

Co jedí sportovci, aneb máme se ve výživě od nich co učit?

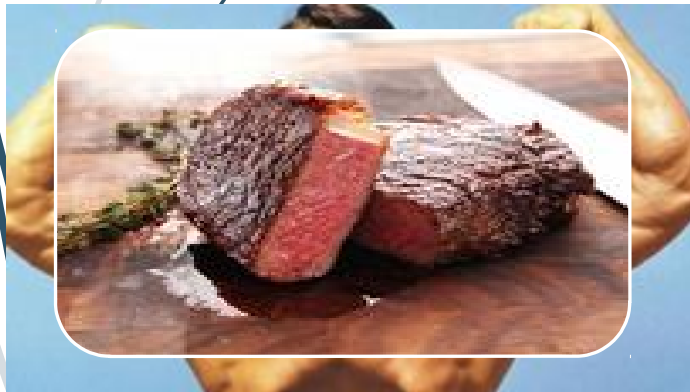
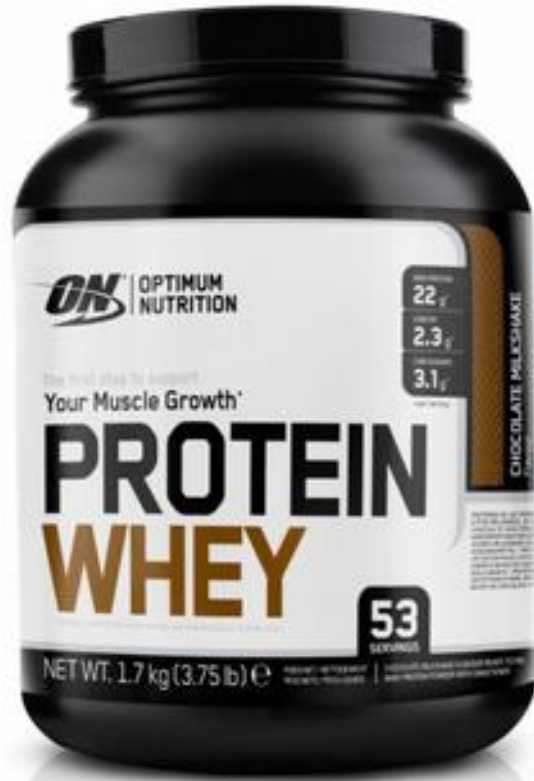
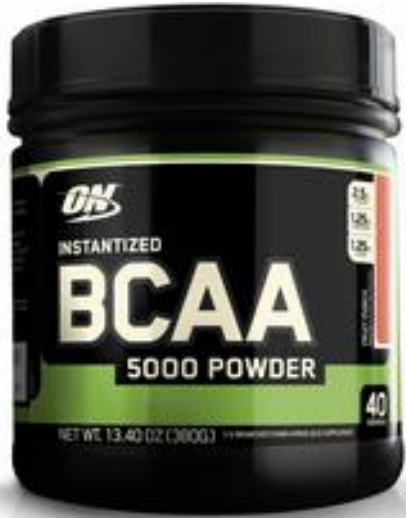
Proč je syrovátka cool ?

MUDr. Michal Frelich, KARIM FNO

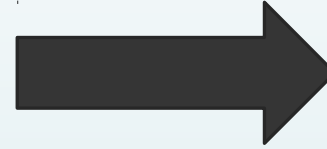
Colours of sepsis 2019



COLOURS  
of Sepsis



# Proč se o tom bavíme ?

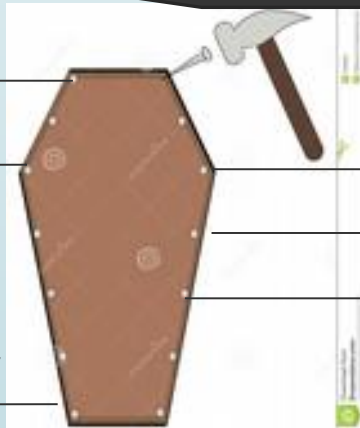


- Ztráta svalových proteinů až 1 kg/den
- Polymyoneuropatie kriticky nemocných – myopatie s atrofií, fibrózou, tuková degenerace svalových vláken

myorelaxancia

hyperglykémie

Atrofie z inaktivity



zánět

kortikoidy

Nedostatek AMK

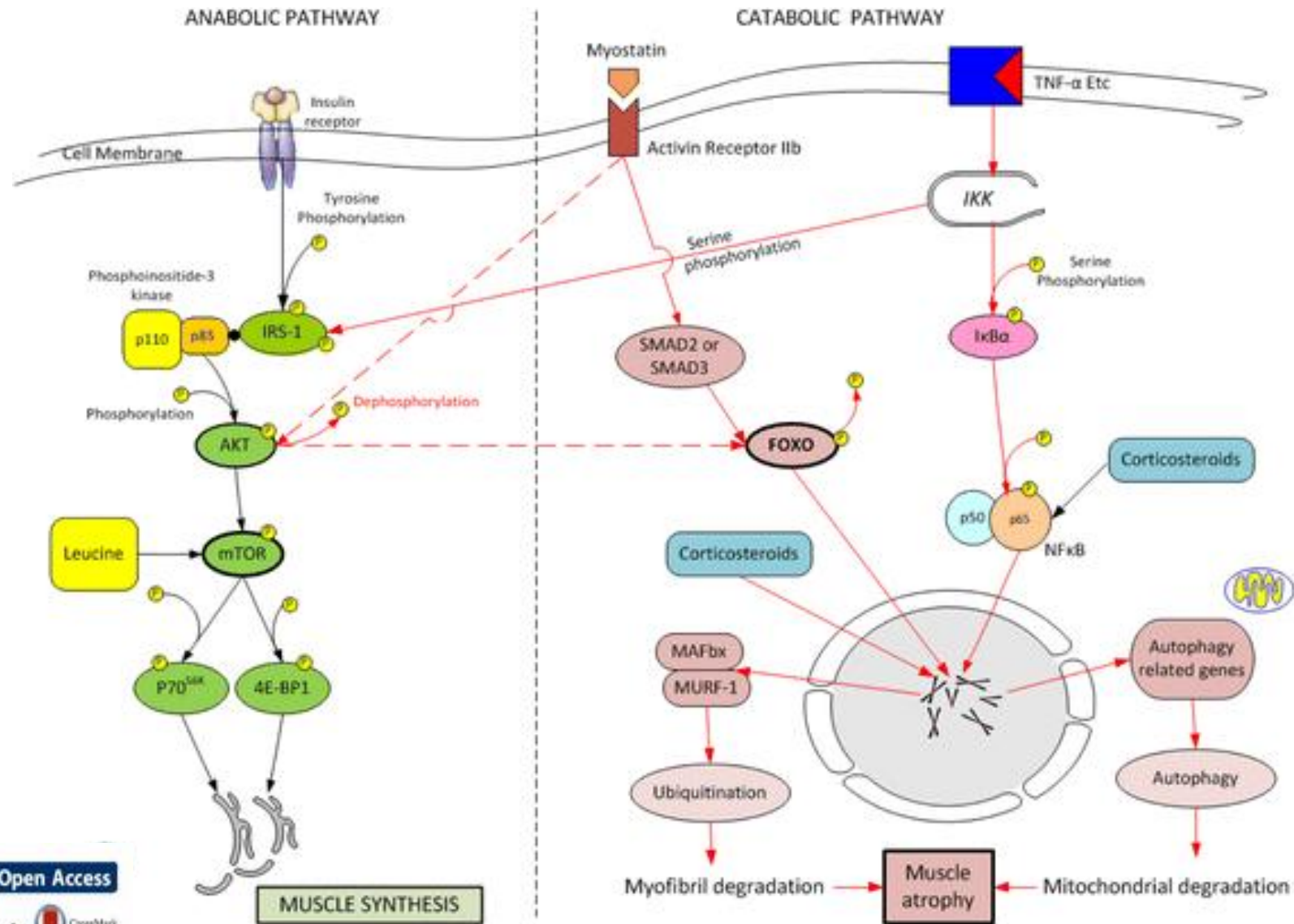
**Prodlužuje se pobyt na ICU  
Prodlužuje se doba na UPV  
Pacienti jsou neodpojitelní  
od ventilace**



Degradace  
svalových  
proteinů

Postprandiální  
syntéza  
proteinů

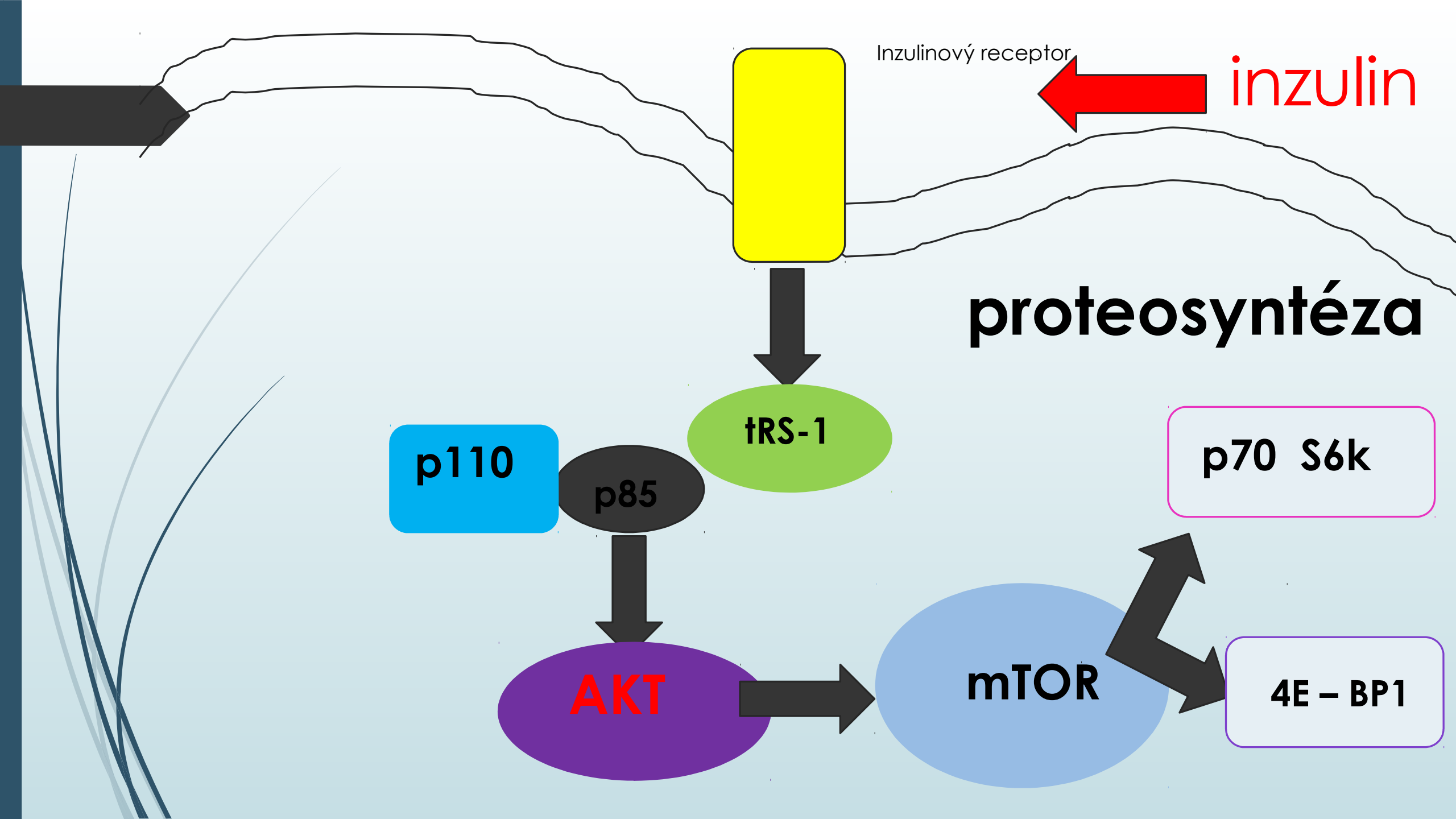




REVIEW Open Access

Feeding critically ill patients the right 'why': thinking outside of the box. A personal view





Inzulínový receptor

inzulin

proteosyntéza

p110

p85

tRS-1

p70 S6k

AKT

mTOR

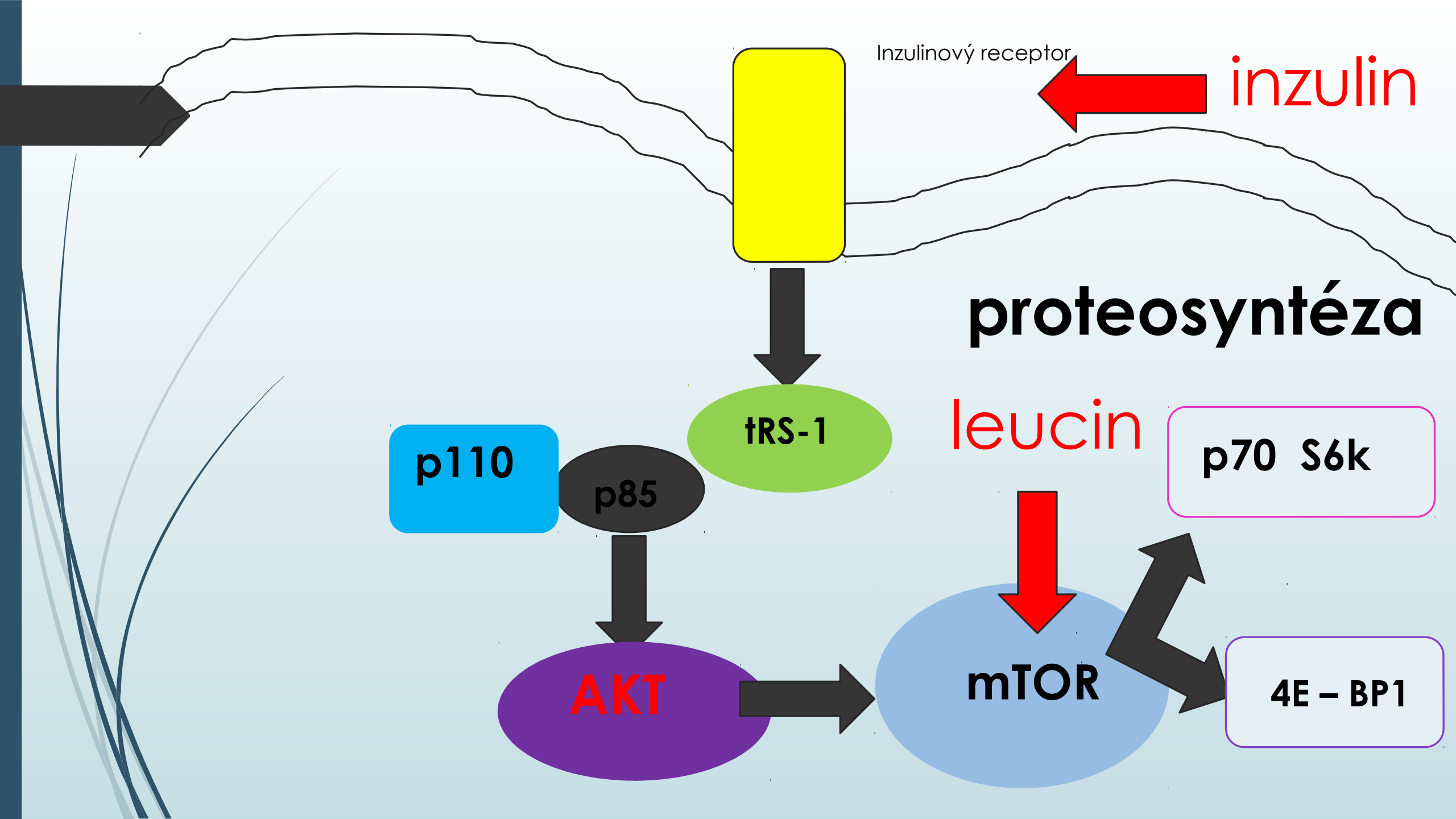
4E - BP1

# Proteosyntéza

Greater stimulation of myofibrillar protein synthesis with ingestion of whey protein isolate v. micellar casein at rest and after resistance exercise in elderly men

Nicholas A. Burd<sup>1†</sup>, Yifan Yang<sup>1†</sup>, Daniel R. Moore<sup>1</sup>, Jason E. Tang<sup>1</sup>, Mark A. Tarnopolsky<sup>2</sup> and Stuart M. Phillips<sup>1\*</sup>

- Proteinový izolát zvýší syntézu proteinů v klidu, efekt je daleko vyšší po zátěži
- Aktivace mTOR závisí na kvalitě proteinu, zejména jako obsahu esenciálních aminokyselin – leucinu
- Syrovátka ( whey protein) vzniká vysrážením z mléka – odstranění kaseinu
- Syrovátka obsahuje leucin ( 14% procent ) a BCAA ( 26%)







2:1:1

	Whey	Casein	Casein hydrolysate
Alanine (g)	1.0	0.6	0.6
Arginine (g)	0.5	0.7	0.7
Aspartic acid (g)	2.3	1.3	1.3
Cysteine (g)	0.7	0.1	0.1
Glutamic acid (g)	3.2	4.1	4.1
Glycine (g)	0.4	0.3	0.3
Histidine (g)	0.4	0.5	0.5
Isoleucine (g)	1.2	1.1	1.1
Leucine (g)	2.5	1.7	1.7
Lysine (g)	2.1	1.4	1.4
Methionine (g)	0.4	0.5	0.5
Phenylalanine (g)	0.7	0.9	0.9
Proline (g)	0.7	2.1	2.1
Serine (g)	0.7	1.3	1.3
Threonine (g)	0.9	0.8	0.8
Tryptophan (g)	0.5	0.2	0.2
Tyrosine (g)	0.8	1.1	1.1
Valine (g)	1.0	1.3	1.3
Total AA (g)	20.0	20.0	20.0
Total NEAA (g)	10.7	12.1	12.1
Total EAA (g)	9.3	7.9	7.9

# Whey protein

- ➔ **Větší stimulace svalových proteinů ve srovnání s kaseinem (lepší stravitelnost, vyšší absorpce a vyšší podíl leucinu)**

BURD, Nicholas A., et al. Greater stimulation of myofibrillar protein synthesis with ingestion of whey protein isolate v. micellar casein at rest and after resistance exercise in elderly men. *British Journal of nutrition*, 2012, 108.6: 958-962.

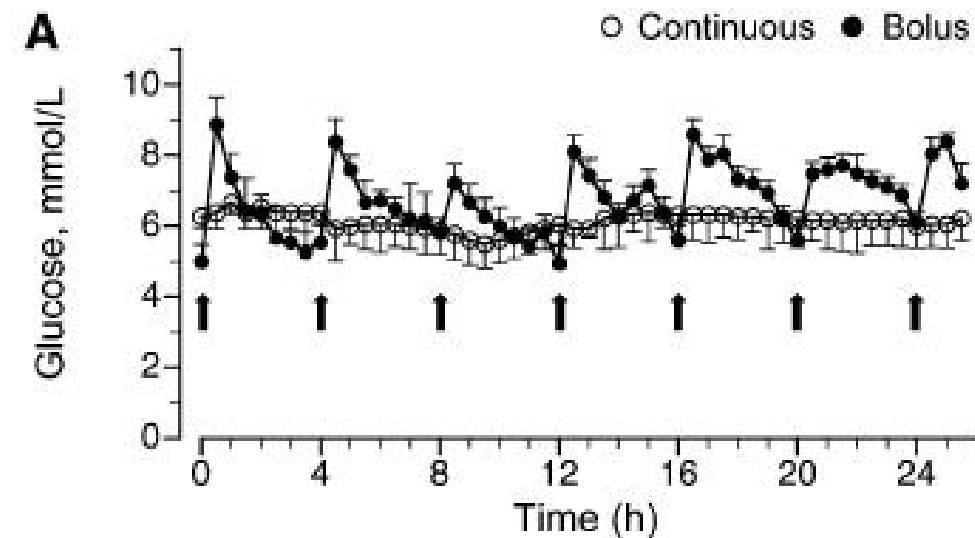
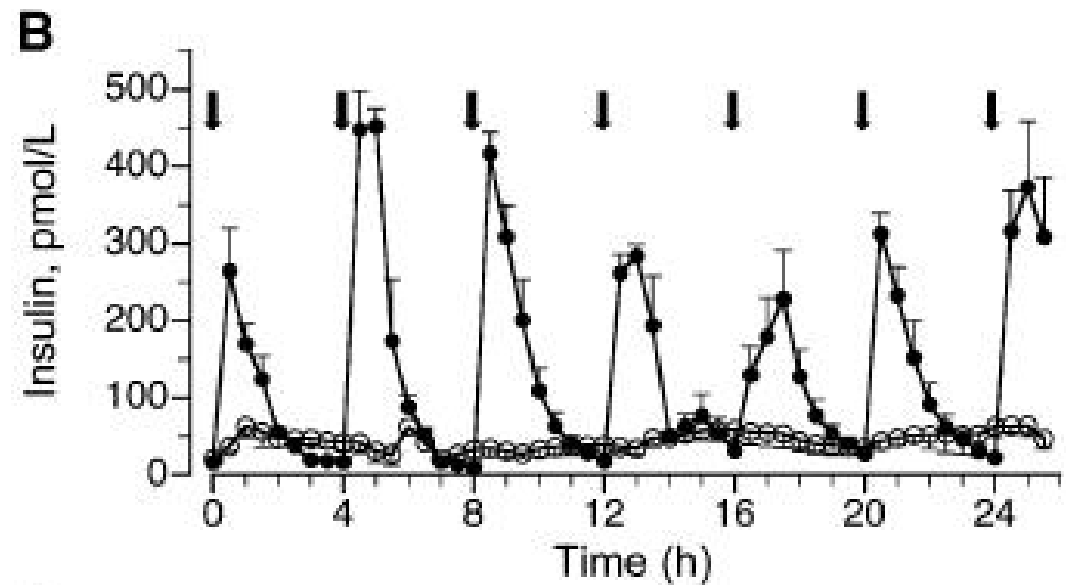
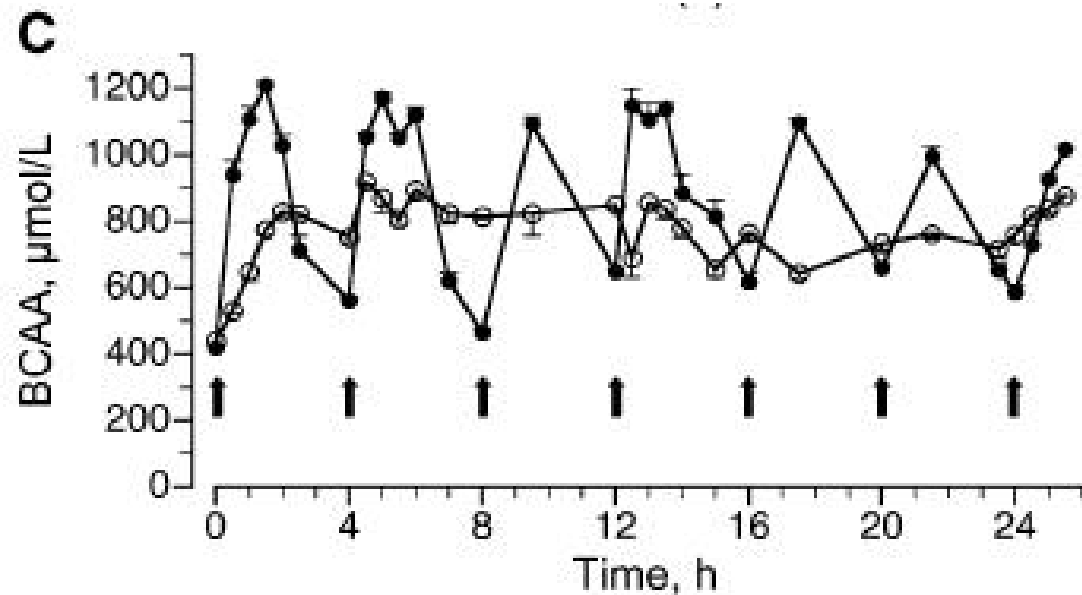
PENNINGS, Bart, et al. Whey protein stimulates postprandial muscle protein accretion more effectively than do casein and casein hydrolysate in older men-. *The American journal of clinical nutrition*, 2011, 93.5: 997-1005.

- **Dávka 20 g proteinu pro maximální efekt na syntézu svalových proteinů**

WITARD, Oliver C., et al. Myofibrillar muscle protein synthesis rates subsequent to a meal in response to increasing doses of whey protein at rest and after resistance exercise-. *The American journal of clinical nutrition*, 2013, 99.1: 86-95.

# Proč je syrovátka cool ?

- Zvýšení postprandiální syntézy proteinů
- Zachování většího množství svalové hmoty u hubnoucích obézních pacientů
- Peptidy ze syrovátky stimulují produkci cholecystokininu, peptidu YY , GLP



The Journal of Nutrition  
Nutrient Physiology, Metabolism, and Nutrient-Nutrient Interactions

## Intermittent Bolus Feeding Has a Greater Stimulatory Effect on Protein Synthesis in Skeletal Muscle Than Continuous Feeding in Neonatal Pigs<sup>1,2</sup>

Maria C. Gazzaneo,<sup>3</sup> Agus Suryawan,<sup>3</sup> Renán A. Orellana,<sup>3</sup> Roberto Murgas Torrazza,<sup>3,5</sup> Samer W. El-Kadi,<sup>3</sup> Fiona A. Wilson,<sup>3,6</sup> Scot R. Kimball,<sup>4</sup> Neeraj Srivastava,<sup>3</sup> Hanh V. Nguyen,<sup>3</sup> Marta L. Fiorotto,<sup>3</sup> and Teresa A. Davis<sup>3\*</sup>



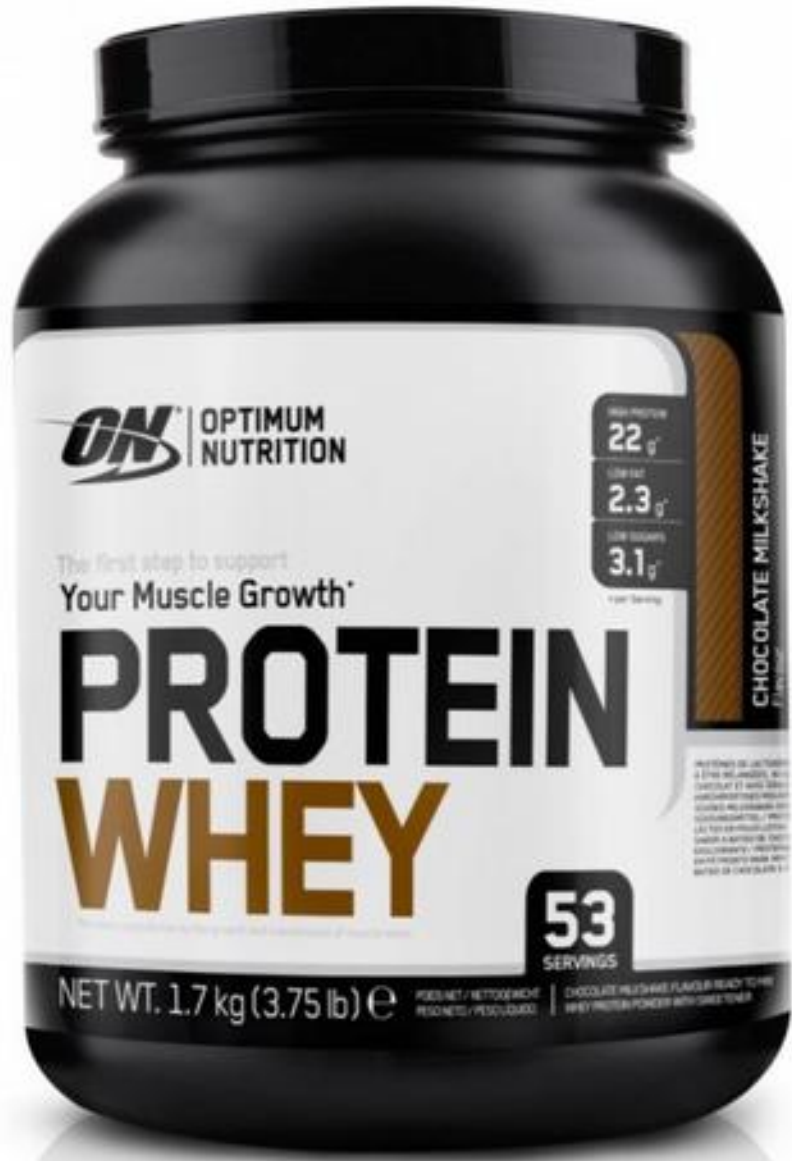
The traditional method of continuous tube feeding is illogical, stupid and quite harmful.



Martin a Denisa Dráb

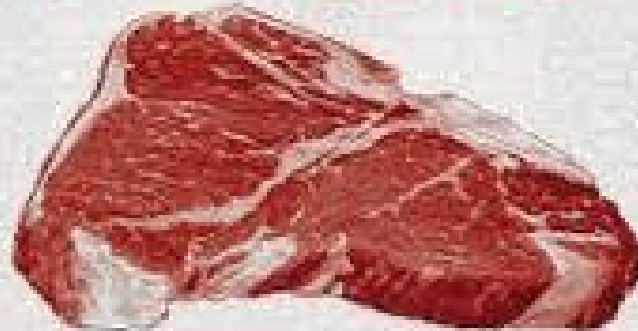
MARTIN : před tréninkem 10 g BCAA  
po tréninku 10 g BCAA + 80 g 80% Whey proteinu

DENISA : před tréninkem 5 g BCAA  
po tréninku 5 g BCAA + 40 g 80% Whey proteinu



??????

**MEAT IS  
MURDER**



TASTY, TASTY MURDER

**Děkuji za pozornost**