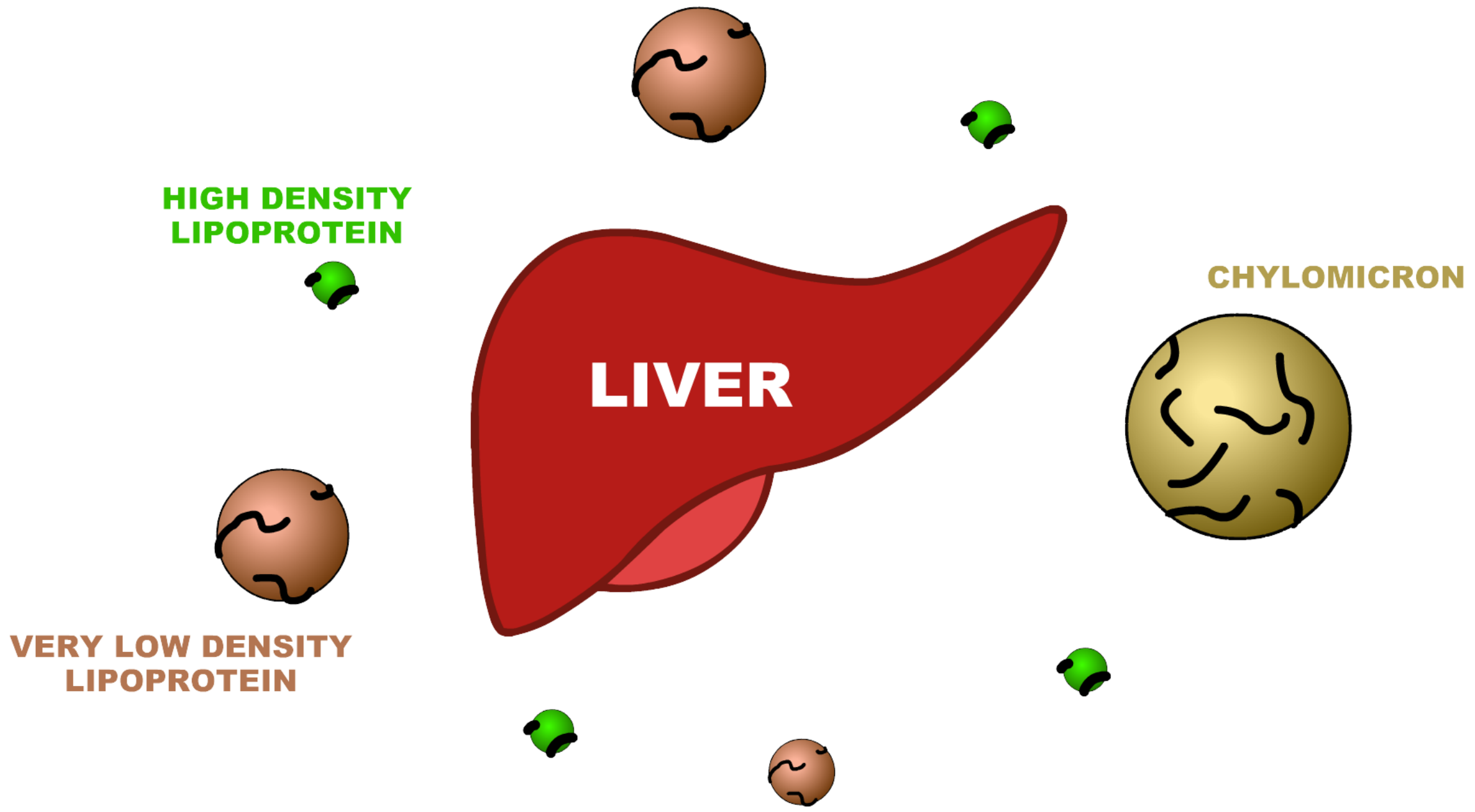


- Started Keto in April 2015
- Enjoyed seven amazing months, feeling better than ever
- Got cholesterol bloodwork done in November 2015
 - *Total Cholesterol: 329!!!*
- Began studying everything I could find on Cholesterol and the Lipid System



WE ALREADY KNOW THE
KILLER IS CHOLESTEROL.

WE JUST NEED TO GET ENOUGH
EVIDENCE TO PROVE IT.



**HIGH DENSITY
LIPOPROTEIN**

CHYLOMICRON

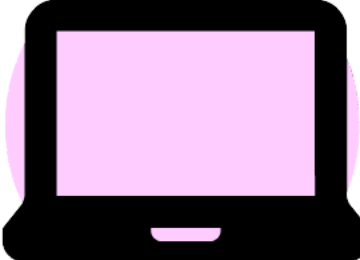
LIVER

**VERY LOW DENSITY
LIPOPROTEIN**

HIGH DENSITY LIPOPROTEIN

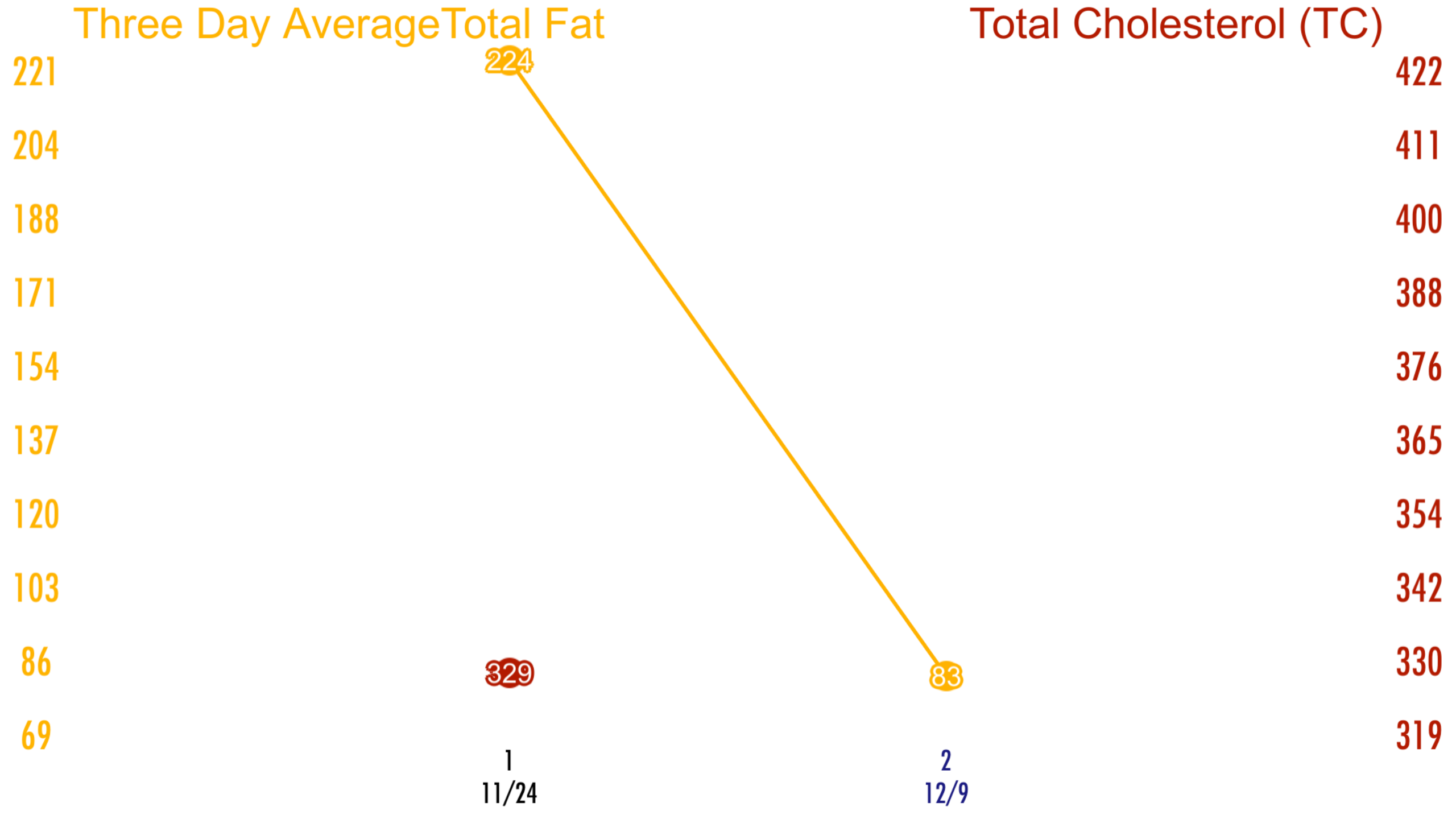


CHYLOMICRON



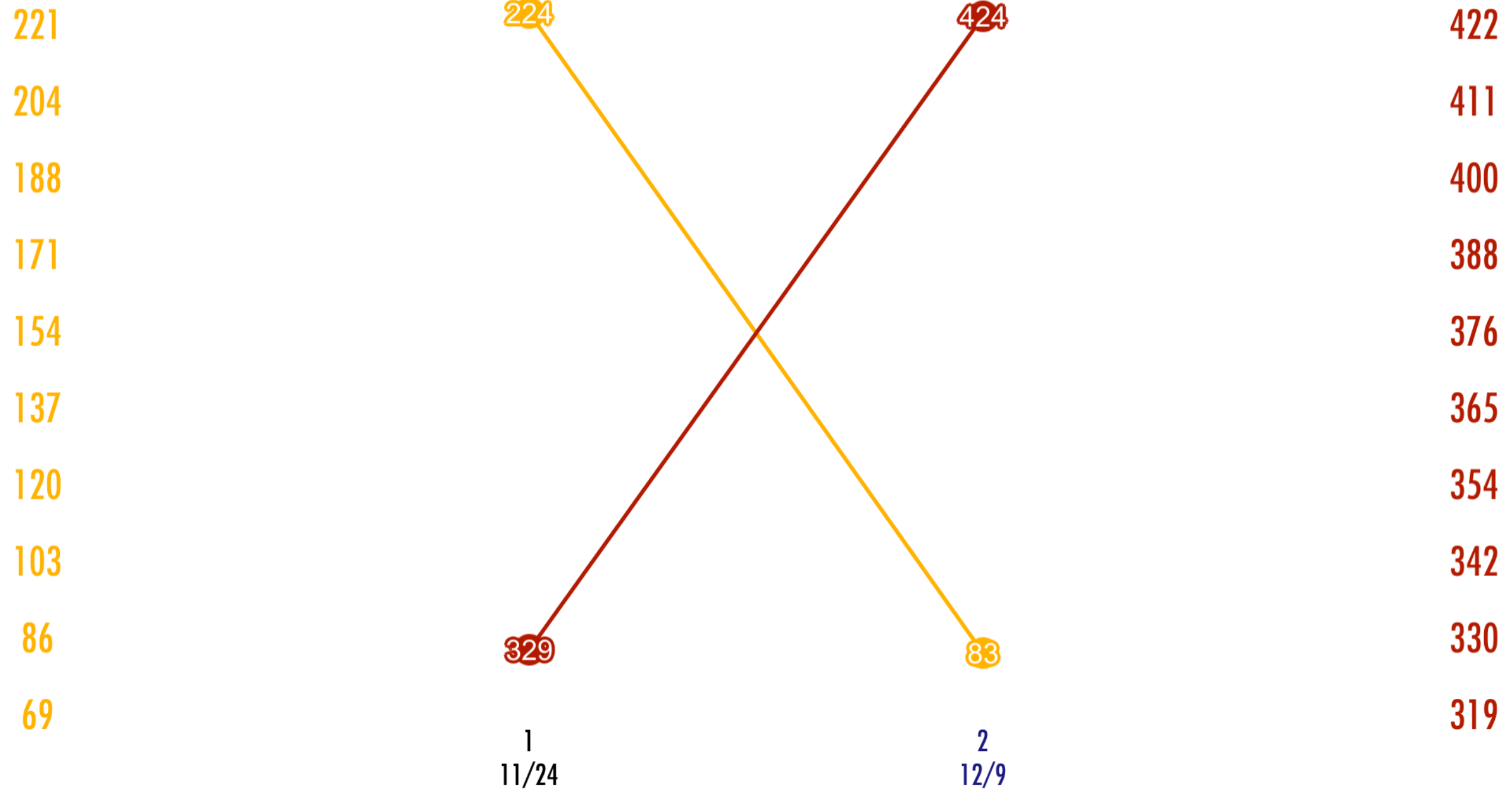
VERY LOW DENSITY LIPOPROTEIN





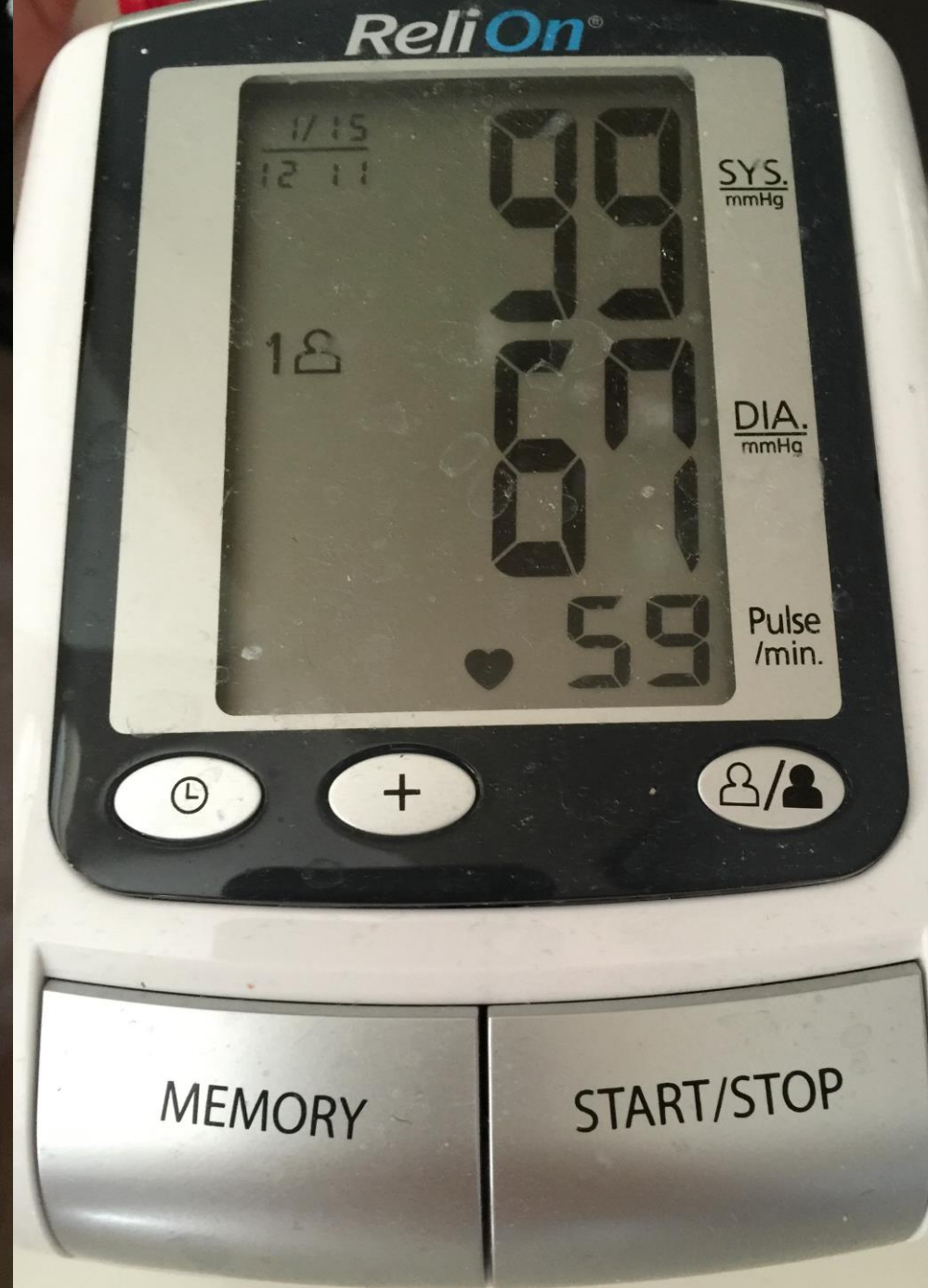
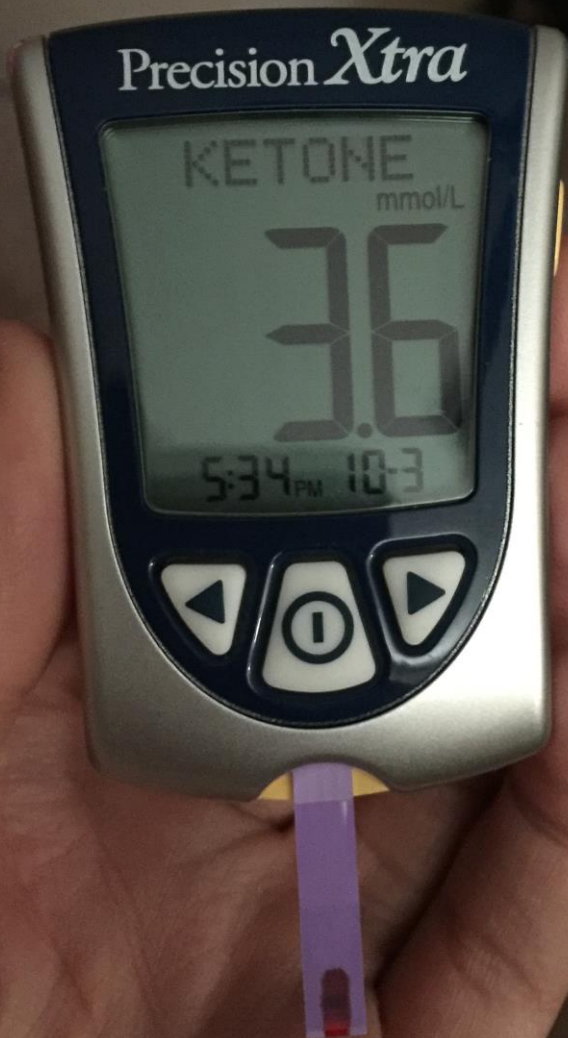
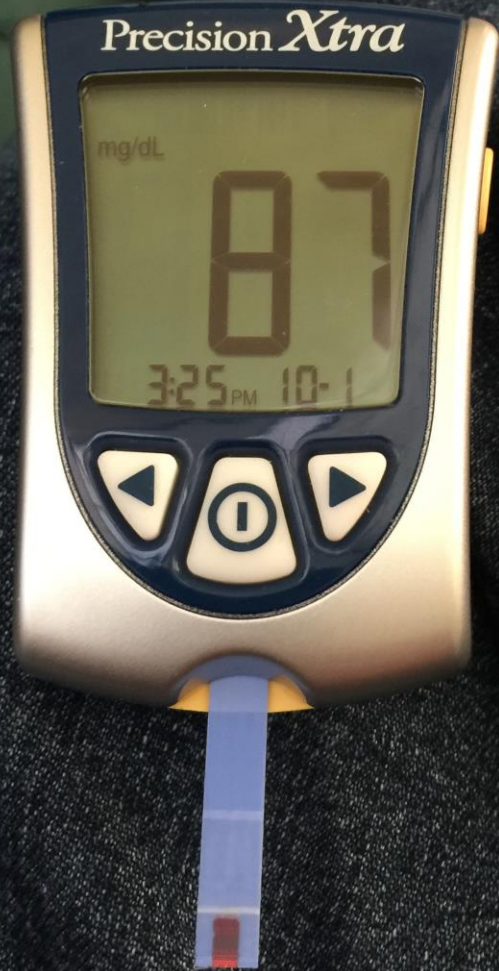
Three Day Average Total Fat

Total Cholesterol (TC)



Extreme N=1

Sometimes science can be a loner









Coca-Cola
ZeroTM

12 FL OZ
(355 mL)

0
CALORIES
PER CAN



BOTTLED AT THE SOURCE

CRYSTAL GEYSER

NATURAL
ALPINE SPRING WATER

BY CG ROXANE

16.9 FL OZ (1.05 PINTS) 500 mL



lb/kg



216
g

zero

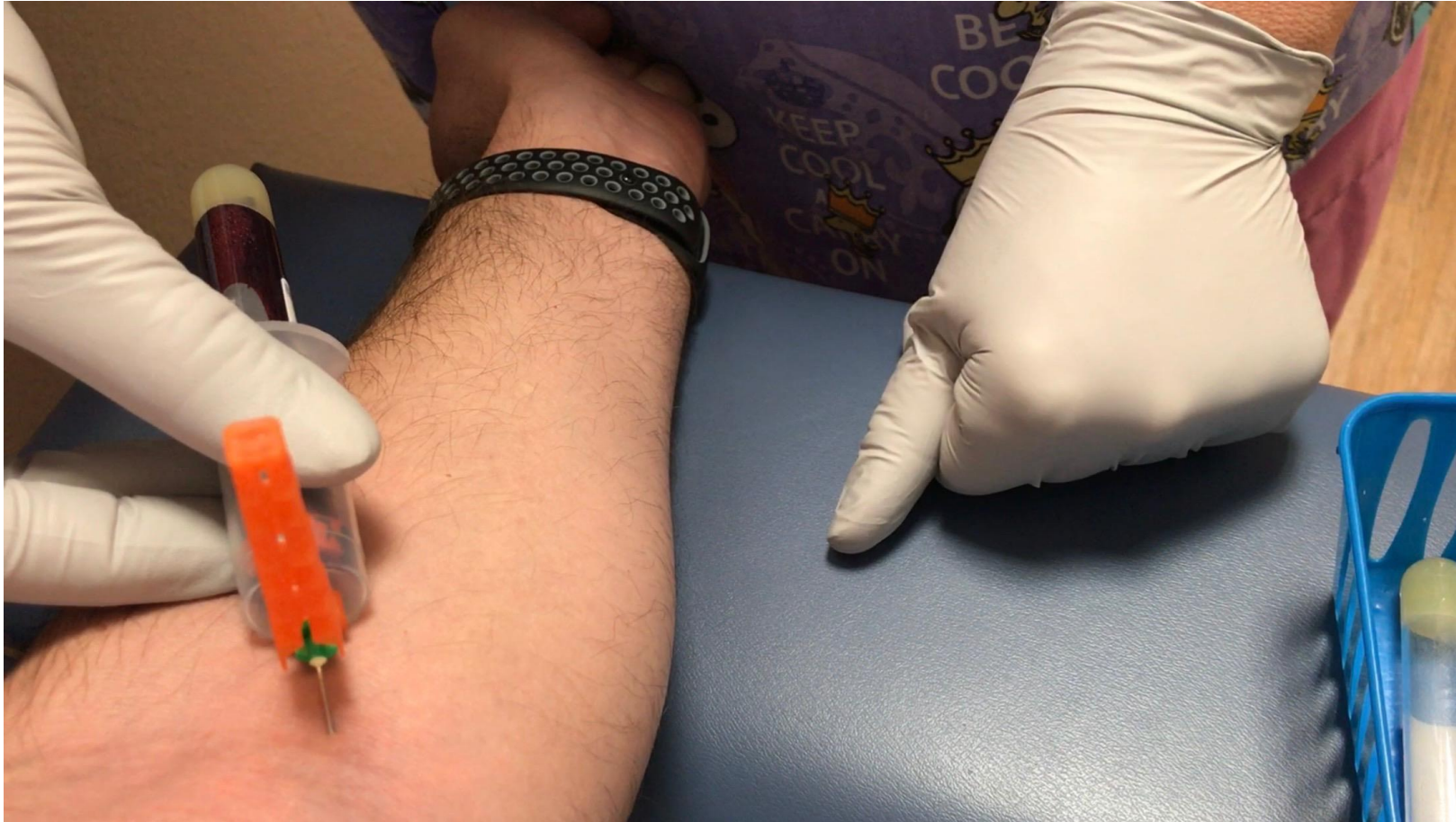


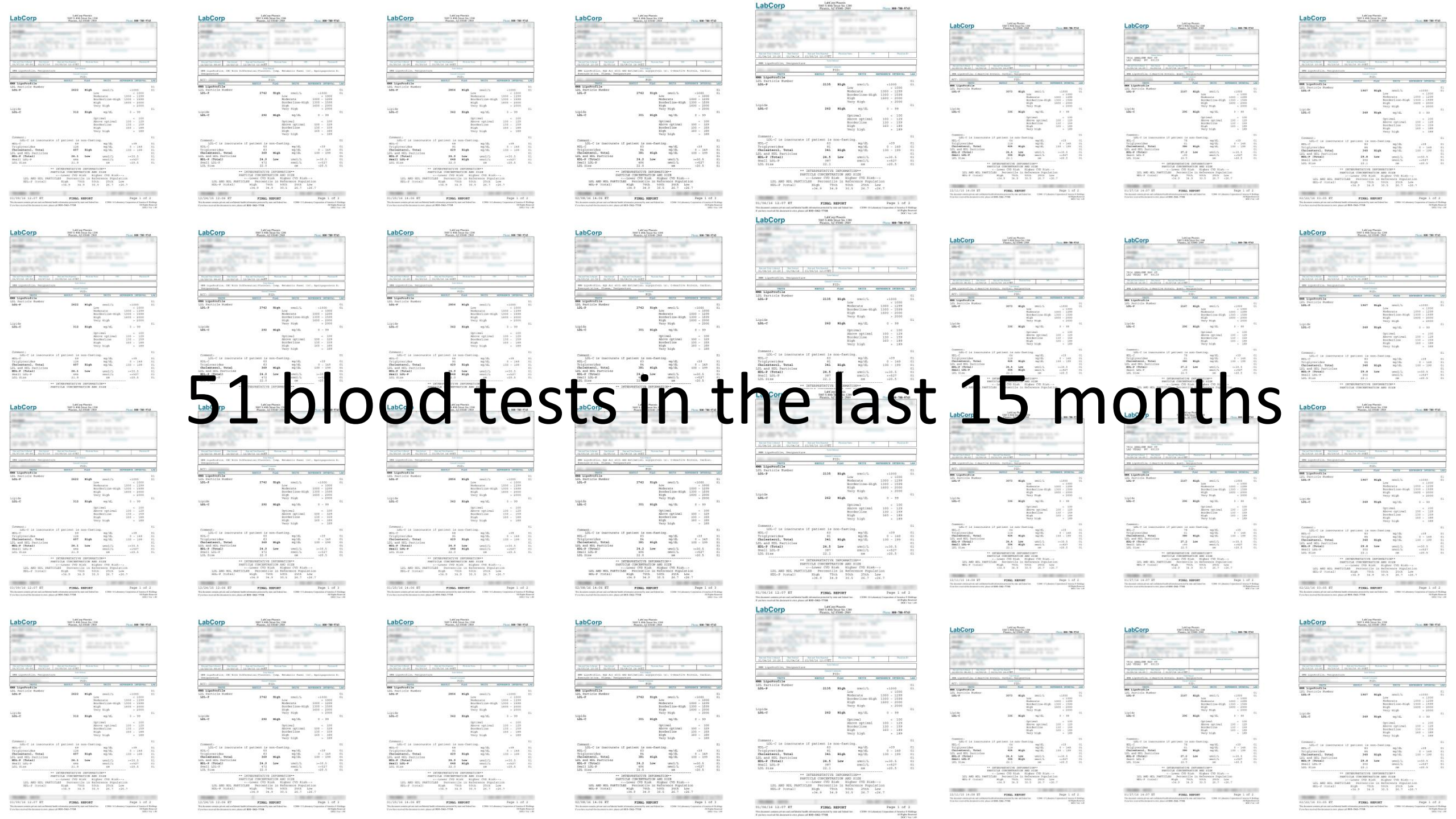
OXO





Blood Tests

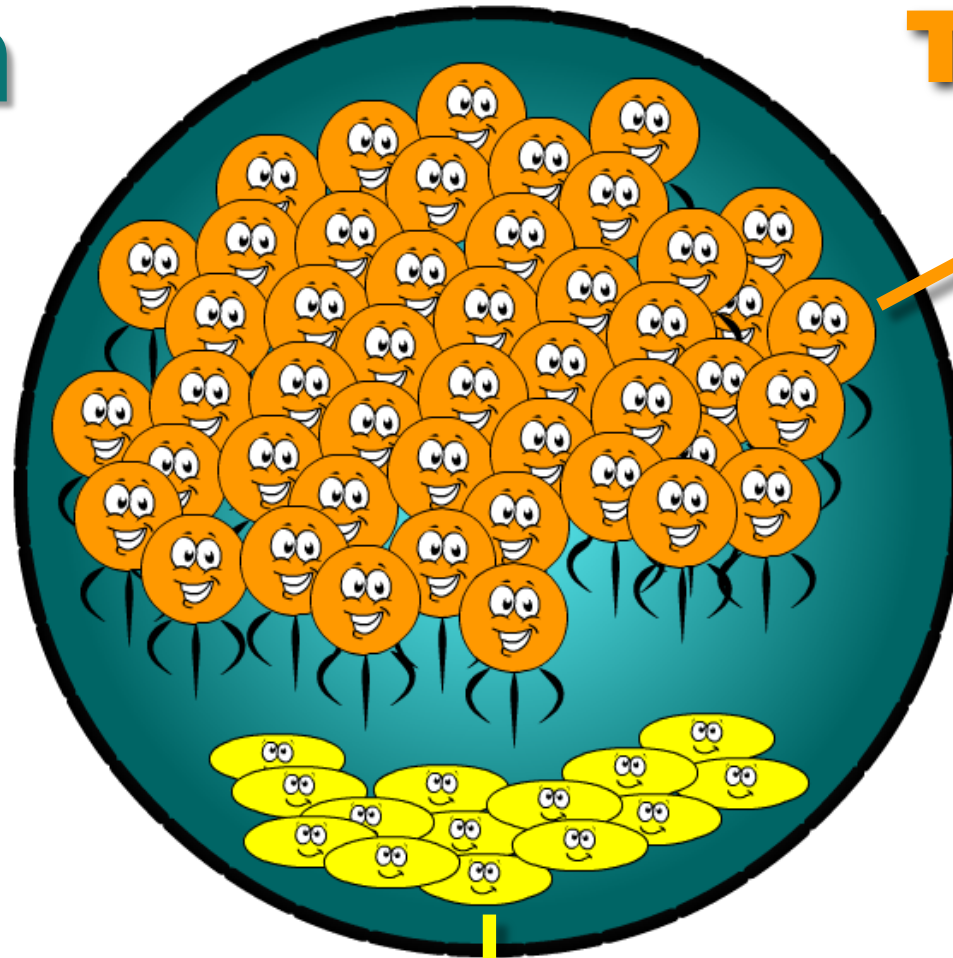




The Inversion Pattern

More Fat, Less Cholesterol... yes, really

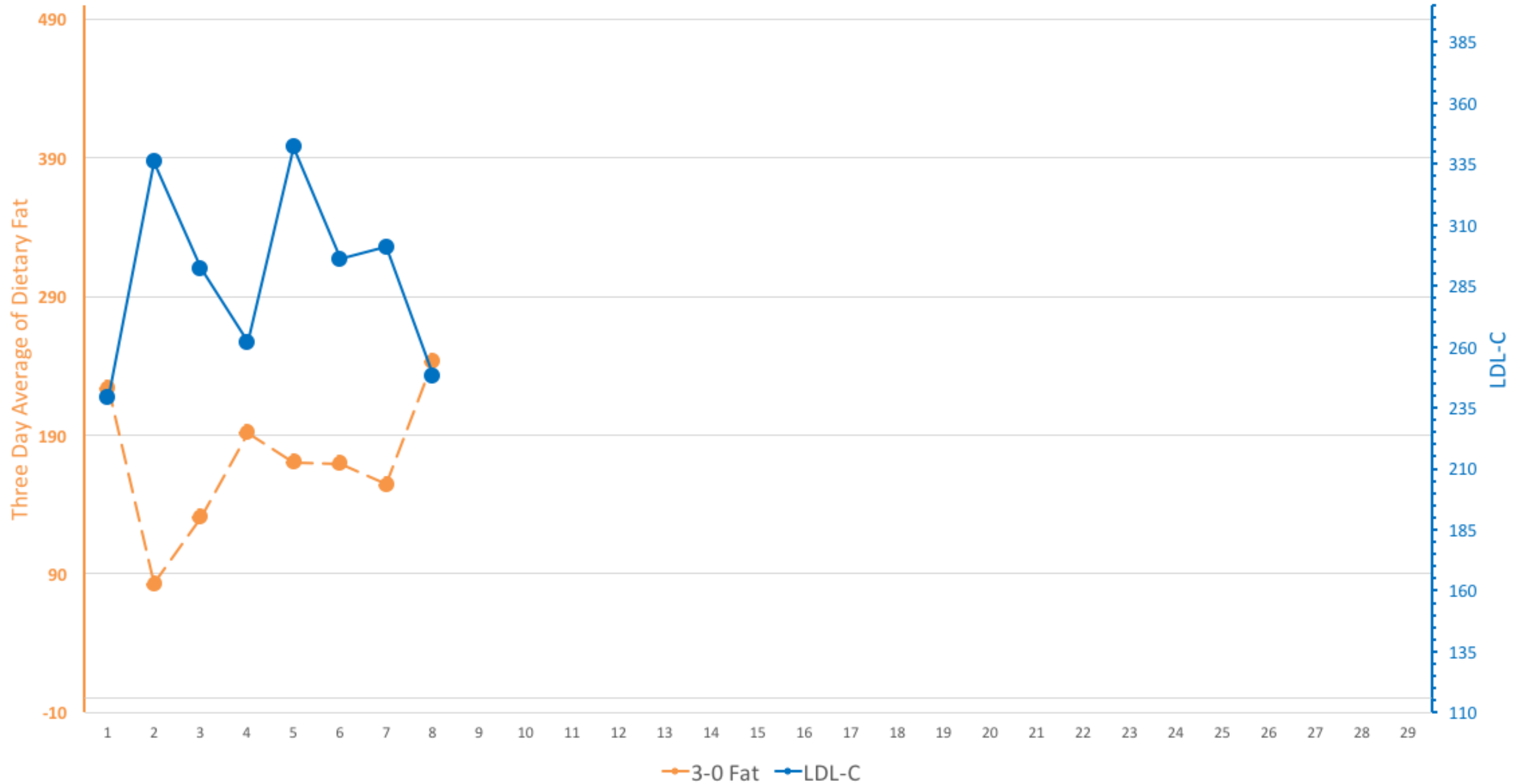
Low Density Lipoprotein (LDL-P)



Triglycerides (Trigs)

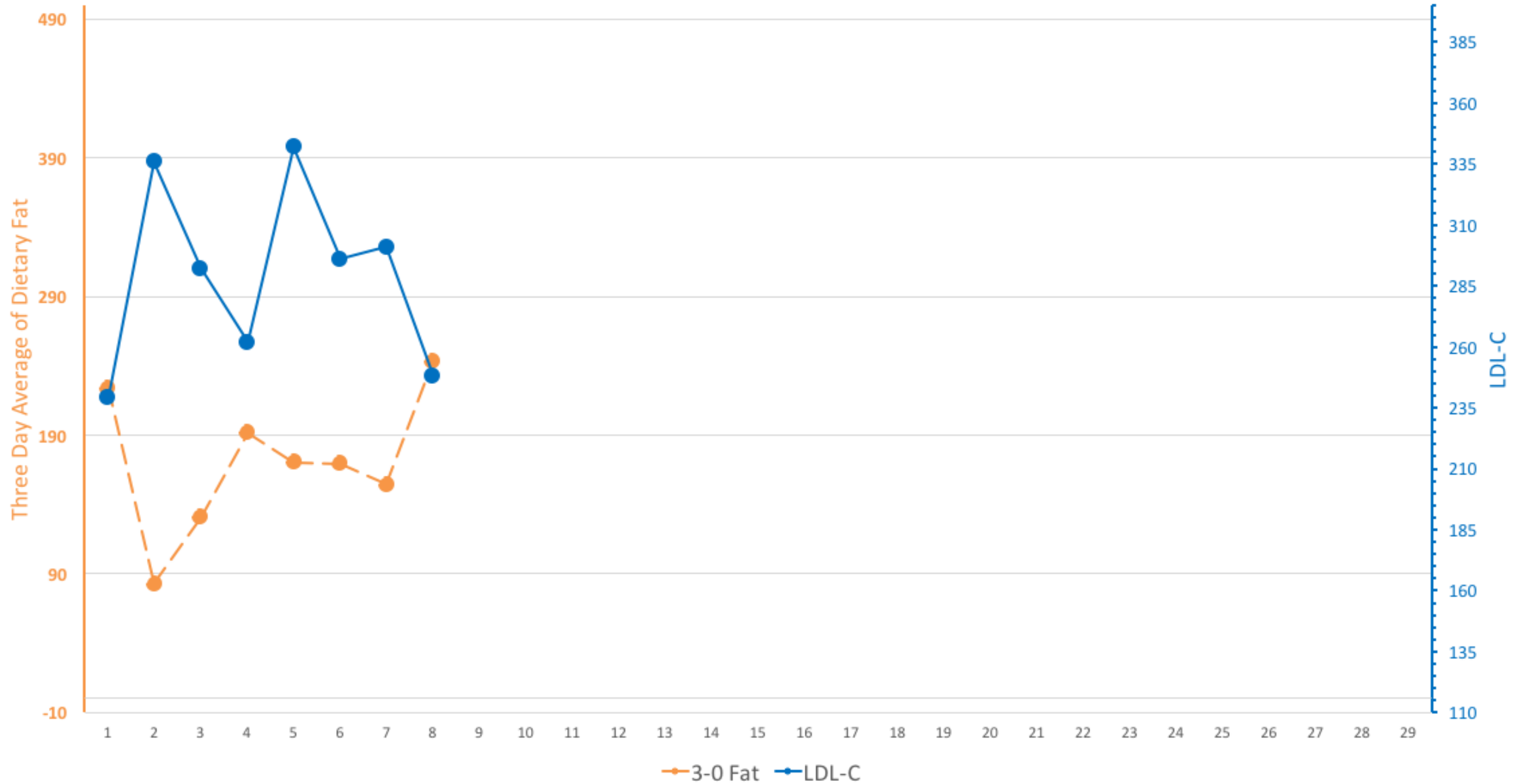
Cholesterol (LDL-C)

Three Day Average of Dietary Fat vs LDL-C Cholesterol

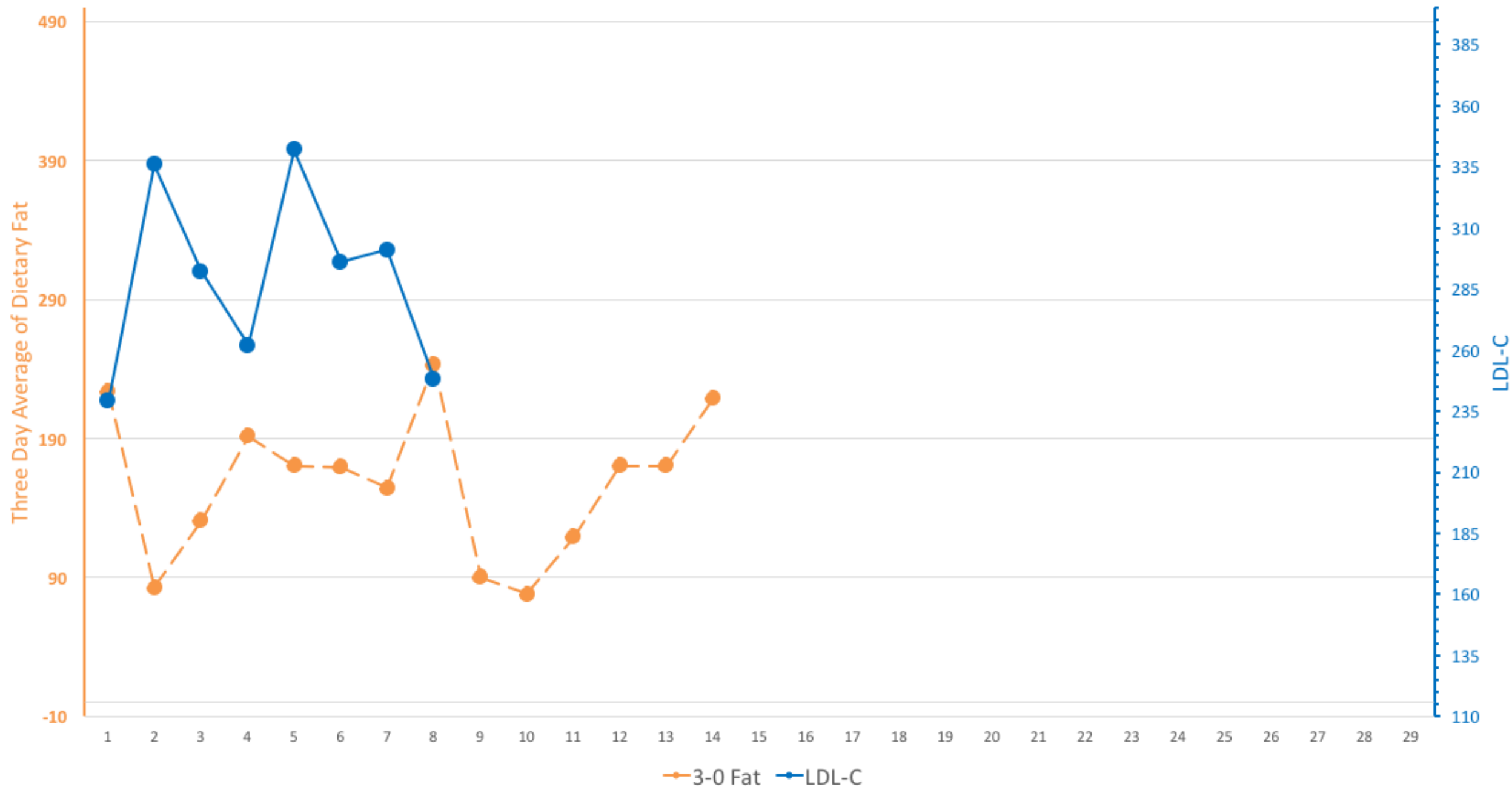




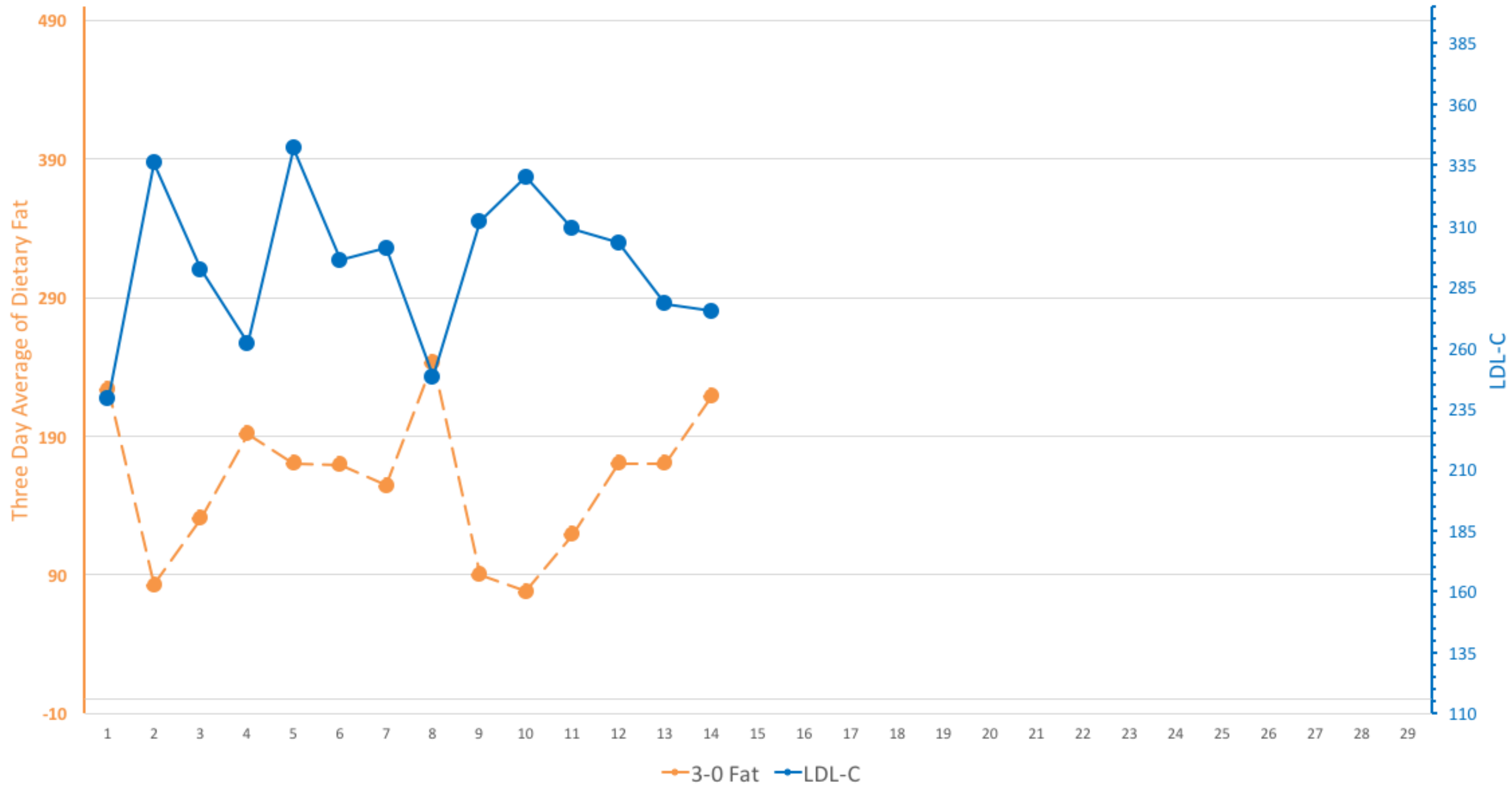
Three Day Average of Dietary Fat vs LDL-C Cholesterol



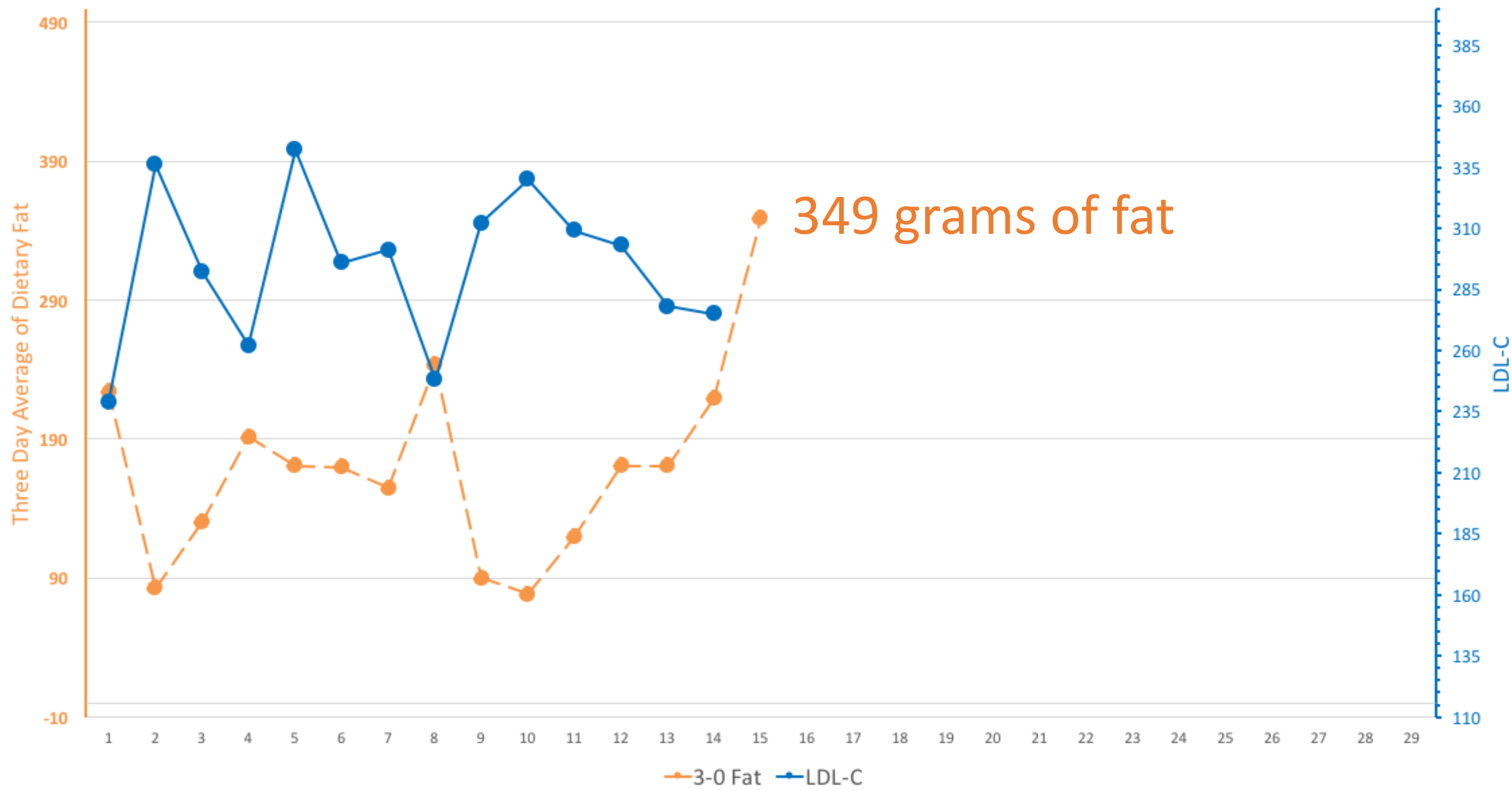
Three Day Average of Dietary Fat vs LDL-C Cholesterol



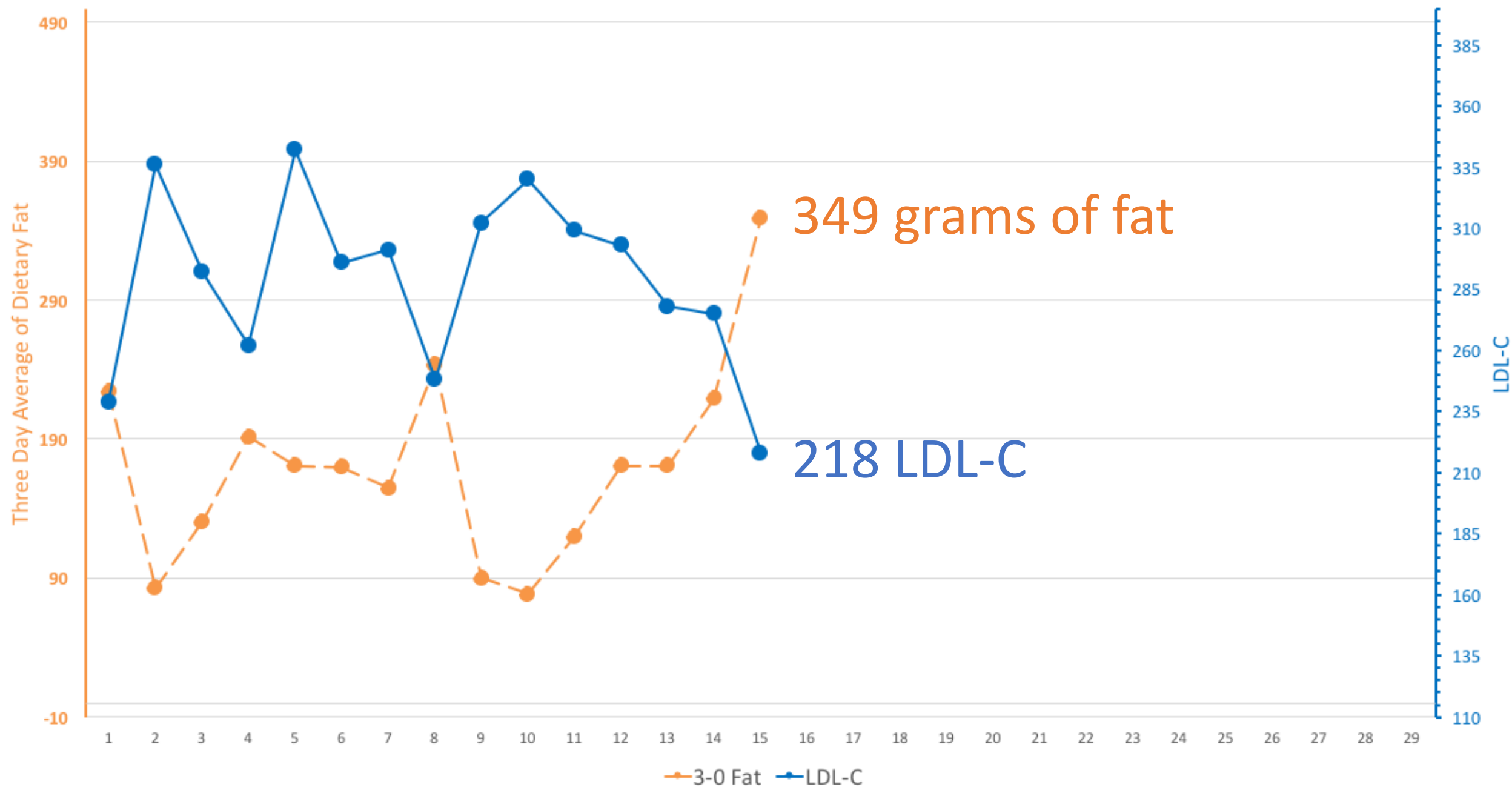
Three Day Average of Dietary Fat vs LDL-C Cholesterol



Three Day Average of Dietary Fat vs LDL-C Cholesterol



Three Day Average of Dietary Fat vs LDL-C Cholesterol



Dietary Fat Inversion for LDL-C

Three Day Average of Dietary Fat Before Day of Blood Test

Dietary Fat from
3 Days Before
Blood Test

Dietary Fat from
2 Days Before
Blood Test

Dietary Fat from
1 Day Before
Blood Test

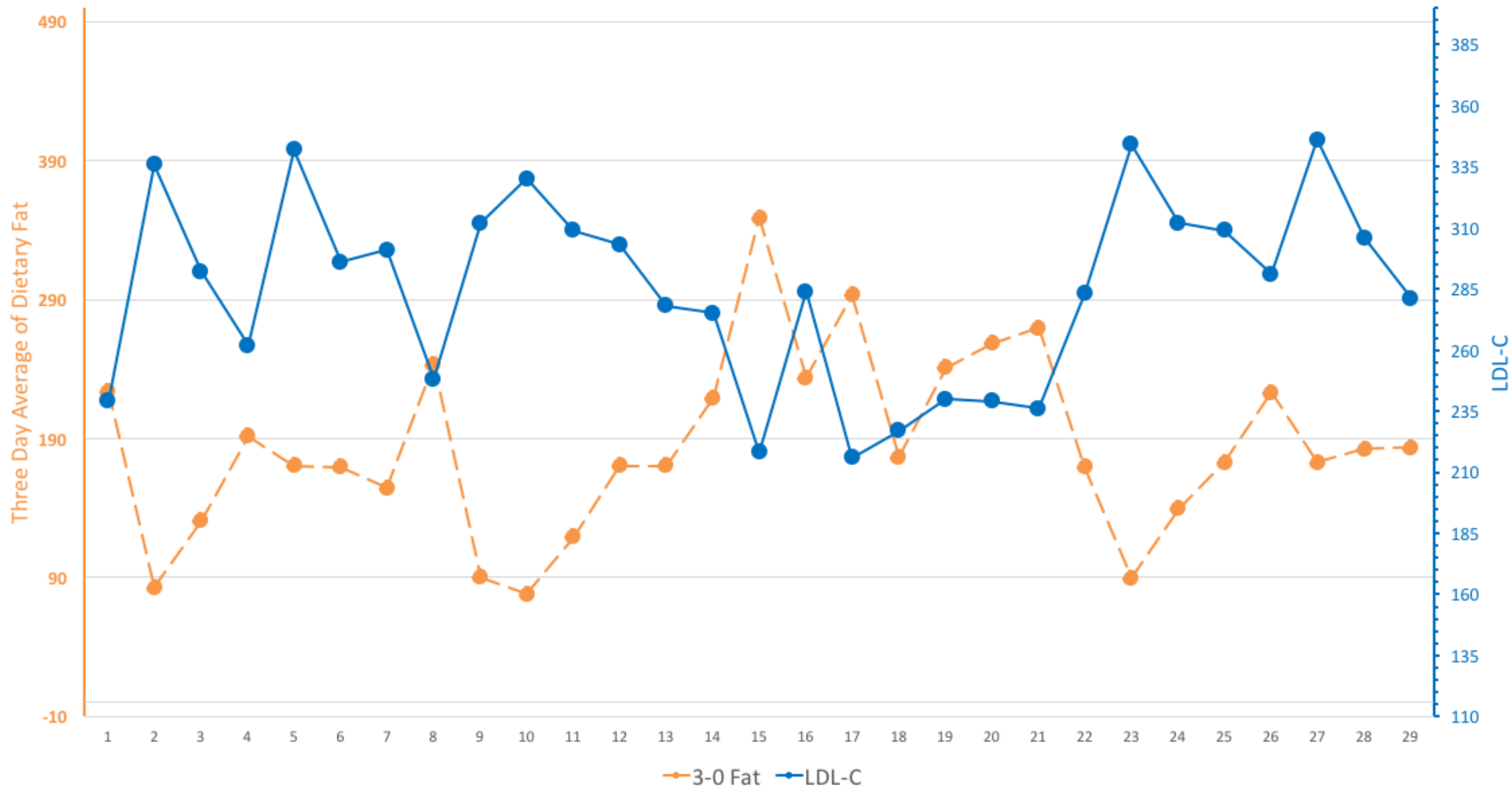
High Inverse Correlation

Resulting LDL-C

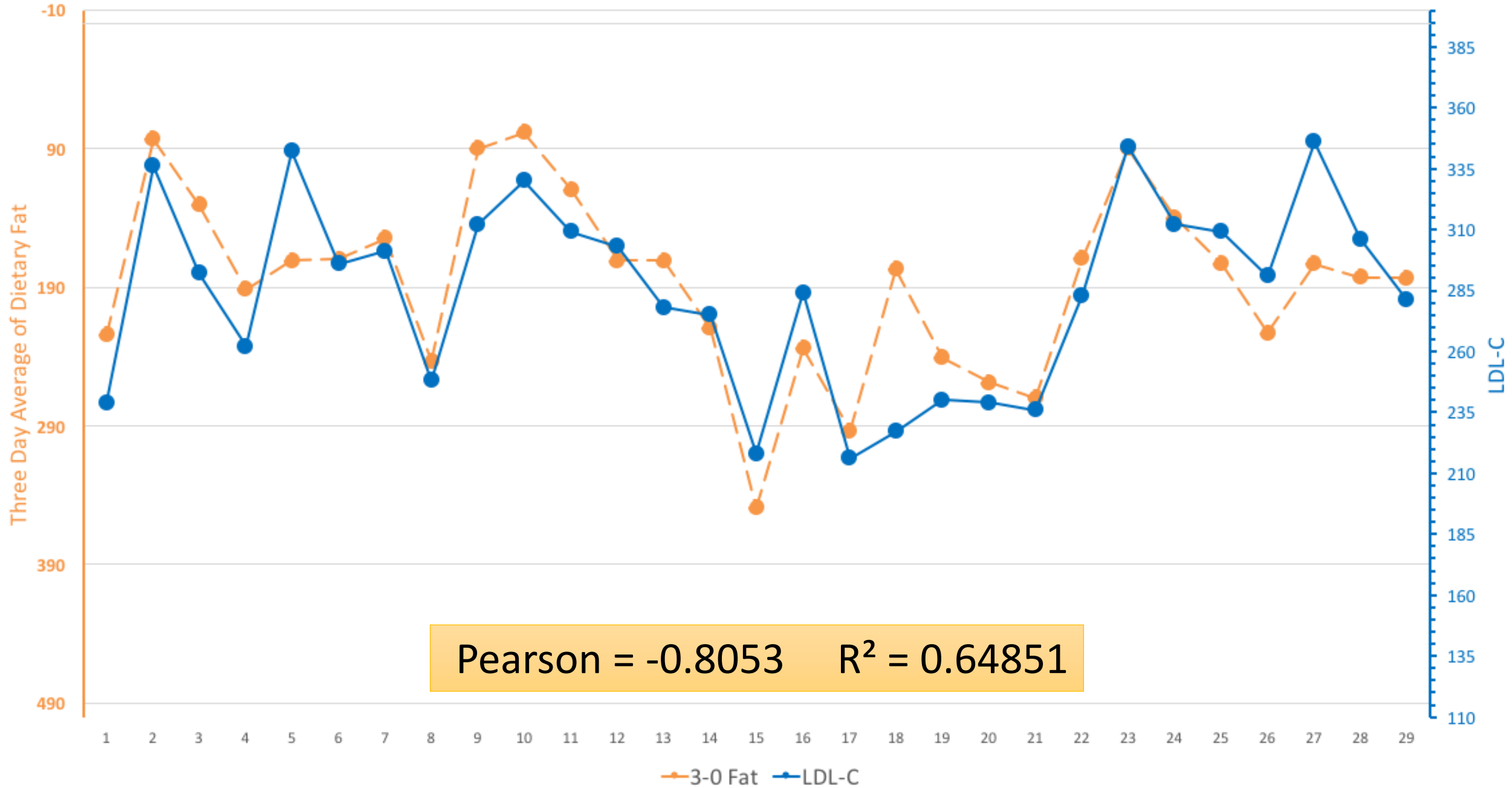
Morning of
Blood Test



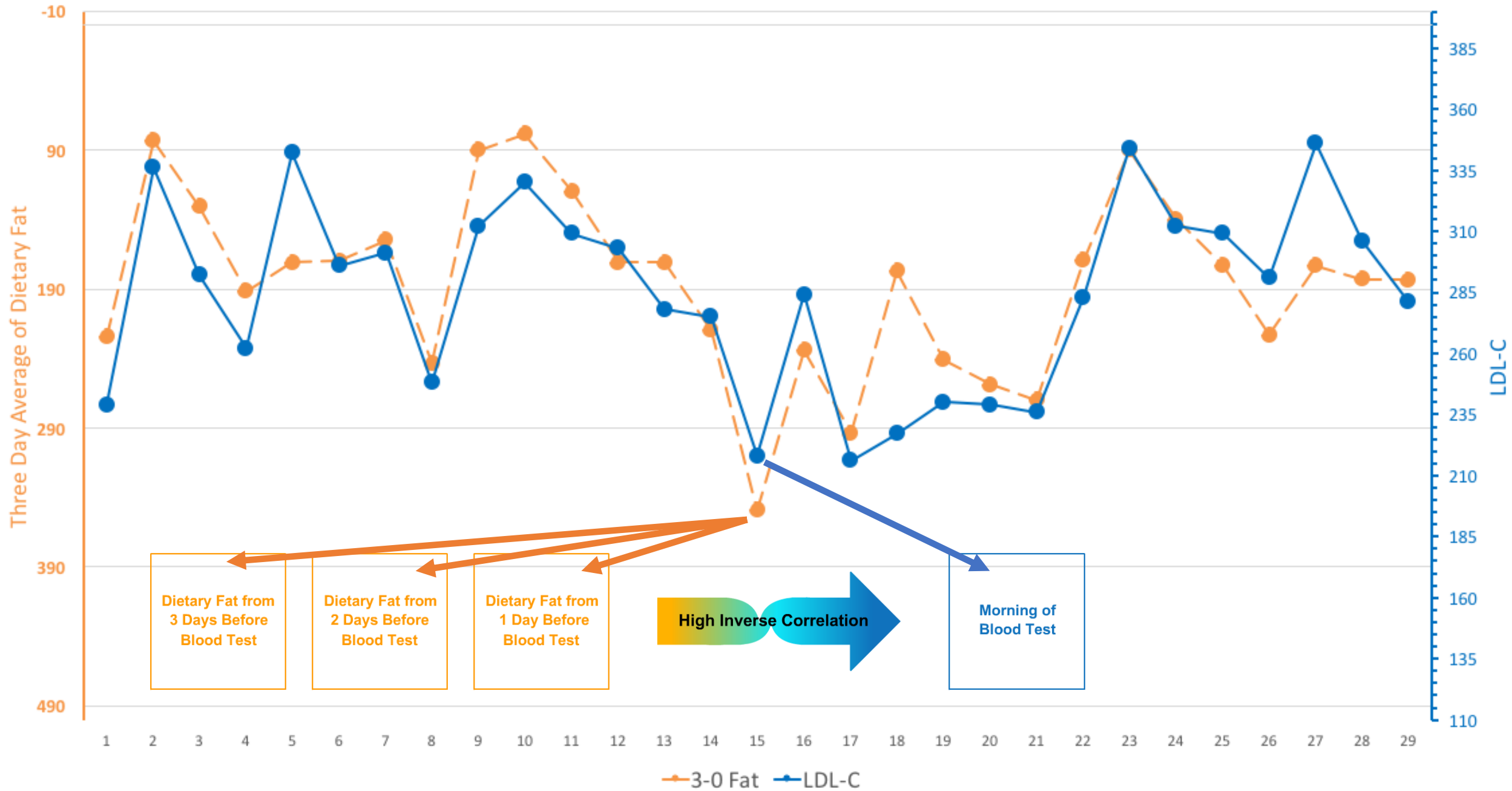
Three Day Average of Dietary Fat vs LDL-C Cholesterol



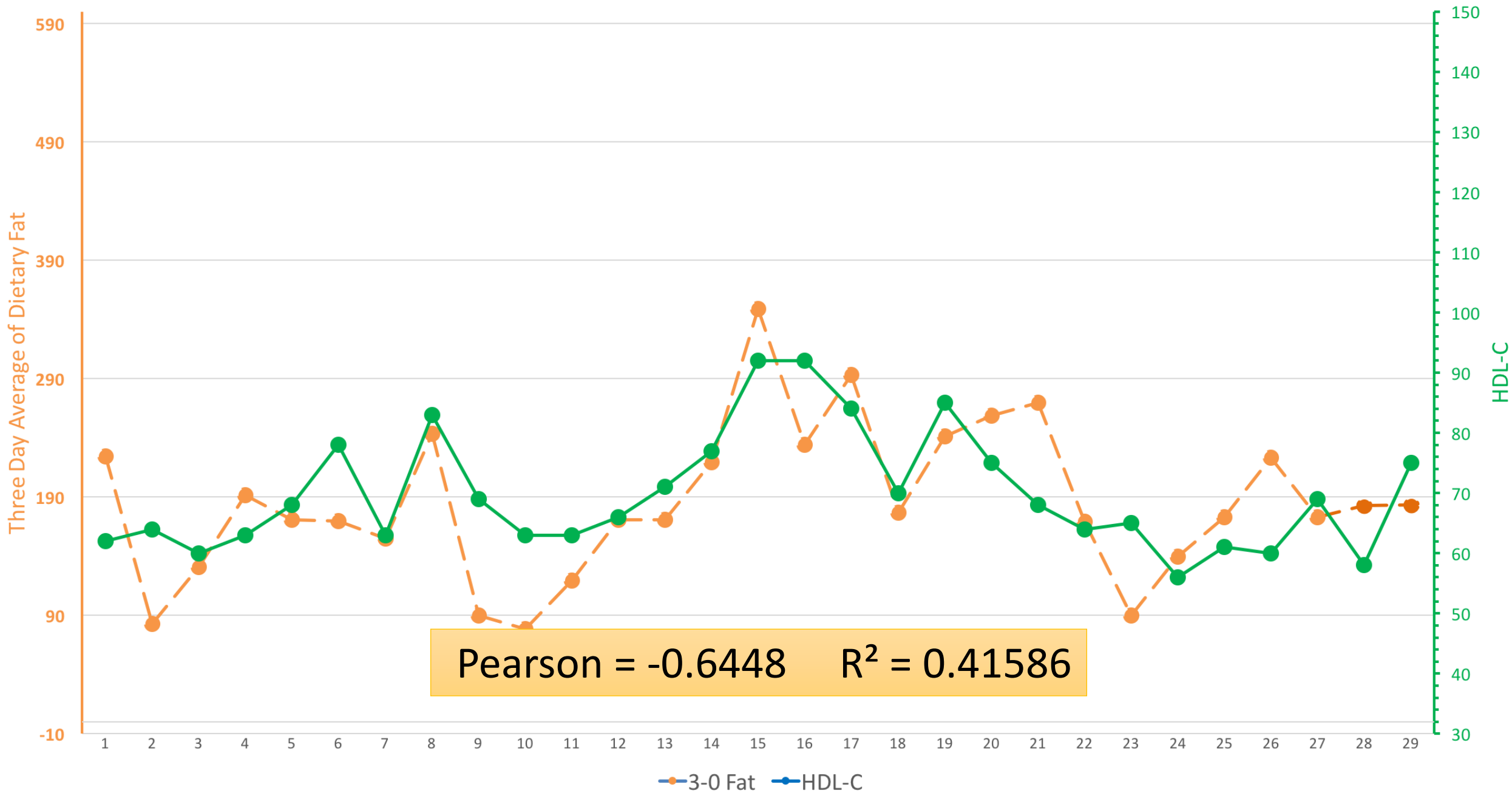
Three Day Average of Dietary Fat *Inverted* vs LDL-C Cholesterol



Three Day Average of Dietary Fat *Inverted* vs LDL-C Cholesterol



Three Day Average of Dietary Fat Inverted vs HDL-C Cholesterol



Dietary Fat Inversion for LDL-P

Three Day Average of Dietary Fat
Before Day of Blood Test

Dietary Fat from
5 Days Before
Blood Test

Dietary Fat from
4 Days Before
Blood Test

Dietary Fat from
3 Day Before
Blood Test

... With a
Two Day Gap

~~Dietary Fat from
2 Days Before
Blood Test~~

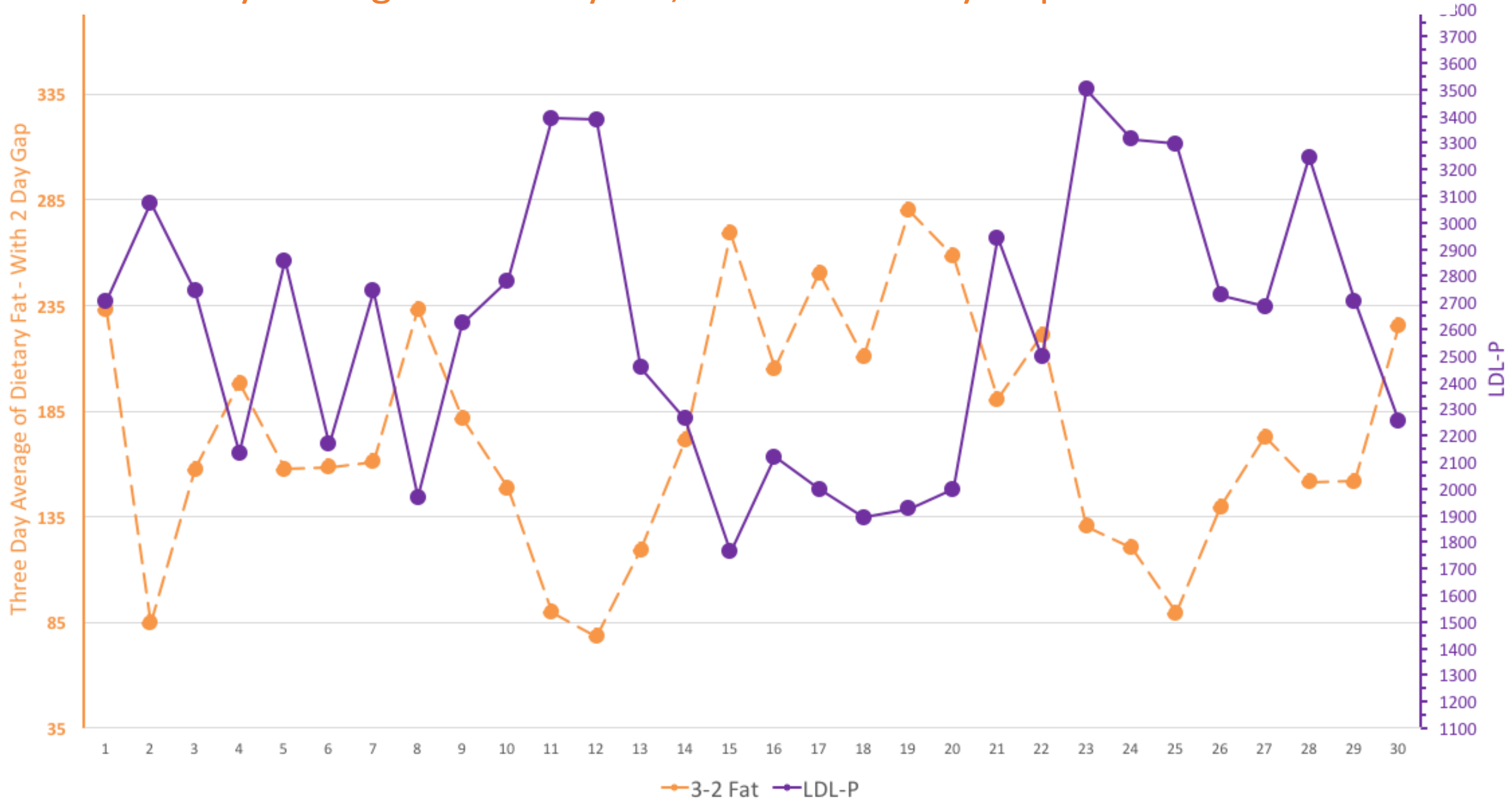
~~Dietary Fat from
1 Day Before
Blood Test~~

High Inverse Correlation

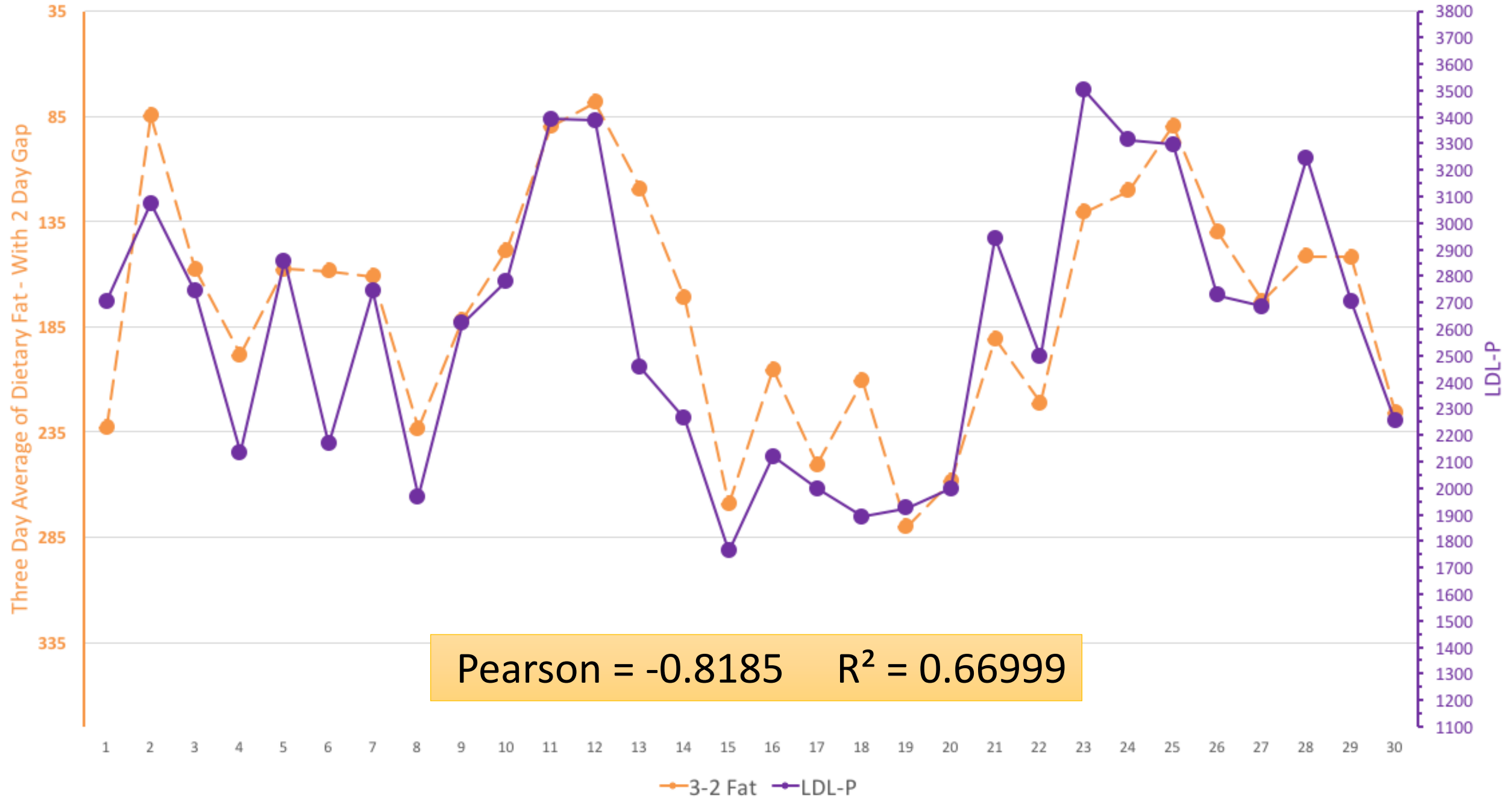
Resulting
LDL-P

Morning of
Blood Test

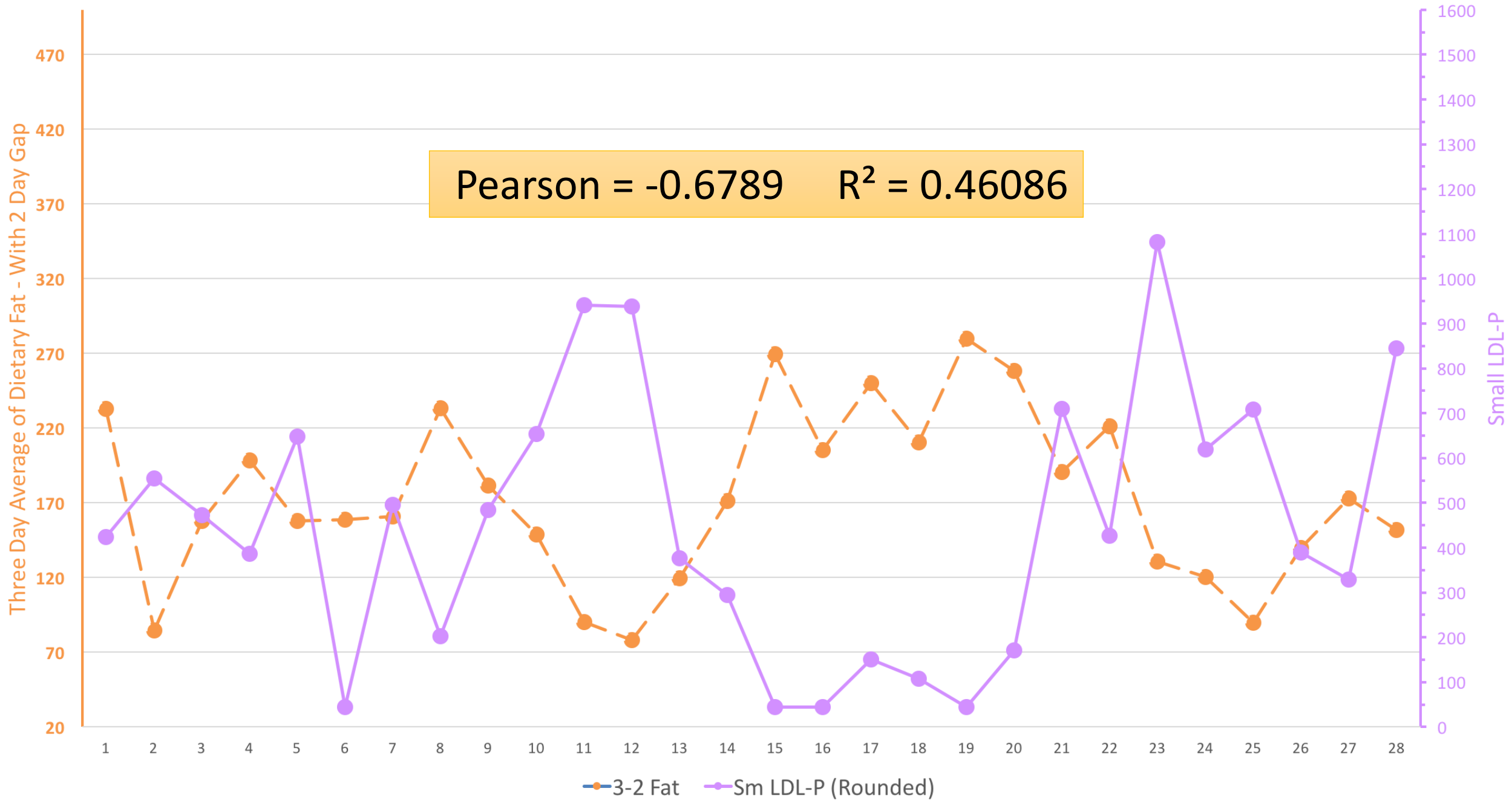
Three Day Average of Dietary Fat, With a Two Day Gap vs LDL-P Cholesterol



Three Day Average of Dietary Fat, With a Two Day Gap *Inverted* vs LDL-P Cholesterol



Three Day Average of Dietary Fat, With a Two Day Gap vs Small LDL-P Cholesterol



The Theory Behind the Inversion

It's About the *Energy*, Not the *Cholesterol*

What everyone on a LCHF diet should know...

- A Low Density Lipoprotein has *many* jobs.
- But its *primary* job is to distribute energy from fat.

What everyone on a LCHF diet should know...

- A Low Density Lipoprotein has *many* jobs.
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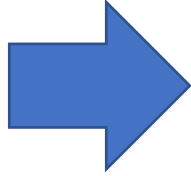
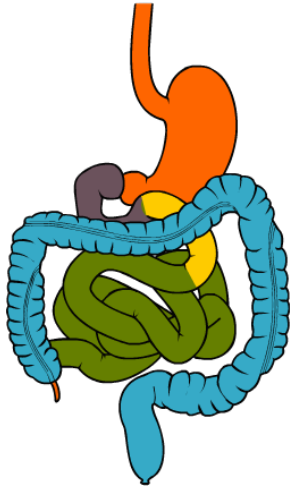
**Boat
(LDL-P)**

**Passengers
(Trigs)**

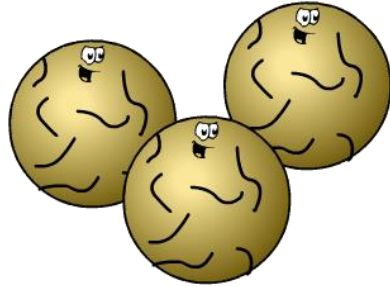


Liferafts (LDL-C)

Gut



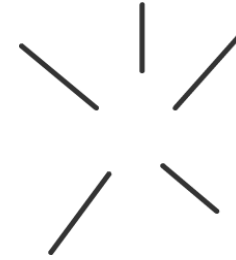
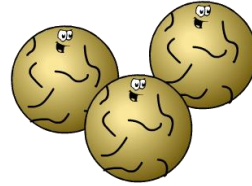
Chylomicrons



**Fat-Based Energy
From Food**



**Chylomicrons
Remnants**



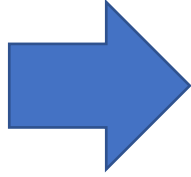
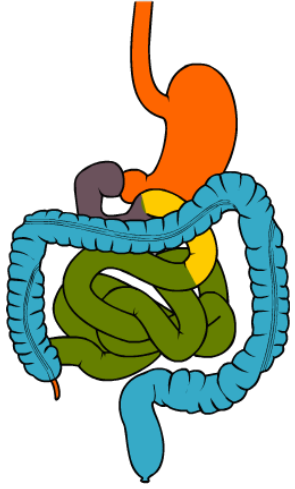
0-60 Minutes

1-5 Hours

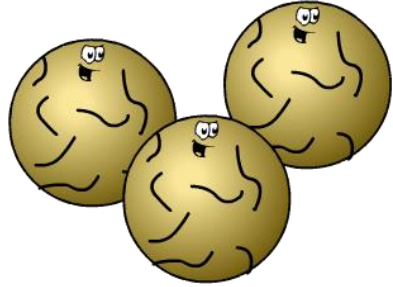
6-12 Hours

12 hours to 4 Days

Gut



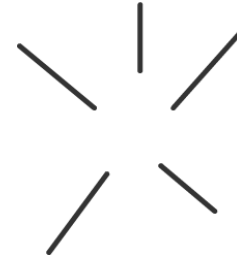
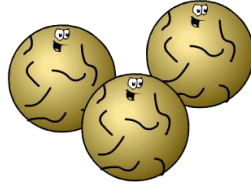
Chylomicrons



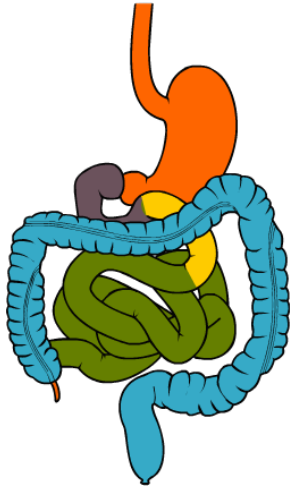
**Fat-Based Energy
From Food**



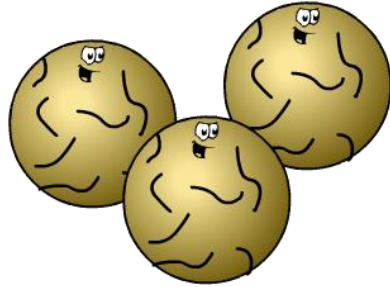
**Chylomicrons
Remnants**



Gut

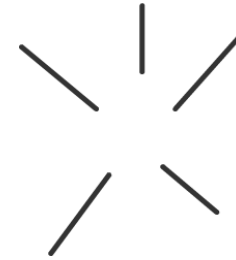
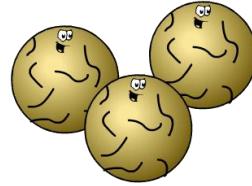


Chylomicrons

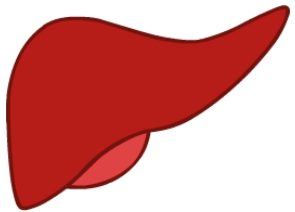


**Fat-Based Energy
From Food**

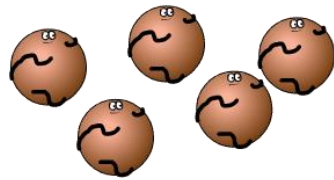
Chylomicrons Remnants



Liver

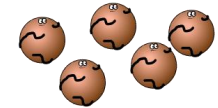
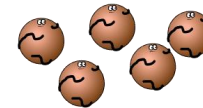


VLDLs



**Fat-Based Energy
From Storage**

LDLs



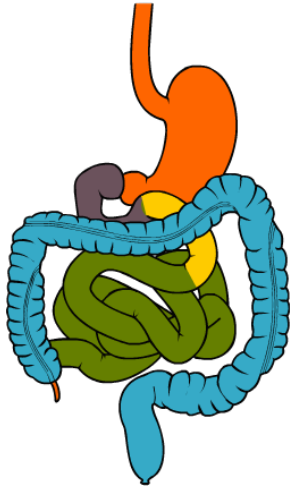
0-60 Minutes

1-5 Hours

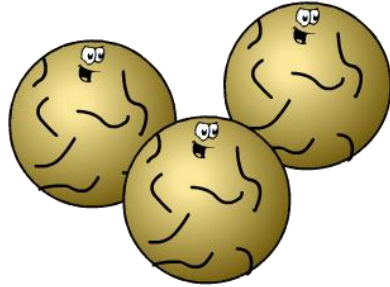
6-12 Hours

12 hours to 4 Days

Gut

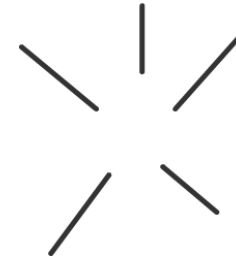
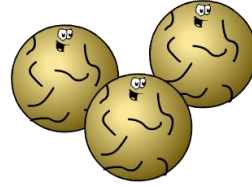


Chylomicrons

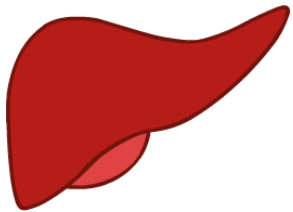


Fat-Based Energy
From Food

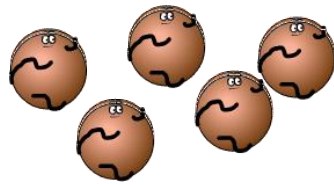
Chylomicrons Remnants



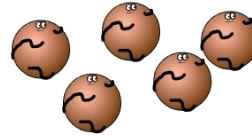
Liver



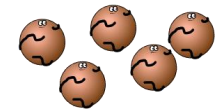
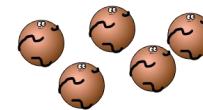
VLDLs



Fat-Based Energy
From Storage



LDLs



0-60 Minutes

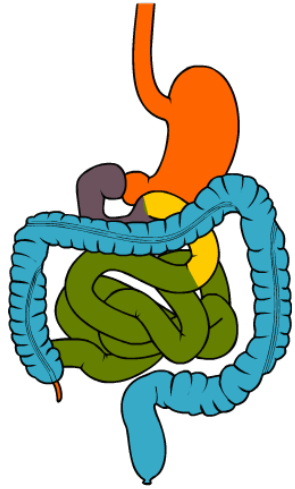
1-5 Hours

6-12 Hours

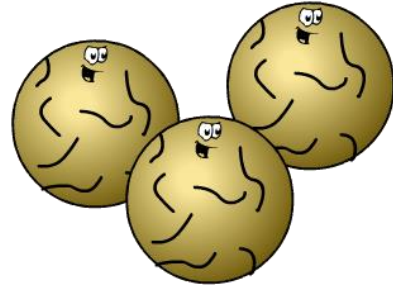
12 hours to 4 Days



Gut

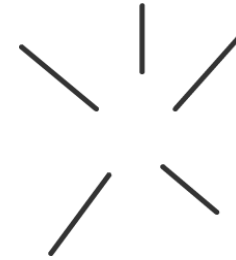
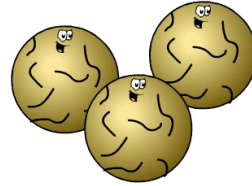


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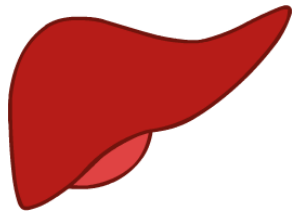


Fat-Based Energy
From Food

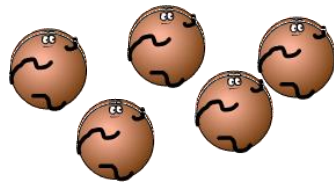
Chylomicrons Remnants



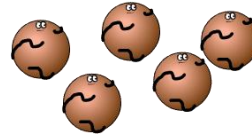
Liver



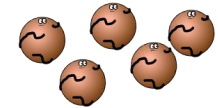
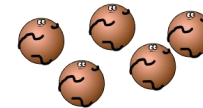
VLDLs



Fat-Based Energy
From Storage



LDLs



0-60 Minutes

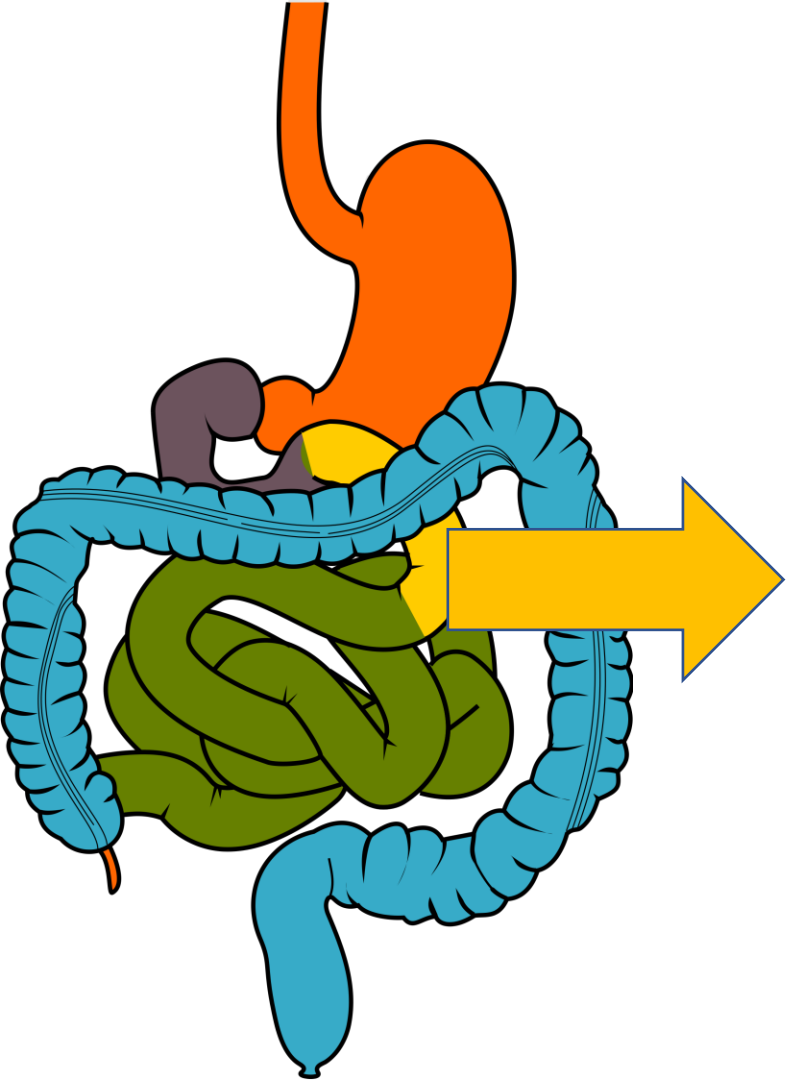
1-5 Hours

6-12 Hours

12 hours to 4 Days

Blood Test

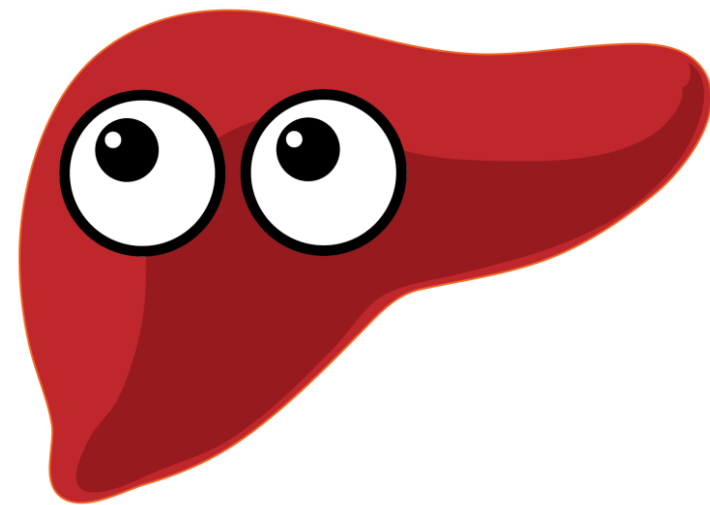


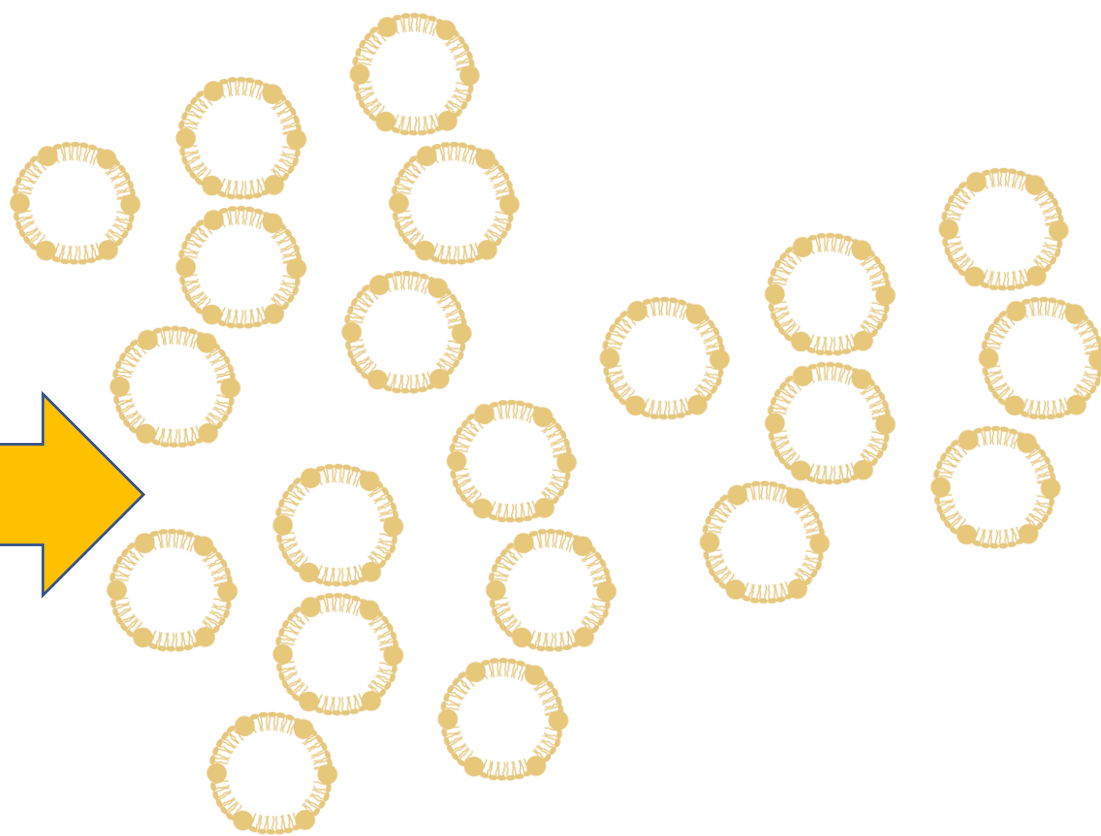
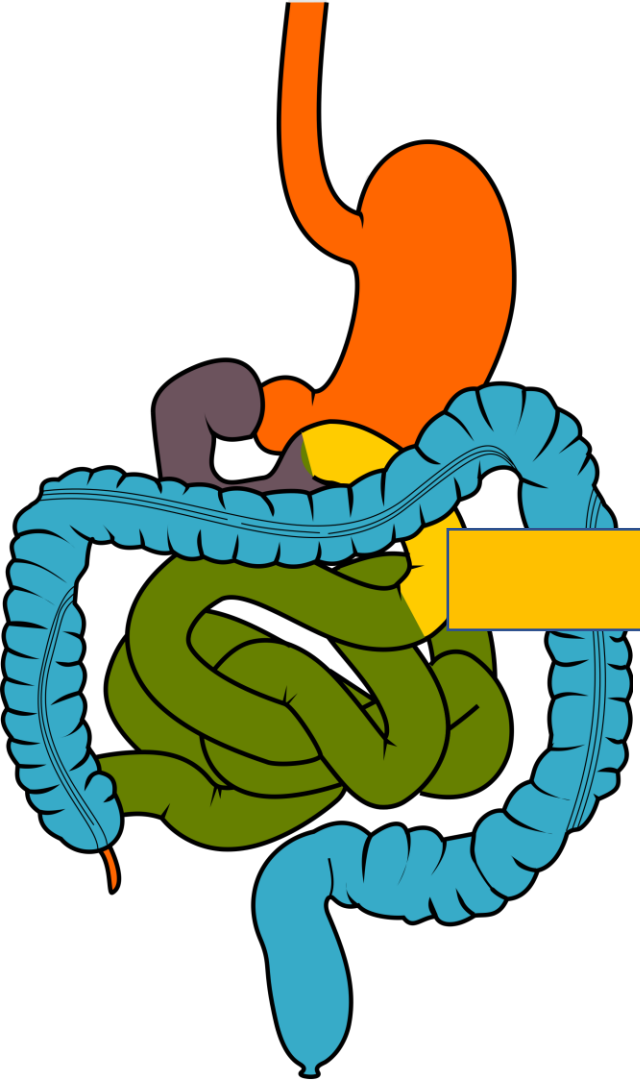


Day 1
?

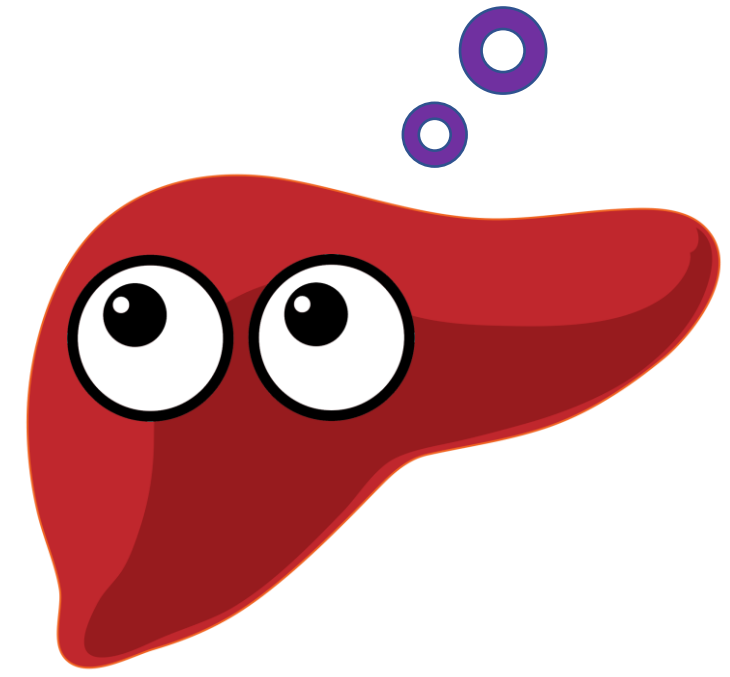
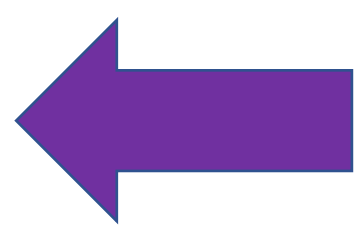
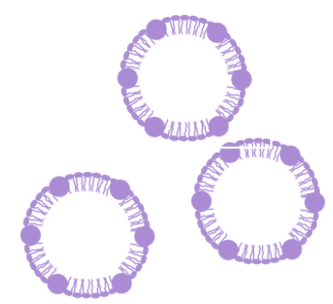
Day 2
?

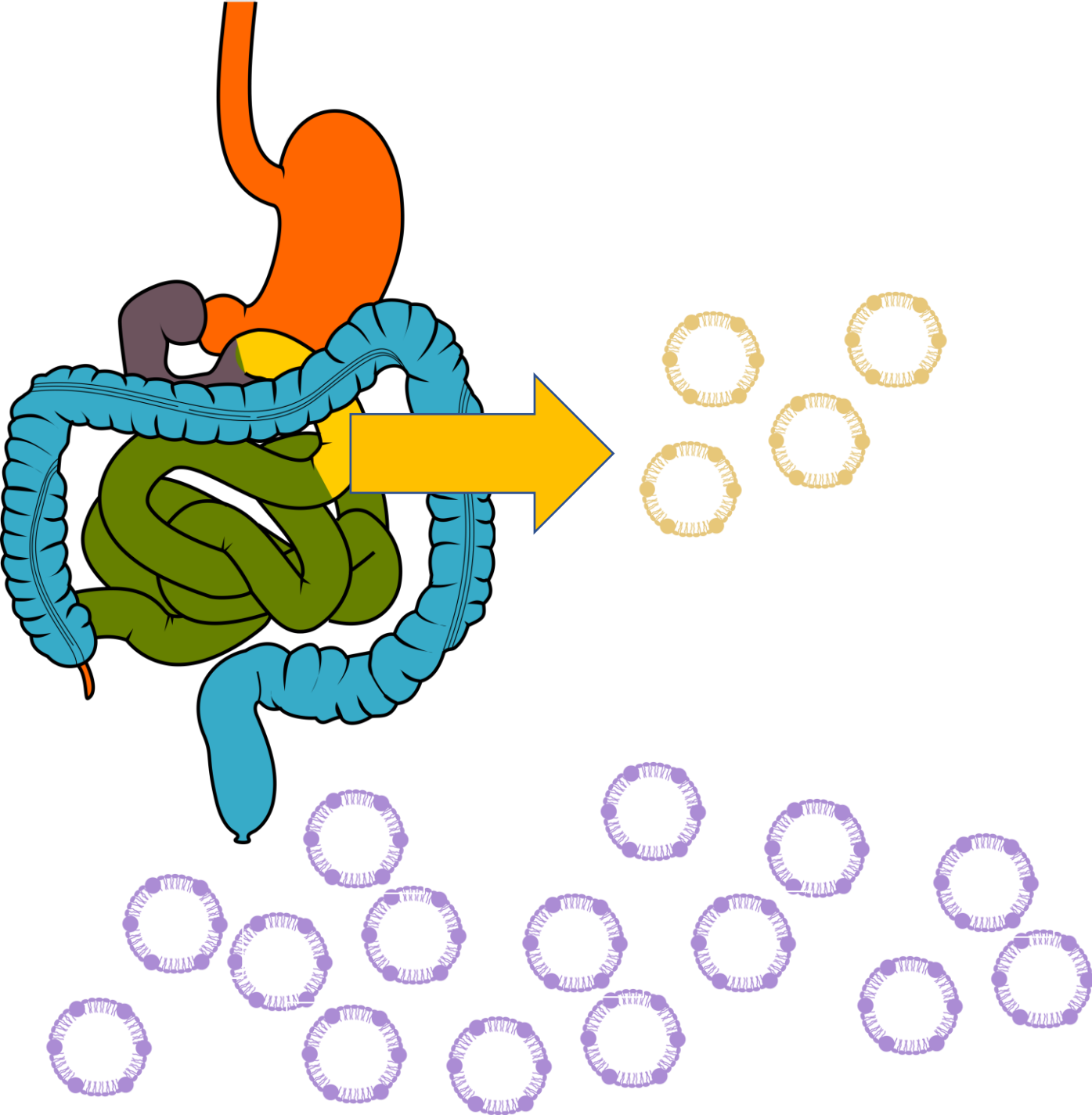
Day 3
?



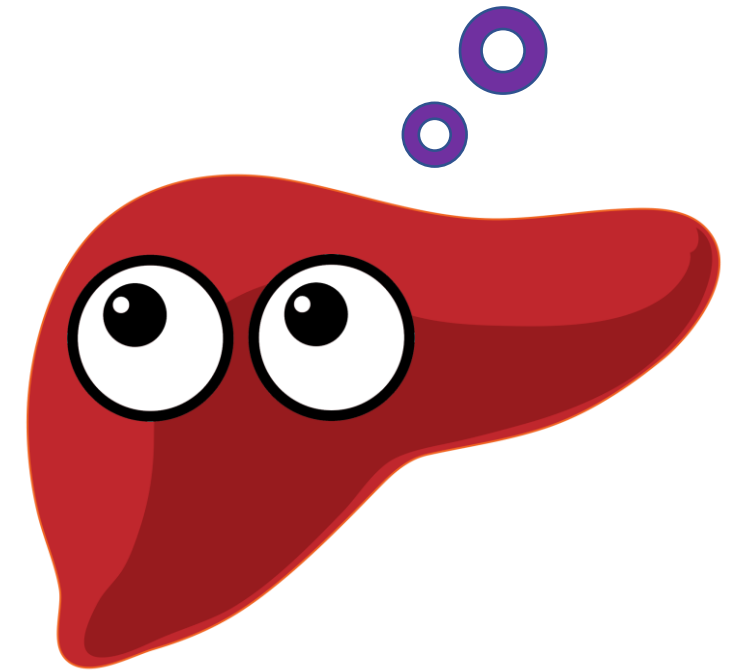


Lots and Lots of incoming energy
from the
GI Tract...
I guess I'll
Downregulate





Very Little
incoming energy
from the
GI Tract...
I guess I'll
Upregulate



Identical Diet Experiment

A.K.A. 2X the Cooking, 10X the Science

Darla Walker

Age 49, 5'3, 142lb

Total Cholesterol: 230

LDL Cholesterol: **152**



Dave Feldman

Age 43, 6'3, 173lb

Total Cholesterol: 372

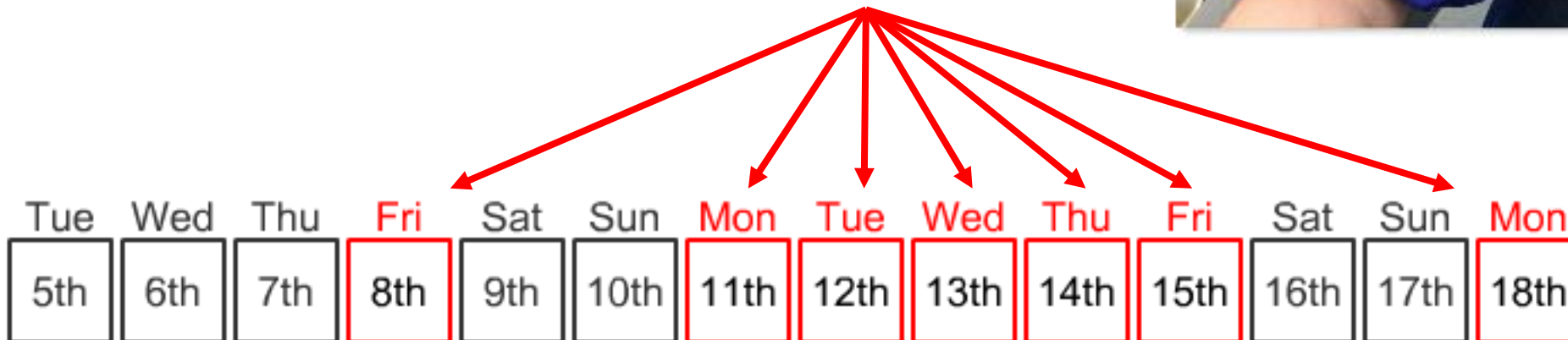
LDL Cholesterol: **280**

Identical Food, Identical Blood Draws



We each ate exactly the same food at exactly the same time for 13 days in a row.

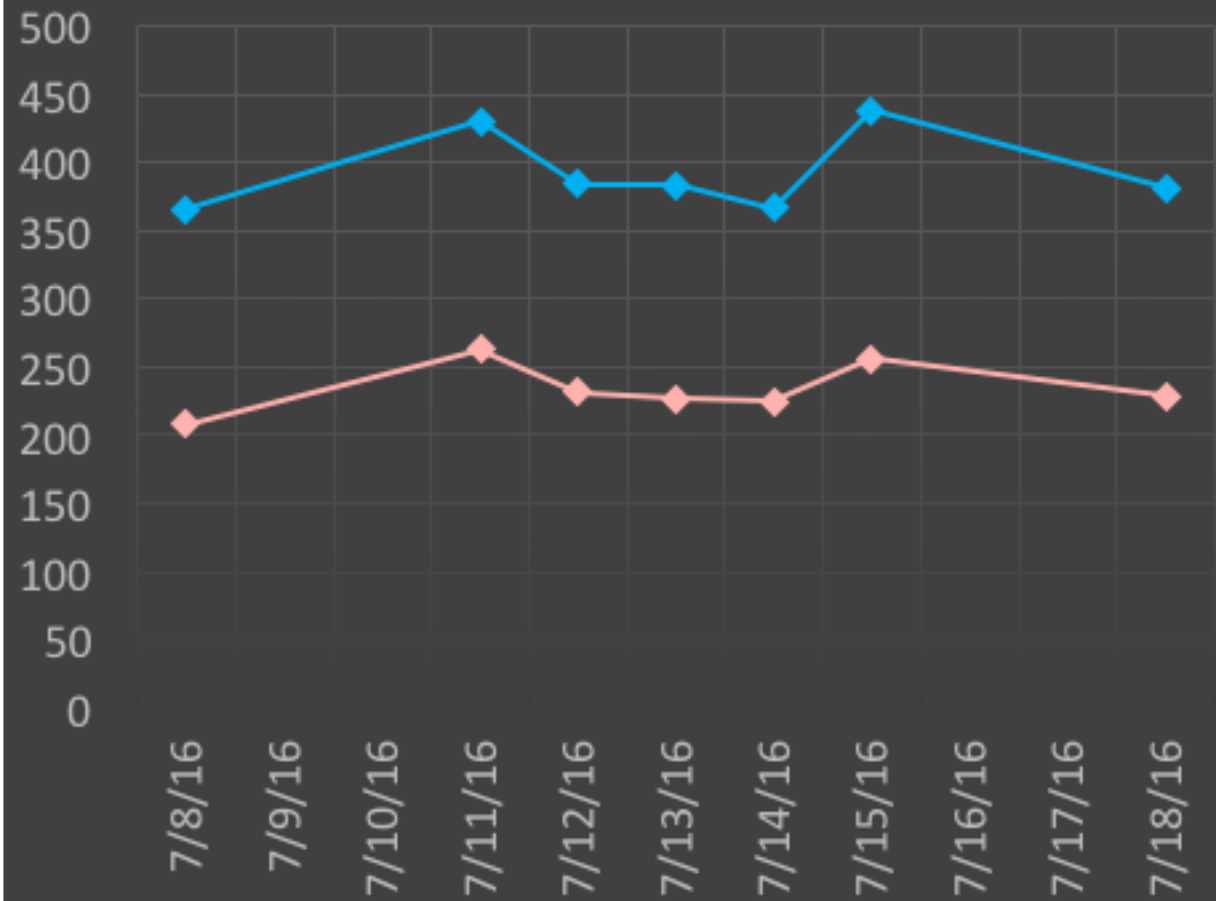
We had our blood drawn at the same time as well.



Total Cholesterol

TC : Absolute Comparison

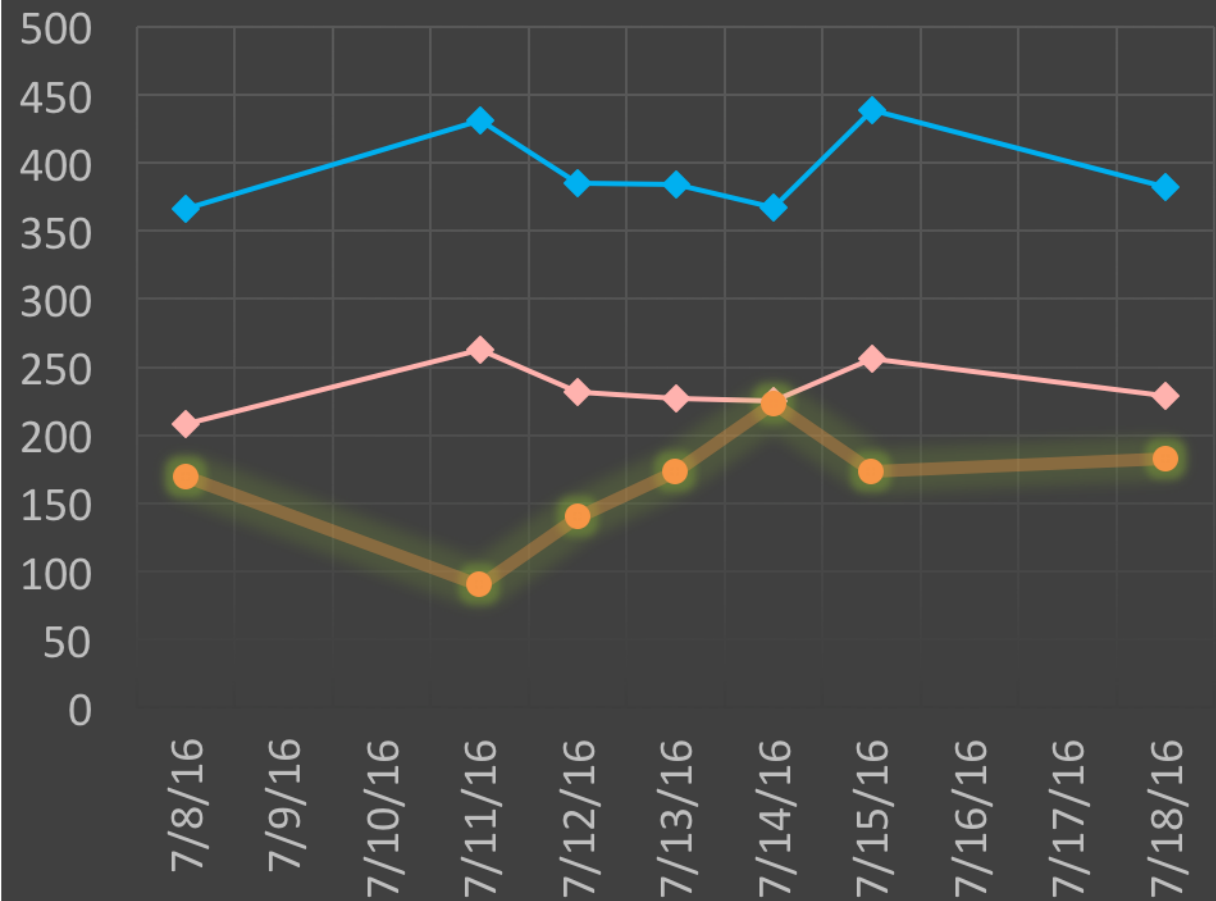
◆ Total Chol Darla ◆ Total Chol Dave



Total Cholesterol

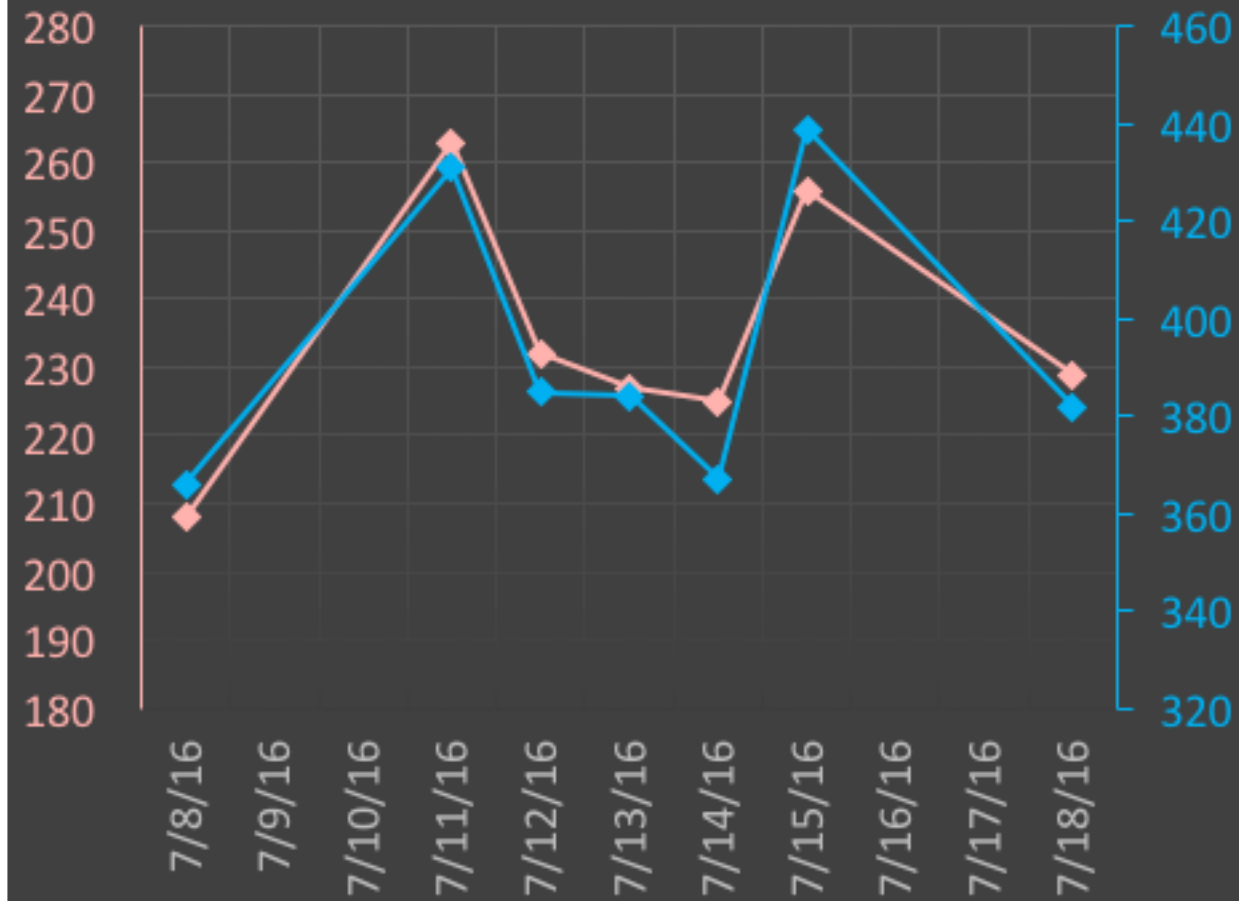
TC : Absolute Comparison

◆ Total Chol Darla ◆ Total Chol Dave ● 3-0 Fat



TC : Relative Comparison

◆ Total Chol Darla ◆ Total Chol Dave

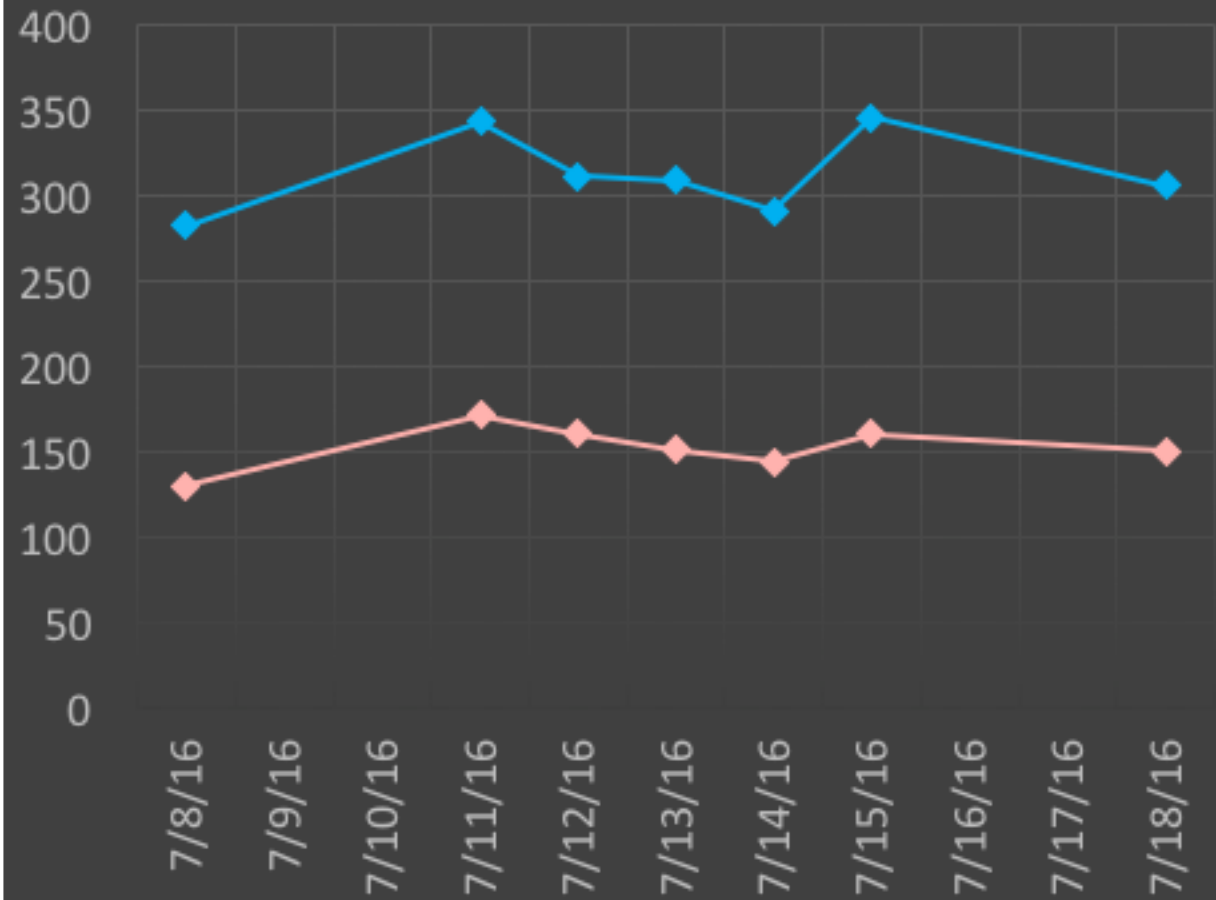


Pearson = 0.9472 R² = 0.89721

LDL Cholesterol

LDL-C : Absolute Comparison

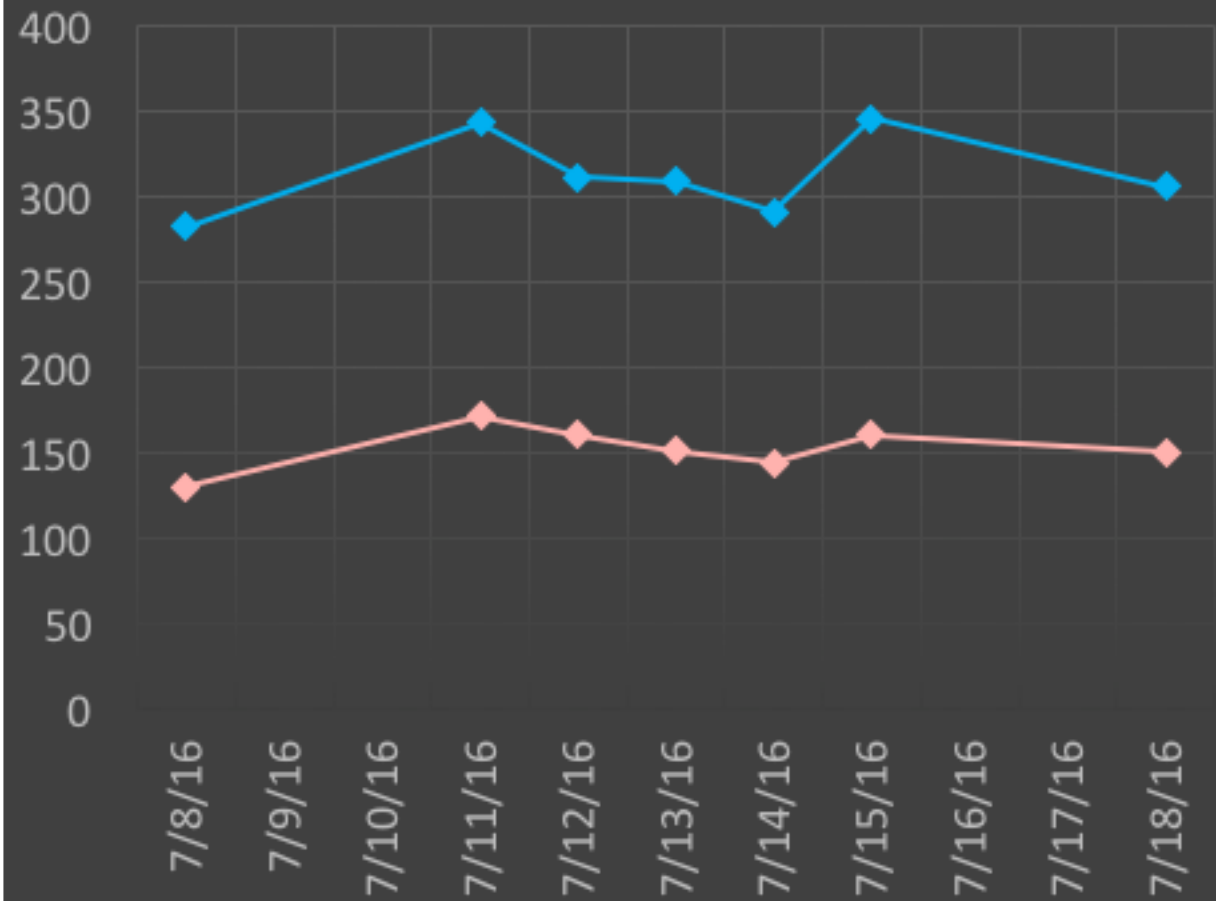
LDL-C Darla LDL-C Dave



LDL Cholesterol

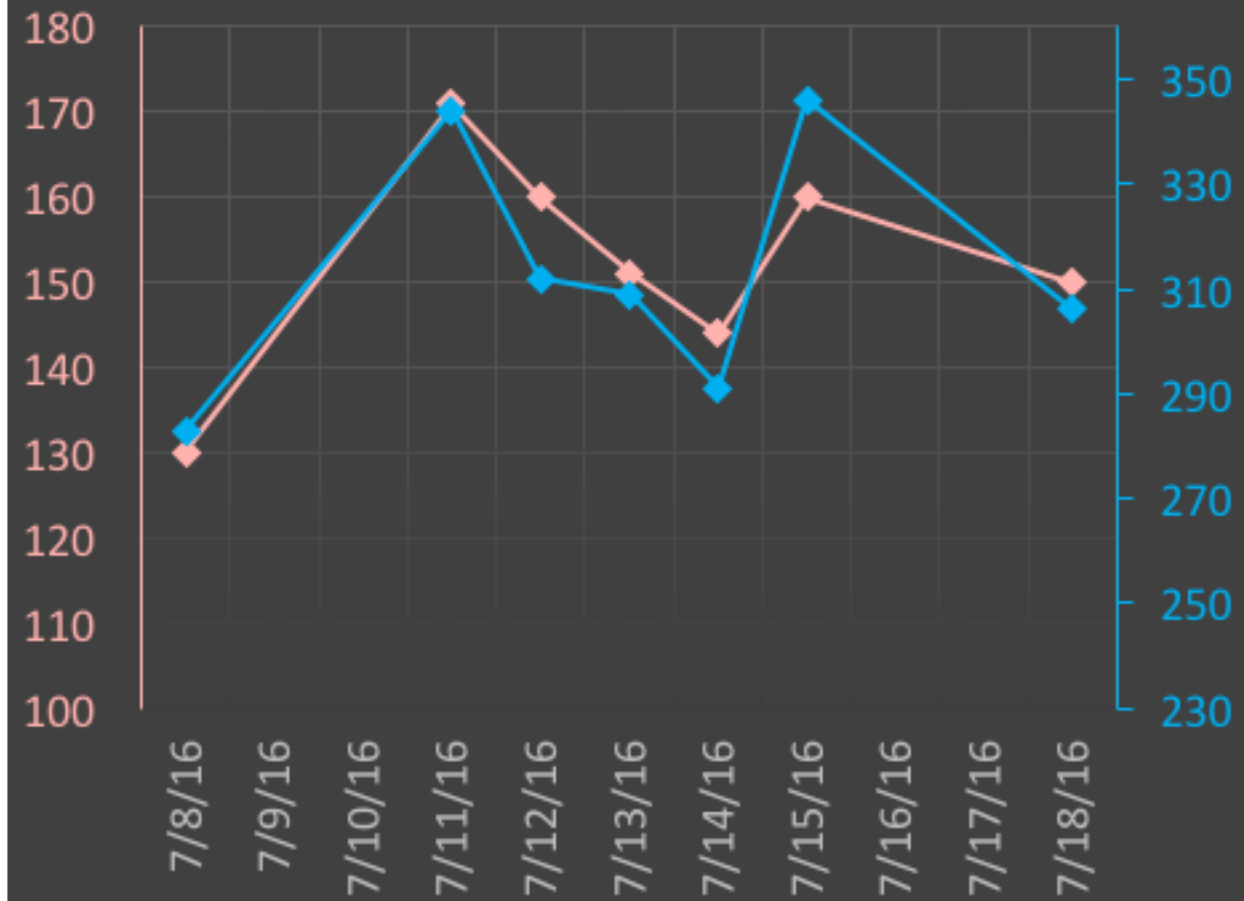
LDL-C : Absolute Comparison

◆ LDL-C Darla ◆ LDL-C Dave



LDL-C : Relative Comparison

◆ LDL-C Darla ◆ LDL-C Dave

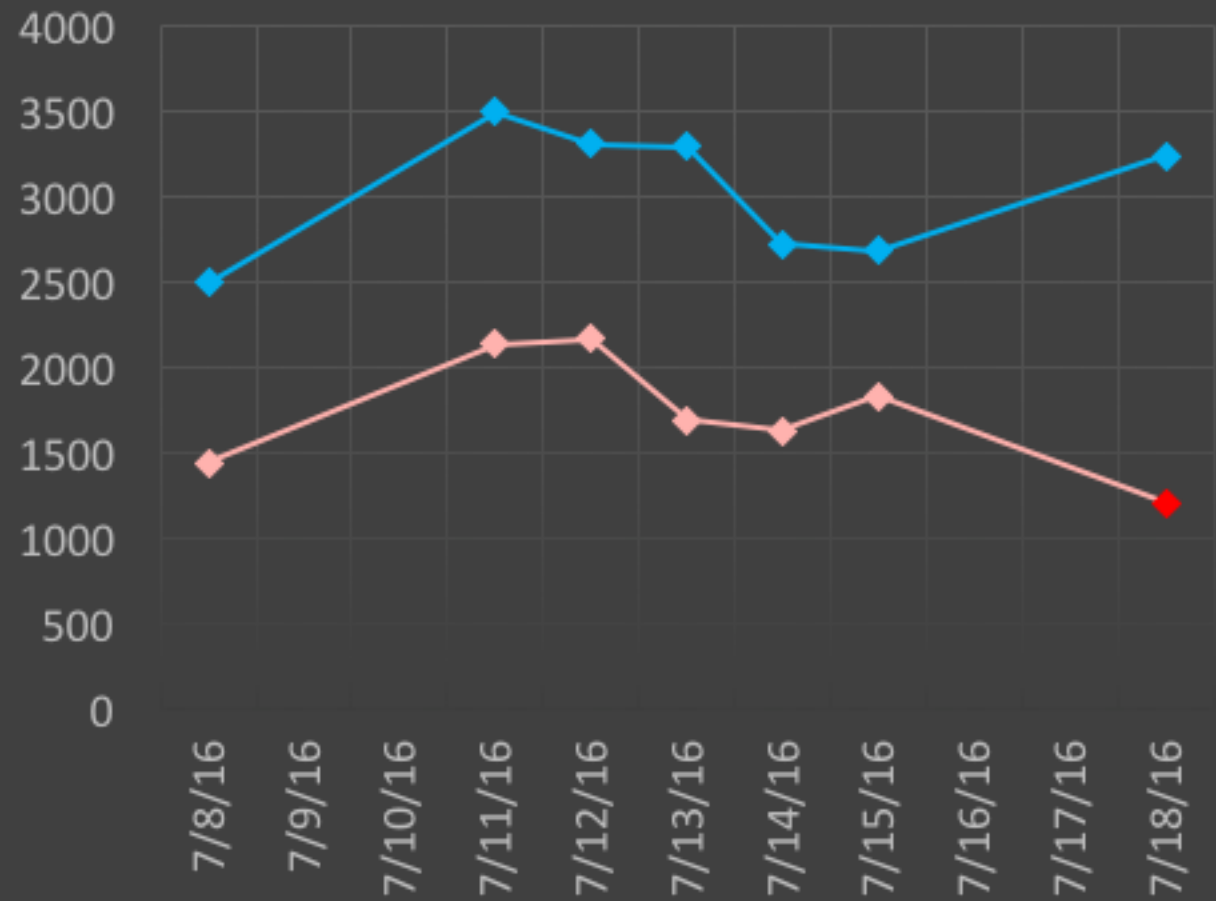


Pearson = 0.8899 $R^2 = 0.79193$

LDL Particle Count

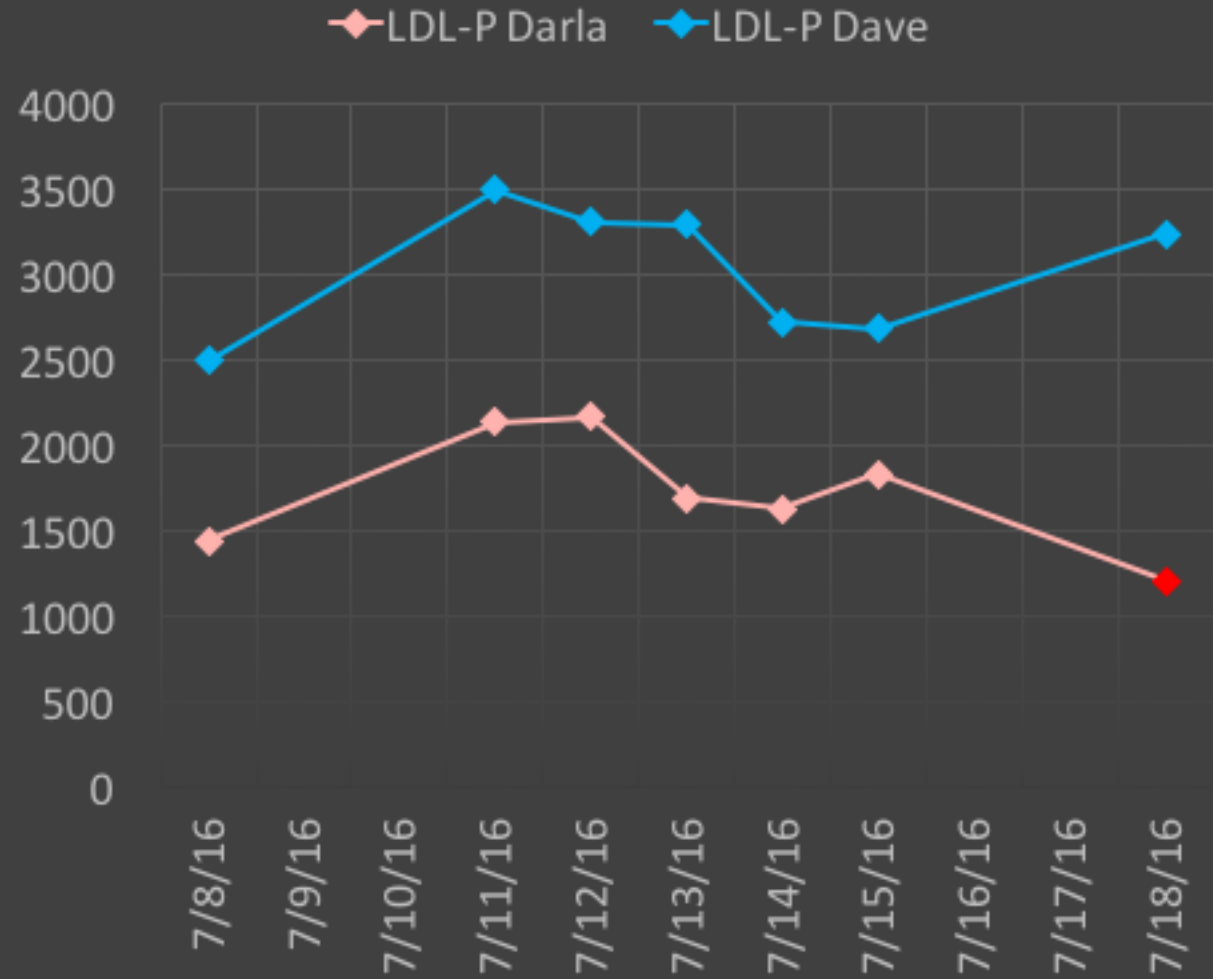
LDL-P : Absolute Comparison

LDL-P Darla LDL-P Dave

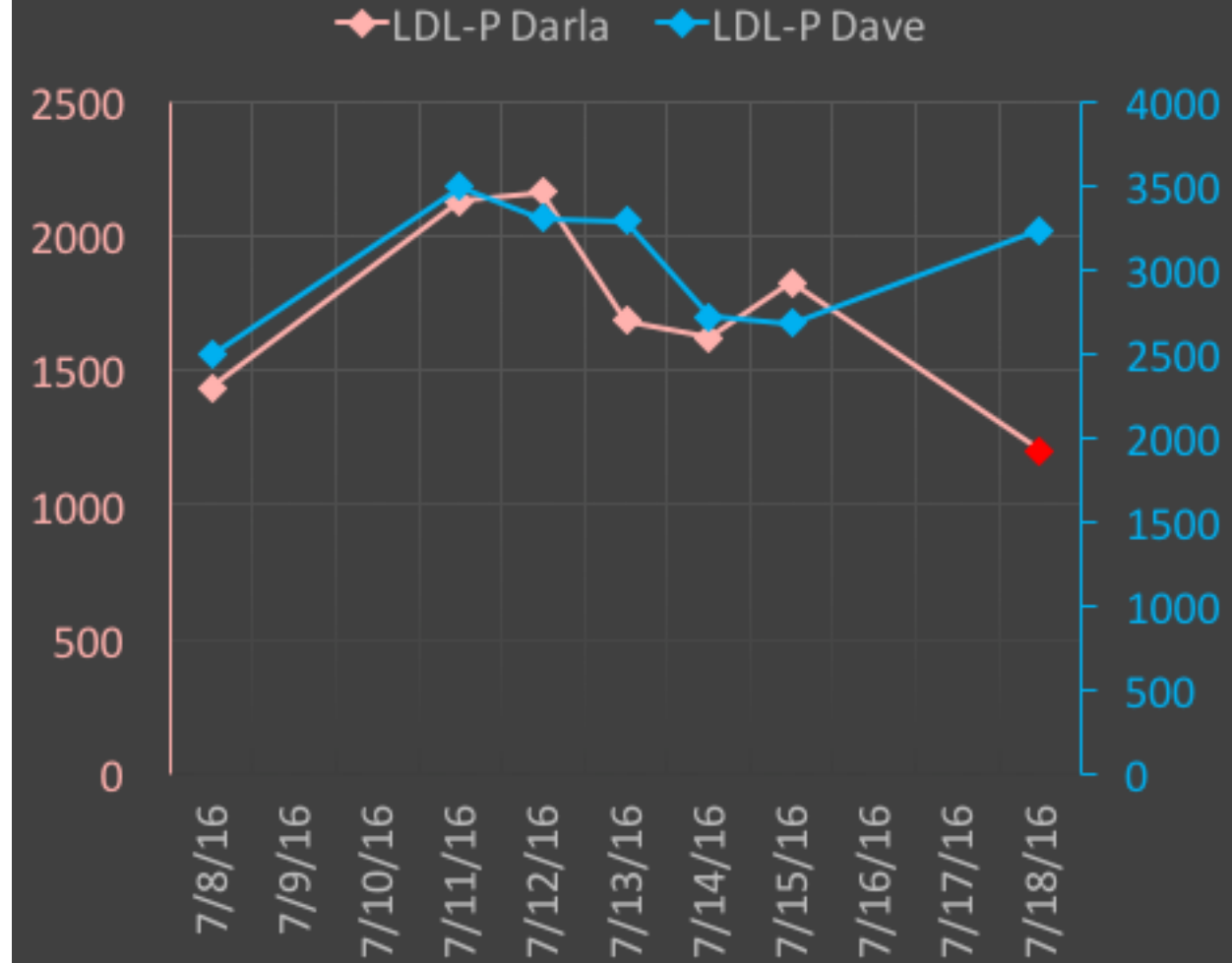


LDL Particle Count

LDL-P : Absolute Comparison



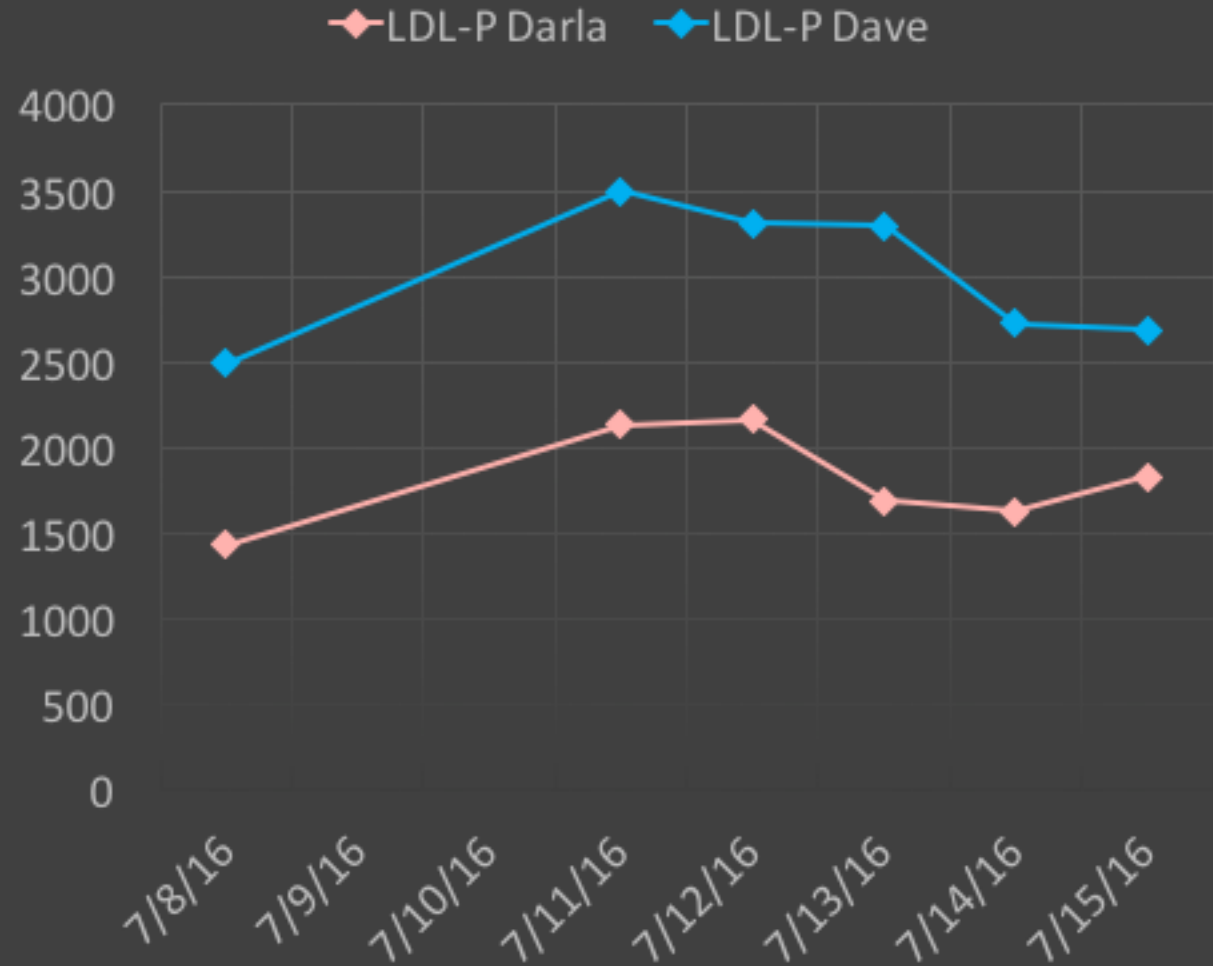
LDL-P : Relative Comparison



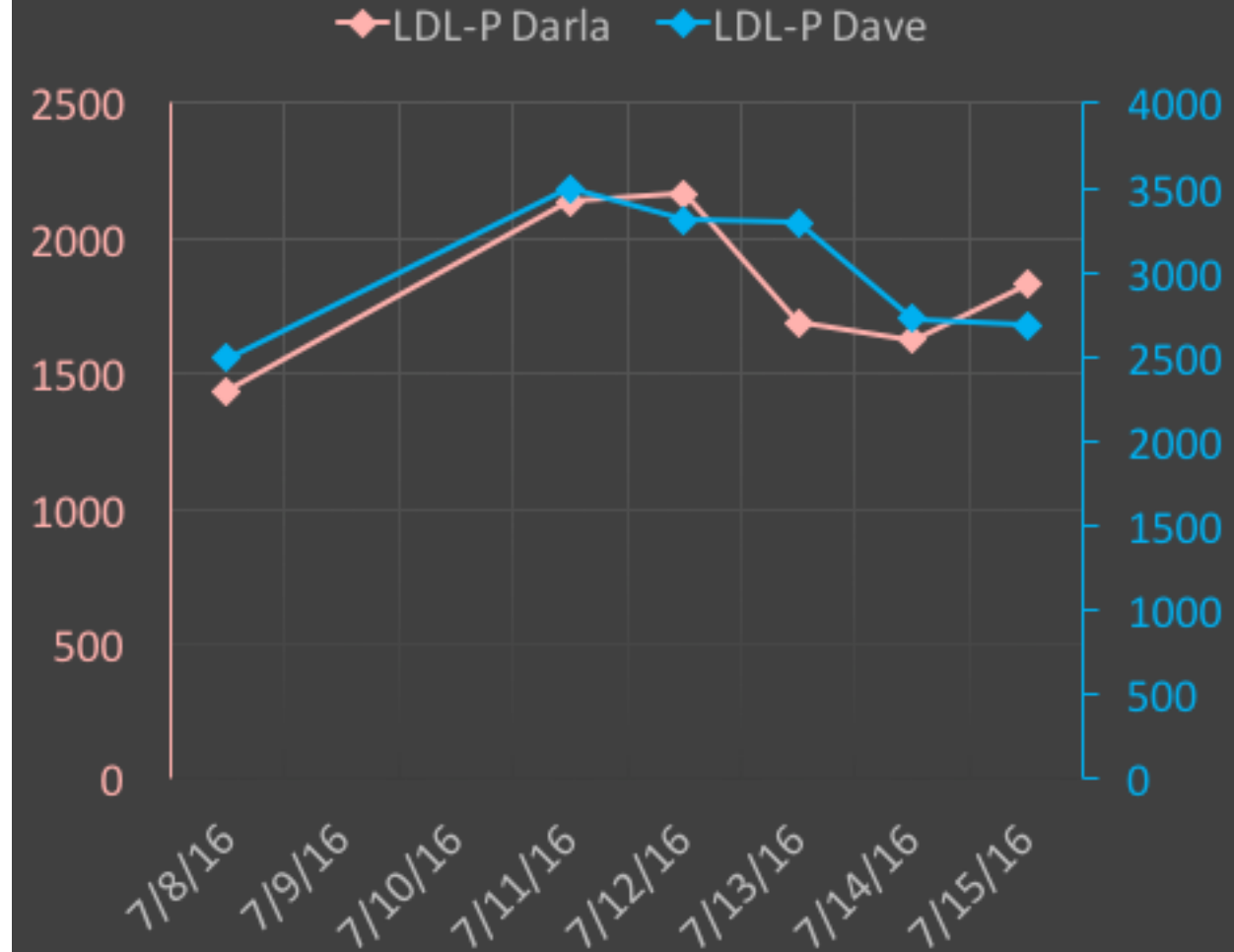
Pearson = 0.4159 $R^2 = 0.17295$

LDL Particle Count (Excluding 7/18/16)

LDL-P : Absolute Comparison



LDL-P : Relative Comparison

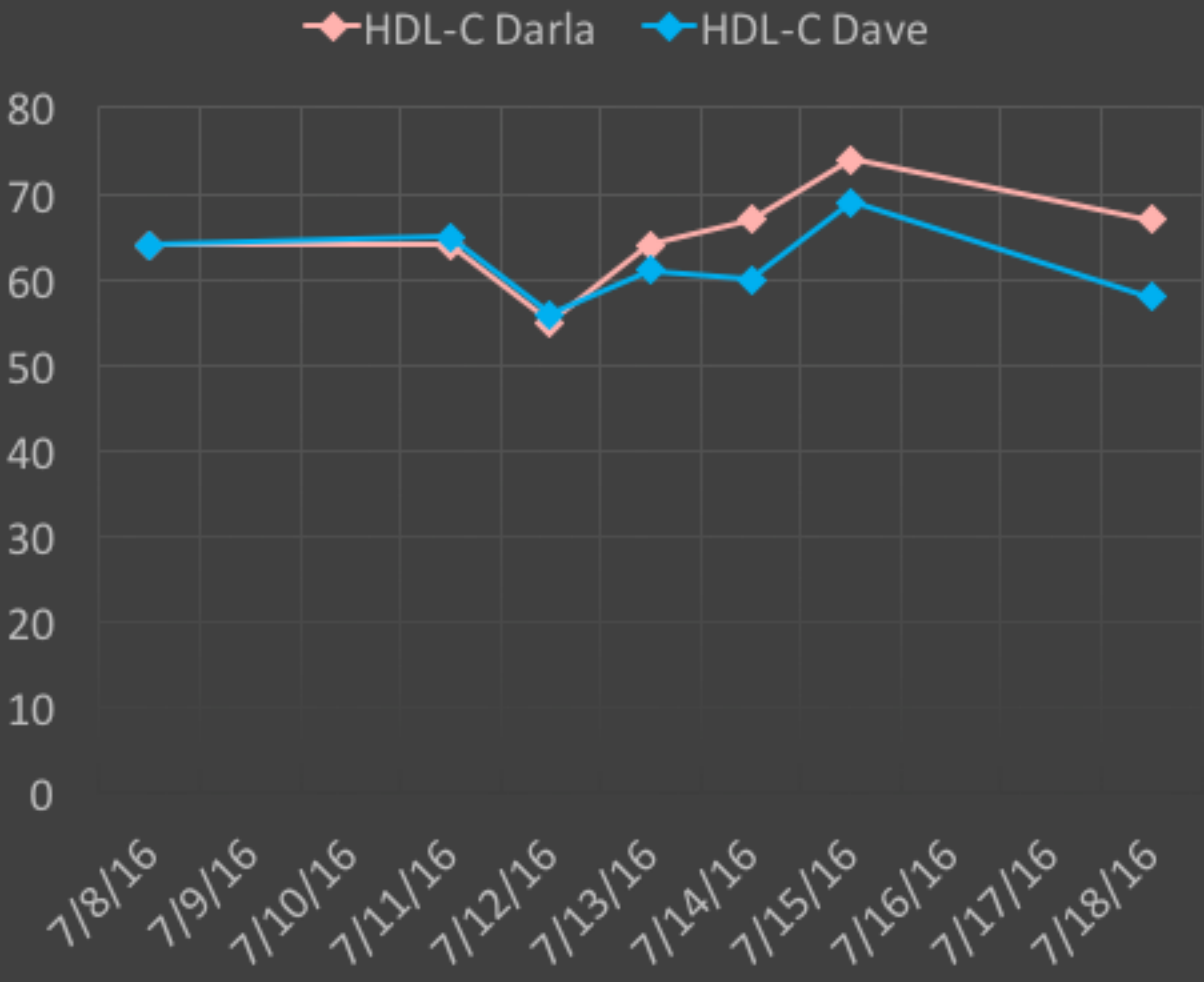


Pearson = 0.78 $R^2 = 0.60843$

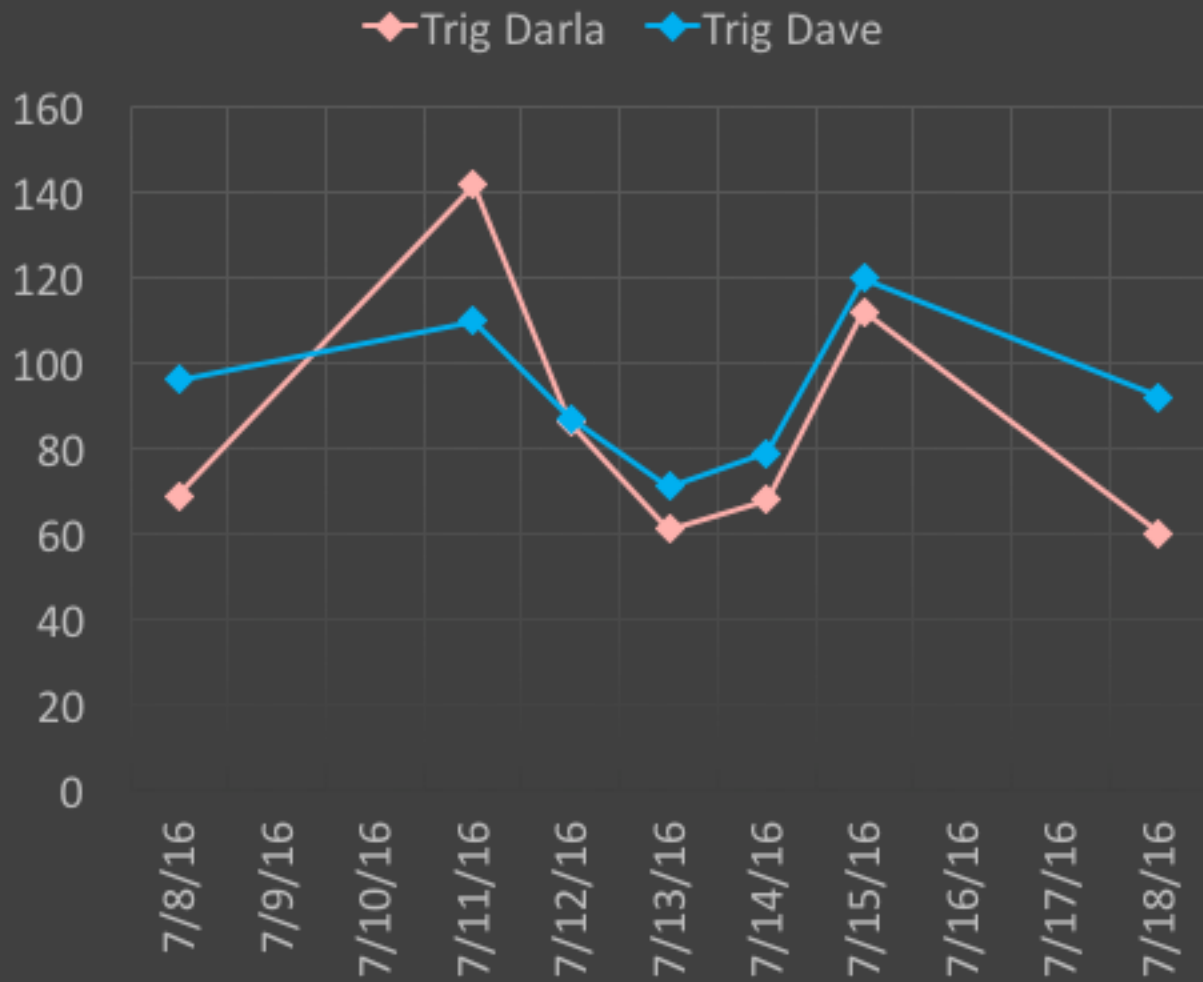
HDL Cholesterol

Triglycerides

HDL-C : Absolute Comparison



Trig : Absolute Comparison

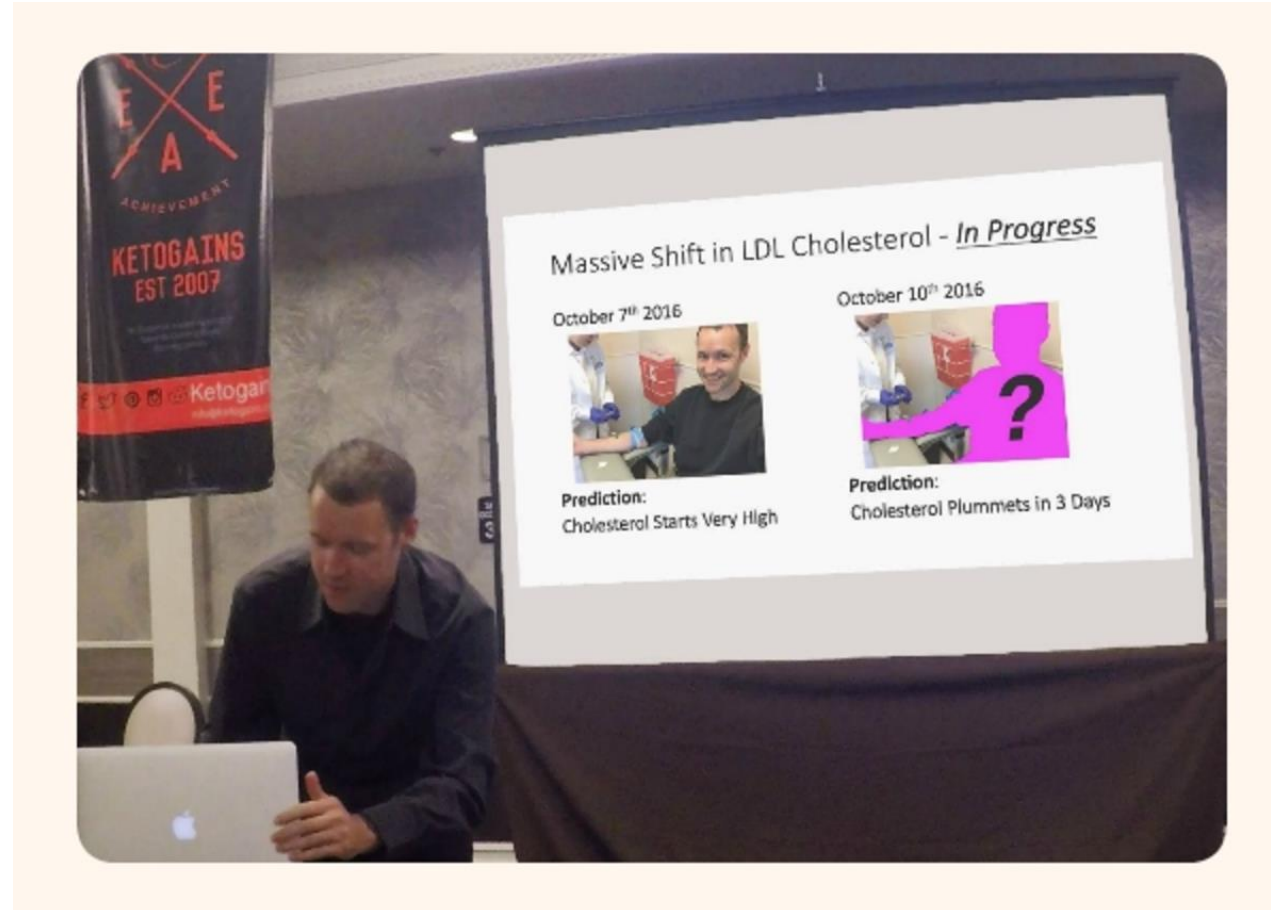


Pearson = 0.7083 $R^2 = 0.59392$

Pearson = 0.7707 $R^2 = 0.59392$

The Extreme Drop Experiment

Ketogains Seminar, October 9th, 2016



Timeline

4th

October 4th, 5th, & 6th

5th

Average day of food for
three days prior to test:



Calories: 748

Fat: 63g

Saturated Fat: 24g

6th

Friday Morning Blood Test

7th

7th

October 7th, 8th, & 9th

Average day of food for
three days prior to test:



Calories: 5,048

Fat: 461g

Saturated Fat: 274g

8th

9th

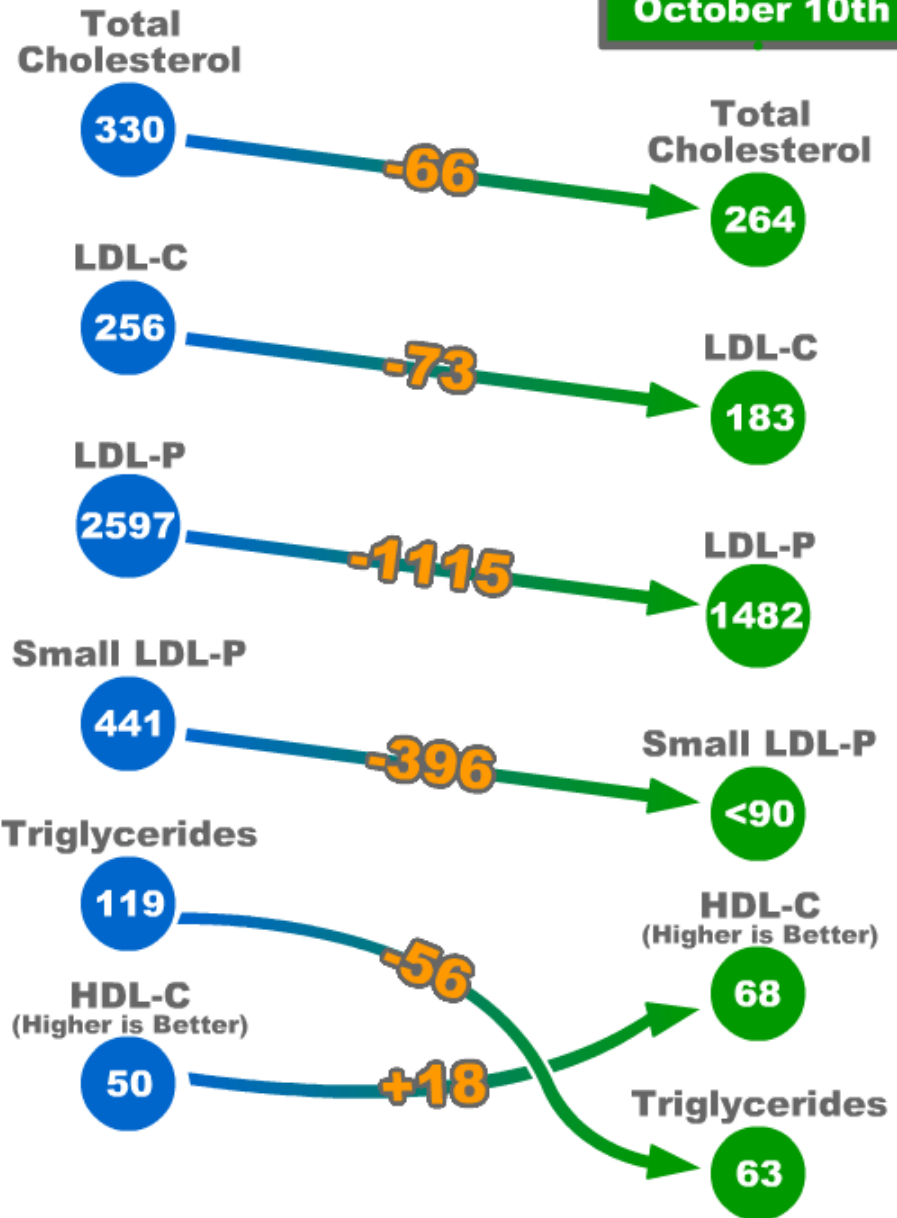
Monday Morning Blood Test

10th

October 7th

Difference

October 10th

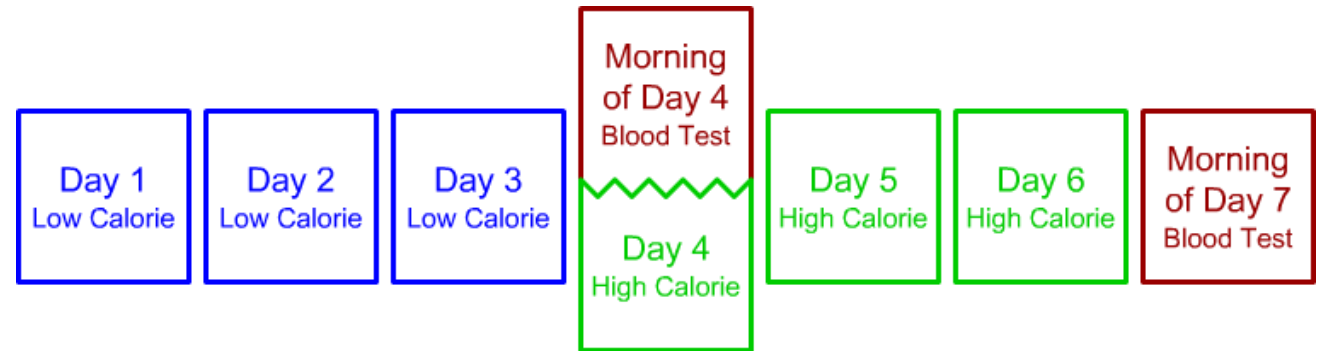


The Cholesterol Drop Protocol (A.K.A. The “Feldman Protocol”)

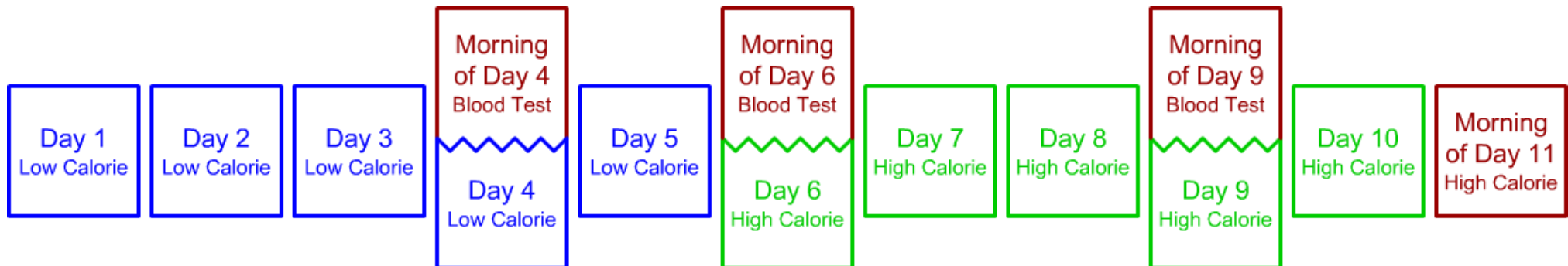
Option 1 - Three and a Half Days, One Blood Test



Option 2 - Six and a Half Days, Two Blood Tests



Option 3 - Ten and a Half Days, Four Blood Tests



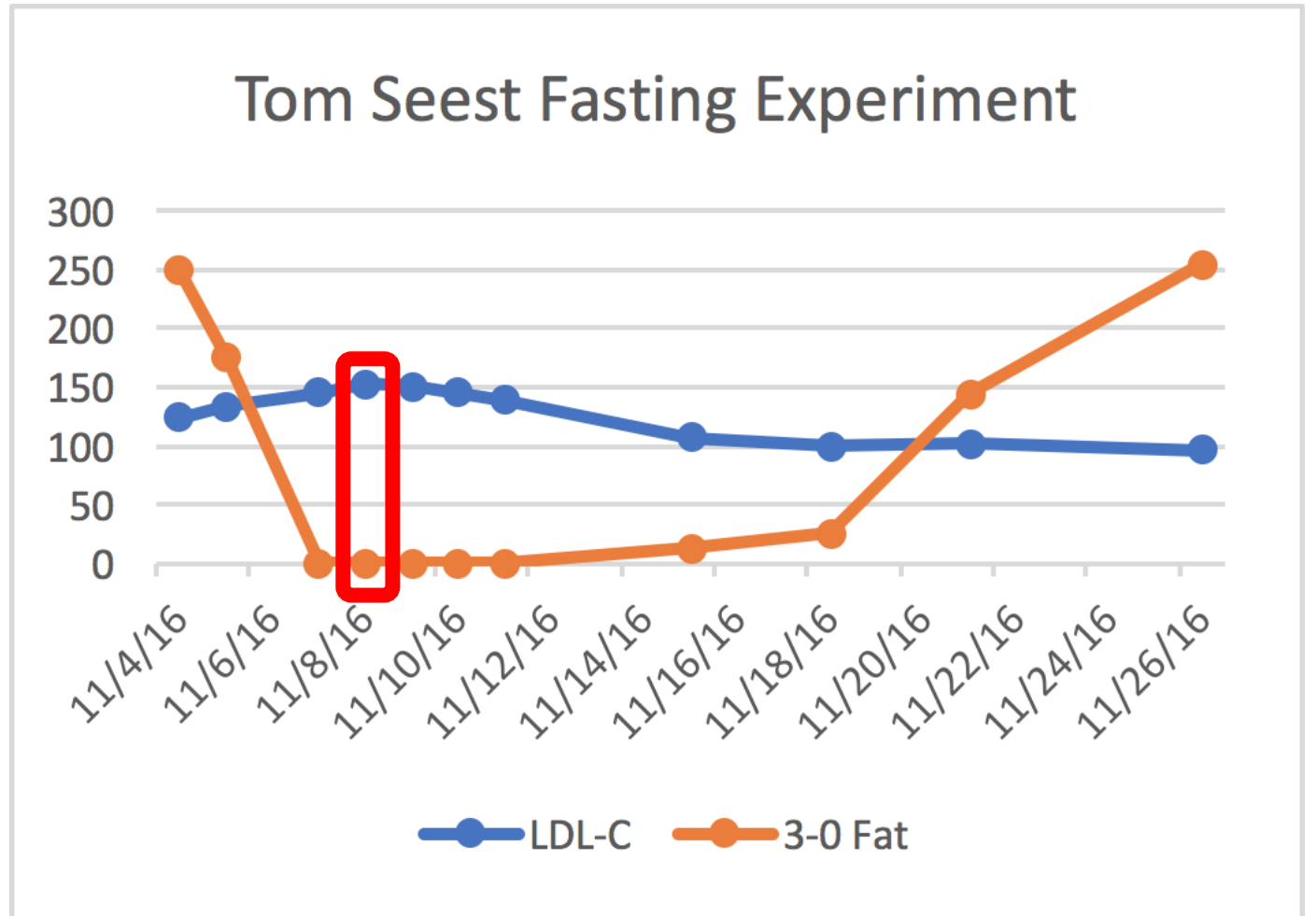
A Few Good Volunteers

Bill Davis

- LDL History for quarterly testing over a year and a half: 138, 109, 174, 141, 130 (8/2016)
- Protocol: 5,000 calories a day for three days. All extra calories from fat.
- LDL as of 11/2016: **88**
- HDL simultaneously went from 98 to 112

Tom Seest

Date	3-0 Fat	LDL-C
11/4/16	248.67	124
11/5/16	175.33	133
11/7/16	0	145
11/8/16	0	153
11/9/16	0	150
11/10/16	0	145
11/11/16	0	139
11/15/16	12.33	107
11/18/16	25.33	100
11/21/16	143.67	102
11/26/16	254.67	96



Richard Morris

	8/1/16	11/25/16	2/13/17
Calories/Day	Apx 1500	Apx 3000	Apx 1500
Fat/Day	Apx 120	Apx 272	Apx 120
Total Cholesterol	275	-36 239	39 278
LDL-C	208	-31 177	28 205
HDL-C	59	-10 49	-3 46
Trig	143	9 152	-11 141

Silvio Ferro

	1/18/17	1/20/17
Calories/Day	746	753
Fat/Day	63	63
Total Cholesterol	286	278
LDL-C	196	200
HDL-C	42	43
Trig	240	175

	1/23/17	1/25/17
Calories/Day	5151	5067
Fat/Day	499	491
Total Cholesterol	239	215
LDL-C	147	120
HDL-C	53	63
Trig	196	160

Silvio Ferro

	1/18/17	Difference	1/25/17
Calories/Day	746	4321	5067
Fat/Day	63	428	491
Total Cholesterol	286	-71	215
LDL-C	196	-76	120
HDL-C	42	21	63
Trig	240	-80	160

Carl Franklin

	2/13/17	2/17/17	2/20/17
Calories/Day	3097	1163	5361
Fat/Day	255	89	510
Total Cholesterol	297	21 318	-58 260
LDL-C	209	30 239	-53 186
HDL-C	59	-10 49	-3 46
Trig	143	9 152	-11 141
LDL-P	2255	264 2519	-398 2121
Small LDL-P	964	-4 960	-144 816

23 Who Have Performed Protocol

- 100% success rate so far.
- Nine have tried out of curiosity.
- Ten have used it to “get my doctor off my back.”
- Four have used it to improve their life insurance rate.

Jill's Story

“What good is a ketogenic diet if you won’t be alive to enjoy it.” – Jill’s GP

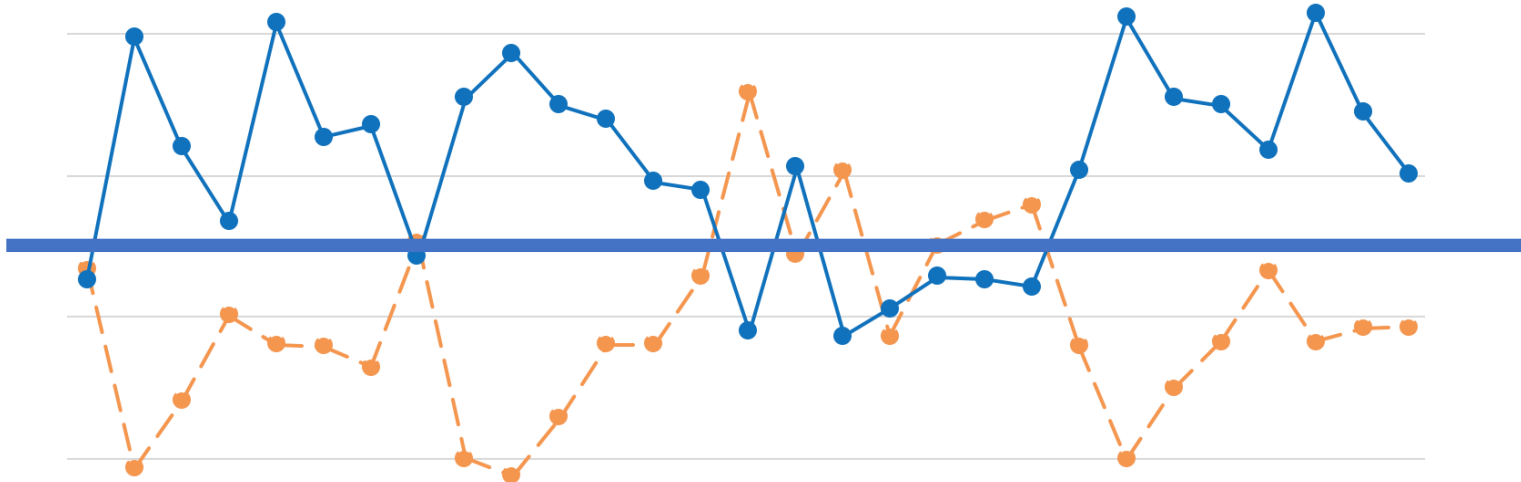
“... that stupid test wrecked my life and got me to ignore what my body was telling me all along: that it LOVES KETO.” – Jill

Closing Thoughts

Do I still have time left?

The “Preference Point”

- There appears to be a distinct level of lipids that the body regulates toward.



- For some on LCHF, this can be dramatically high. (*Hyper-responders*)
- Is this bad? We don't know yet. But I have a lot of reason to feel it isn't.

Why this new data may be a Game Changer

- The lipid system is far more dynamic than has been believed.
 - **All cholesterol markers** are highly influenced by the diet of just the previous **three days**.
 - **All particle markers** are highly influenced by the diet of just the previous **five days**.
- This pattern is an ***inversion***.
 - The higher the dietary fat, the lower total and LDL cholesterol.
 - The lower the dietary fat (including fasting), the higher total and LDL cholesterol.

Next Steps

- Try the protocol yourself! – It just takes a few days and you can expand the data for all of us.
- Celebrity Low Carbers – PLEASE try it!
- I'm currently working at getting a formal study put together. Please let me know if you can help.

Acknowledgements

- Peter Defty
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- Justin Hayes
- Kevin Ruther
- Richard Morris
- Silvio Ferro
- Tom Seest