OPTIMIZING PROTEIN INTAKE FOR ATHLETES

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MAXIMIZING ATHLETIC PERFORMANCE

GATORADE
THE SPORTS FUEL COMPANY™

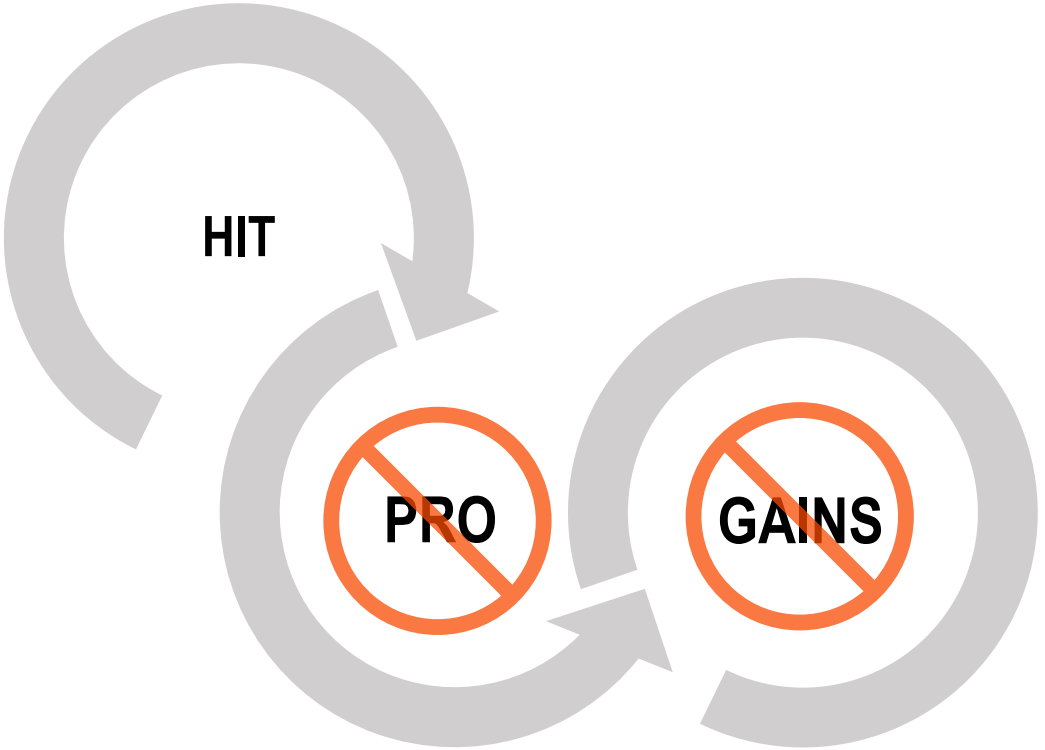
WHY ARE YOU HERE?

How much protein?

What types?

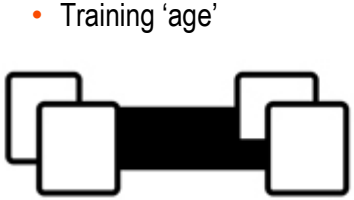
When and how often?

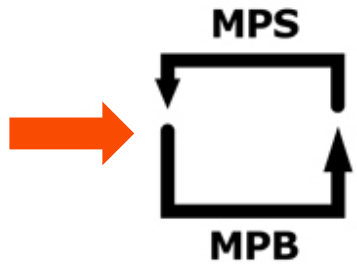
What makes ineffective?



Key Variables:

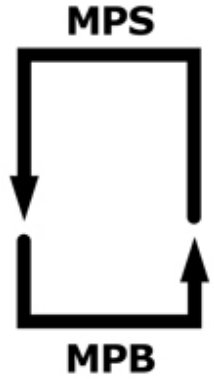
- High effort (failure)
- Time under tension
- Volume
- Frequency of bouts
- Training ‘age’





Key Variables:

- Source
- Dose
- Timing
- Pattern
- Macro coingesion



Negative net protein balance:
Breakdown and removal of damaged and / or
dysfunctional proteins

Positive net protein balance:
Synthesis of new proteins for repair and growth

Morton, 2015

- Source
- Dose
- Timing

INGESTED AMINO ACIDS/PROTEIN

- Pattern
- Macronutrient coingestion

- Rate of protein digestion
- Rate of amino acid absorption

Blood Amino Acid Concentrations

- Splanchnic extraction of amino acids

RESISTANCE EXERCISE

- Blood flow
- Insulin-medidated capillary recruitment

Amino Acid Delivery to skeletal muscle

- Microvascular perfusio

- Activity of amino acid transporters

Amino Acid Uptake by skeletal muscle

MUSCLE PROTEIN BREAKDOWN

(MYOFIBRILLAR) MUSCLE PROTEIN SYNTHESIS

SKELETAL MUSCLE PROTEIN REMODELLING

CHANGE IN SKELETAL MUSCLE MASS

- Determined by other stimuli, e.g., Exercise mode

- Change in quality of all muscle proteins

Witard, 2016

OUTLINE

Current understanding of protein needs

- Relative vs. absolute recommendations
- Protein timing
- How much is too much
- Night-time protein
- BCAAs

Inhibitors of MPS

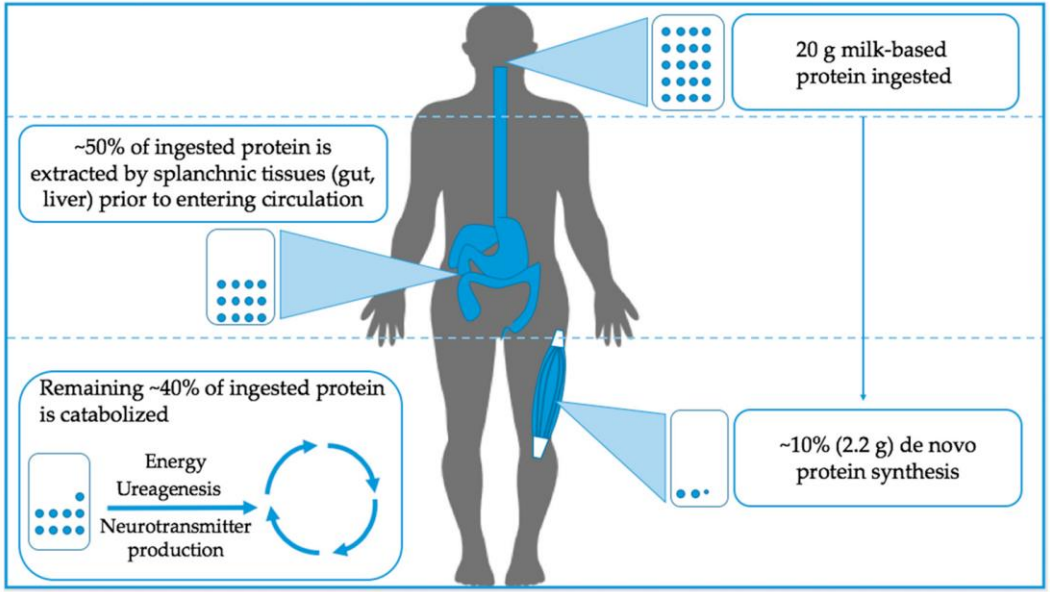
Cost effective protein

What to do when not hungry

Q & A

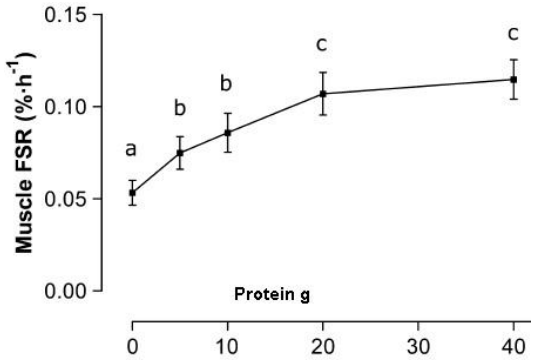
TOO MUCH PROTEIN?

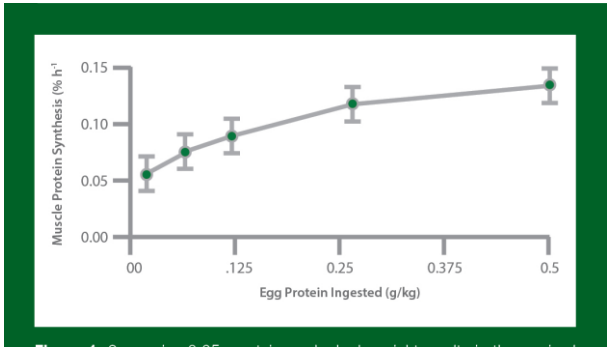
Myth that AA just hang out waiting to be used if over-eaten.



Stokes, 2018

RELATIVE VS. ABSOLUTE RECOMMENDATIONS





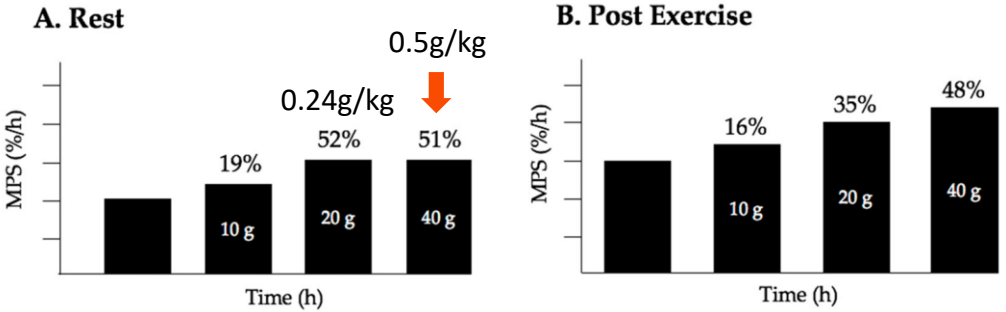
Moore, 2009

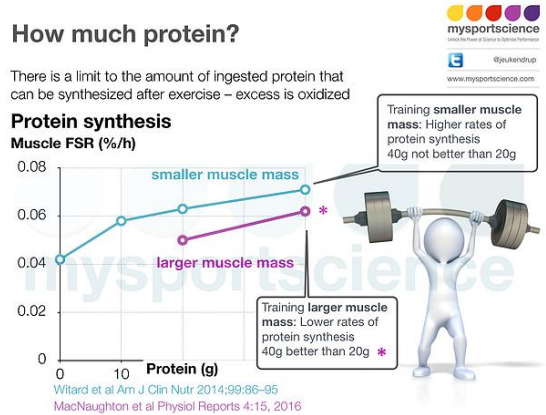
MPS at rest is maxed out at 20g whey (40g mixed meal)

Post exercise

- 10 → 20g = 2x MPS
- 20 → 40g increases MPS but diminishing

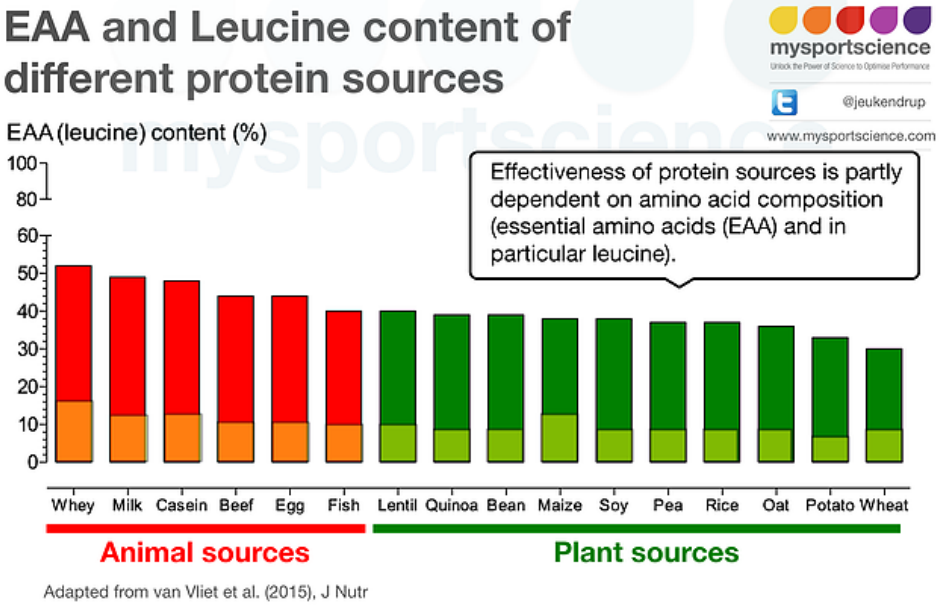
Whole body RT drives greater needs

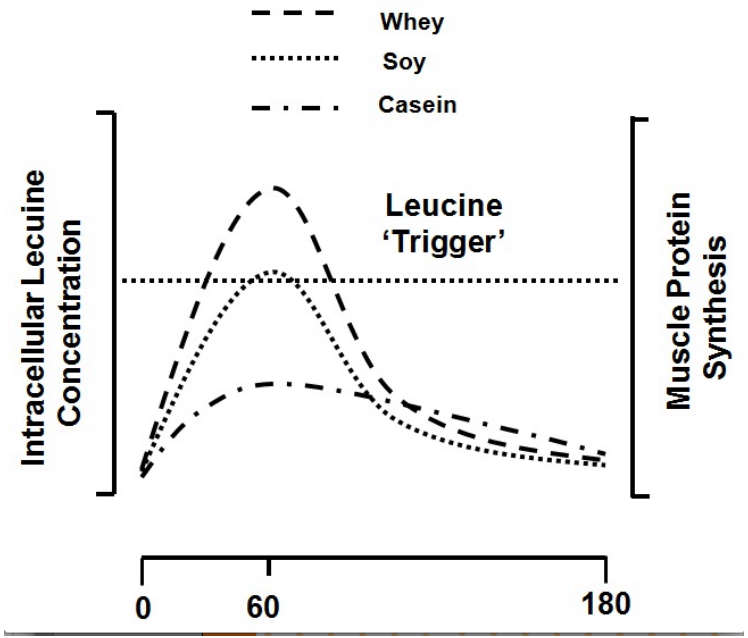




Witard, 2014
MacNaughton, 2016

KEY AMINO ACID IN MUSCLE GROWTH





Wolfe, 2017

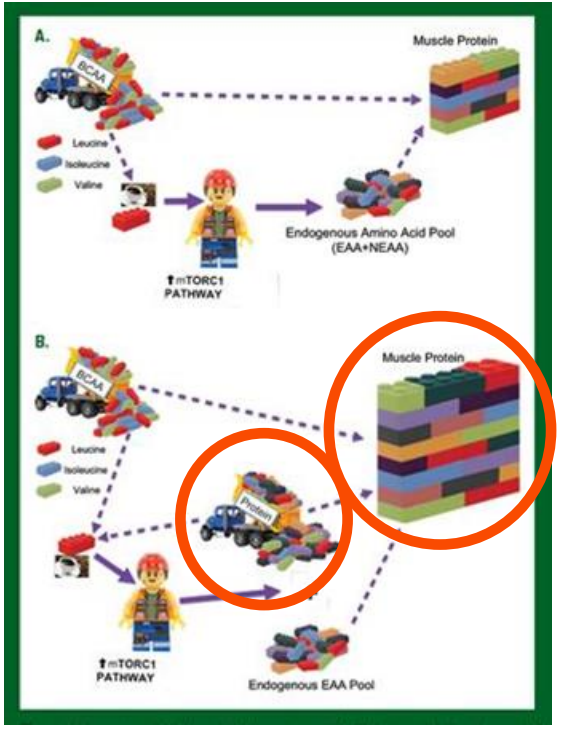
BRANCH CHAIN AMINO ACIDS FOR MAX GROWTH?

Whole protein (EAAs) > BCAAs

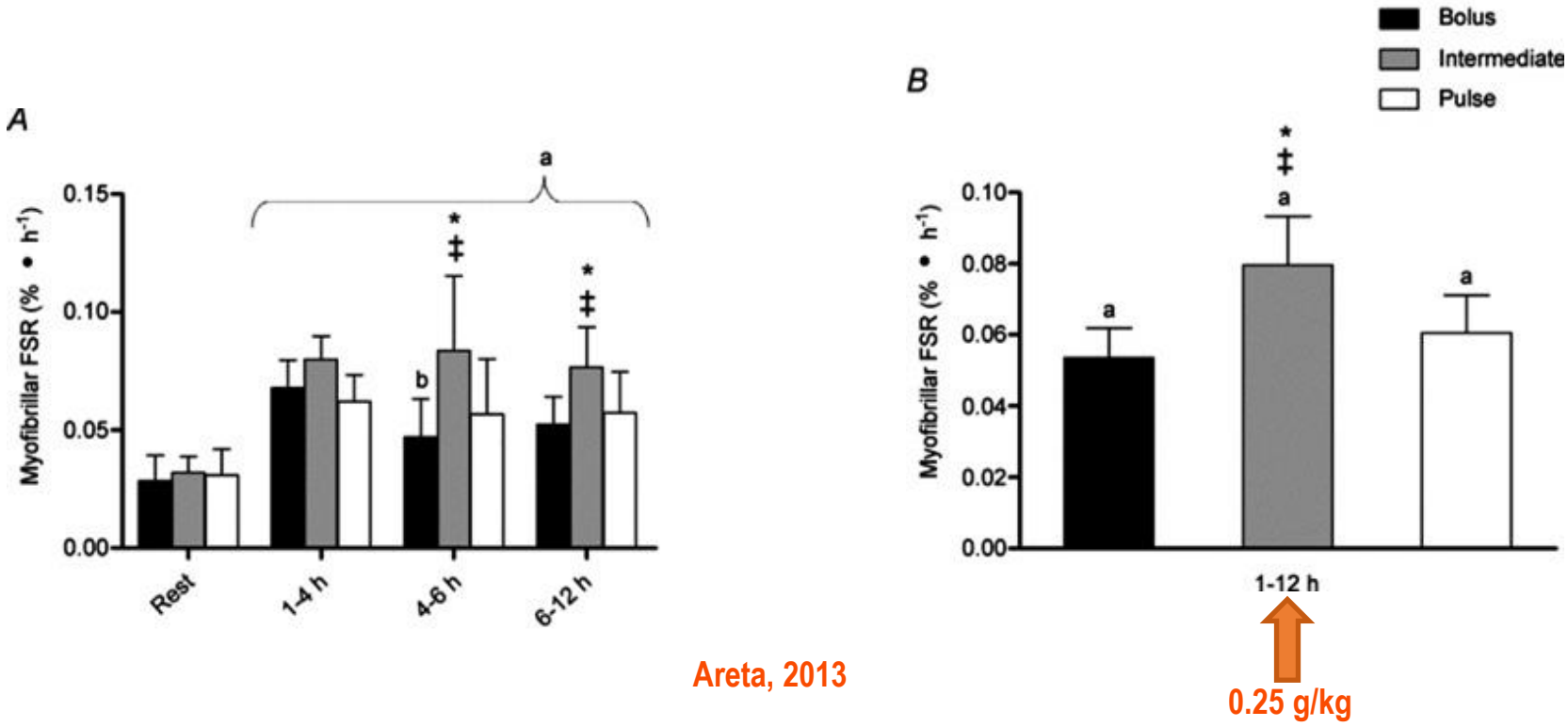
Leucine content is the driver of “protein quality” when it comes to MPS.

- Milk, eggs, whey

When whole protein consumption is limited – acute negative energy balance



PROTEIN ALL THE TIME! NOT EXACTLY.

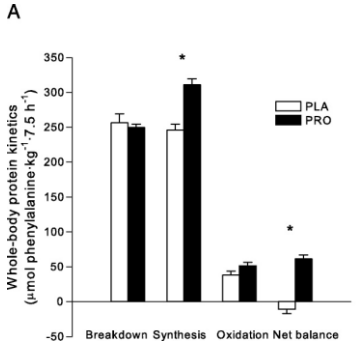


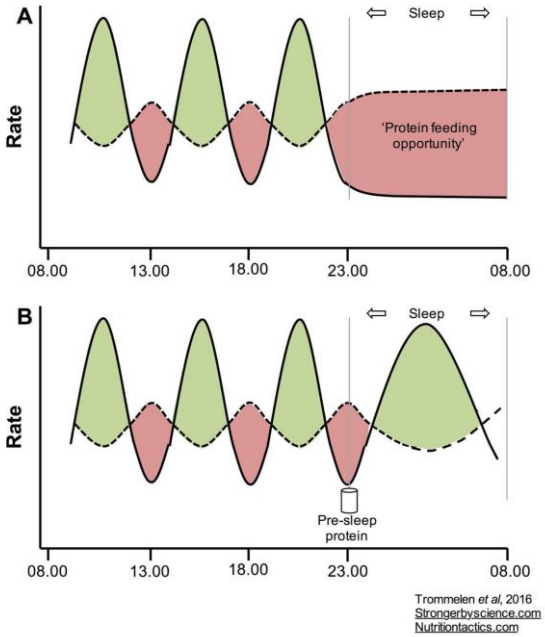
Areta, 2013

NIGHT-TIME PROTEIN

40g before bed (0.5 g/kg)
Res, 2012

40g > 30g +2g leucine
Trommelen, 2017





BUT IF I EAT TOO MUCH PROTEIN I'LL GET BIG

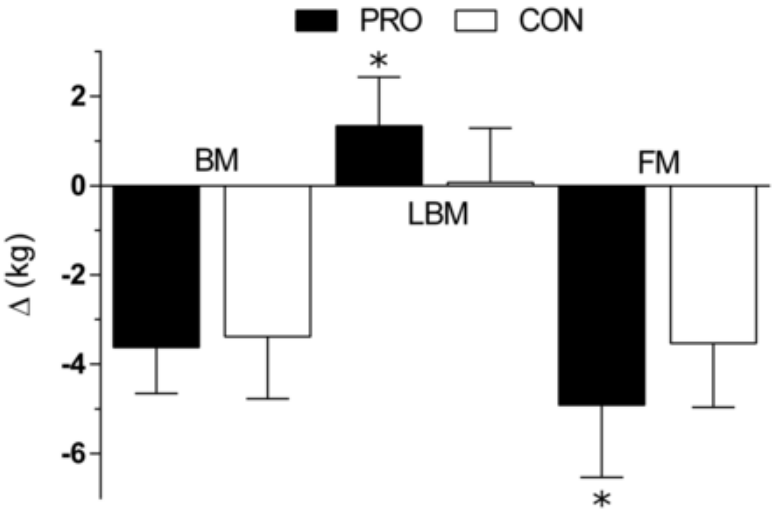
Athletes concerns of wt gain if adding protein…

RT + Hpro + Cal Restriction =

- Lighter & Leaner w/ increased LBM

Protein is the most satiating macro

- Should be the base of any weight loss plan (athlete or non)



Longland, 2016

OPTIMIZING MUSCLE MASS ACCRETION

So many variables

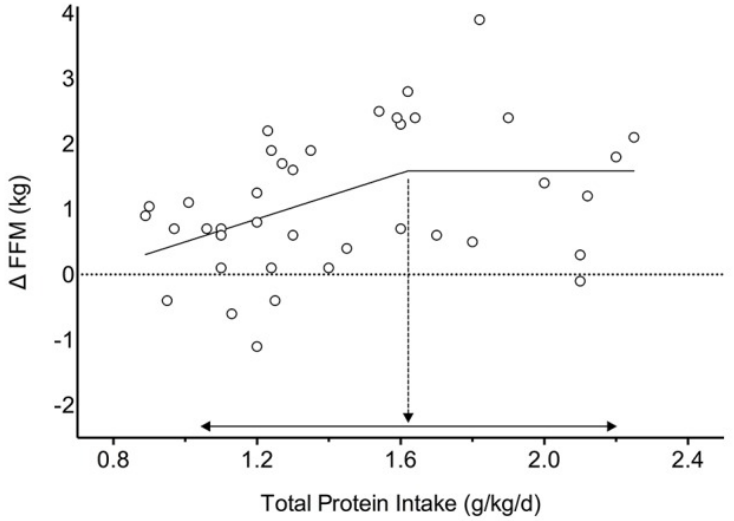
- Does
- Timing
- Source
- Concurrent training

1.6 – 2.2 g/kg/day

- 0.4 g/kg every ~4 h + 0.5 g/kg pre-bed
  - 0.3 when just using whey isolate
  - Almost always doing whole body RT

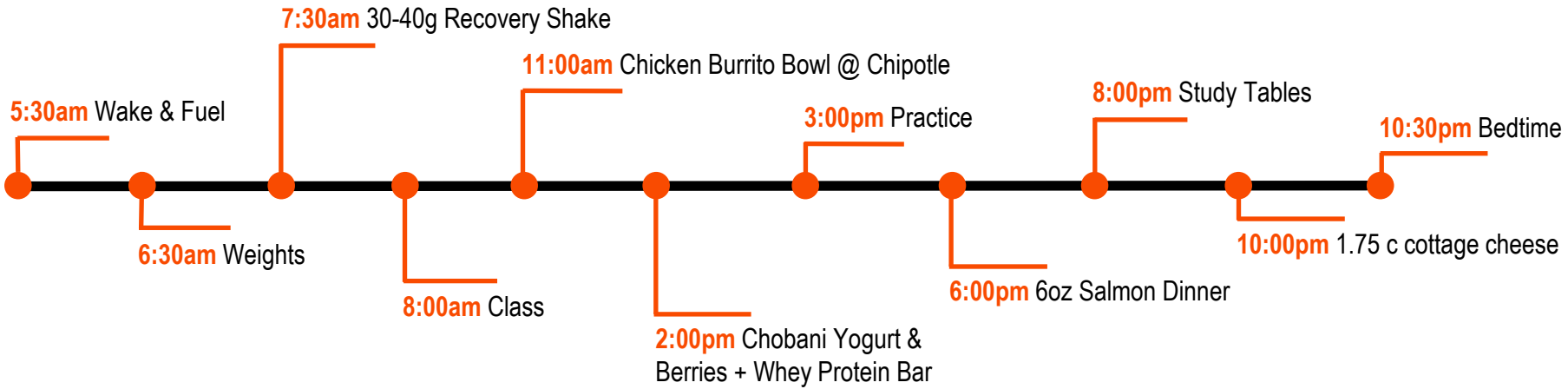
2.3– 3.1 g/kg/day

- During long-term energy restriction
- Trained athletes lose LBM faster than untrained
- Leucine (3.5g) during acute energy restriction

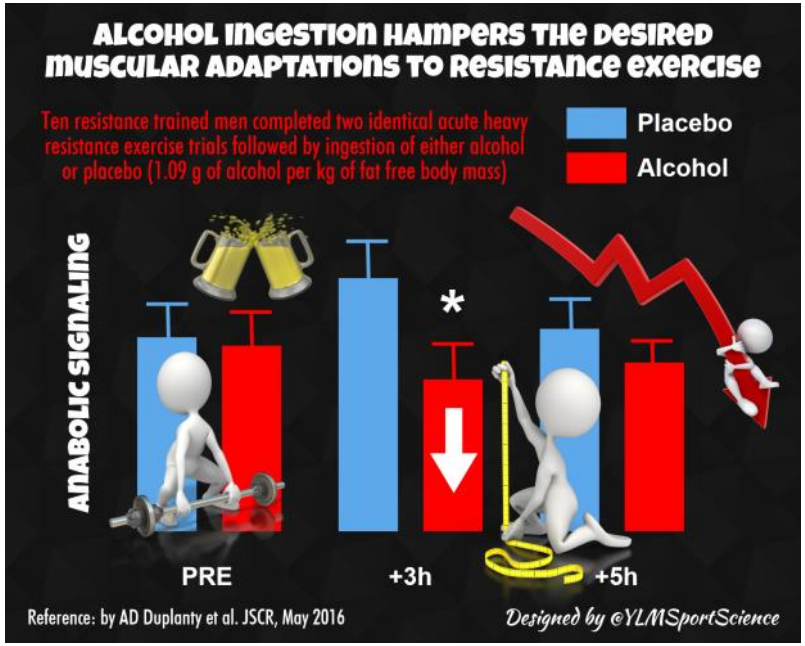


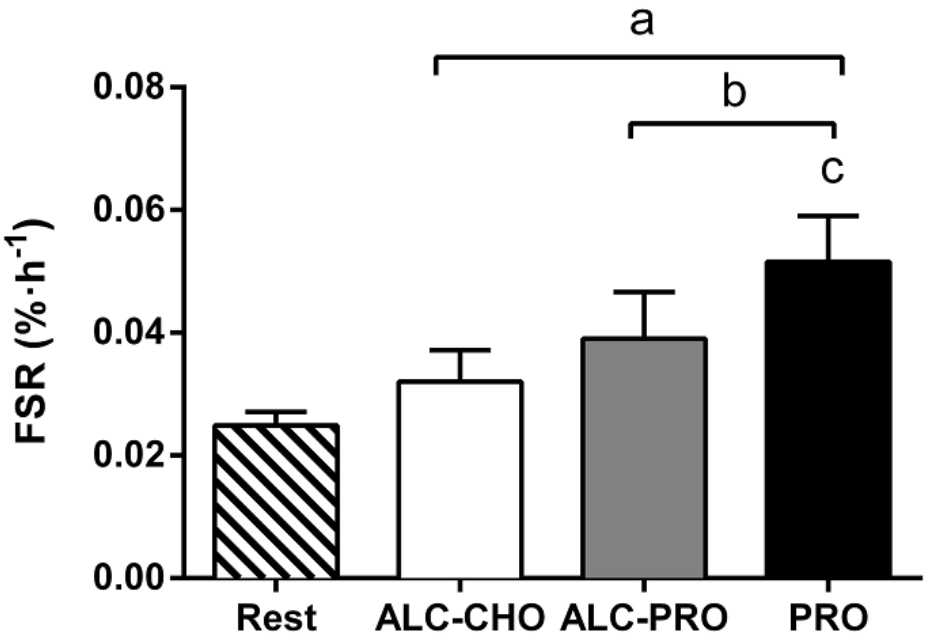
Morton, 2017
Stokes, 2018

FUELING PATTERN – 220LB FOOTBALL PLAYER



BEER BELLY GAINZ

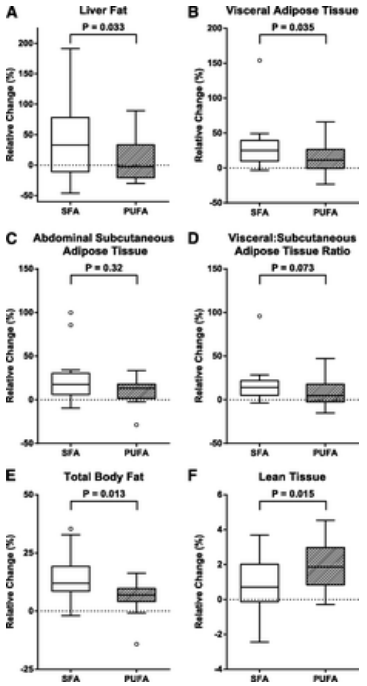




JUST GET CALORIES???

PUFAs vs. SFA

- SFA had greater visceral fat gains
- PUFAs had 3x greater LBM gains



Rosqvist, 2014

COST EFFECTIVE PROTEIN

PROTEIN SUPPS???

- Whey
- Peas/Hemp
- Soy
- Vegan blends
- Casein
- BCAAs
- L-arginine
- Vitamin D
- Omega-3
- NMS

RESOURCES

GSSIweb.org

YLMsportscience.com
Yann Le Meur

Mysportscience.com
Asker Jeukendrup

SportsRD.org
CPSDA – educational resources

THANK YOU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