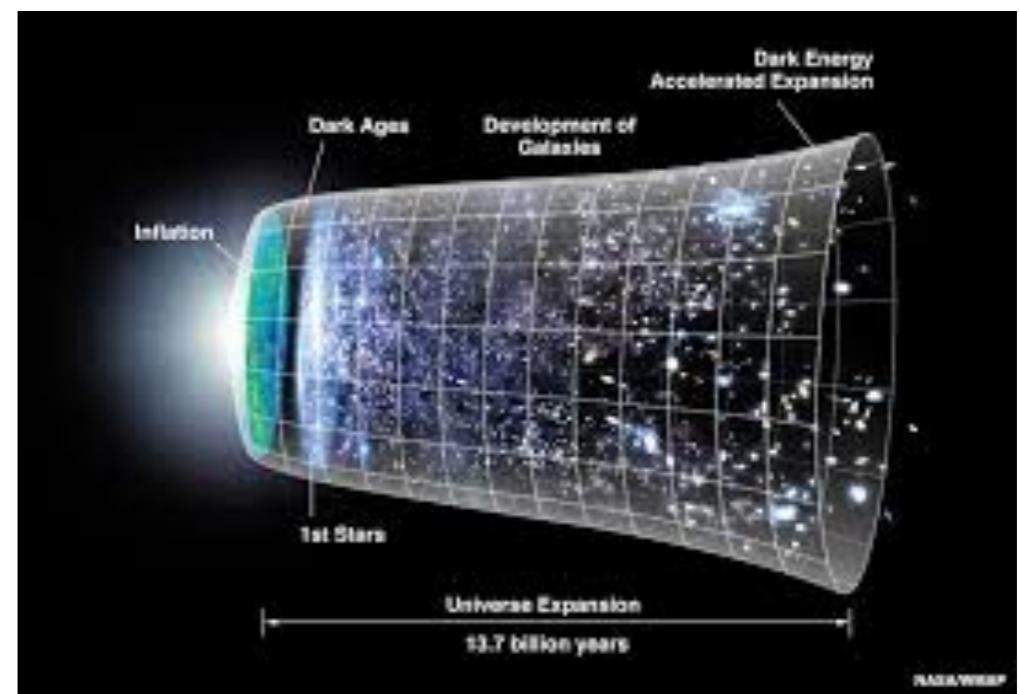
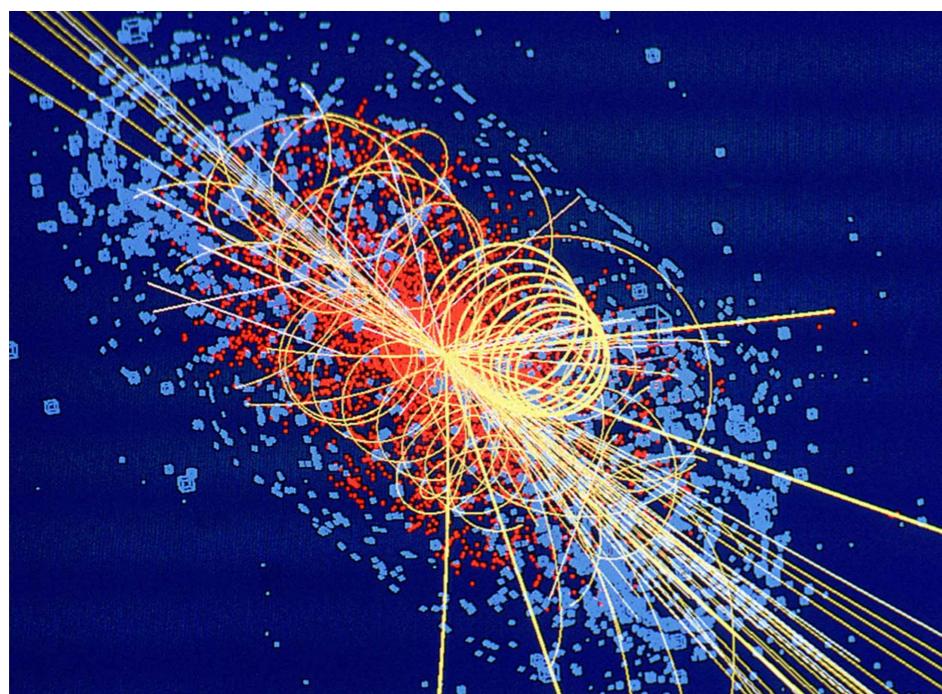


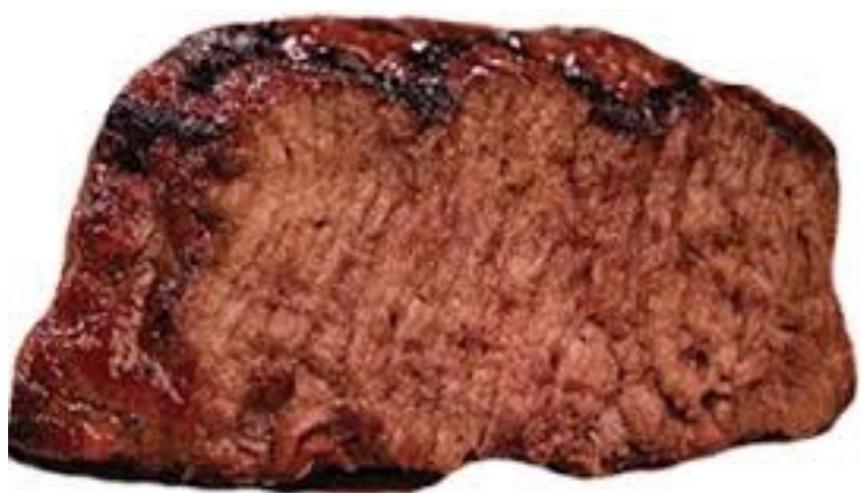
Cooking meat

Let's use some physics

We try to understand the physics of extreme situations...



... but we don't use this to understand what is going on in food



Overview

What is meat?

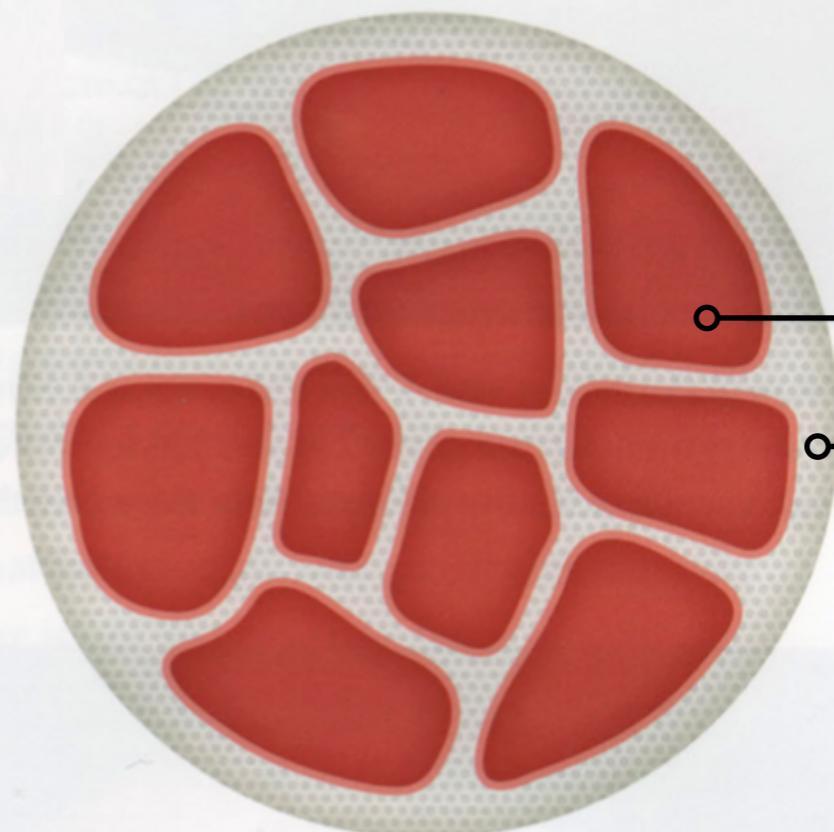
Why cook it?

Examples

Expand your ‘parameter space’



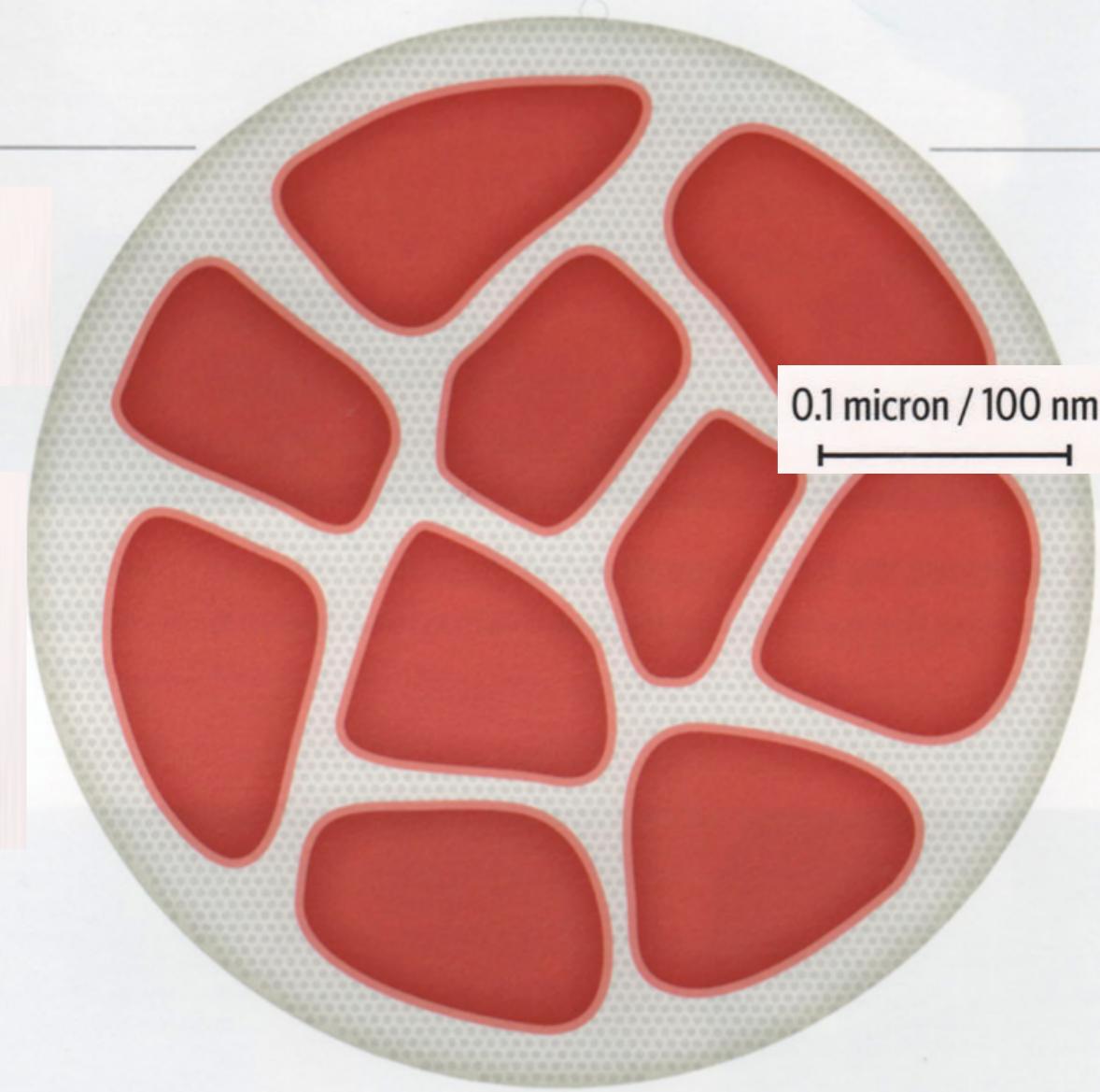
Tough meat contains more collagen than lean meat



Myosin &
Actin

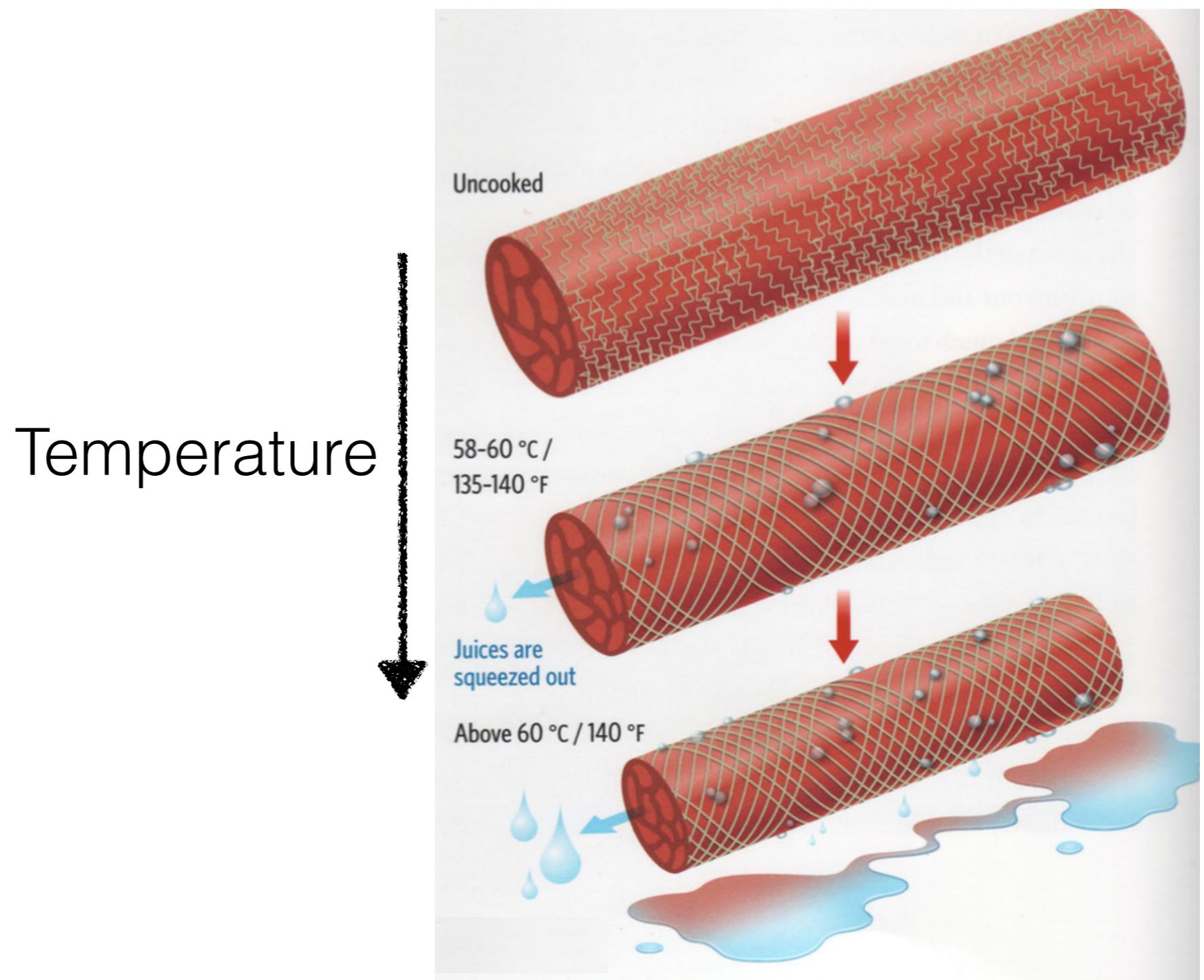
Collagen

Tender



Tough

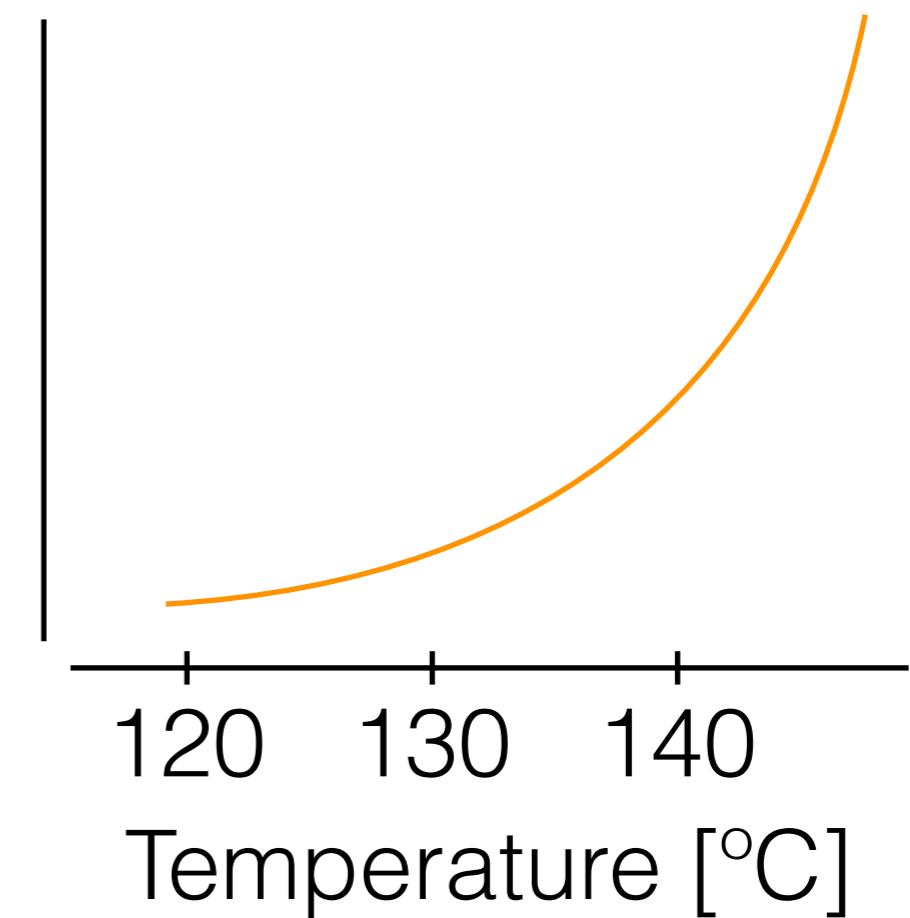
Heat increases molecule vibrations and degenerations



The outside browns as sugars
are converted above 140 °C

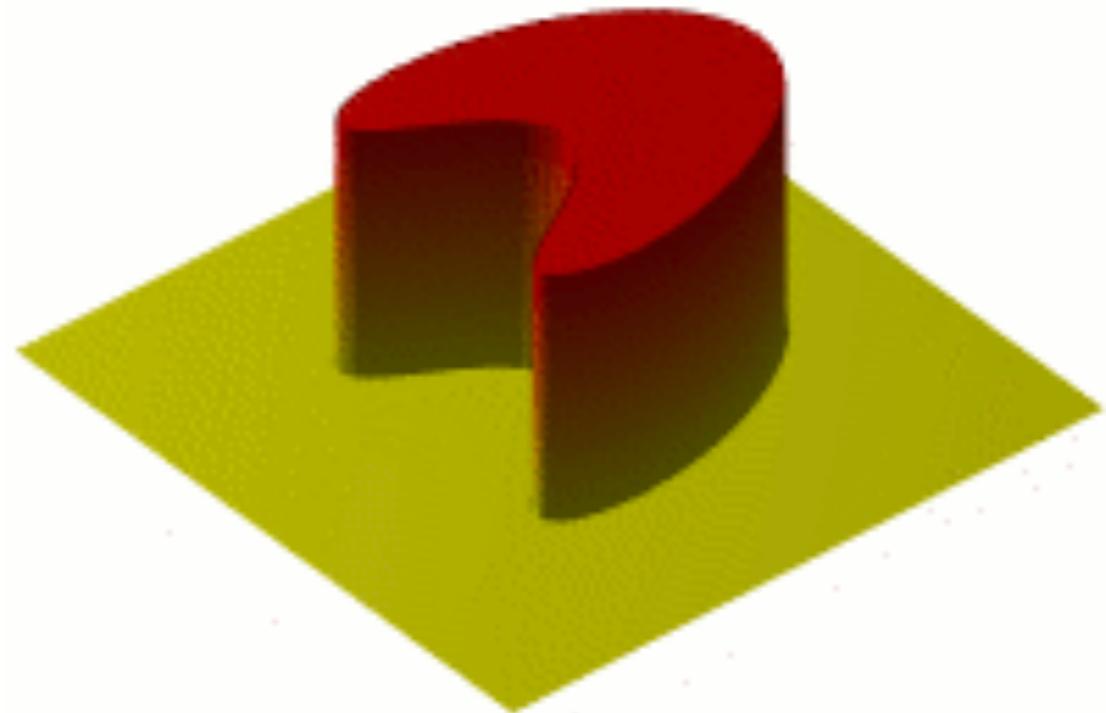


Browning
rate

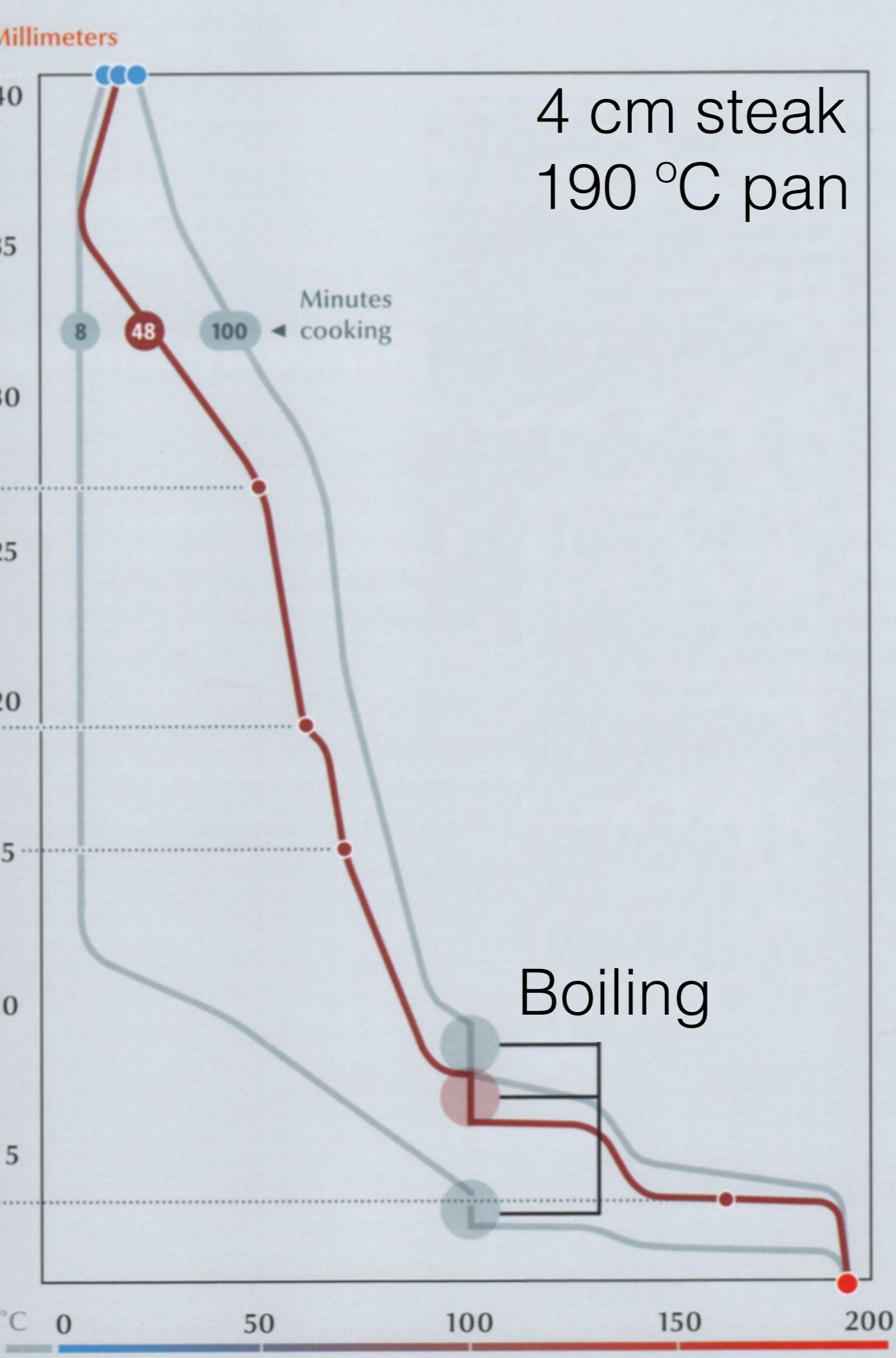
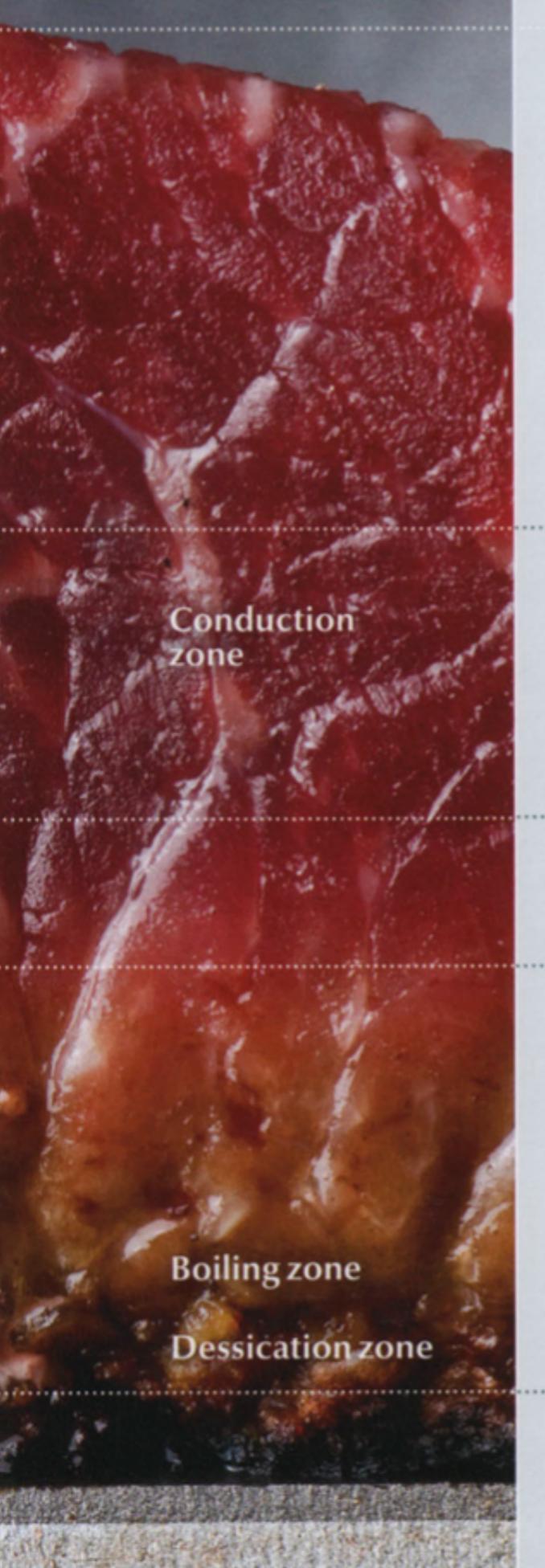


Finally, some physics

$$\frac{\partial u}{\partial t} = \alpha \nabla^2 u$$



Cooking time: 48 minutes



This online heat equation solver shows your meat throughout the process of cooking

Cook My Meat Instructions About Celsius Fahrenheit

Recipe: 4 minutes a side Name: 4 minutes a side Protein State Temperature

as table as text

Meat type: Steak

Thickness: 3 cm

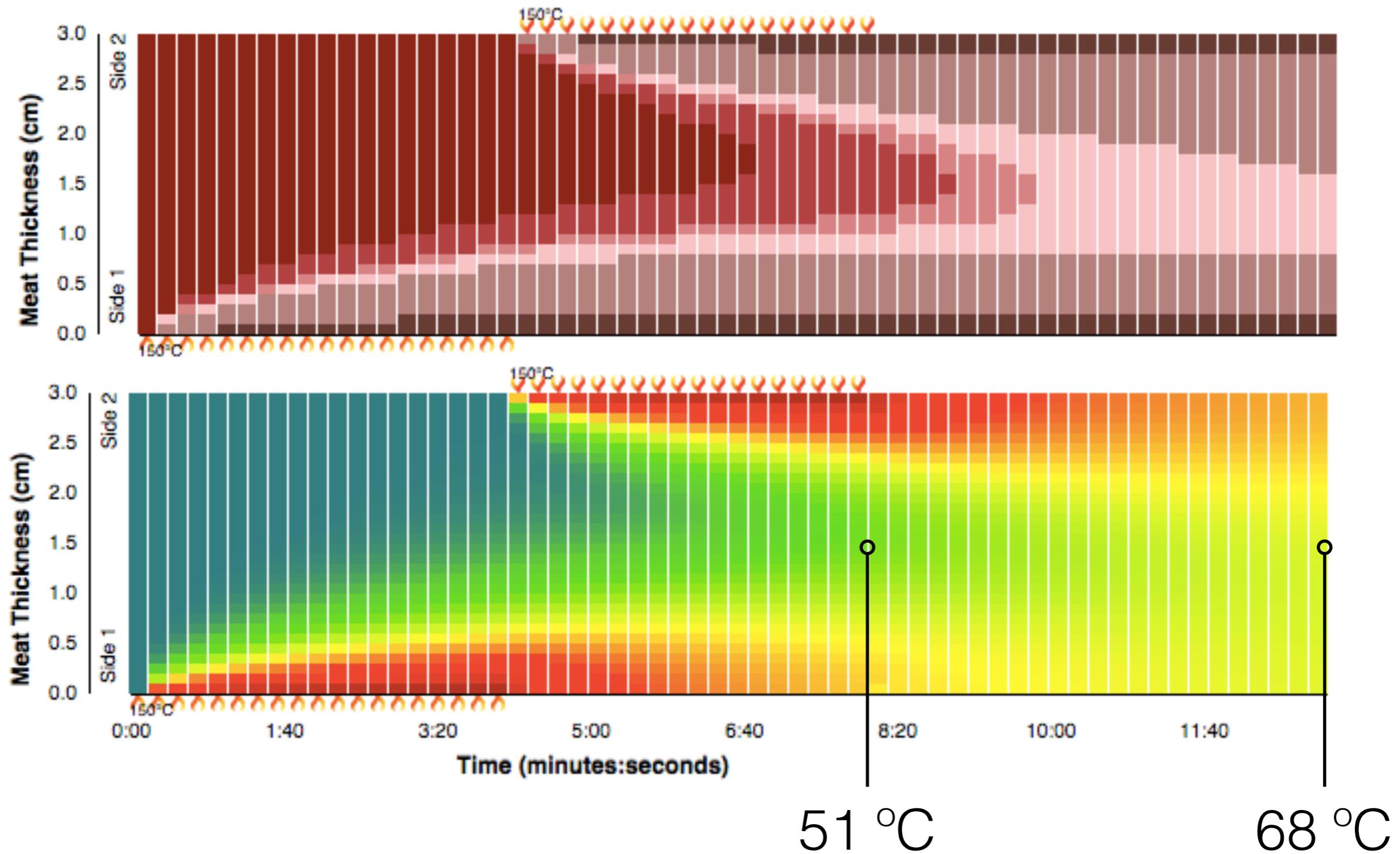
Starting at: 23 °C

	Side 1	Side 2	min:sec		
1.	150 °C	↔	23 °C	4:00	x
2.	23 °C	↔	150 °C	4:00	x
3.	23 °C	↔	23 °C	5:00	x

+ Total: 13:00

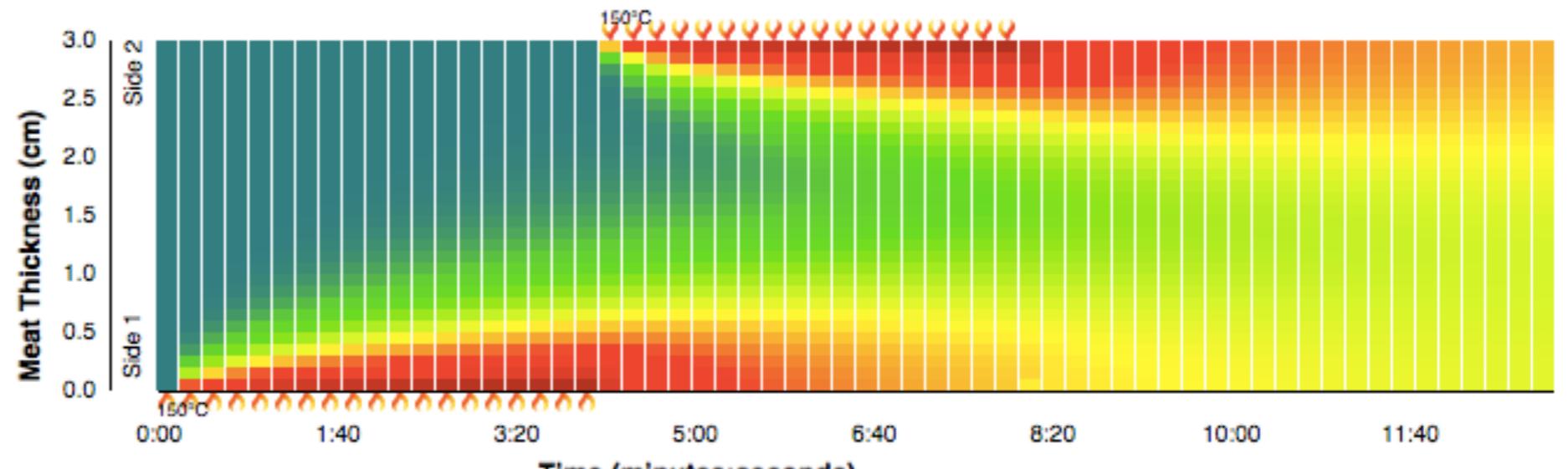
Cook

What happens in a steak: 4 minutes a side (+ 5 min. rest)

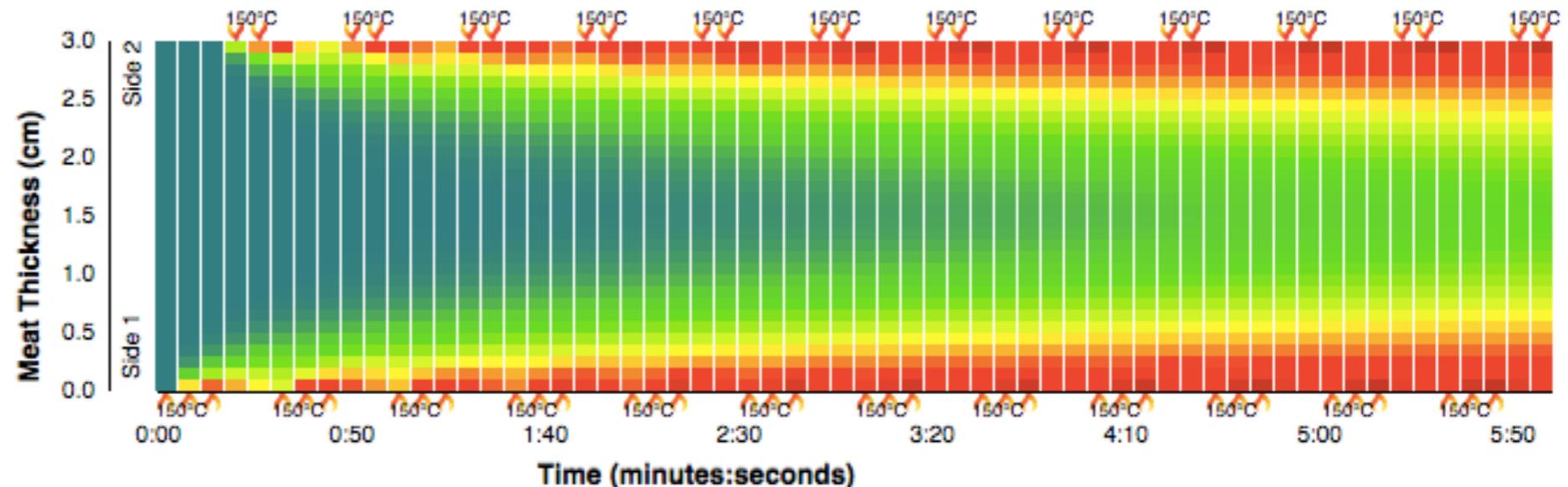


It allows you to compare cooking techniques

4 minutes
a side

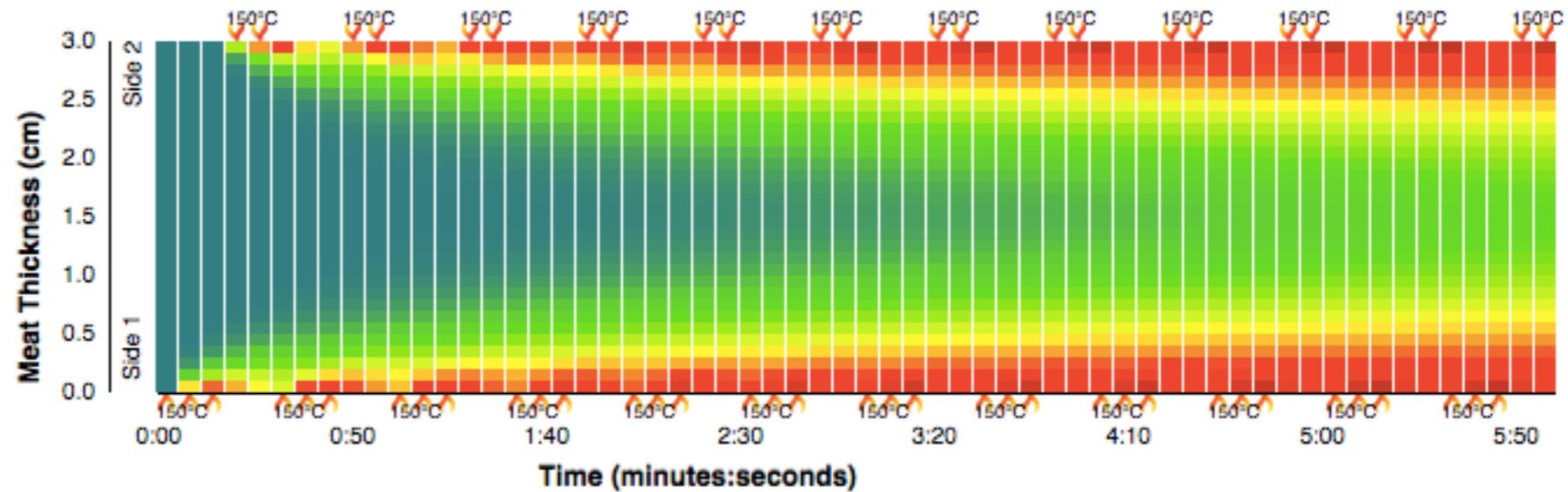


Flip every
15 seconds

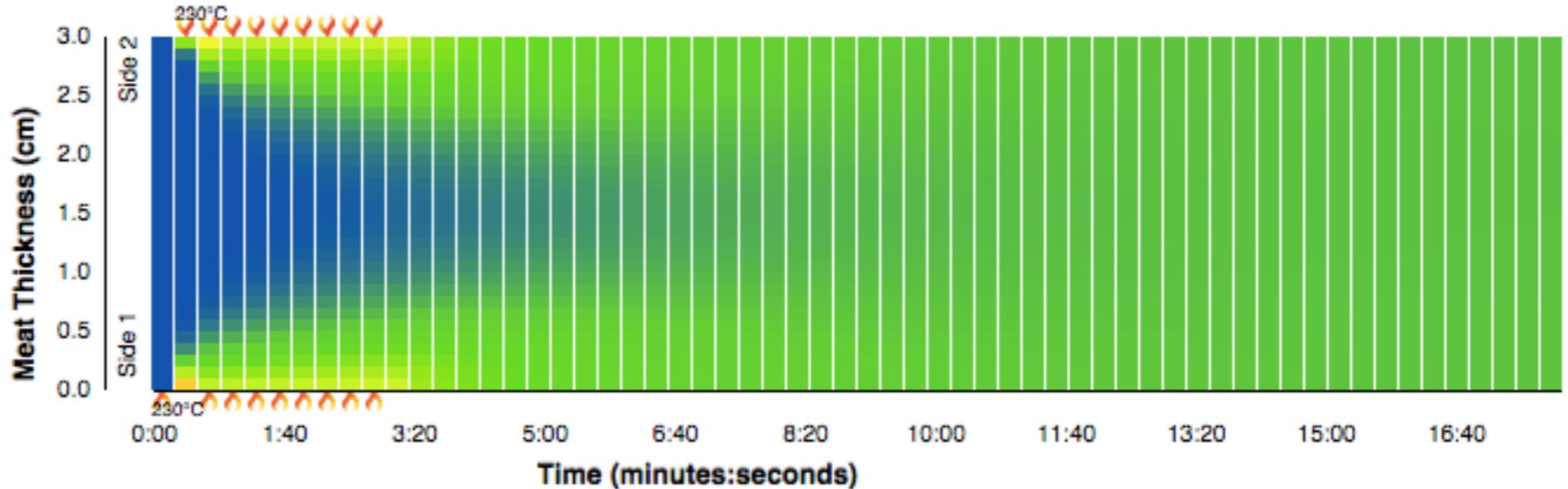


And it allows you to compare cooking techniques

Flip every
15 seconds

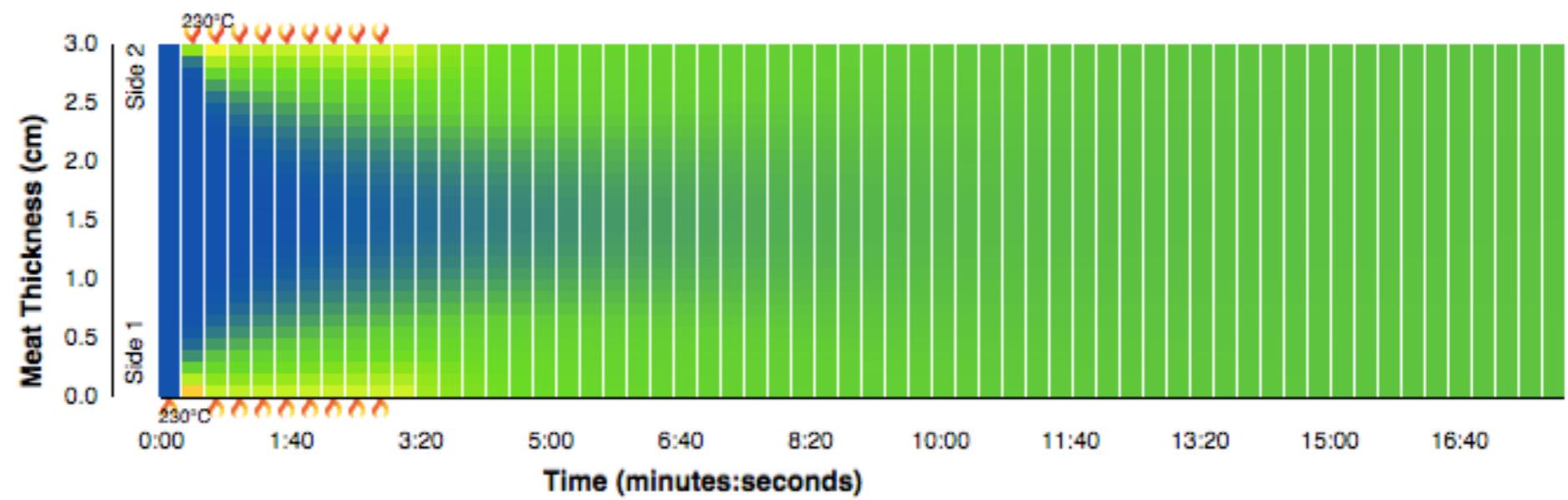


Sear, then
cook low

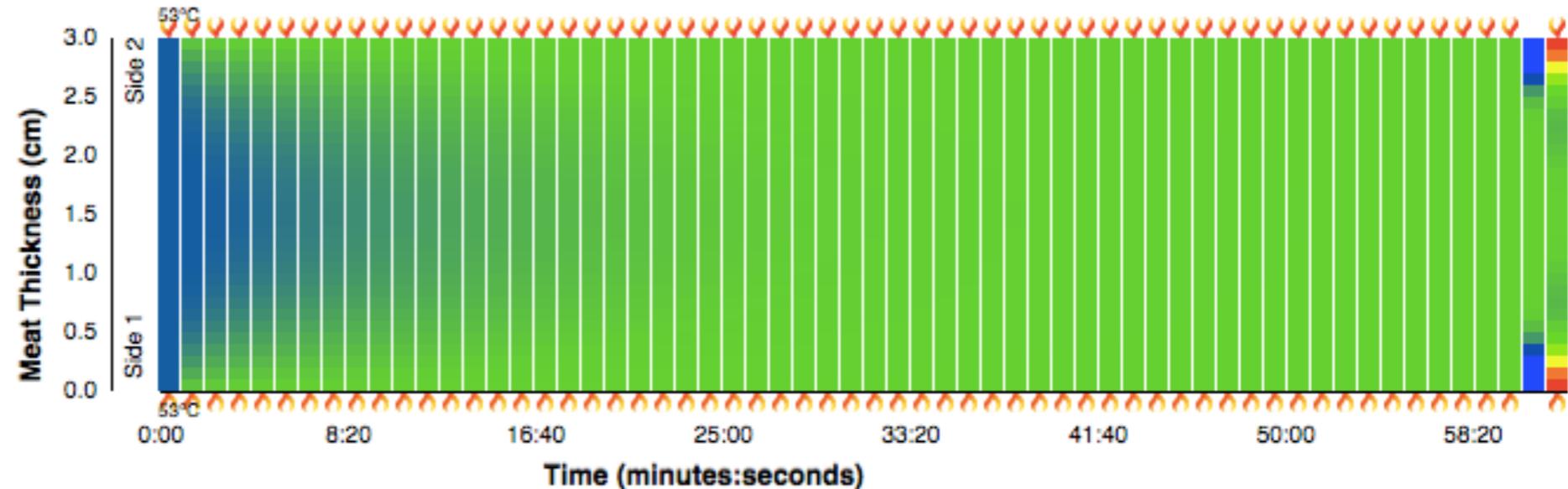


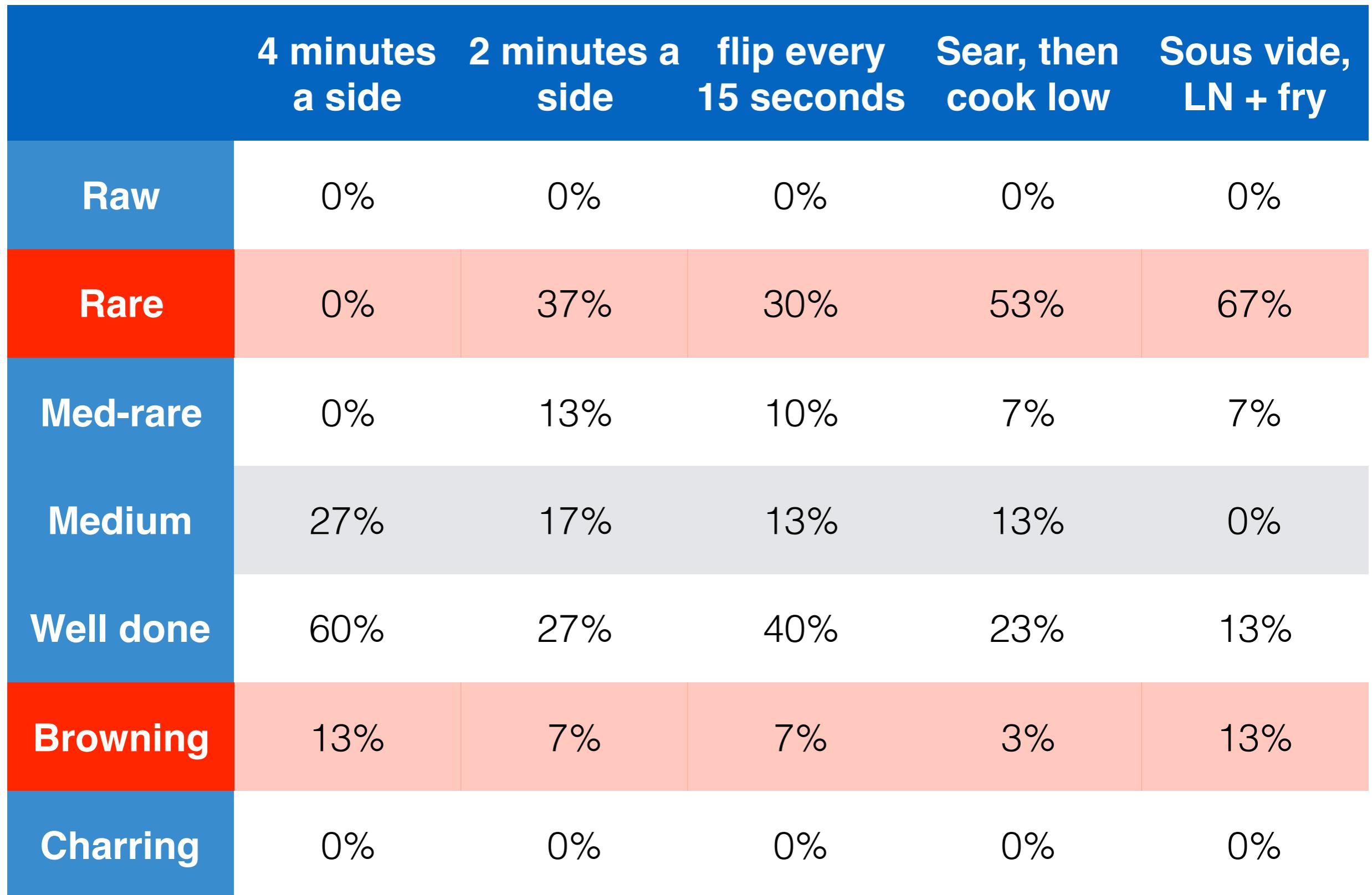
And it allows you to compare cooking techniques

Sear, then cook low

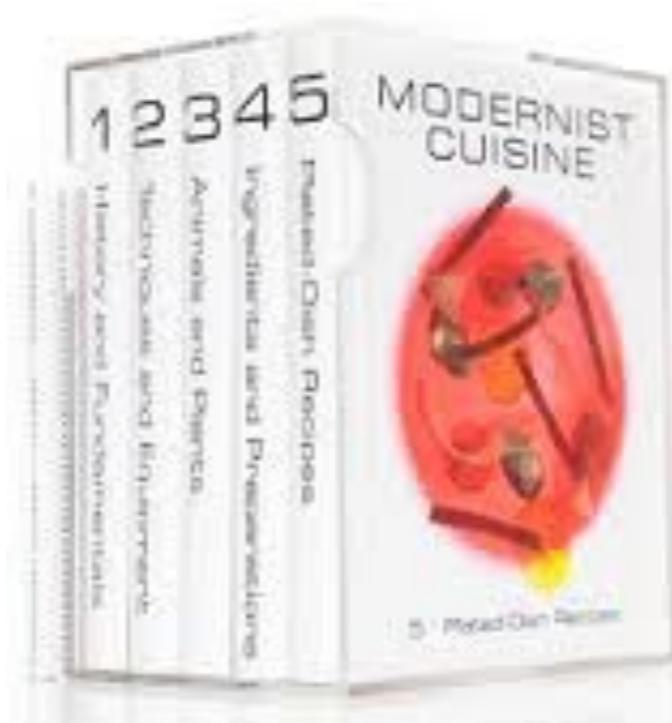
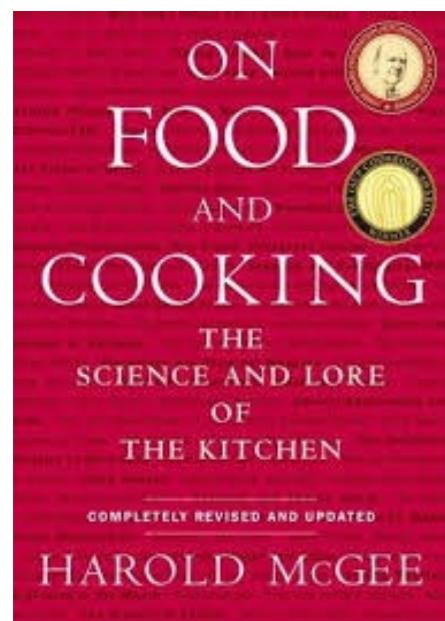


Sous vide,
LN + deep fry

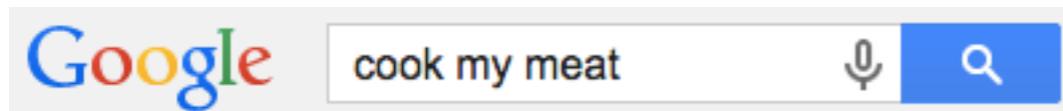




Resources and other stuff



- Brining
- Ageing
- Marinating
- Pressure cooking
- Slow cooking



Cooking Issues

There are enough tools available for cooking

- Rest your meat
- Tender meat requires even heating throughout
- Temperature ‘control’ is important for the result