

# Lateral Agitation Effects on Shelf-Stable Food Products In Flexible and Semi-Rigid Containers

Adam Reichert

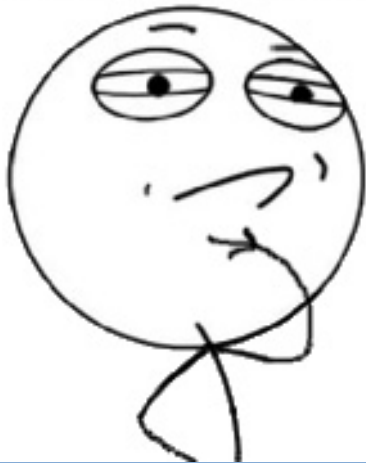
Thermal Processing Specialist

Allpax Products

# The Challenge

Devise an agitation system for horizontal containers – pouches and plastic trays – that provides the same benefits that vertical containers see in rotary agitation.

**CHALLENGE CONSIDERED**



**CHALLENGE ACCEPTED**



# Remember These Guys?

## Gentle Motion

- ✓ 30 – 90 shakes per minute (1 shake = movement in 1 direction), 6 inch stroke
- ✓ Up to 6 baskets, 1400-1550mm diameter

## The Shaka Process

- ✓ 180 shakes per minute (1 shake = movement in both directions), 6 inch stroke
- ✓ 1 basket, 1300 and 1600mm diameter

# The Containers

10.5 oz. rectangular plastic trays – Thanks, Silgan!

7 oz. rectangular plastic trays – Thanks, Silgan!

Gusseted pouches – Thanks, Ampac!

Pillow pouches – Thanks, pixie who lives in my lab and provides me with random containers!



# The Louisiana Retort Container Pixie



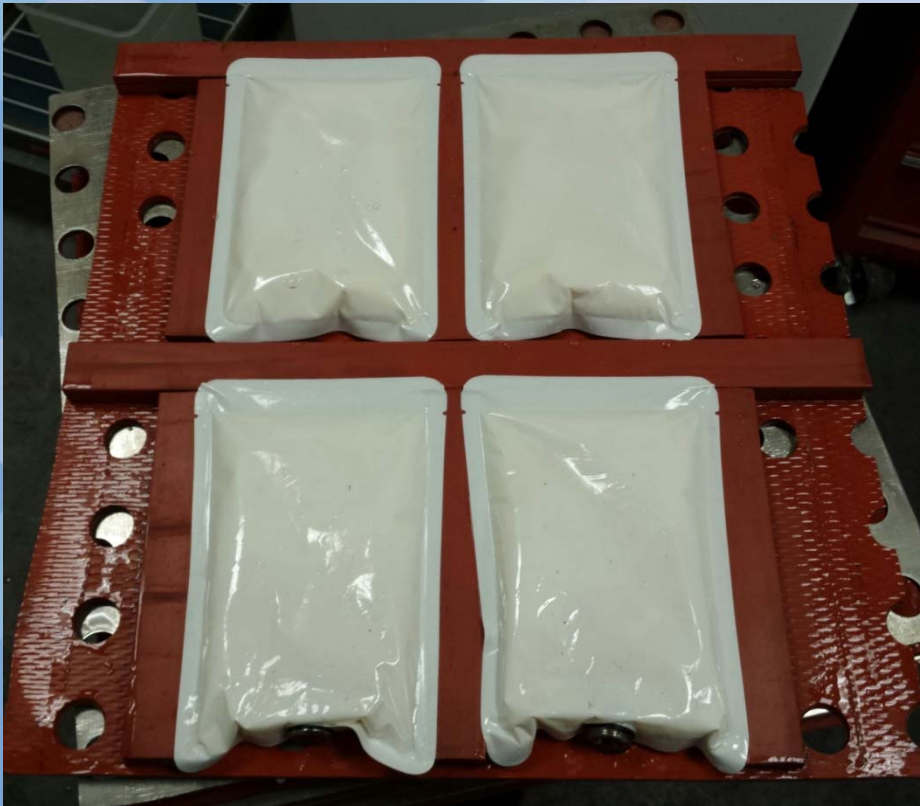
# A Quick Investigation – Cold Spot

Static -

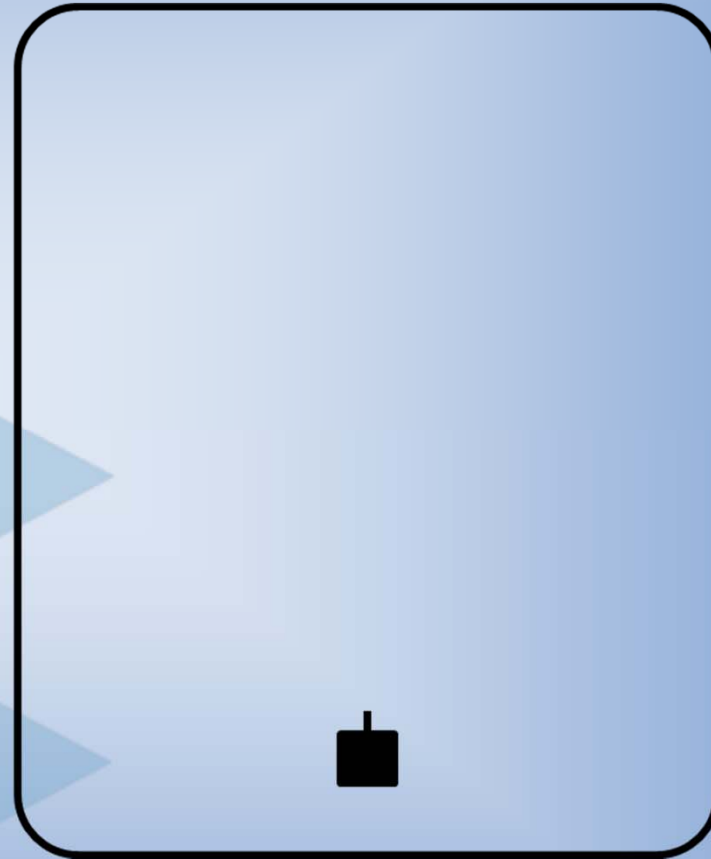
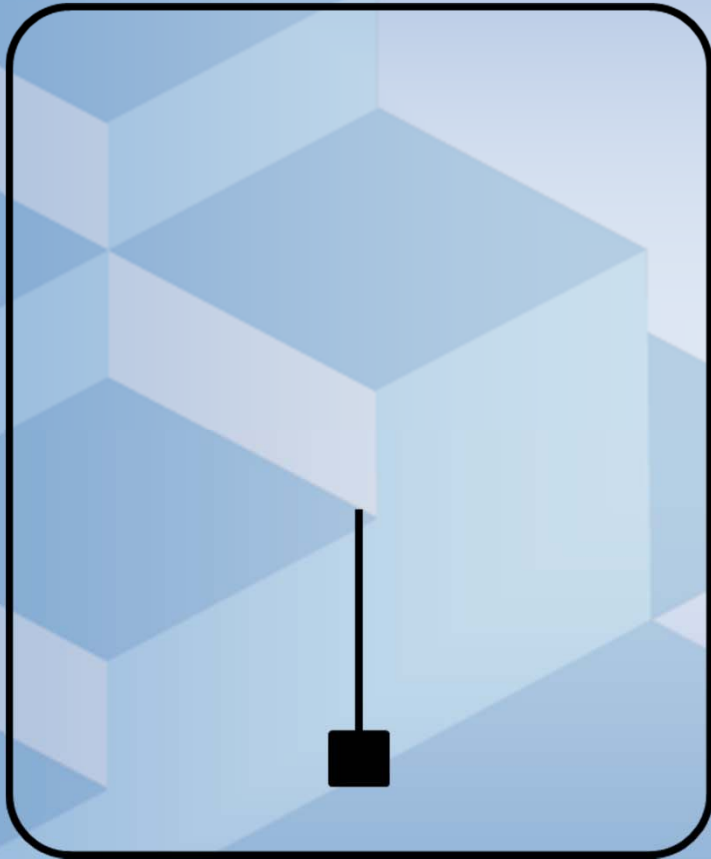


# A Quick Investigation – Pouch Cold Spot

(Gentle Motion first – Following results from Shaka)



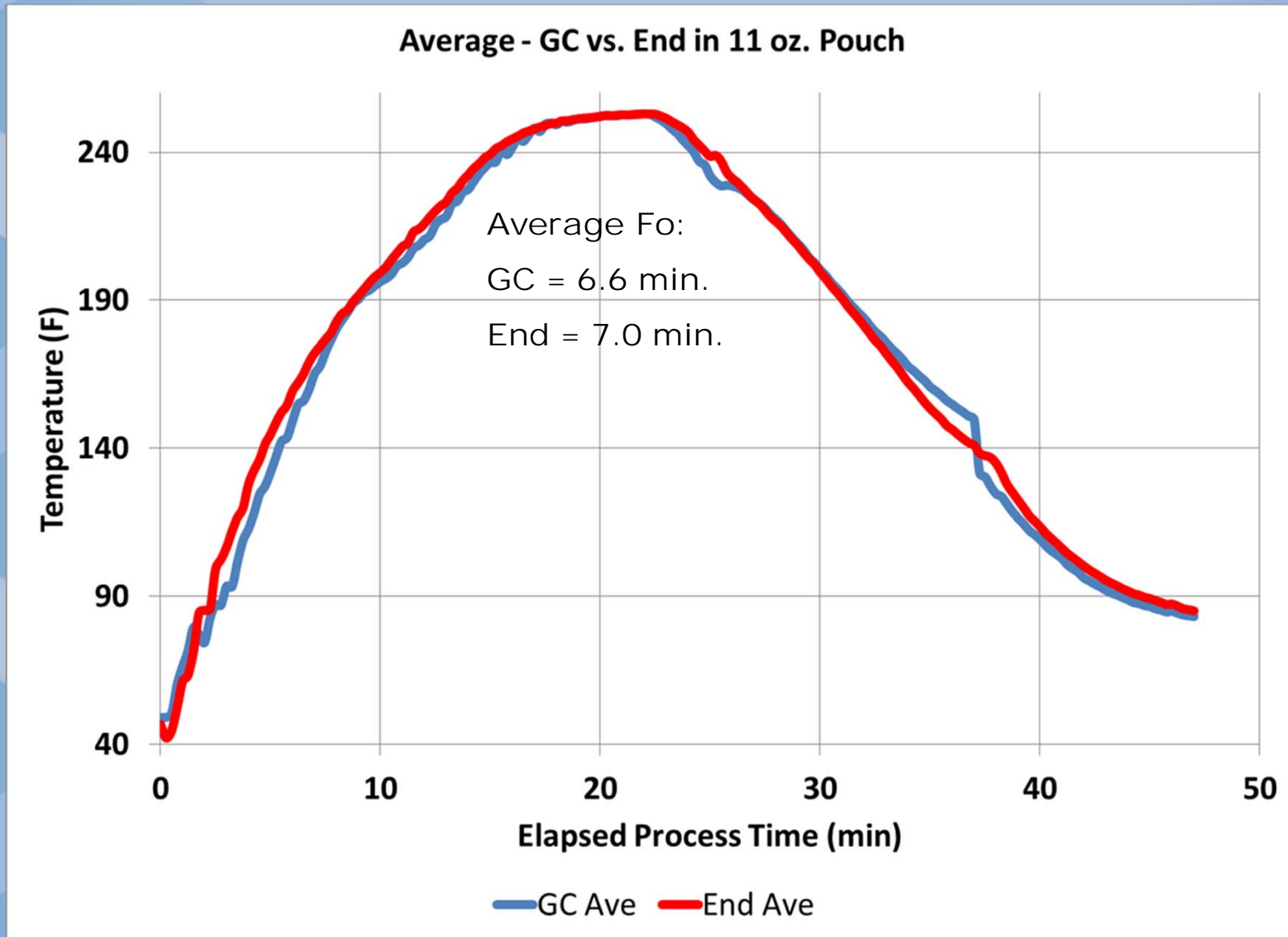
# A Quick Investigation – Pouch Cold Spot





# A Quick Investigation – Pouch Cold Spot

Conclusion – With GM in a pouch, the GC is still technically the cold spot.



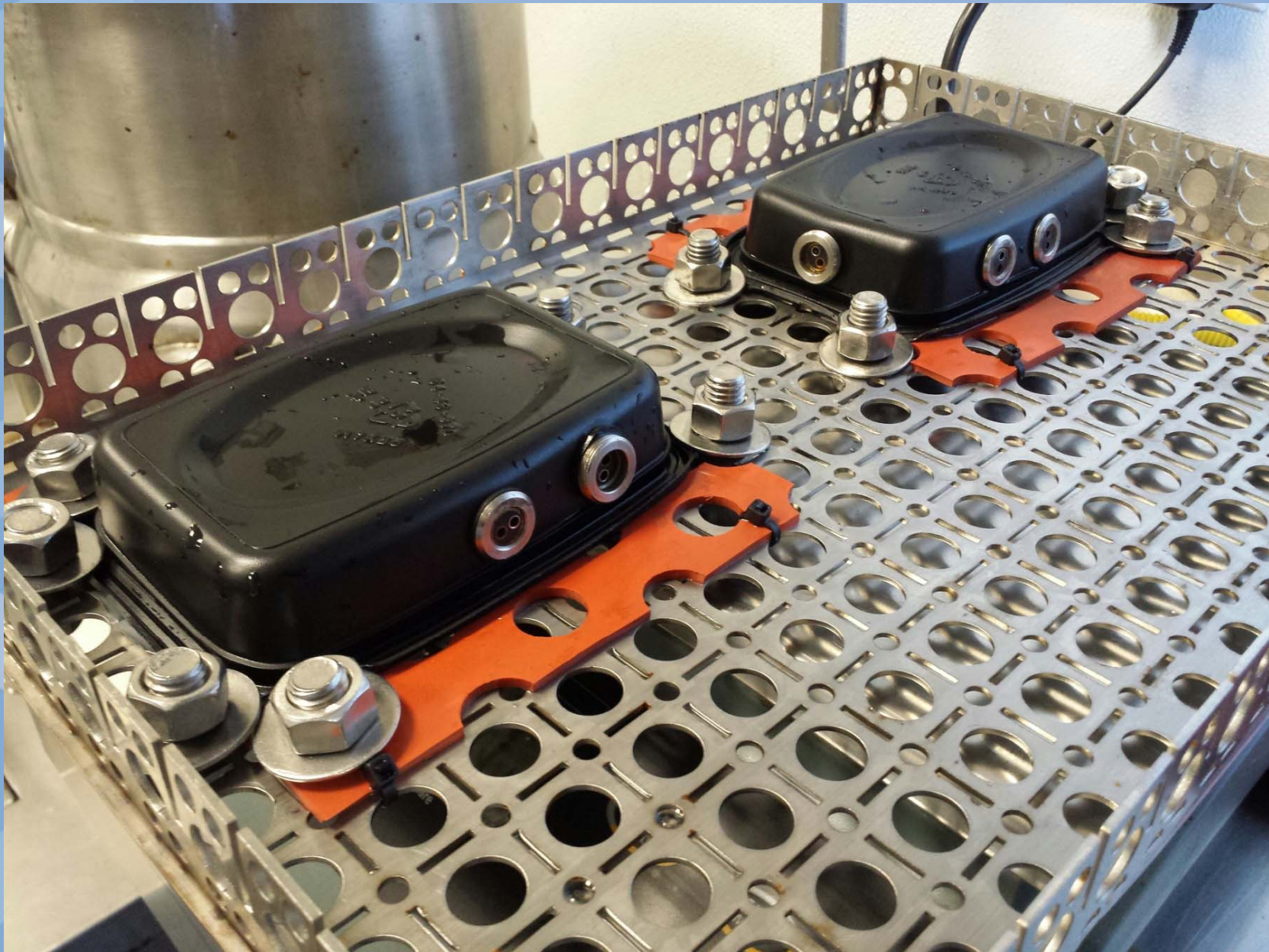
# A Quick Investigation – Tray Cold Spot



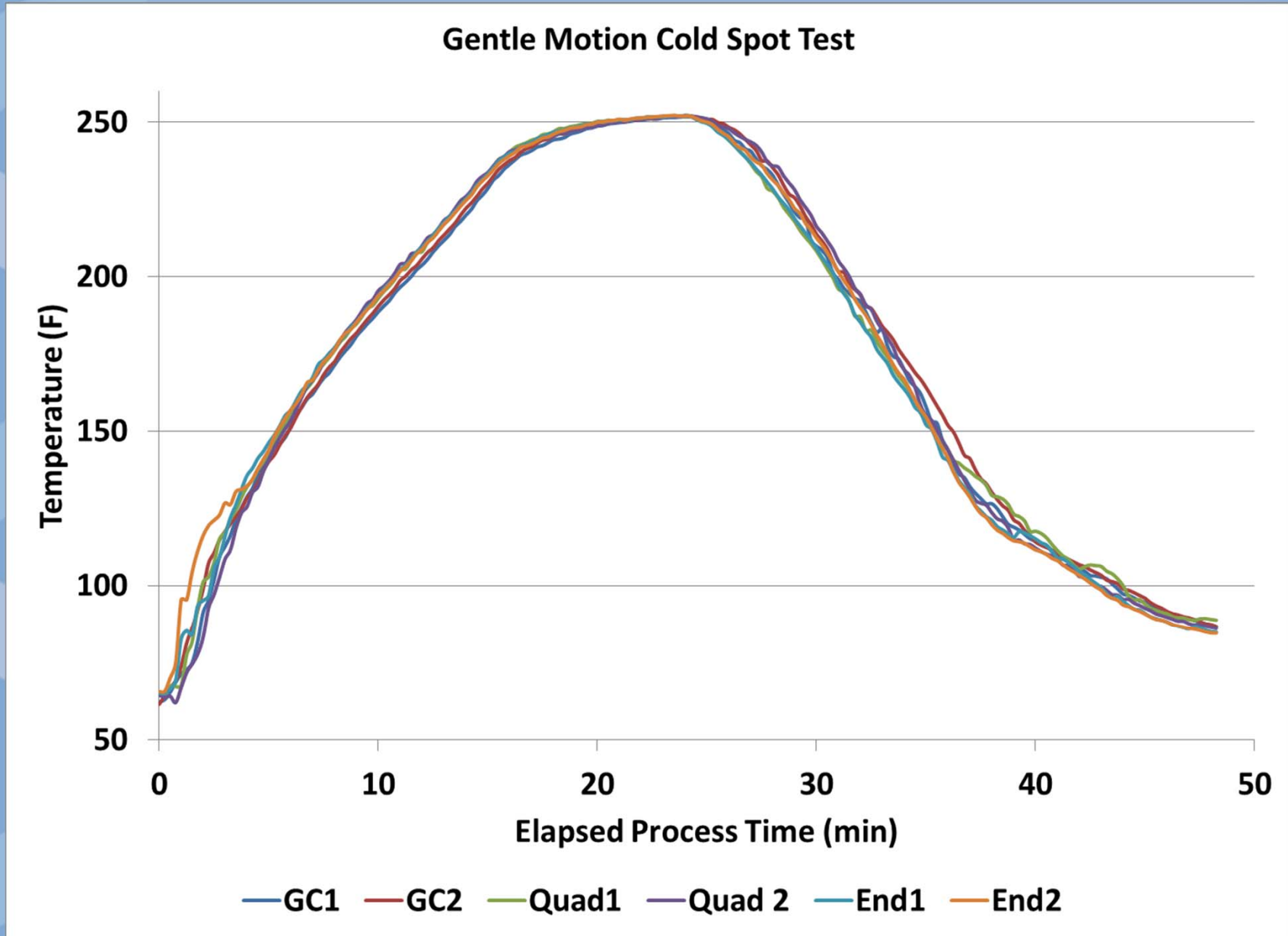
(5% solution of  
GPC Pure-Gel  
starch)



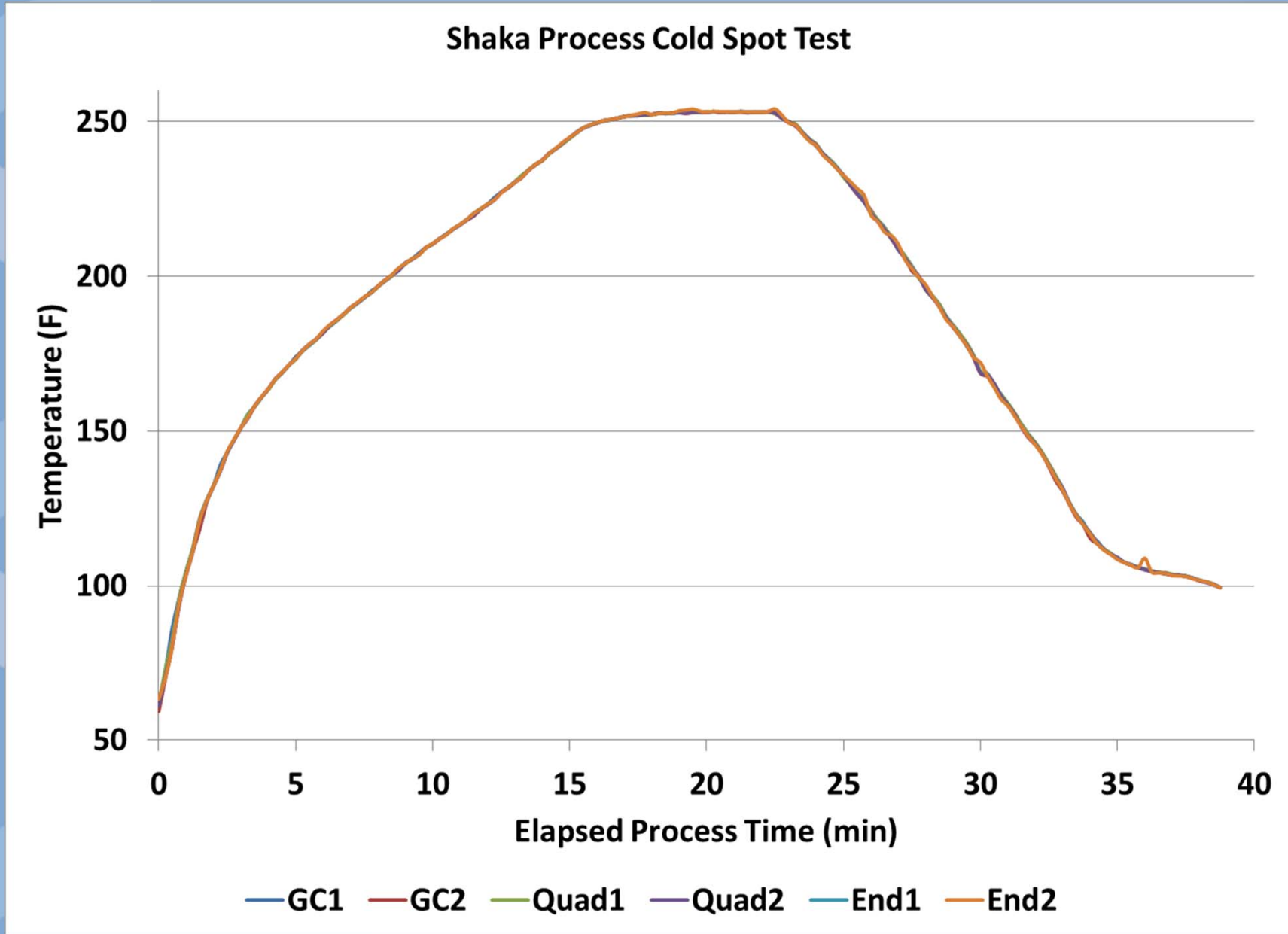
# A Quick Investigation – Tray Cold Spot



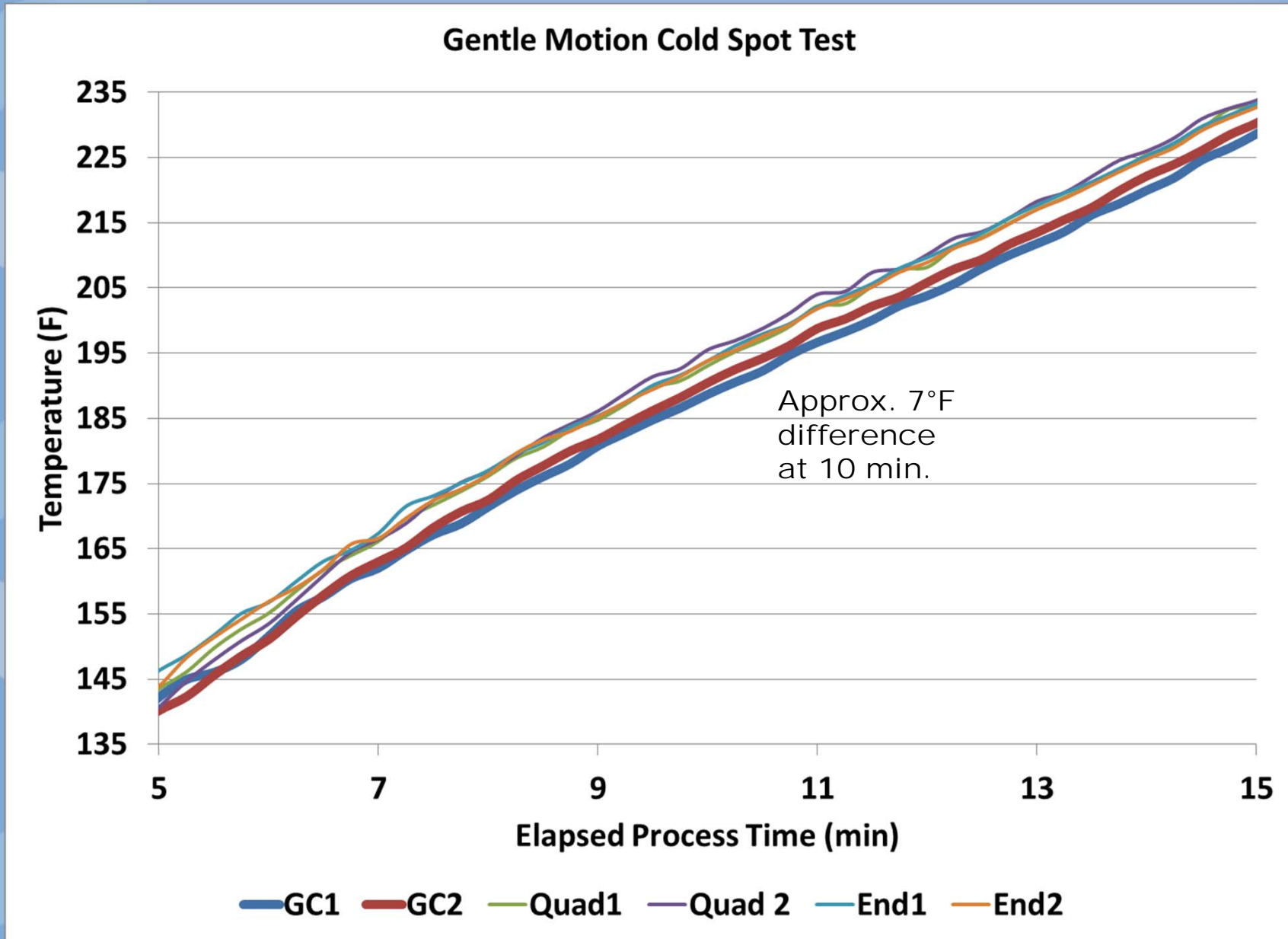
# A Quick Investigation – Tray Cold Spot



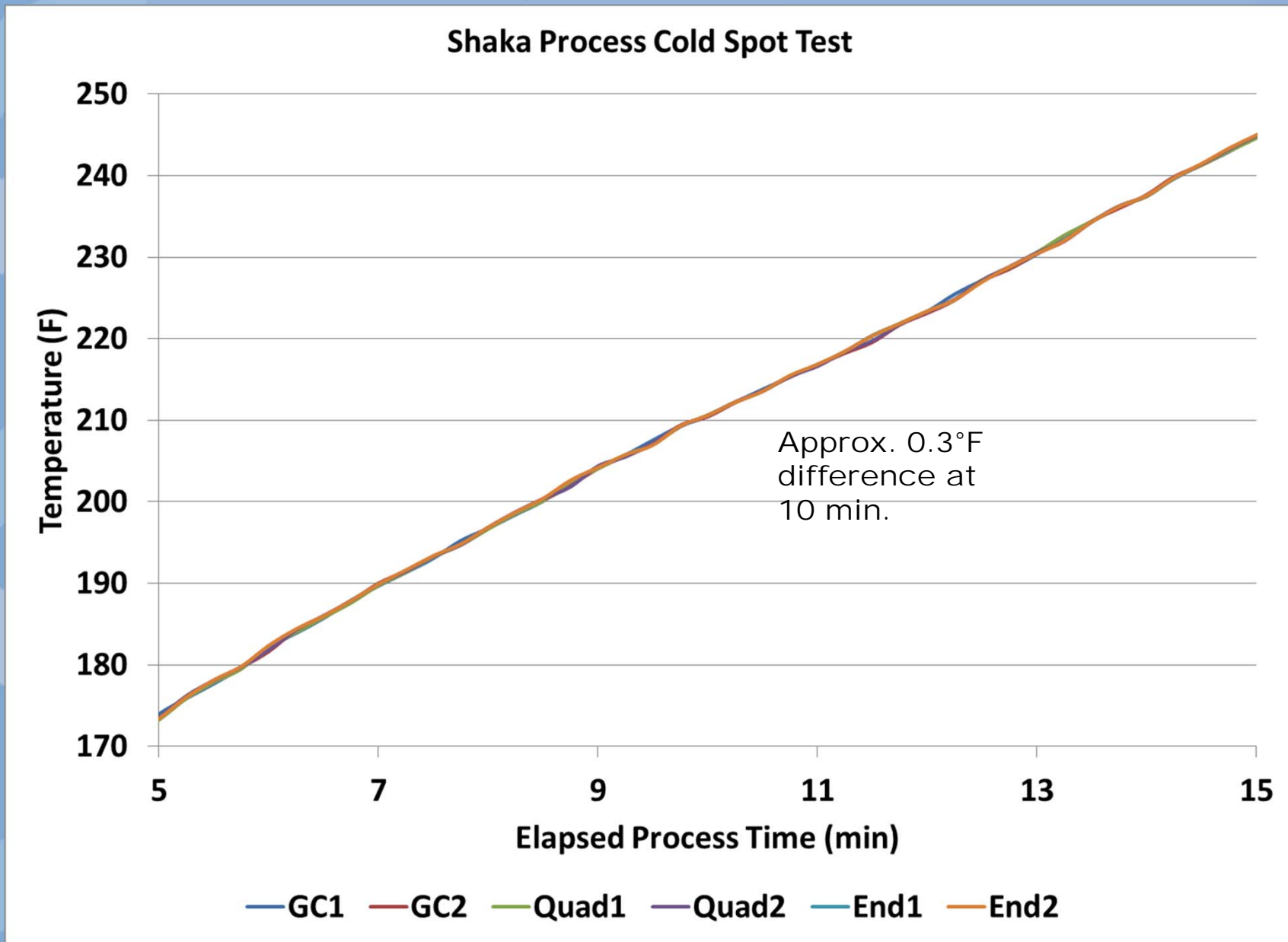
# A Quick Investigation – Tray Cold Spot



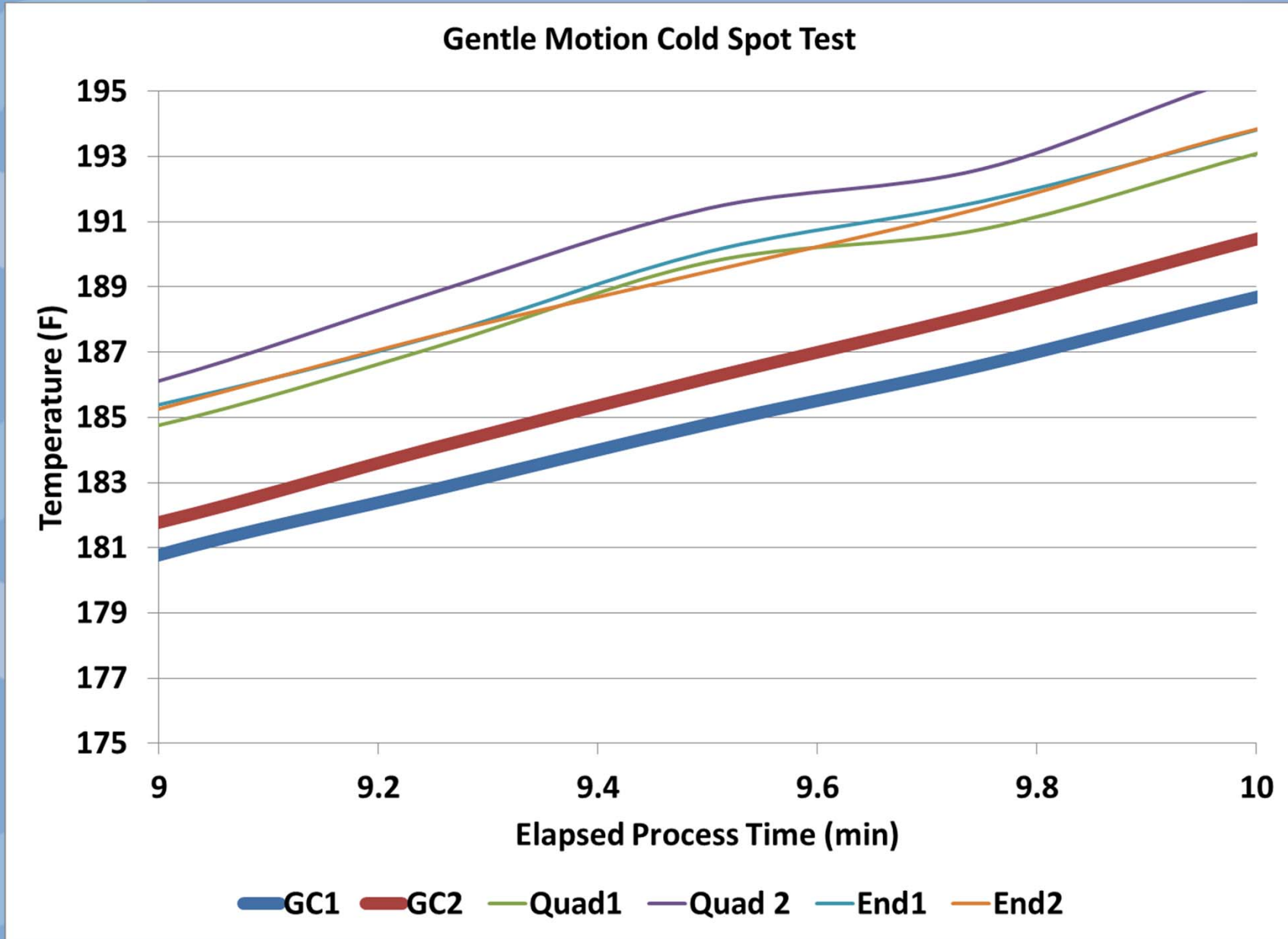
# A Quick Investigation – Tray Cold Spot



# A Quick Investigation – Tray Cold Spot

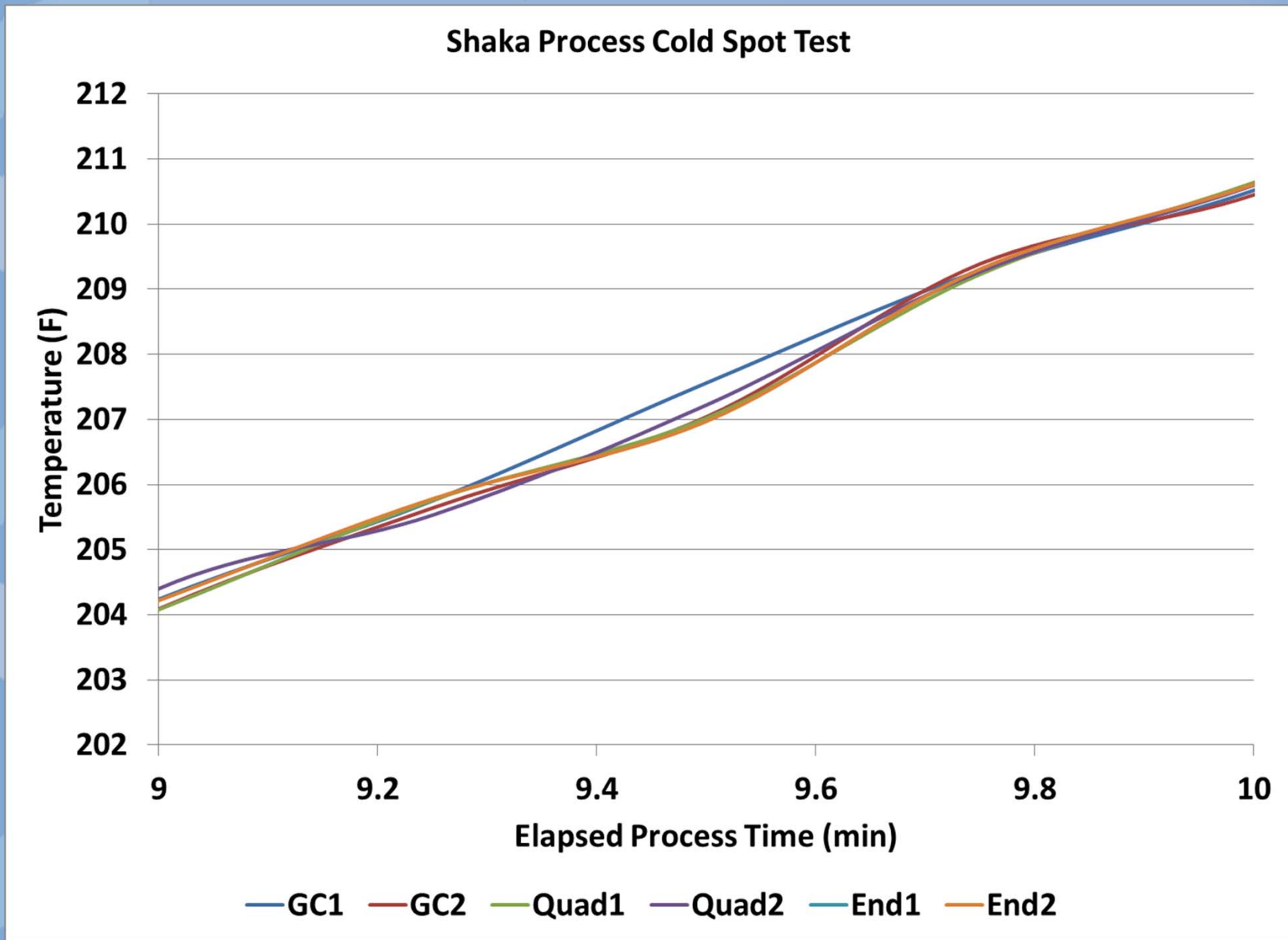


# A Quick Investigation – Tray Cold Spot

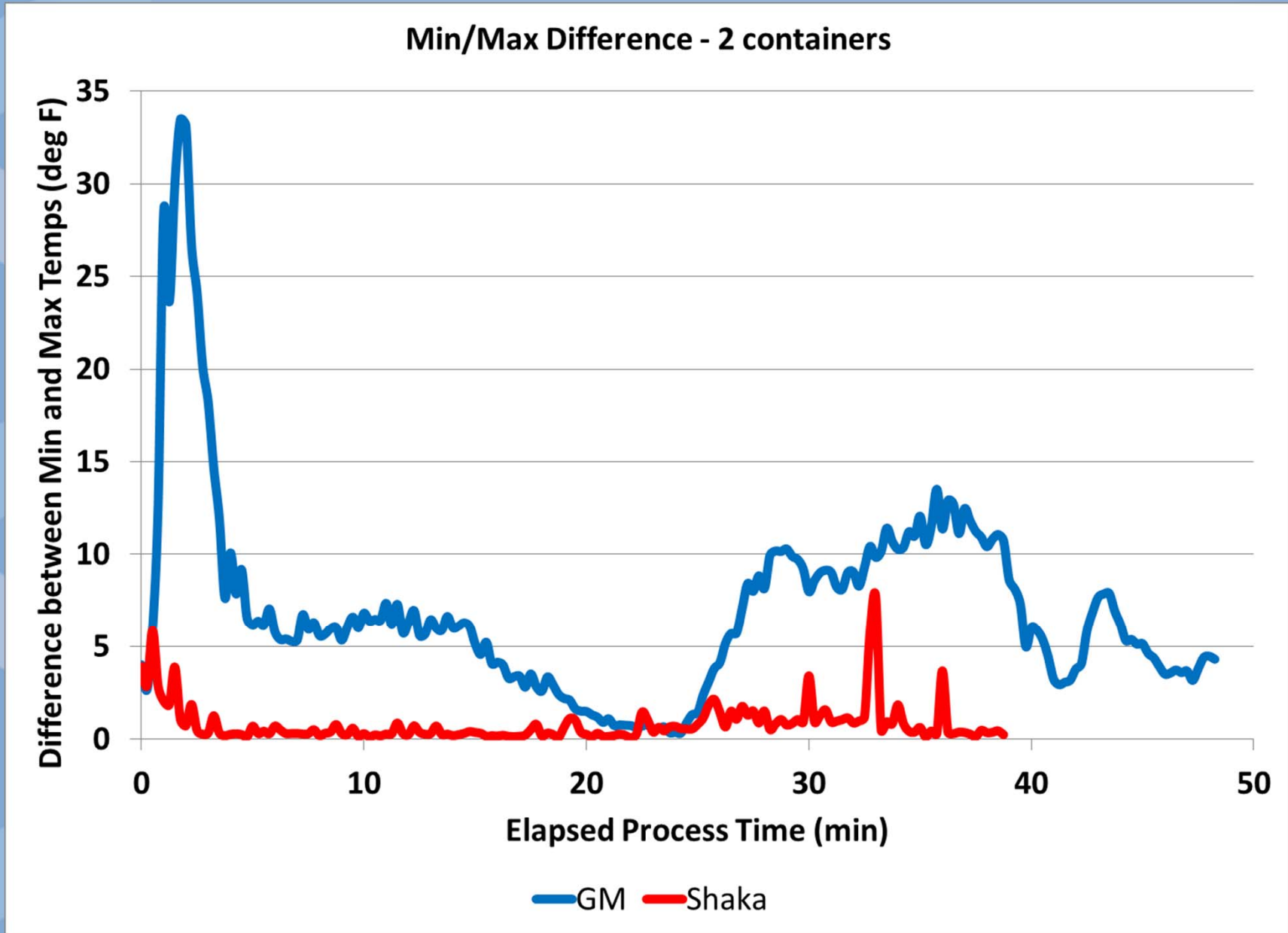




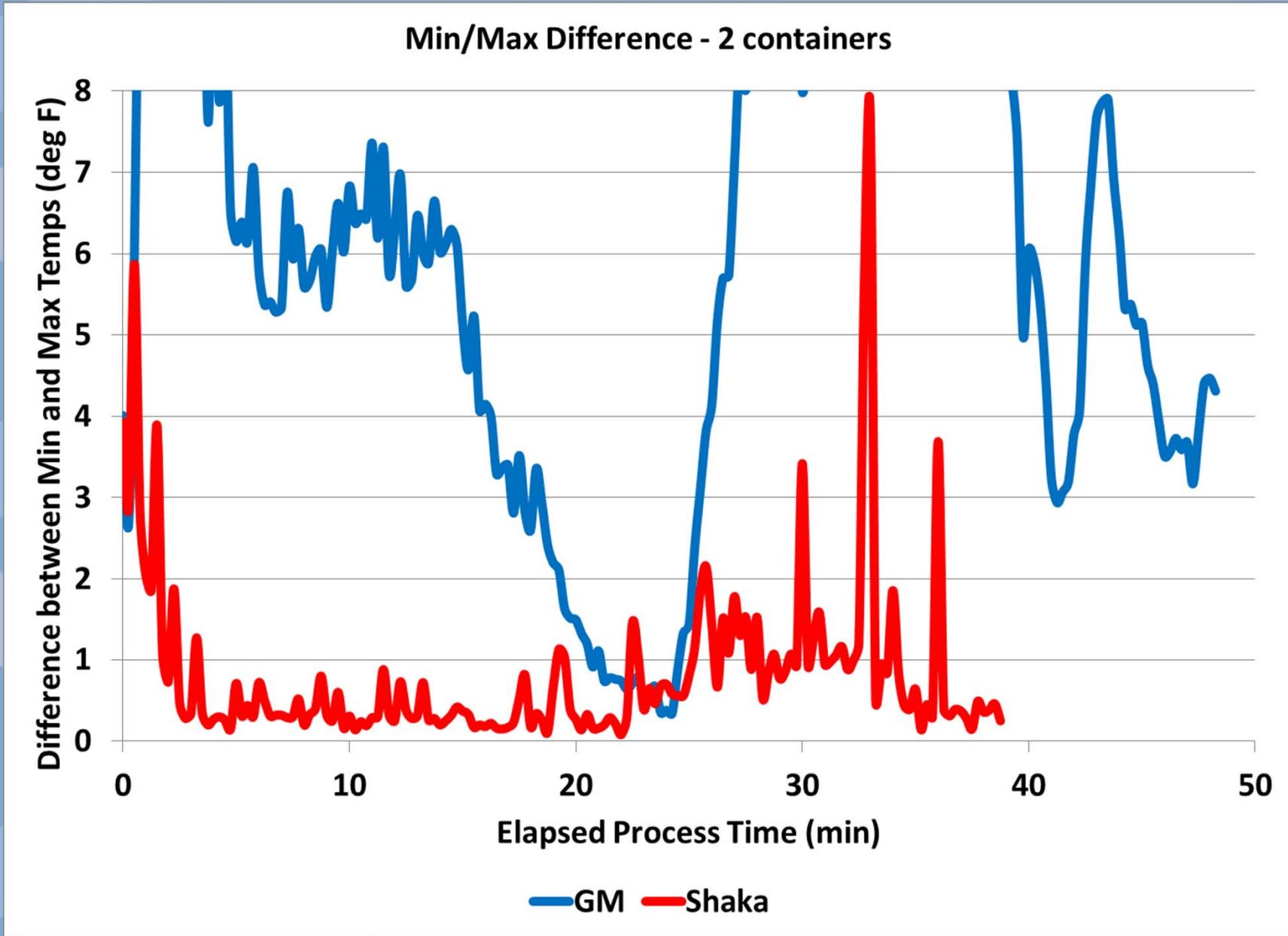
# A Quick Investigation – Tray Cold Spot



# A Quick Investigation – Tray Cold Spot



# A Quick Investigation – Tray Cold Spot

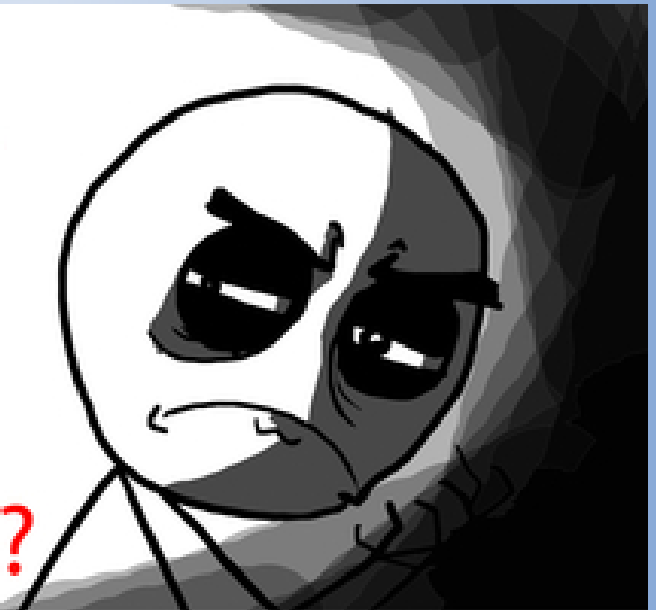


# It's...gone...

Conclusion – With Shaka, the GC is wherever you want it to be.



YOU...  
WHAT  
HAVE  
YOU  
DONE?



"That's the sound of your brain crackin'..."

--Tracy Bonham

# Shaka Rule No. 1

The product must move. The containers must not.



# Tasty Stuff – The Products

- Bechamel Sauce
- Beef Stew
- Green Chili
- Mac and Cheese
- Pea and Ham Soup
- Shrimp Pasta

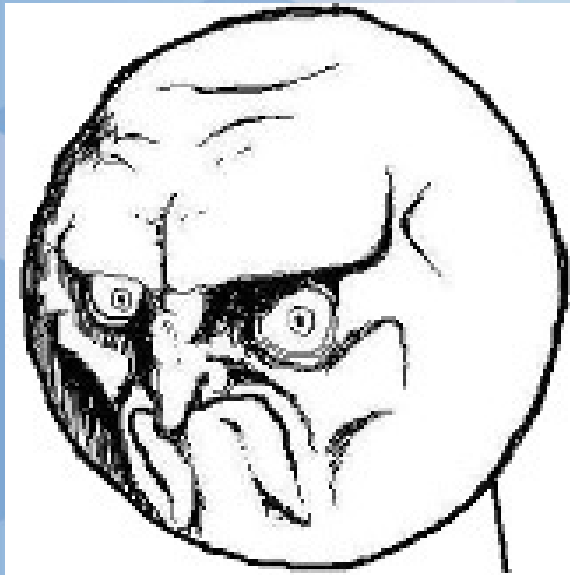
(These are grocery store ingredients.)

# Bechamel Sauce

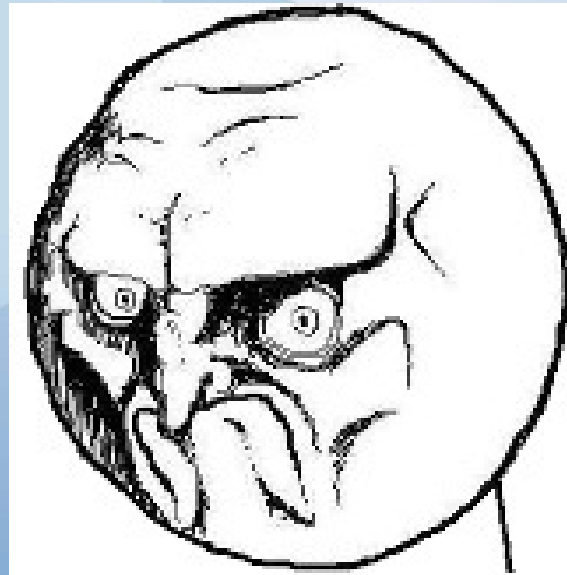
Ingredients: Butter, garlic, starch, chicken stock, half and half

DID IT WORK?!?!?!?

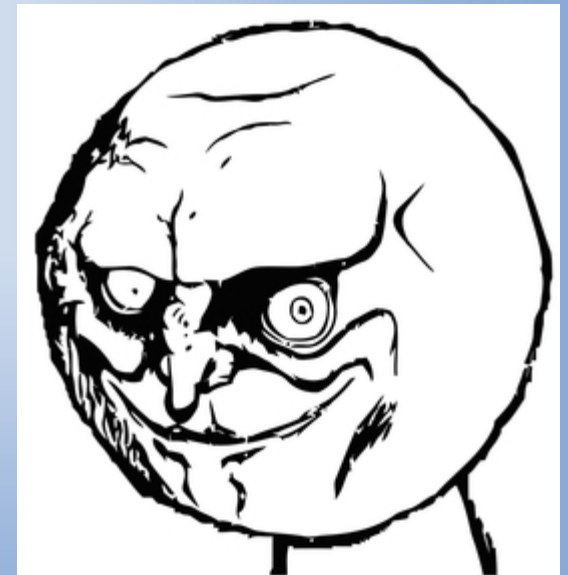
Static



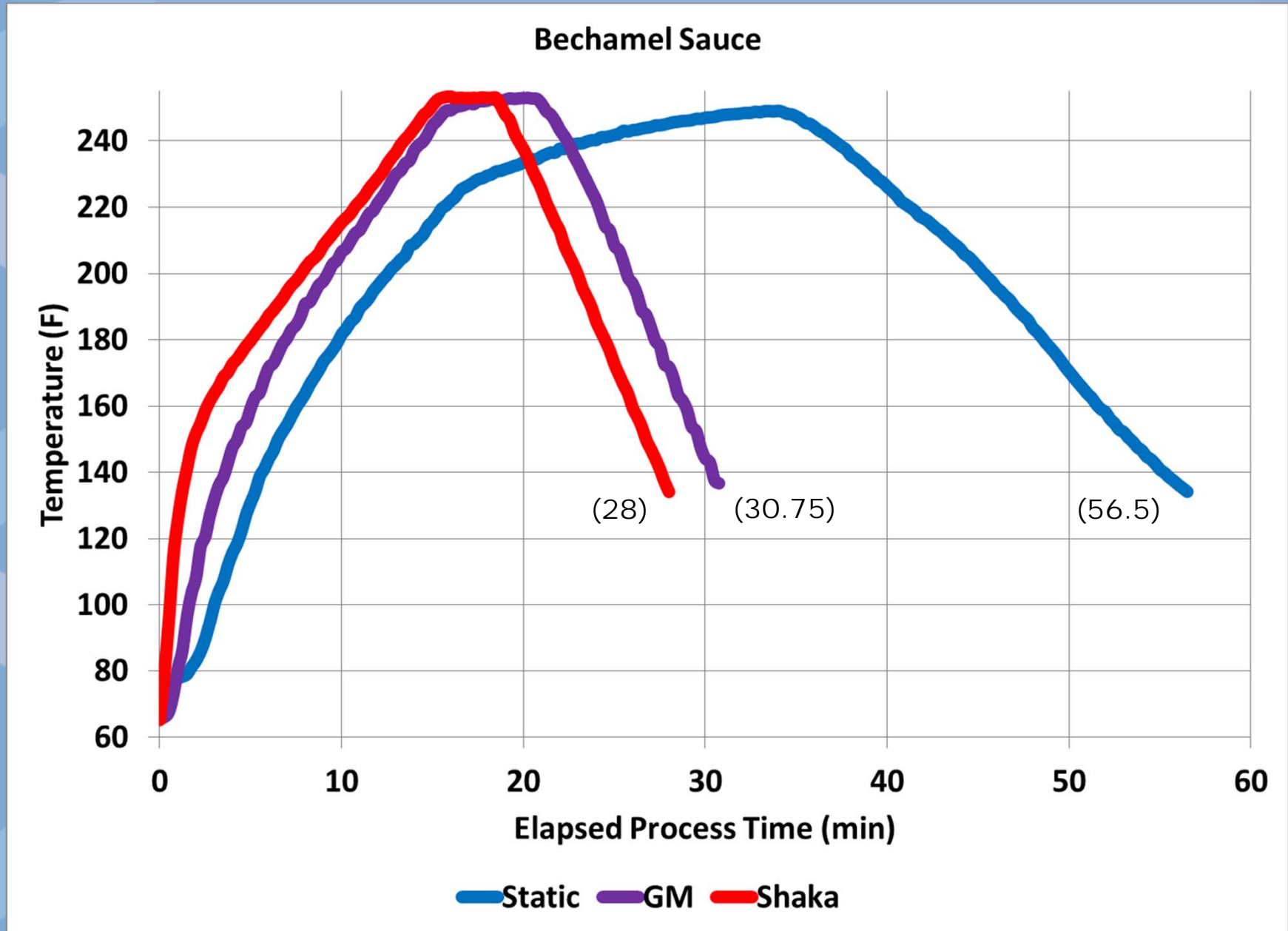
GM



Shaka



# Bechamel Sauce – 200g pouch





# Bechamel Sauce - Static



# Bechamel Sauce – GM90



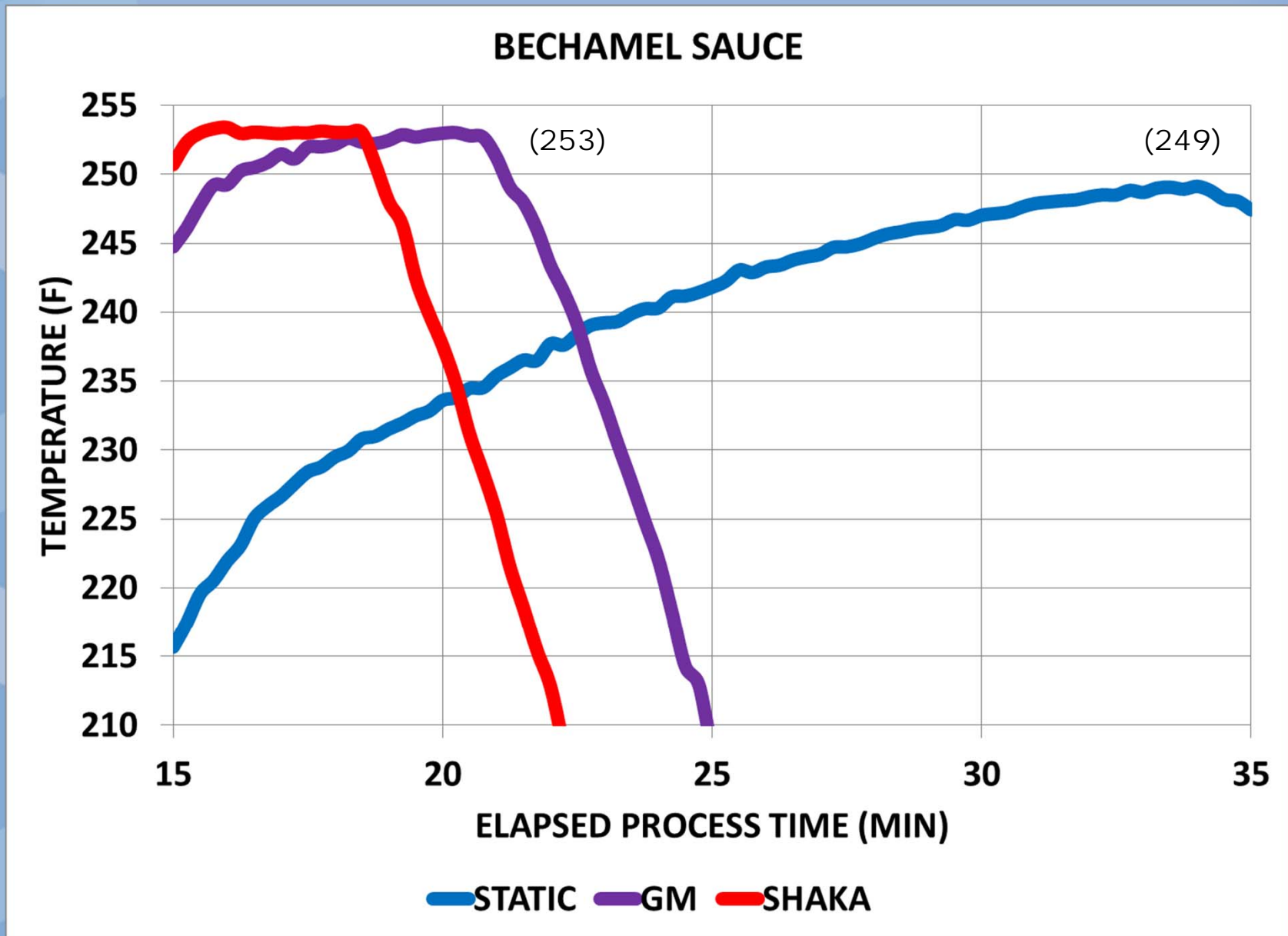
# Bechamel Sauce - Shaka



# Bechamel Sauce



# Bechamel Sauce – Interesting Note

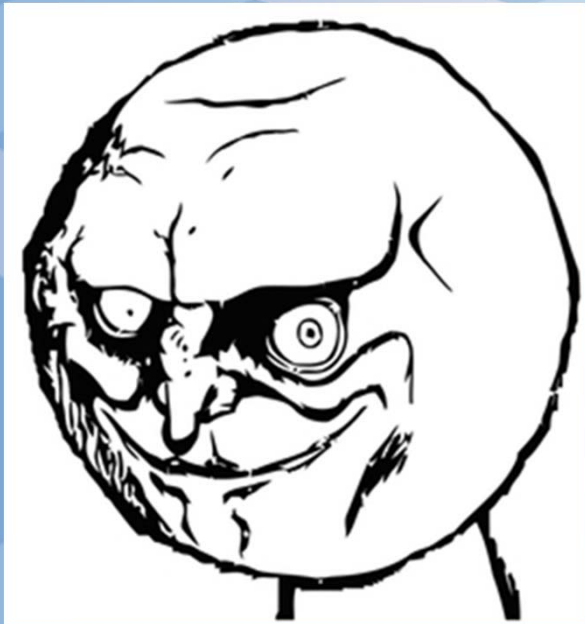


# Beef Stew

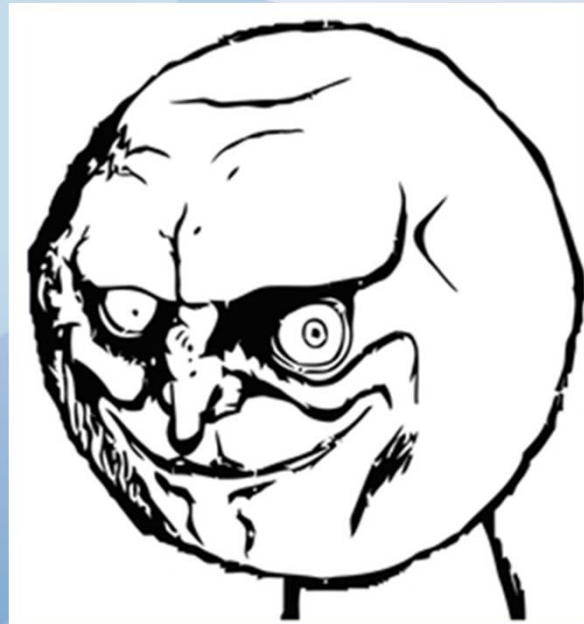
Ingredients: Onion, beef stock, stew beef, starch, potatoes, carrots, peas

DID IT WORK?!?!?!?

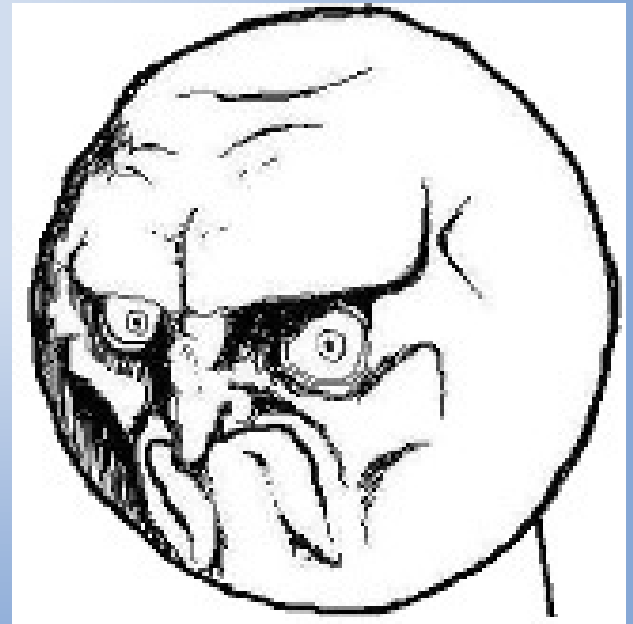
Static



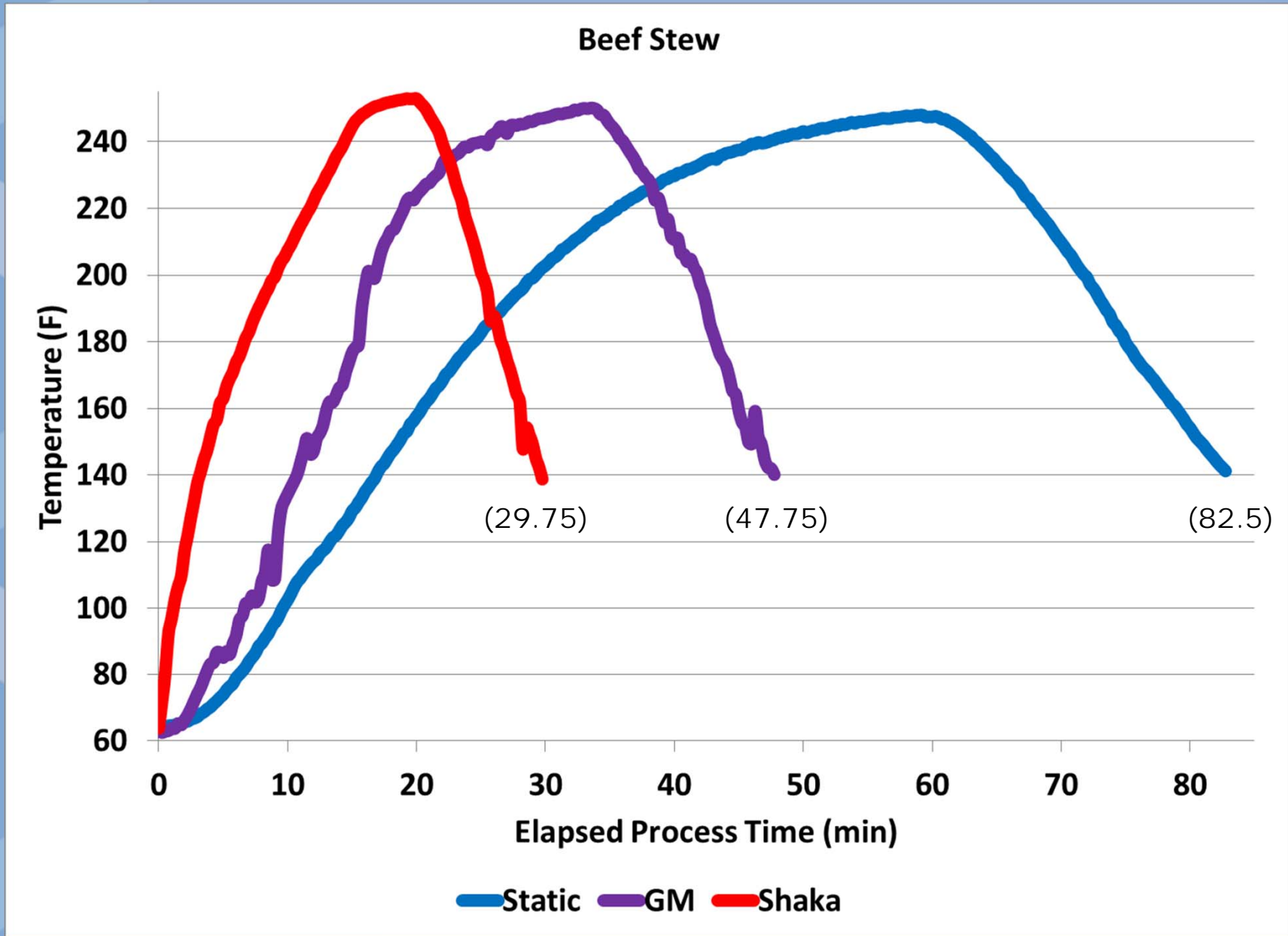
GM



Shaka



# Beef Stew – 350g pouch



# Beef Stew - Static

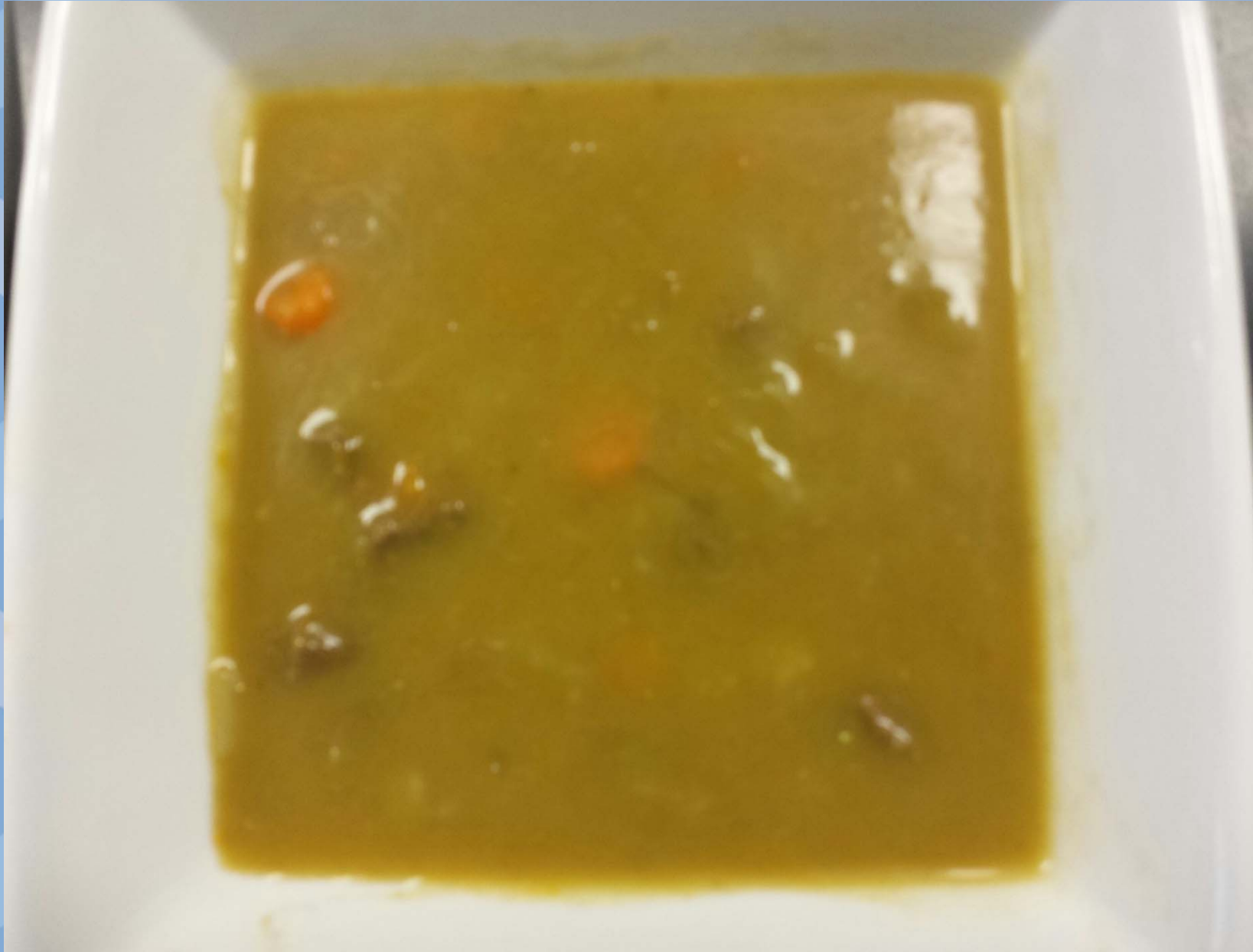




# Beef Stew - GM



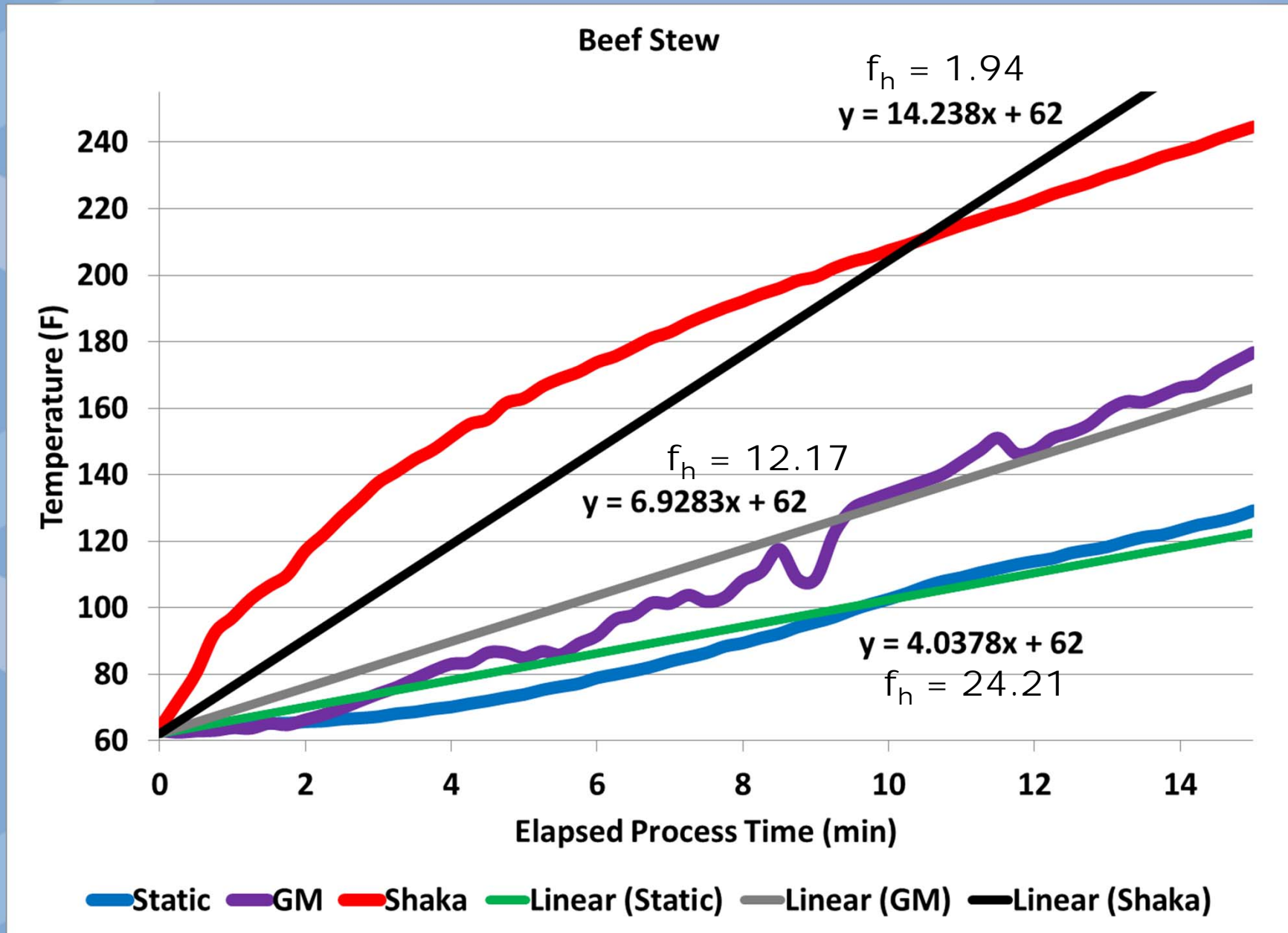
# Beef Stew - Shaka



# Beef Stew



# Fun With Excel and CalSoft...

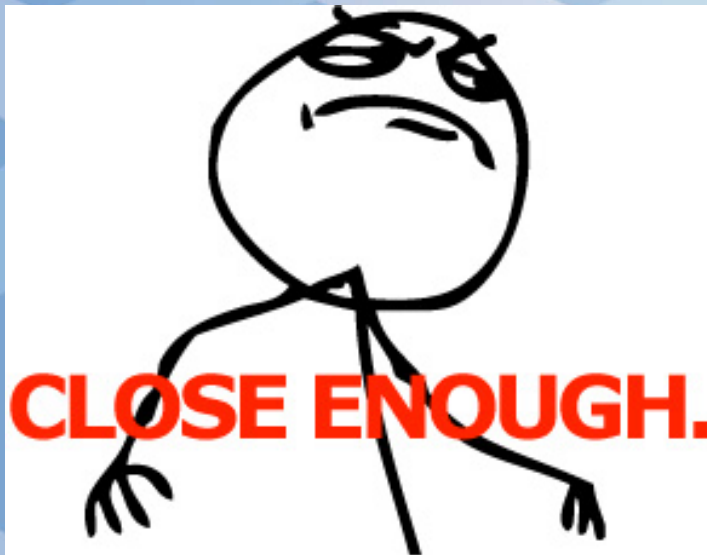


# Green Chili (Chili Verde)

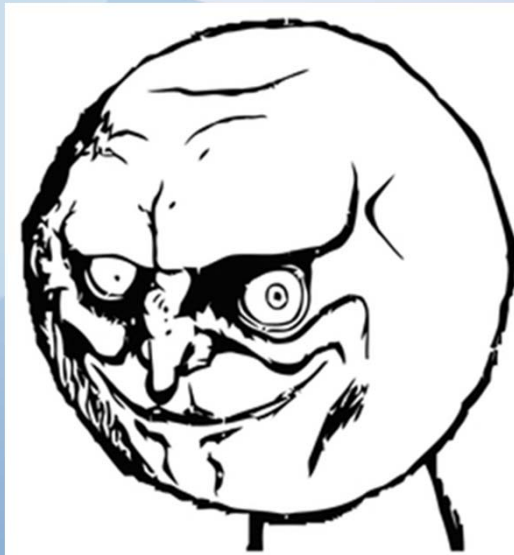
Ingredients: Onion, chicken stock, cubed ham, green chilies, starch, tomatoes, salsa verde, garlic

DID IT WORK?!?!?!?

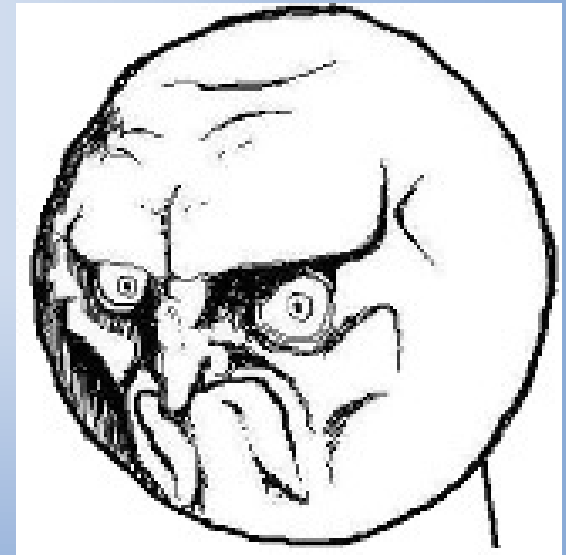
Static



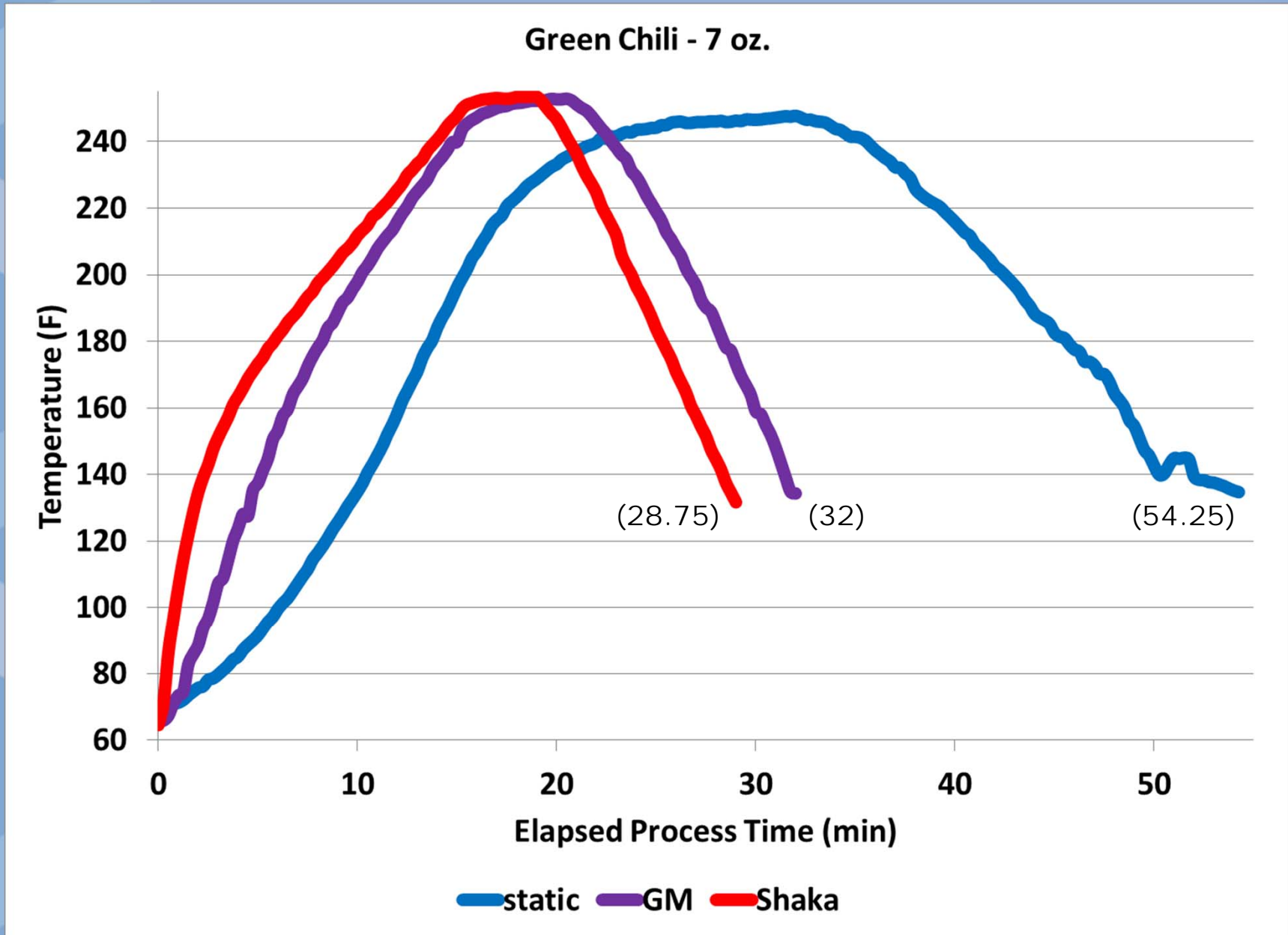
GM



Shaka



# Green Chili (Chili Verde) – 7 oz. tray



# Chili Verde - Static



# Chili Verde – 90GM





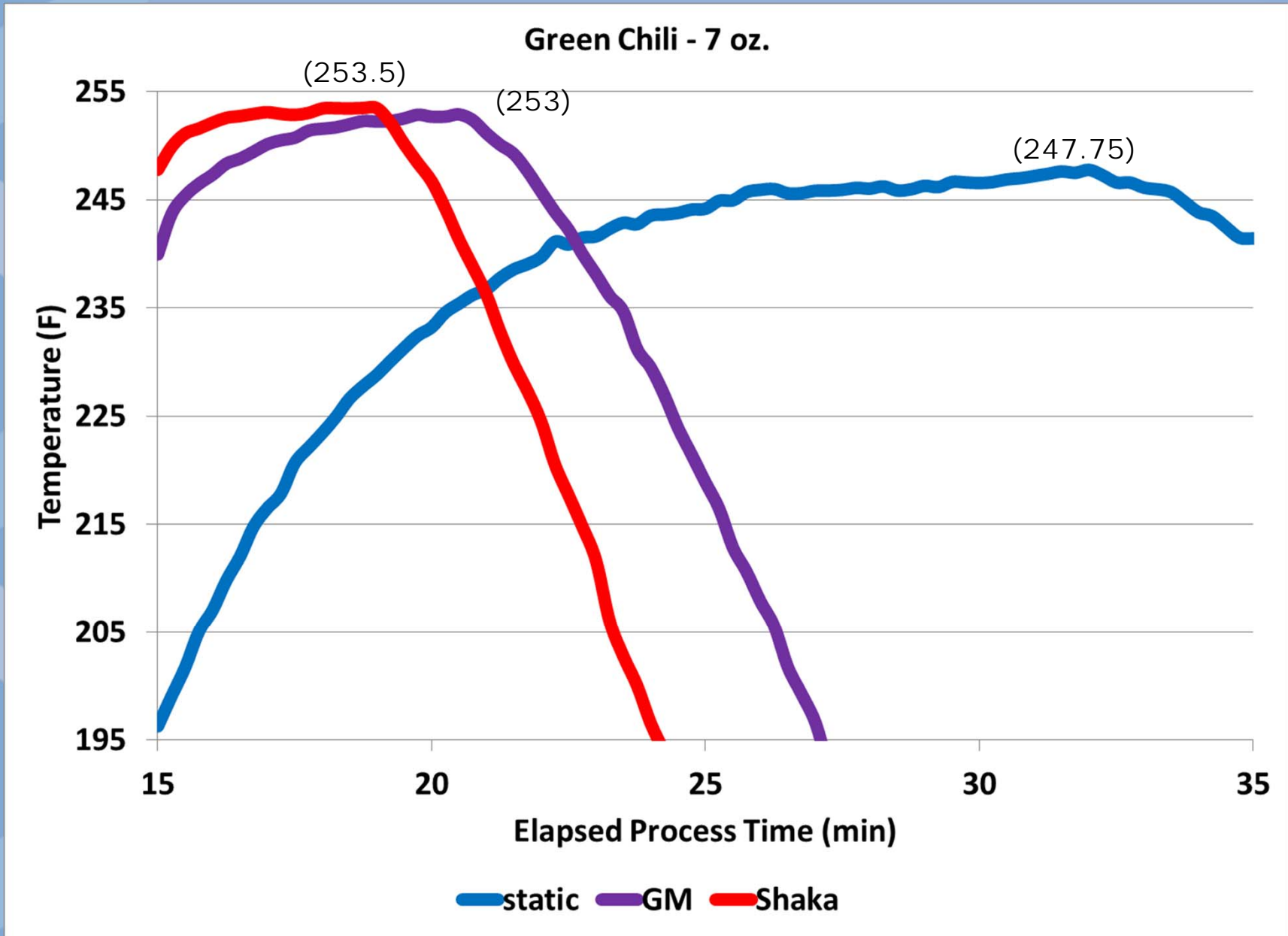
# Chili Verde – Shaka



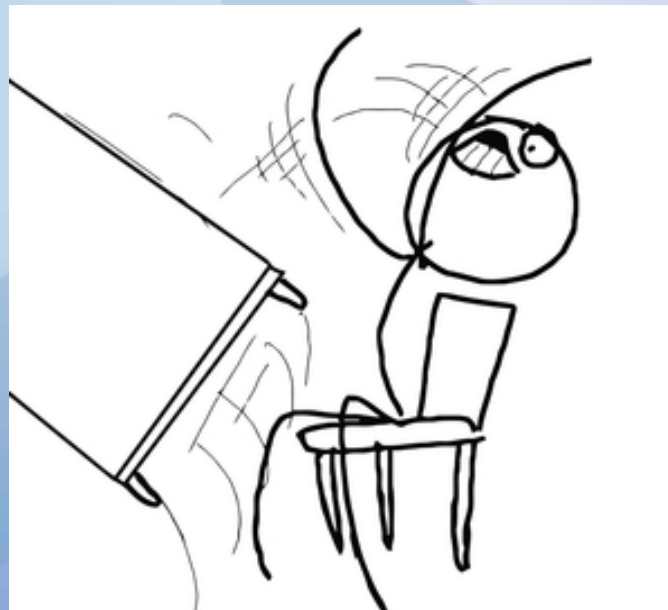
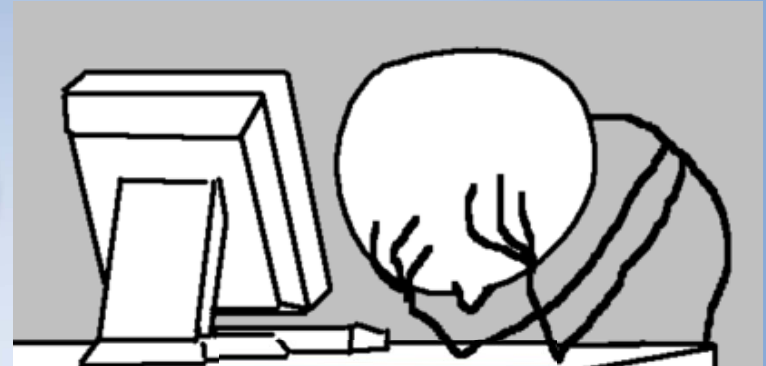
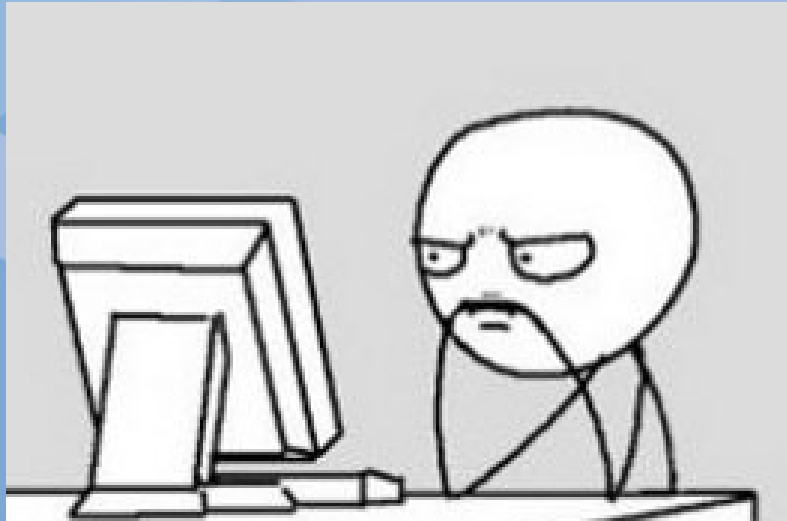
# Chili Verde



# There it is again...



# Why don't you work?!?!?!?



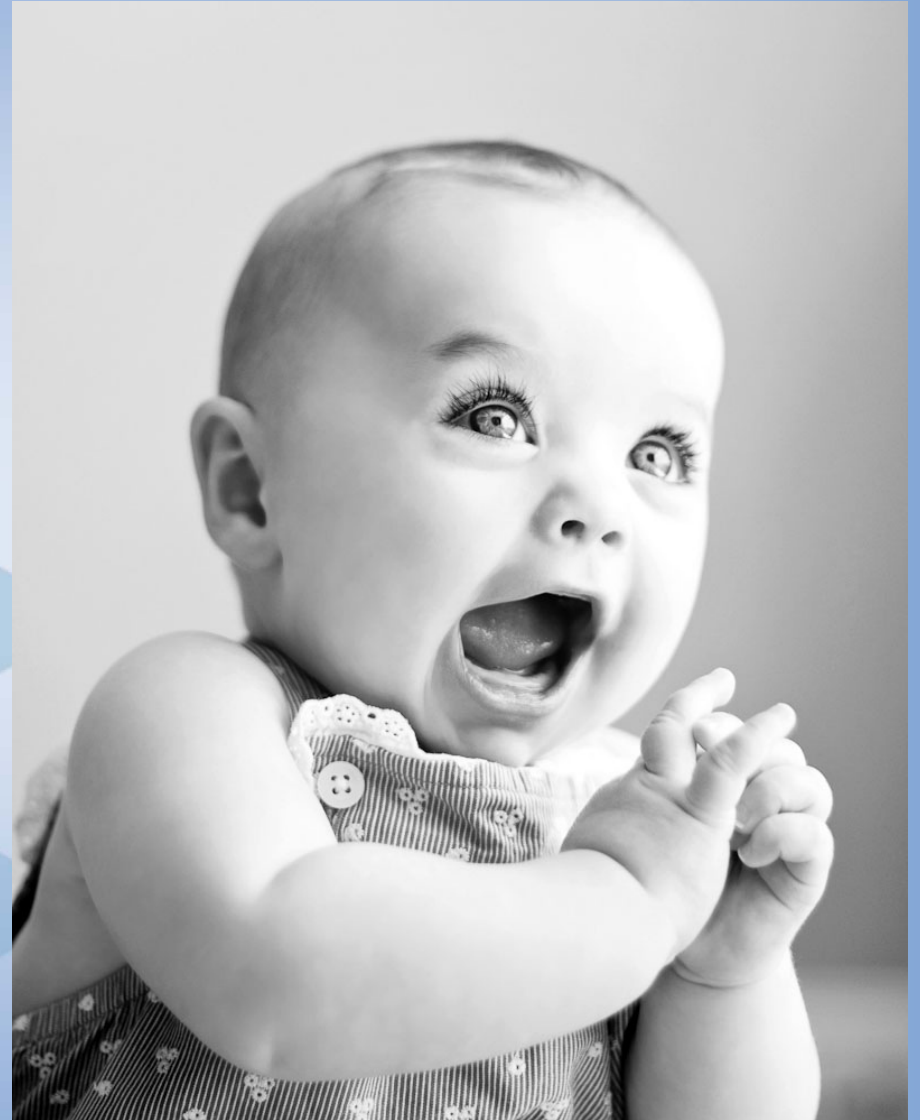
## But wait...

What about baby food  
and/or purees?

Shaka can cut out an entire  
pre-retort processing step.

“It is wise to persuade  
people to do things and  
make them think it was  
their own idea.”

--Nelson Mandela

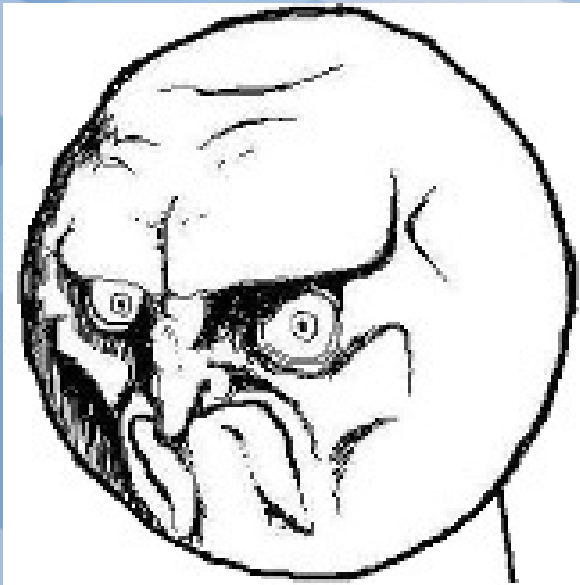


# Macaroni and Cheese

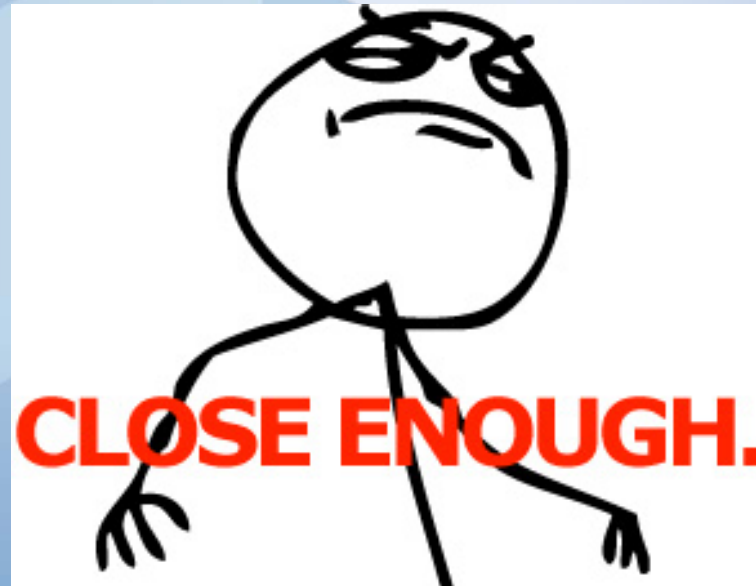
Ingredients: Noodles (raw), chicken stock, butter, starch, half and half, American cheese

DID IT WORK?!?!?!?

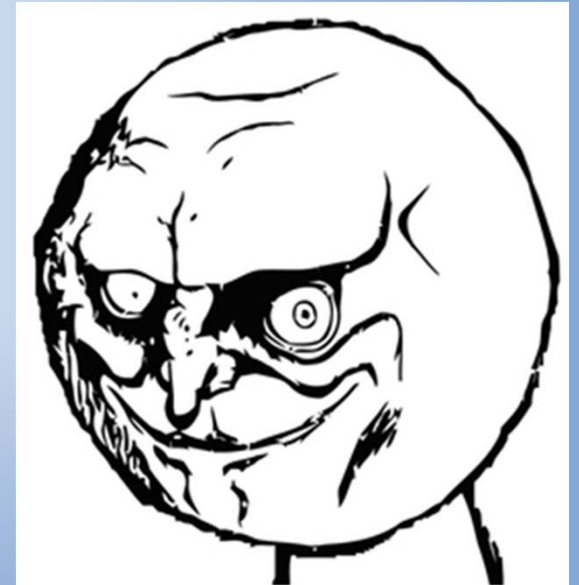
Static



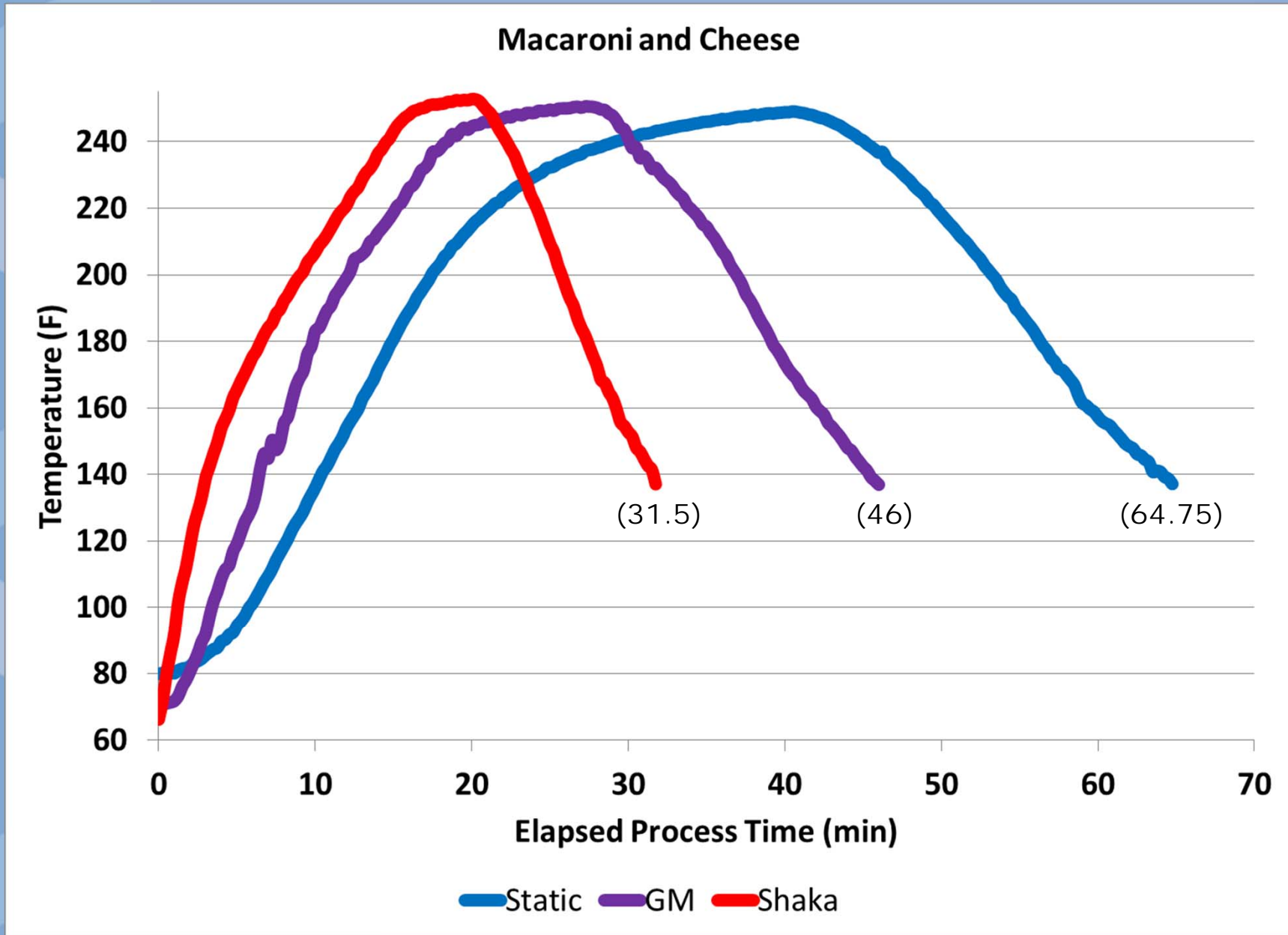
GM



Shaka



# Macaroni and Cheese – 10.5 oz. tray



# Macaroni and Cheese - Static





# Macaroni and Cheese – 90GM



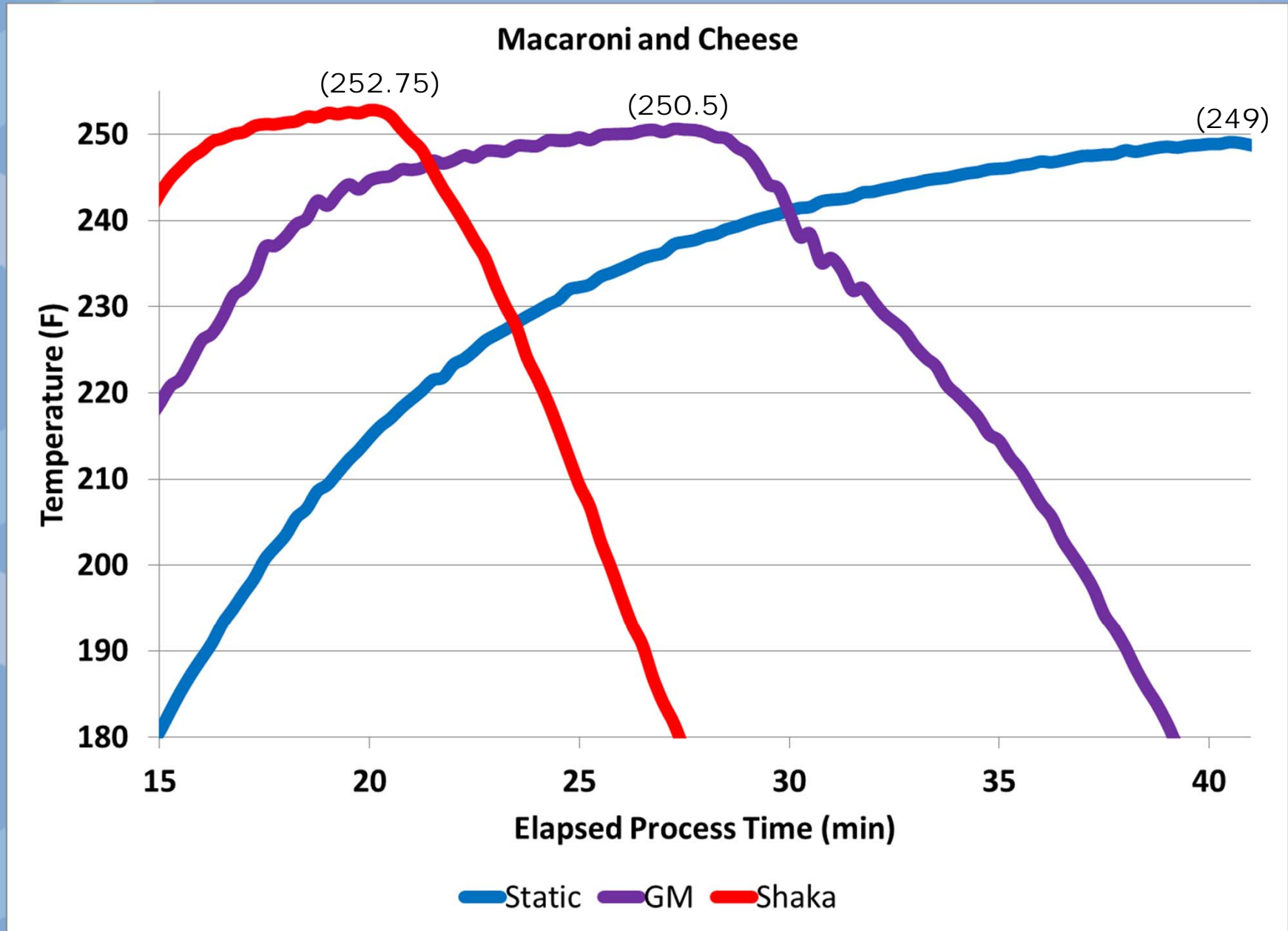
# Macaroni and Cheese – Shaka



# Macaroni and Cheese



# Last time...



# Pea and Ham Soup

Ingredients: Peas, chicken stock, carrots, starch, ham, onion

DID IT WORK?!?!?!?

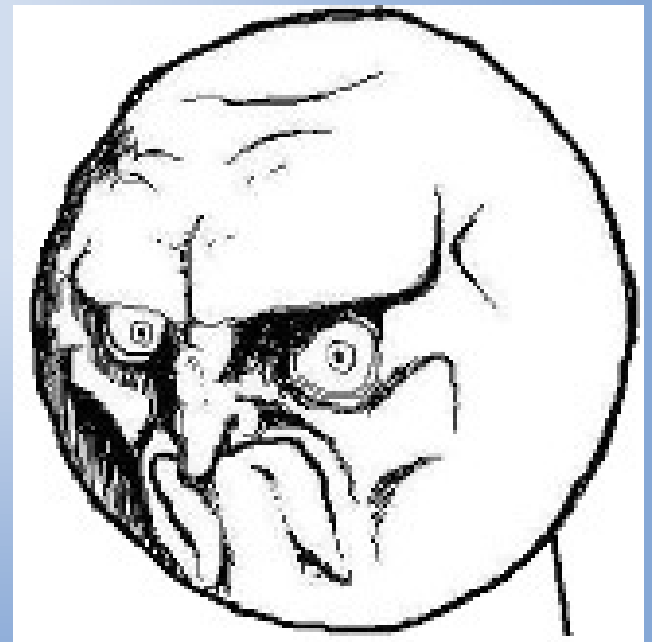
Static



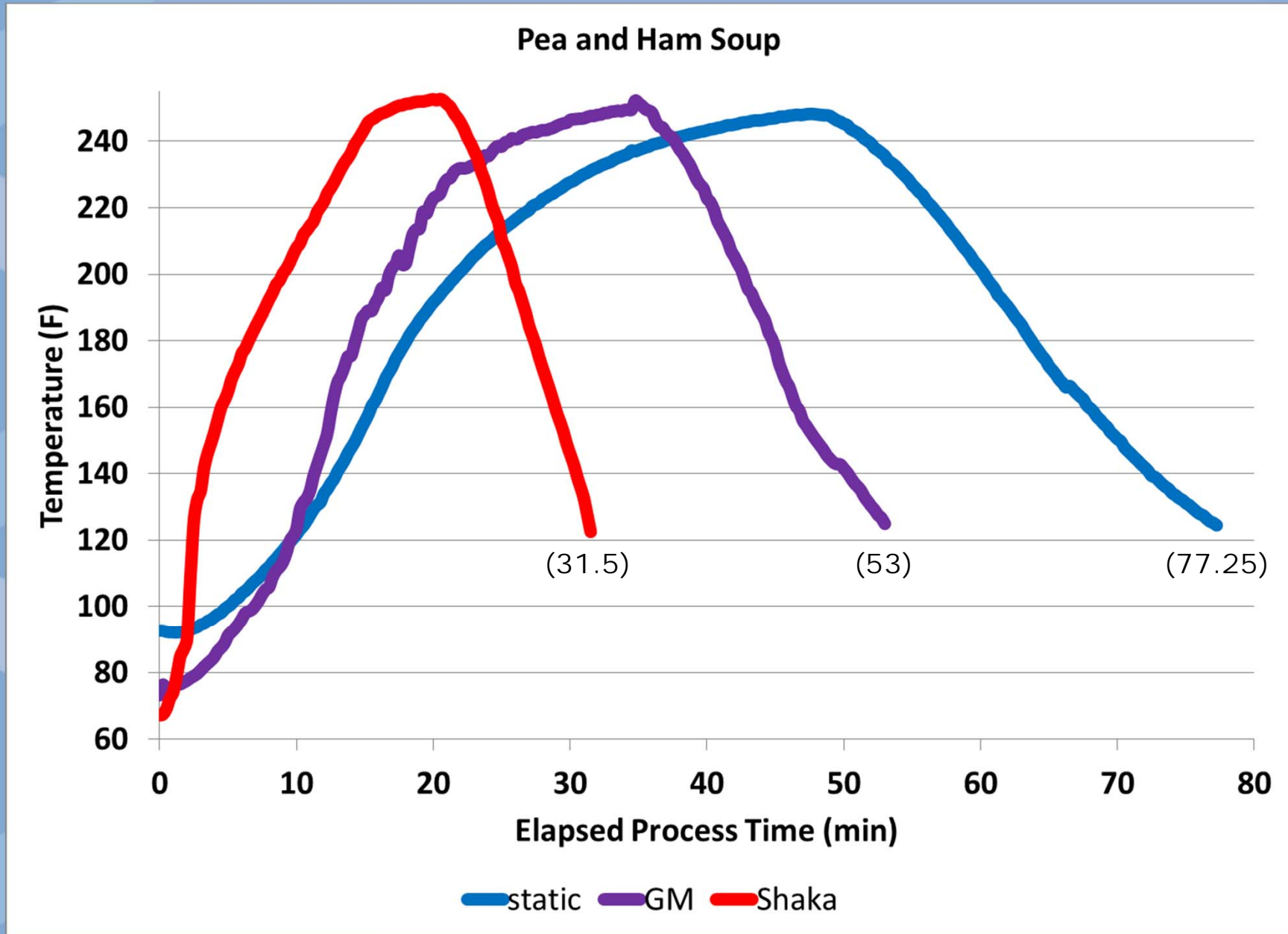
GM



Shaka



# Pea and Ham Soup – 350g pouch



# Pea and Ham Soup - Static



# Pea and Ham Soup – 90GM





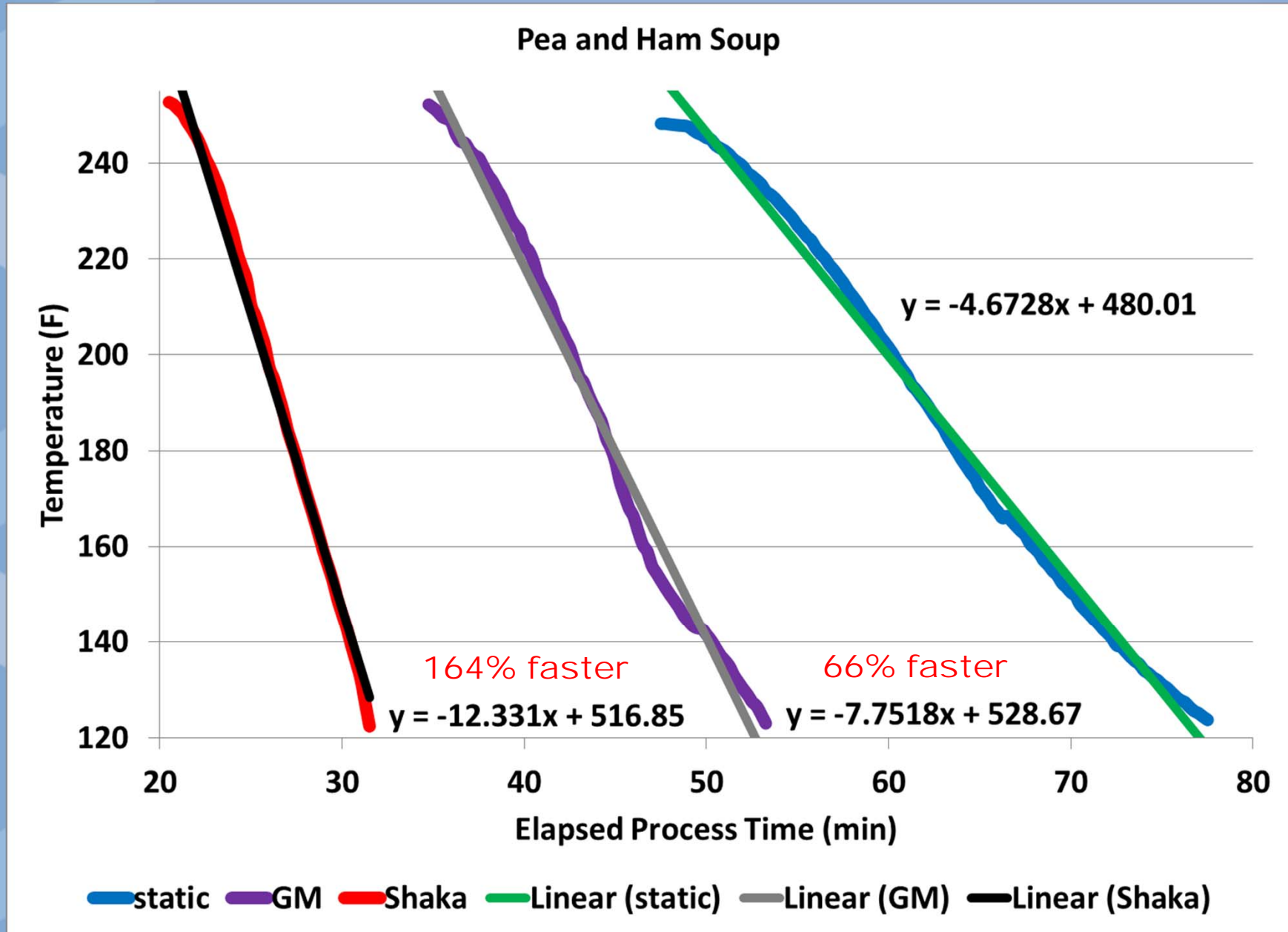
# Pea and Ham Soup - Shaka



# Pea and Ham Soup



# More Fun With Excel...

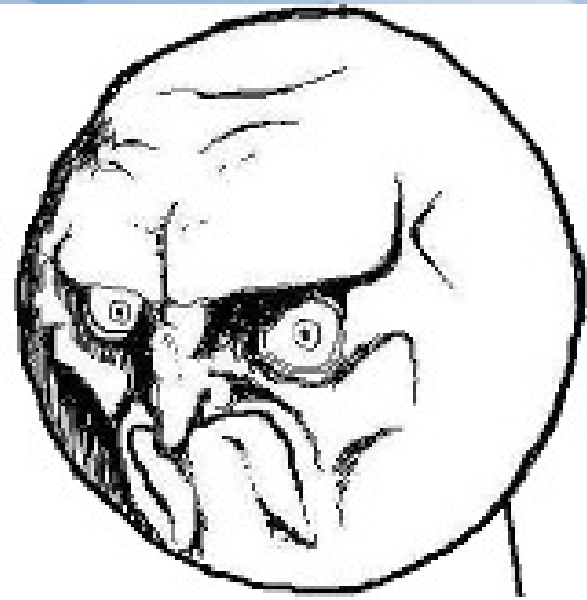


# Shrimp Pasta

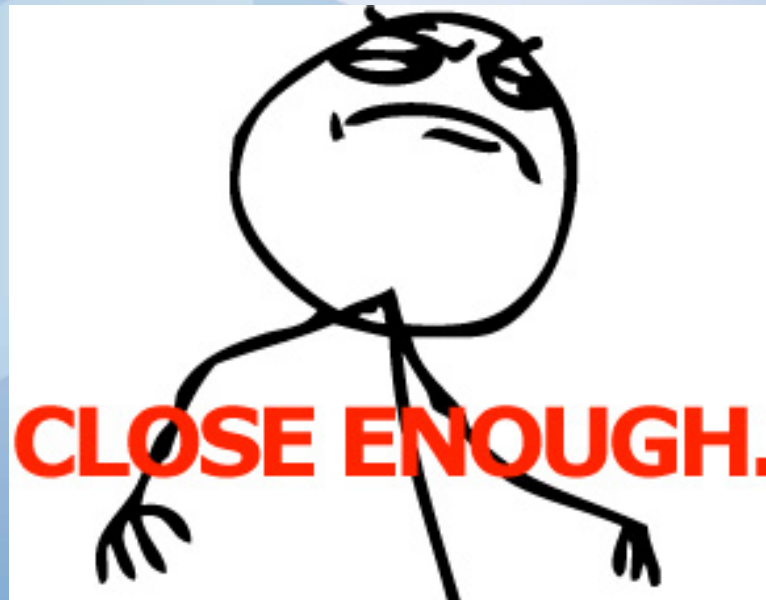
Ingredients: Noodles (raw), chicken stock, shrimp, starch, half and half, tomatoes, colby jack cheese, parmesan cheese

DID IT WORK?!?!?!?

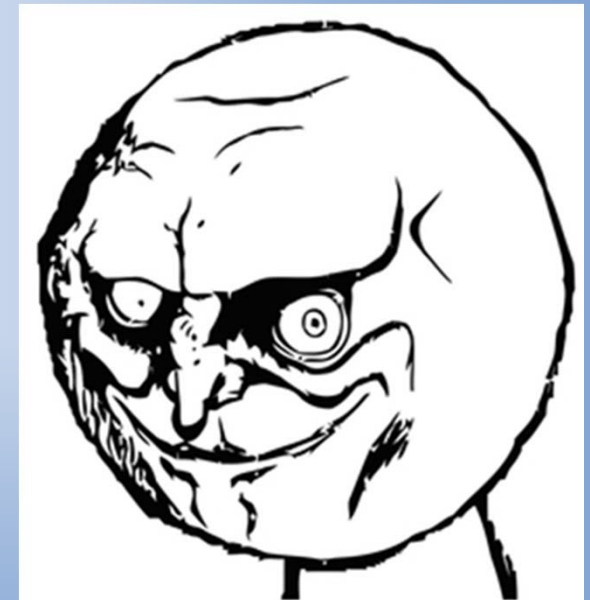
Static



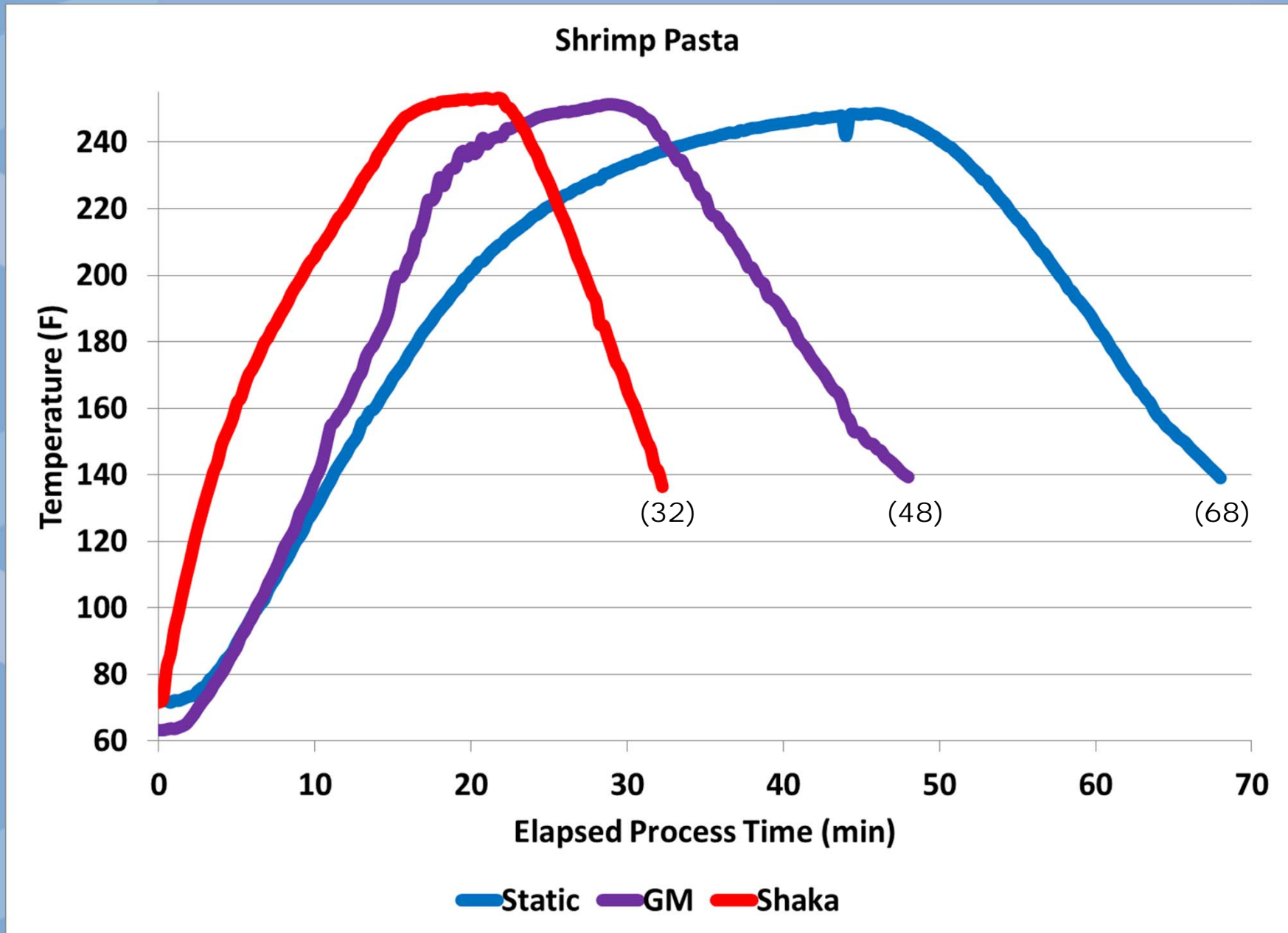
GM



Shaka



# Shrimp Pasta – 10.5 oz. tray



# Shrimp Pasta - Static



# Shrimp Pasta - GM



# Shrimp Pasta - Shaka





# Shrimp Pasta



So proud!



## Another product of note...

Chili with no beans has been run with great success in Shaka.

(It wouldn't cooperate with me. At all.)

# Conclusions, conclusions.

- Lateral agitation changes cold spot location according to agitation rate. Faster shaking = more delocalization.

# Conclusions, conclusions.

- Shaka provides dramatic heating and cooling efficiency but it doesn't "work" for all products. Thicker products with robust particulates (or fragile products with no particulates) are ideal.

# Conclusions, conclusions.

- With Shaka, super-premium products (like seafood) can now be retorted. Possible new application with in-container pureeing?

# Conclusions, conclusions.

- Shaka and GM both make higher in-container temperatures possible.

# Conclusions, conclusions.

- Gentle Motion gives the same or better product quality in approximately half the time for most products.



He's kidding. You should definitely consider purchasing a retort.

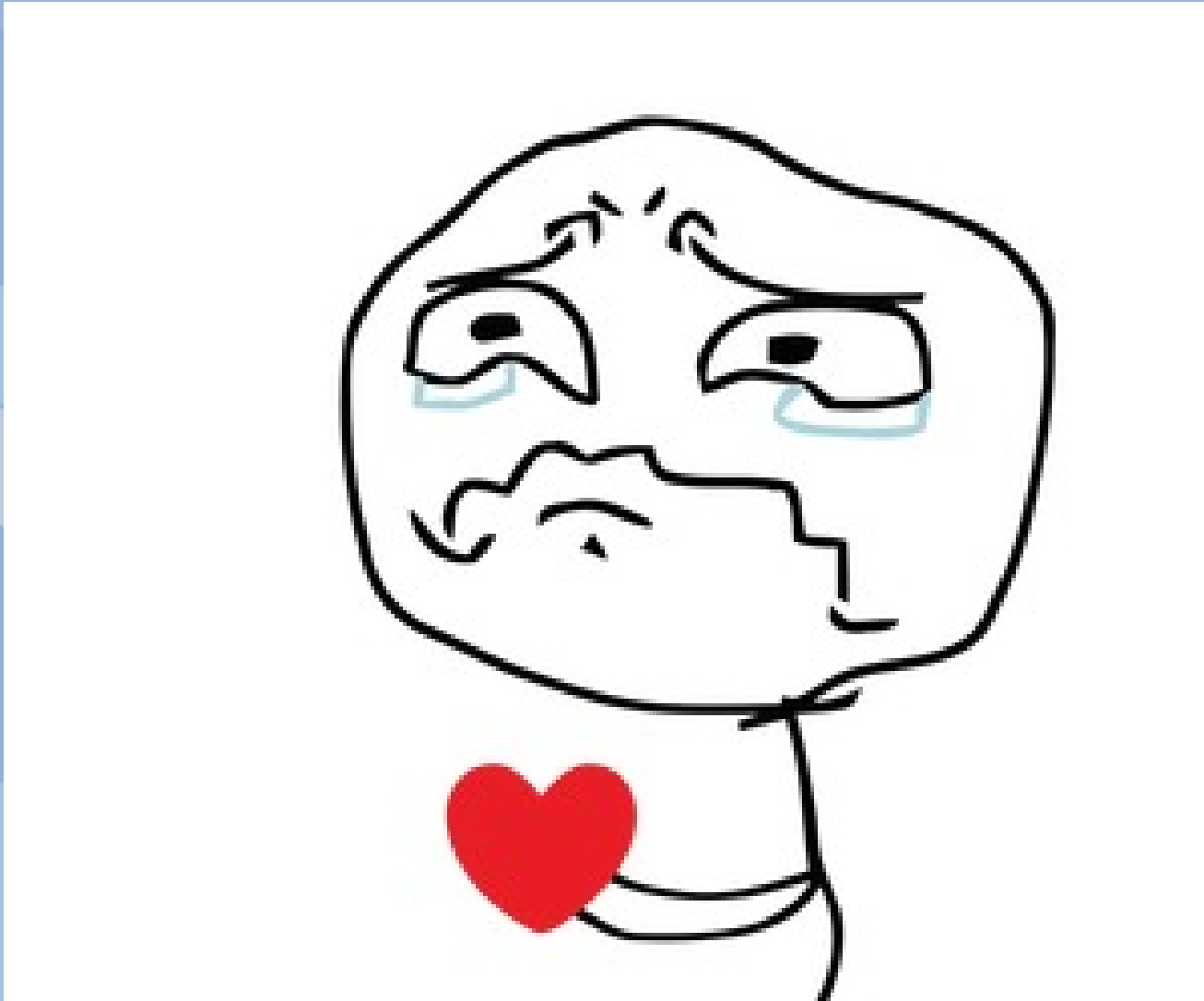


I mean...how awesome is this agitation stuff?

Don't look anywhere else.  
We've got the market cornered.



Seriously. His boss is here.



Please don't crush his dreams. Buy something.

# Thanks everybody!

## Any questions?

Special Thanks:

Silgan Containers

Grain Processing Corporation

Ampac

Nypro