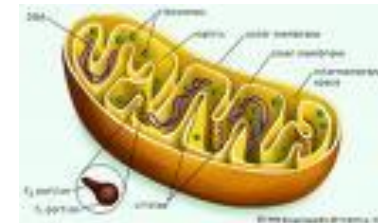
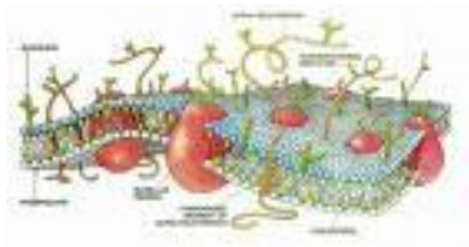


# Metabolismo de Lipídeos



## **Caso Clínico**

Criança de 10 anos, sem patologia pregressa

Há 2 meses apresenta apetite voraz, perda de peso, sede e produção de urina excessiva

Apresenta hálito mal cheiroso há alguns dias, com dificuldade de concentração e confusão mental

### **Ao exame:**

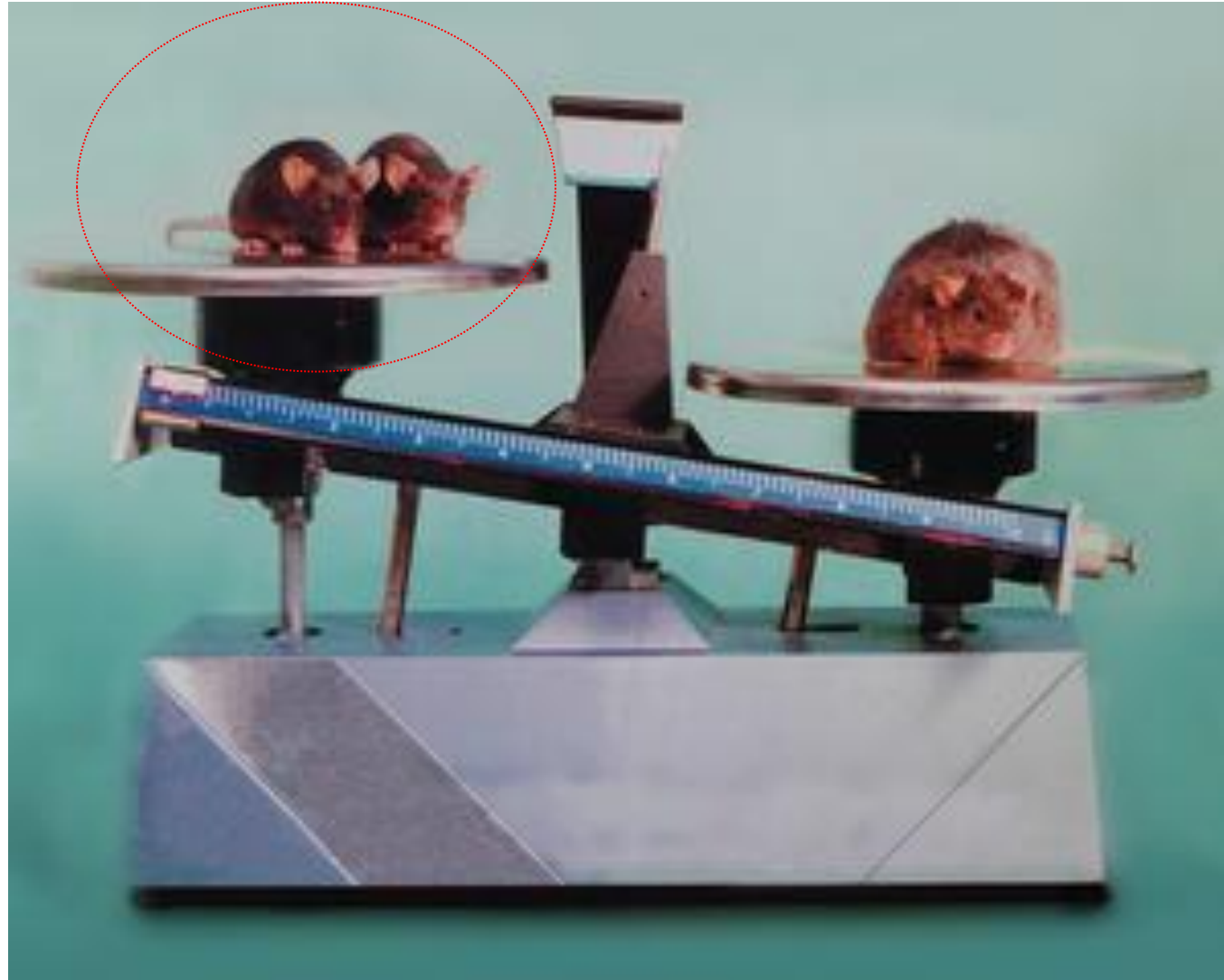
- Elevada frequência respiratória, hálito cetônico, sem alterações à ausculta pulmonar.
- Taquicardia, pele e mucosas desidratadas
- Letargia e confusão mental

glicemia = 323 mg/dL

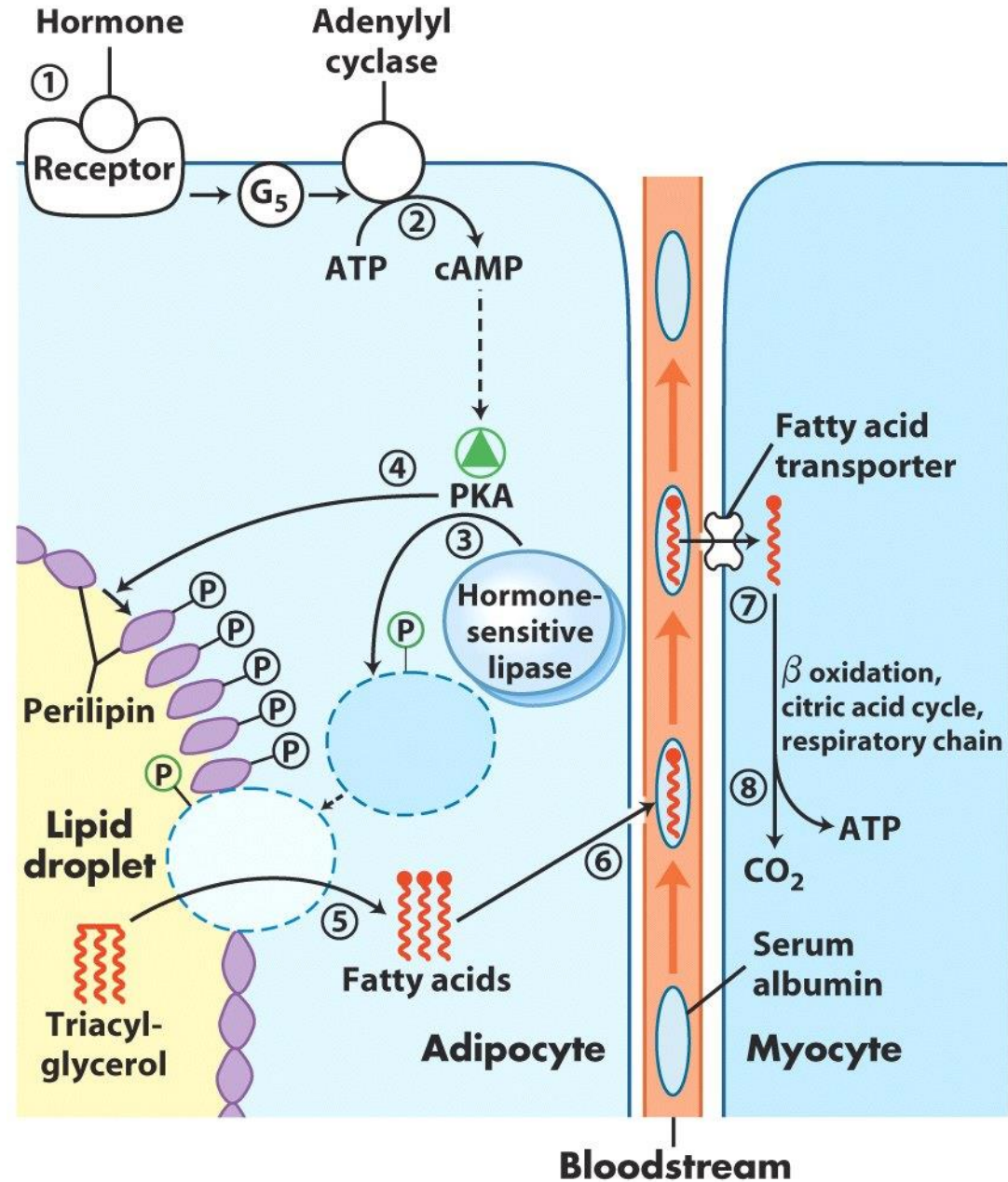
pH = 7,2

corpos cetônicos 2,9 mmoles/L (normal = 0,05-0,29 mmol/L)

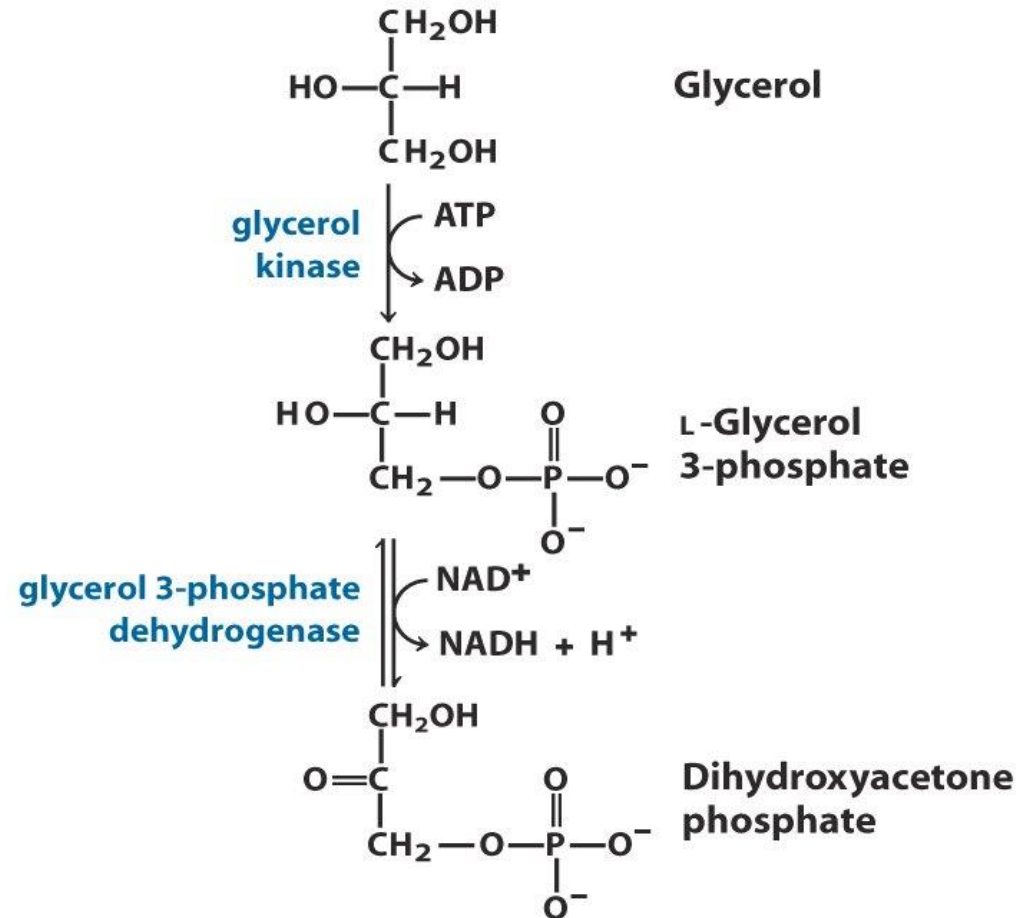
# Síntese e Degradação de Ácidos Graxos



# Glucagon e Adrenalina X Lipase

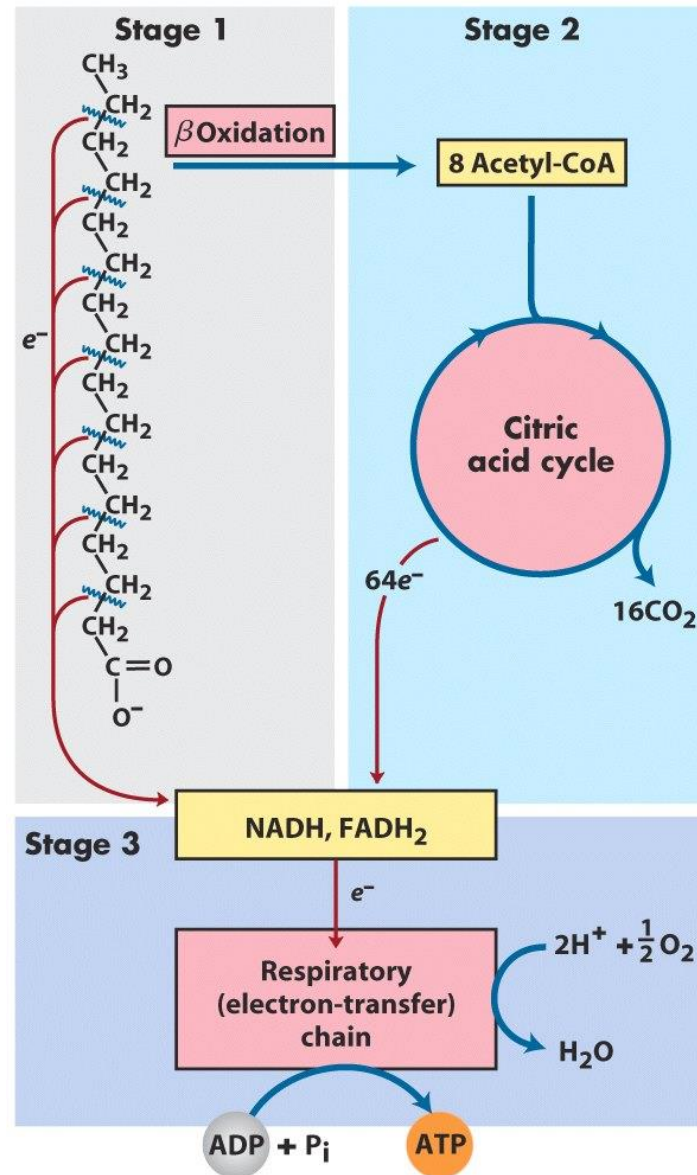


# Destino do Glicerol

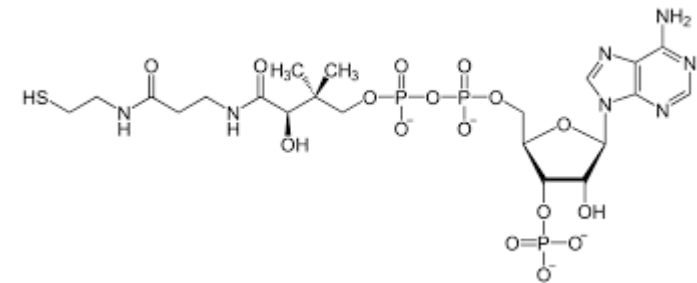
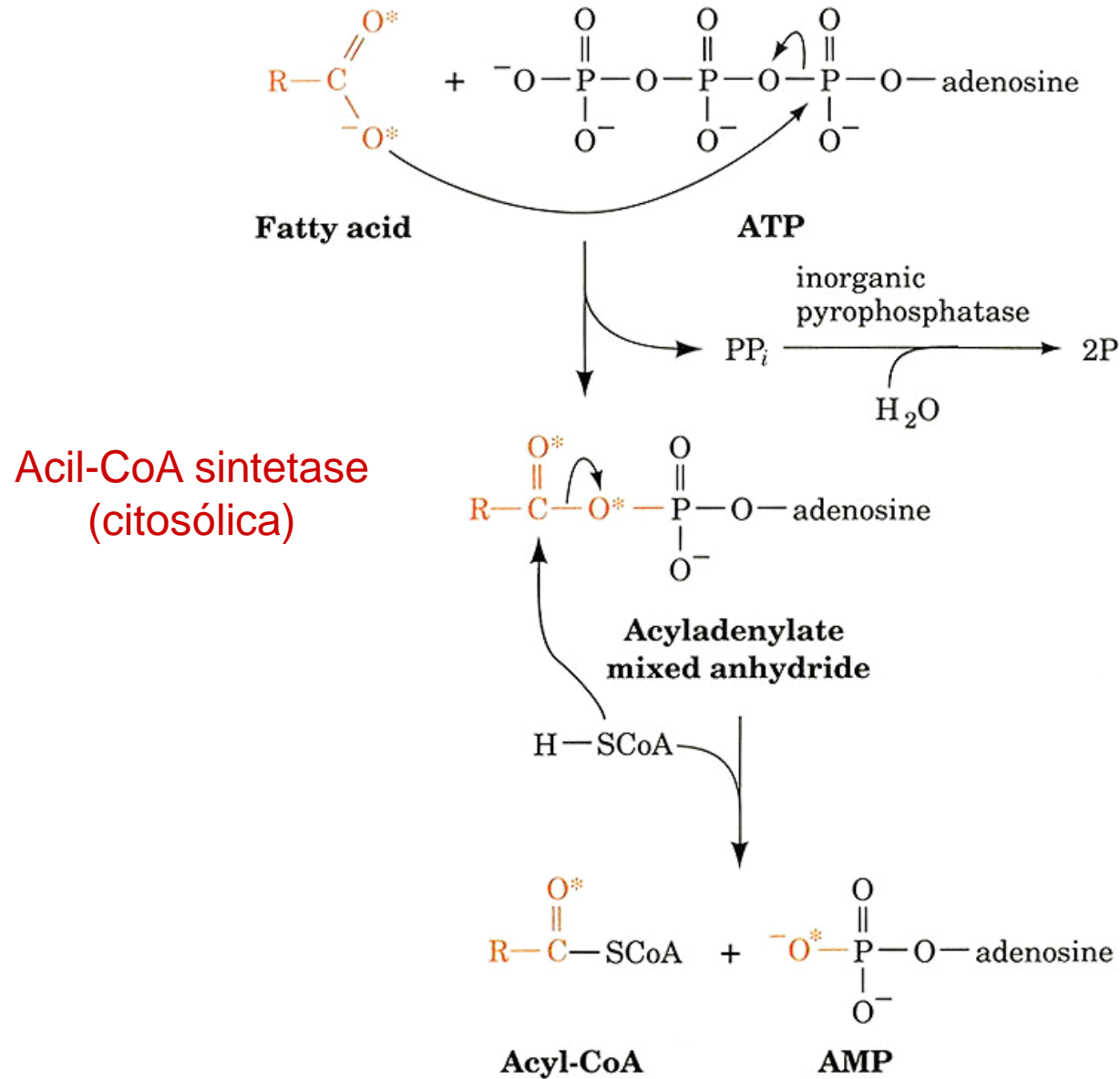




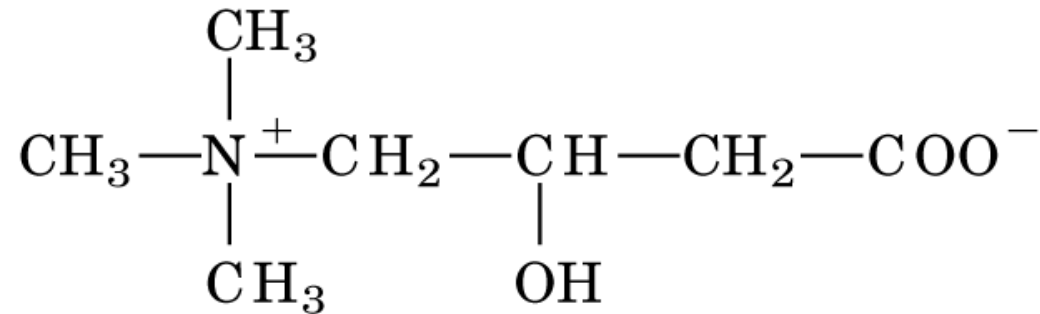
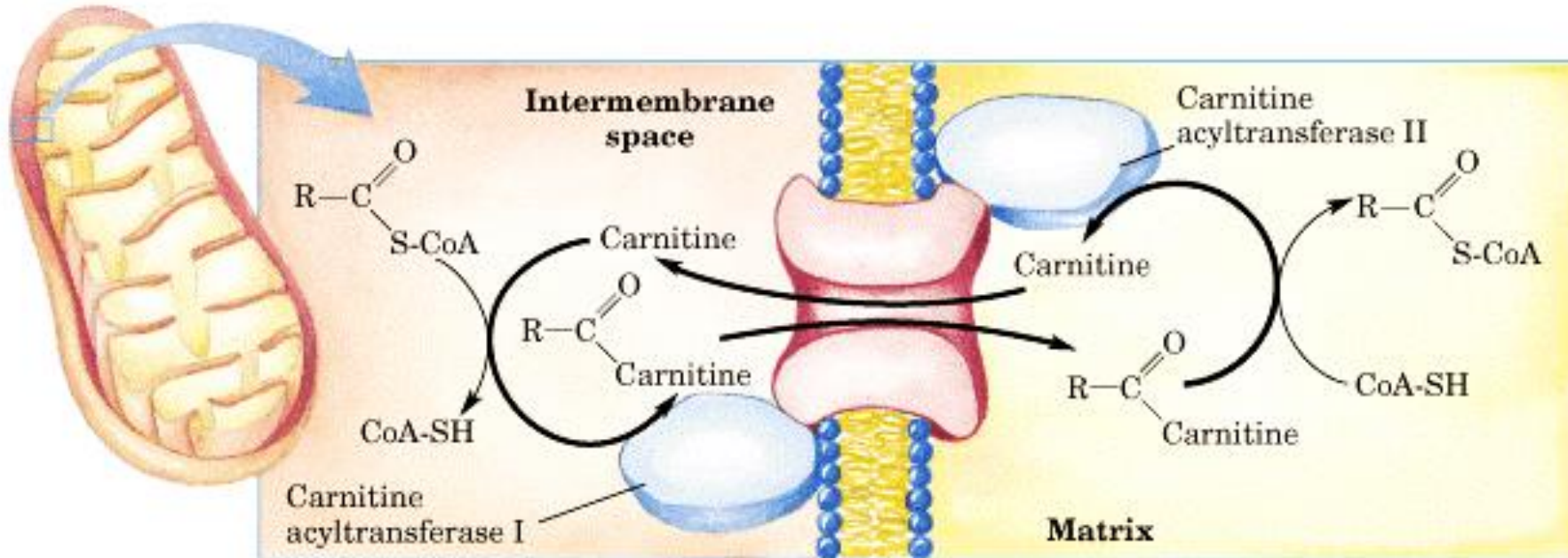
# Destino dos Ácidos Graxos



# Ativação de Ácidos Graxos



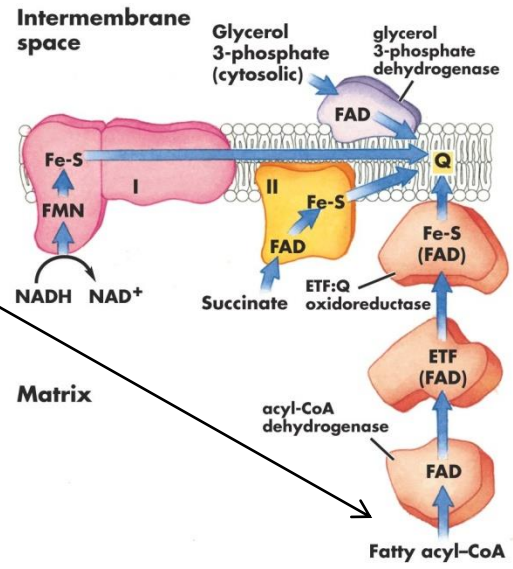
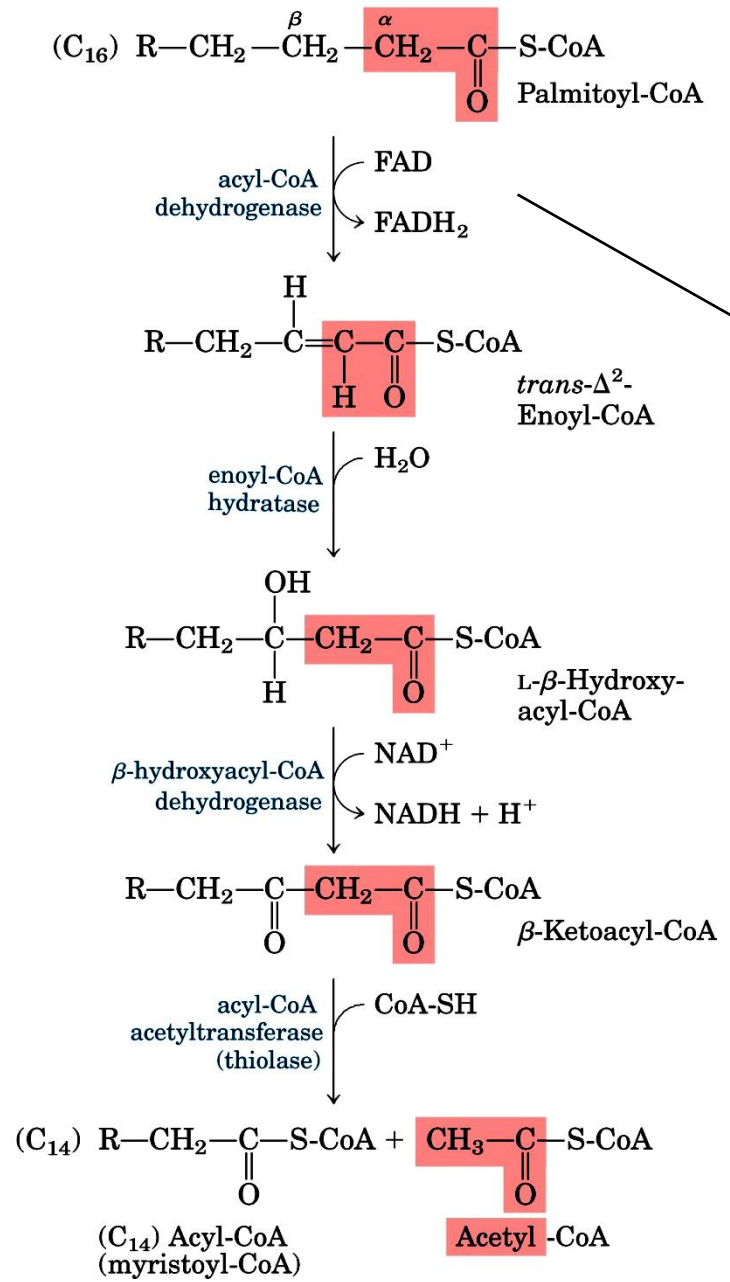
# Transporte do Ácido Graxo para a Mitocôndria



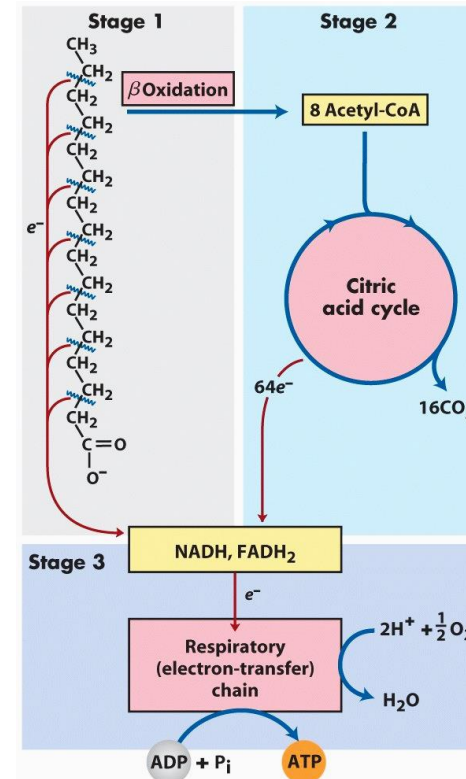
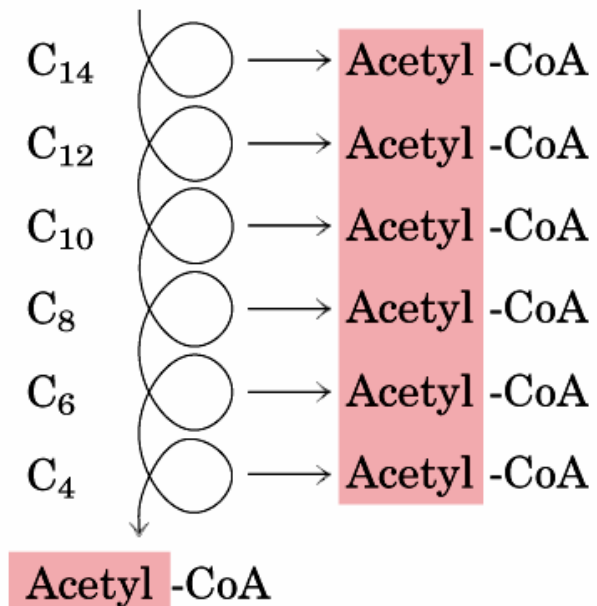
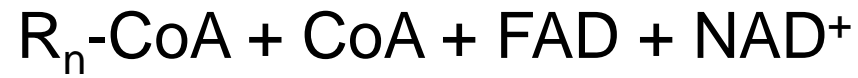
Carnitine



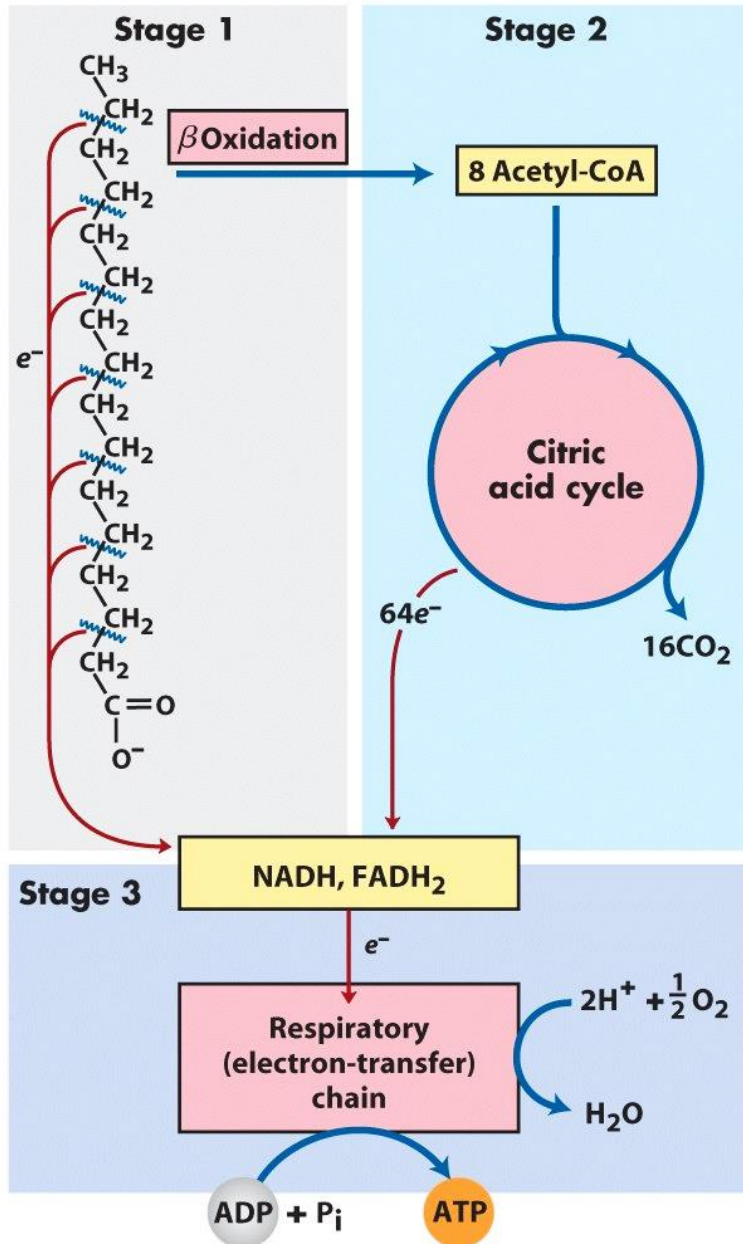
# $\beta$ Oxidação de Ácidos Graxos (Ciclo de Lynen)



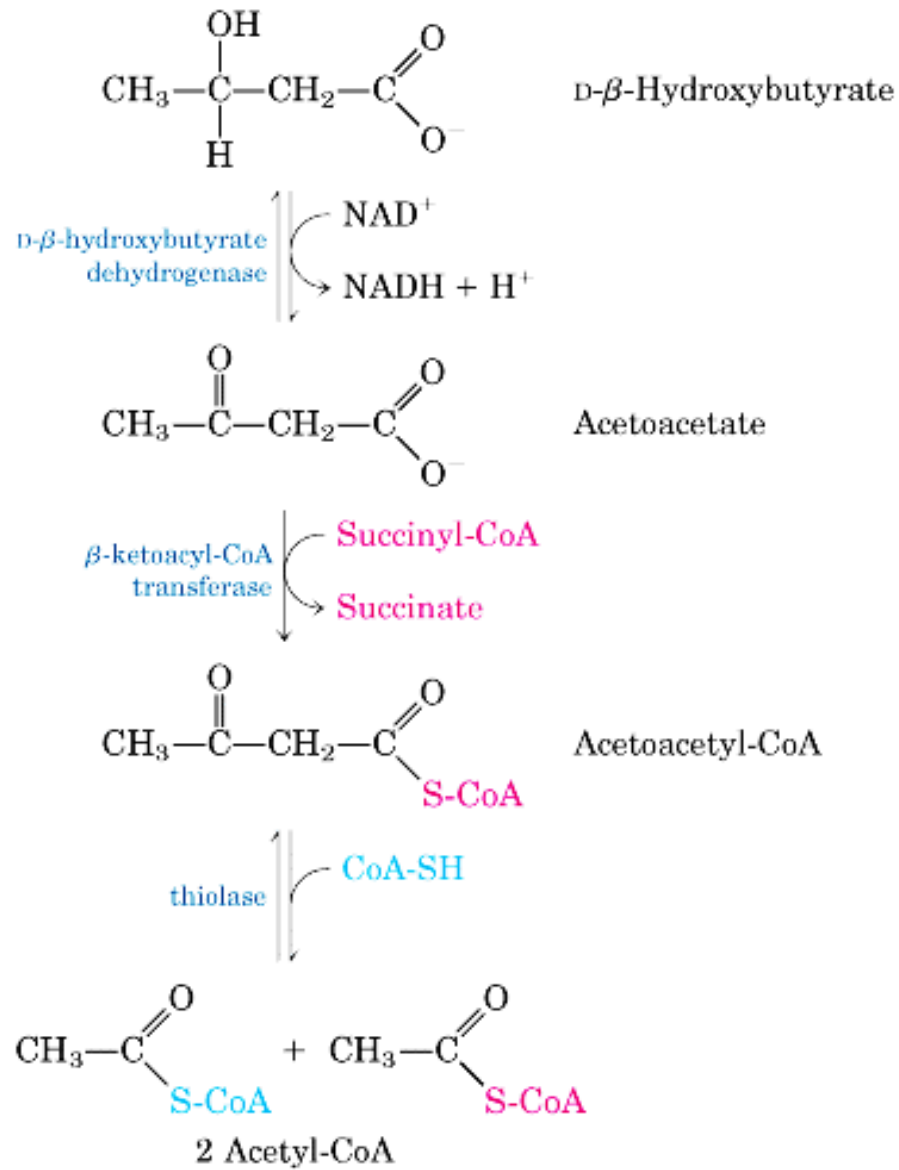
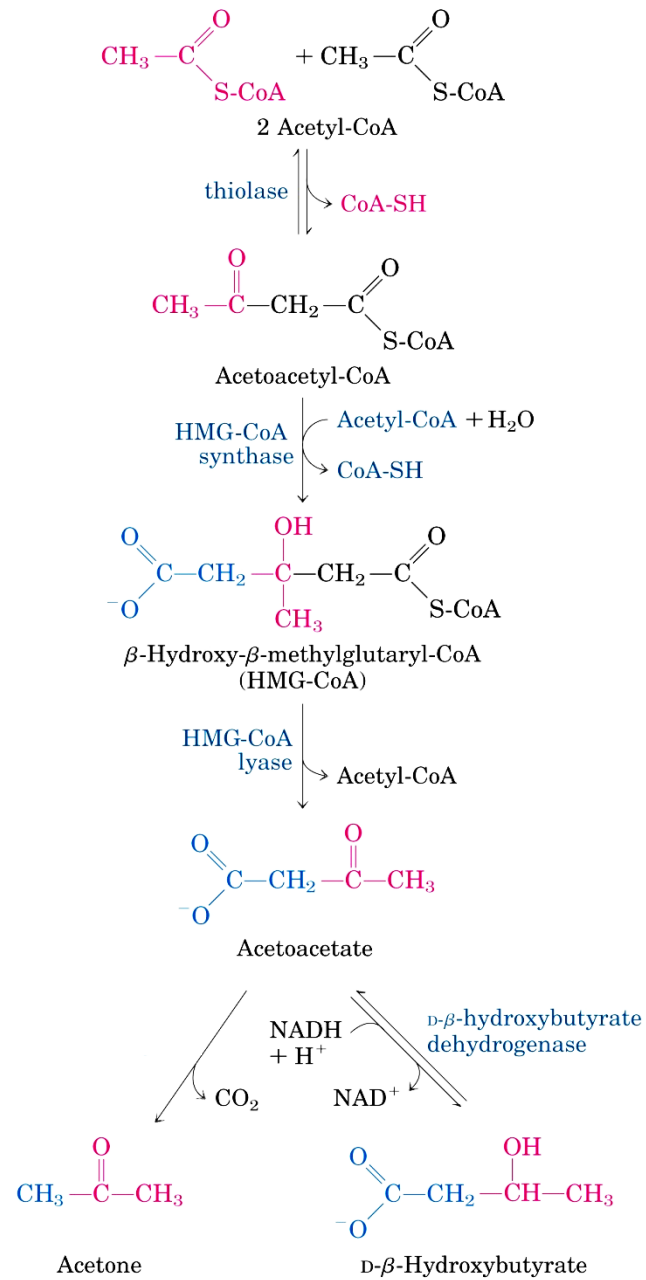
# $\beta$ Oxidação de Ácidos Graxos (Ciclo de Lynen)



# Corpos Cetônicos



- Acetoacetato,  $\beta$  Hidroxibutirato (Acetona)
- Formados no fígado como forma de exportação de AcCoA
- Usados por coração, músculo esquelético, rim, cérebro
- Síntese é estimulada pelo acúmulo de AcCoA



# Ceto-Acidose

- Baixa relação insulina/glucagon
- Estímulo à  $\beta$  oxidação
- Neoglicogênese, diminuição de oxaloacetato
- Diminuição relativa Krebs
- Formação de corpos cetônicos
  - acidose
  - acúmulo de acetona
- Tratamento:
  - correção da acidose
  - insulina/glicose em diabéticos



# A life-threatening complication of Atkins diet

*Tsuh-Yin Chen, William Smith, Jordan L Rosenstock, Klaus-Dieter Lessnau*

*Lancet* 2006; 367: 958

See [Comment](#) page 880

Department of Medicine, Lenox Hill Hospital, 100 East 77th Street, New York, NY 10028, USA (T-Y Chen MD, W Smith MD); and New York School of Medicine, 300 East 93rd Street #18B, New York, NY 10128, USA (Prof J L Rosenstock MD, Prof K-D Lessnau MD)

Correspondence to: Prof Klaus-Dieter Lessnau [KLessnau@pol.net](mailto:KLessnau@pol.net)

In February, 2004, we saw a 40-year-old obese white woman who complained of dyspnoea. 5 days earlier, her appetite had decreased, and she had felt nauseous and had since vomited four to six times daily. She became increasingly short of breath, and presented to us as an emergency. She had strictly followed the low-carbohydrate high-protein Atkins diet, eating meat, cheese, and salads for the previous month. She took vitamins recommended by the diet: chromium picolinate, Atkins Basic3 (multivitamins; Atkins Nutritionals, Inc, USA), Atkins Essential Oils (omega fatty acids), Atkins Dieters' Advantage (electrolytes and extracts), and Atkins Accel (a "thermogenic" formula). As instructed by the original Atkins diet book,<sup>1</sup> she monitored her urine twice daily, with dipsticks strongly positive for ketones. She reported a weight loss of about 9 kg over this 1-month period.

Test	Result	Normal
Anion gap	26 mmol/L	10–14 mmol/L
Sodium	144 mmol/L	136–145 mmol/L
Potassium	4.8 mmol/L	3.5–5 mmol/L
Chloride	110 mmol/L	96–106 mmol/L
Bicarbonate	8 mmol/L	24–30 mmol/L
Blood urea nitrogen	3.2 mmol/L	1.8–5.4 mmol/L
Creatinine	106 µmol/L	44–133 µmol/L

**Table:** Laboratory blood test results on admission

[Intervention Review]

## Low-carbohydrate versus balanced-carbohydrate diets for reducing weight and cardiovascular risk

Celeste E Naude<sup>1</sup>, Amanda Brand<sup>1</sup>, Anel Schoonees<sup>1</sup>, Kim A Nguyen<sup>1</sup>, Marty Chaplin<sup>2</sup>, Jimmy Volmink<sup>1</sup>

<sup>1</sup>Centre for Evidence-based Health Care, Division of Epidemiology and Biostatistics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa. <sup>2</sup>Department of Clinical Sciences, Liverpool School of Tropical Medicine, Liverpool, UK

**Contact:** Celeste E Naude, [cenaude@sun.ac.za](mailto:cenaude@sun.ac.za).

**Editorial group:** Cochrane Public Health Group, Cochrane Heart Group.

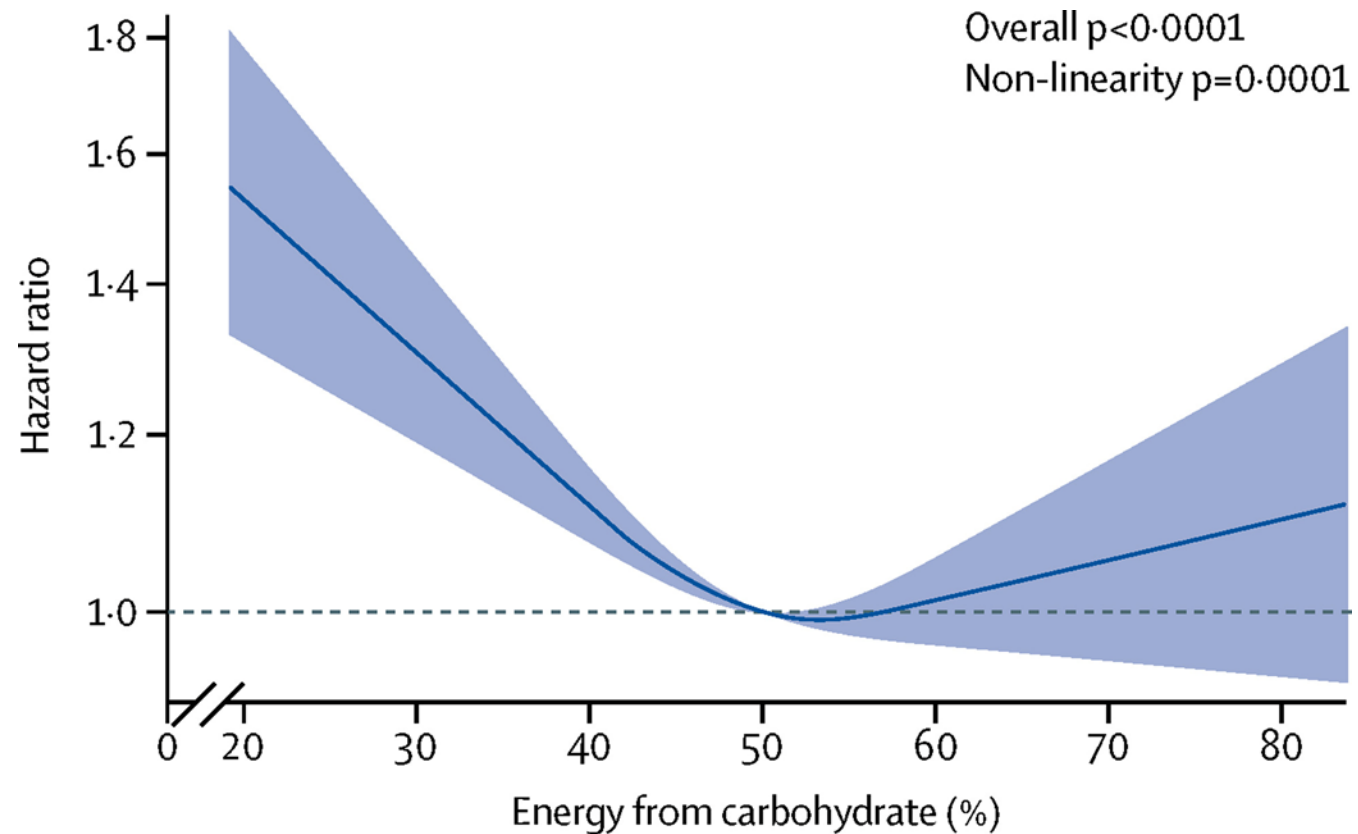
**Publication status and date:** New, published in Issue 1, 2022.

**Citation:** Naude CE, Brand A, Schoonees A, Nguyen KA, Chaplin M, Volmink J. Low-carbohydrate versus balanced-carbohydrate diets for reducing weight and cardiovascular risk. *Cochrane Database of Systematic Reviews* 2022, Issue 1. Art. No.: CD013334. DOI: [10.1002/14651858.CD013334.pub2](https://doi.org/10.1002/14651858.CD013334.pub2).

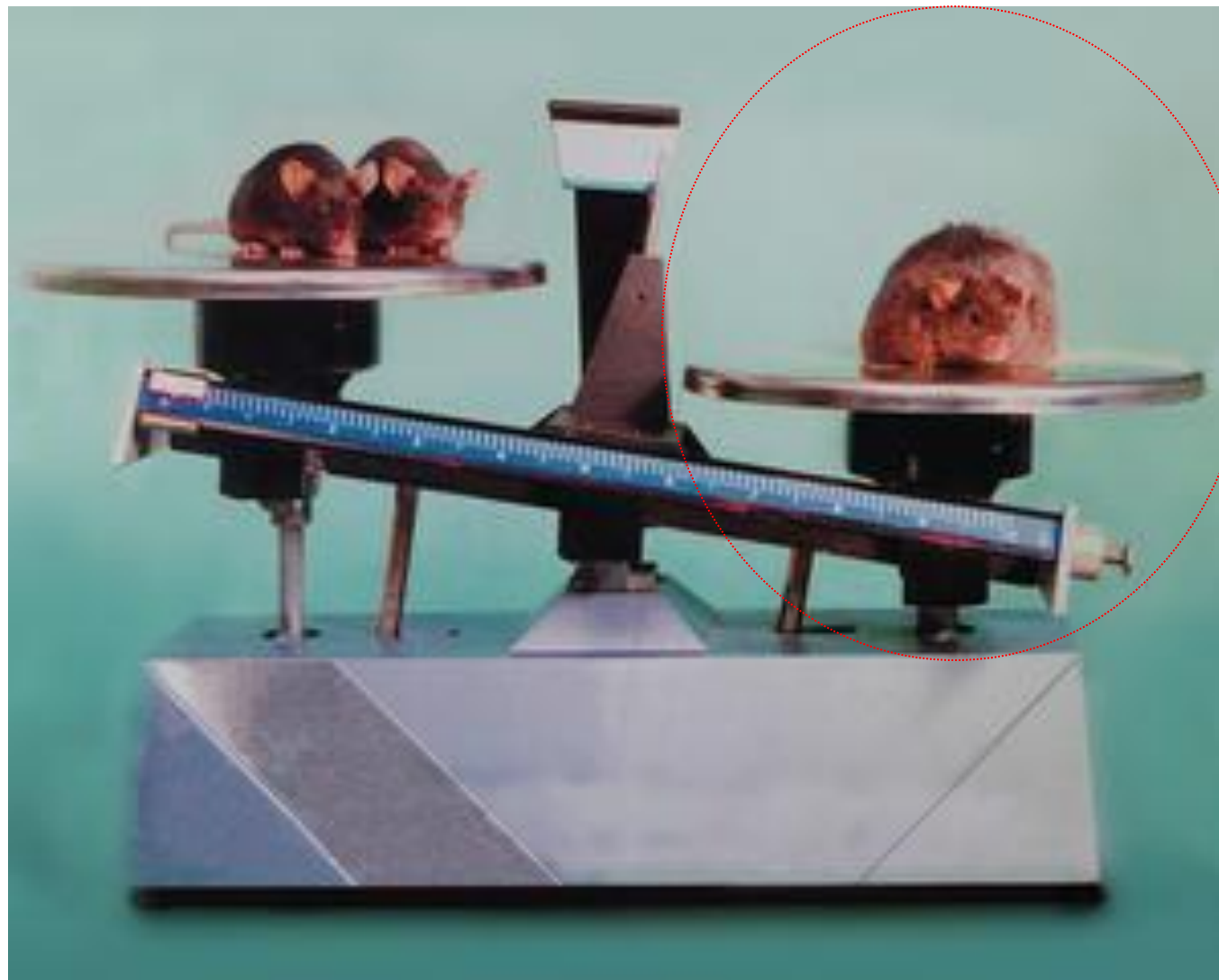
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# Dietary carbohydrate intake and mortality: a prospective cohort study and meta-analysis

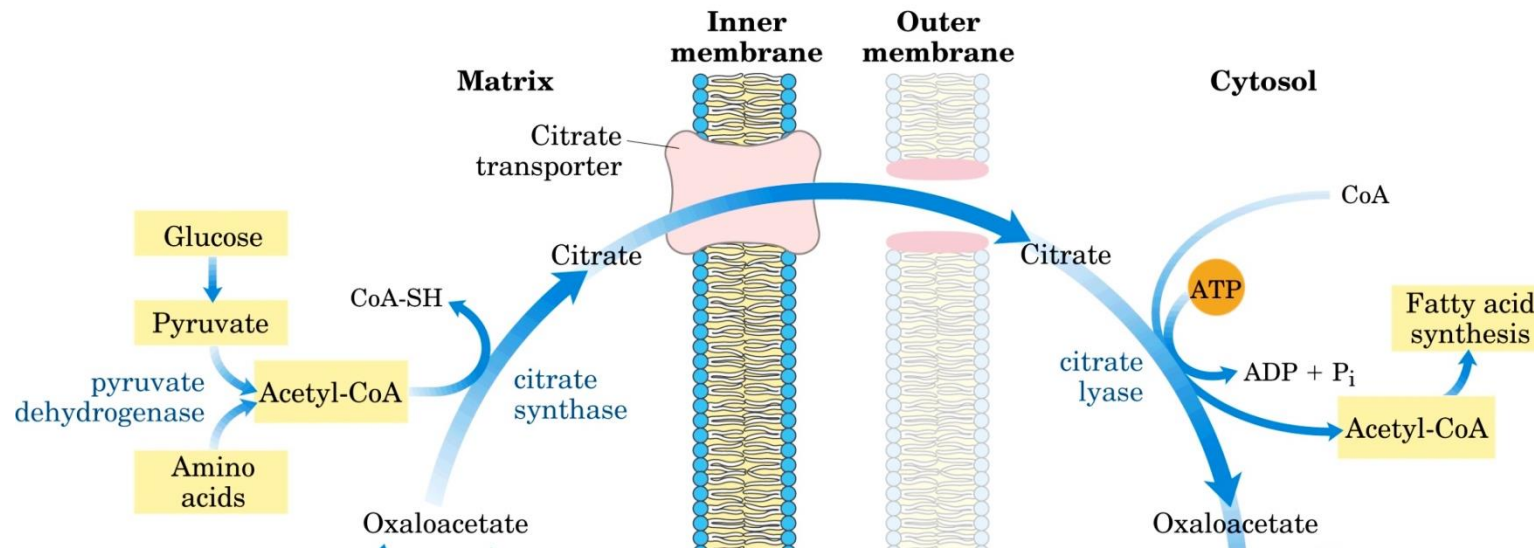
Sara B Seidelmann, MD • Brian Claggett, PhD • Susan Cheng, MD • Mir Henglin, BA • Amil Shah, MD •  
Lyn M Steffen, PhD • et al. [Show all authors](#)



# Síntese de Lipídeos

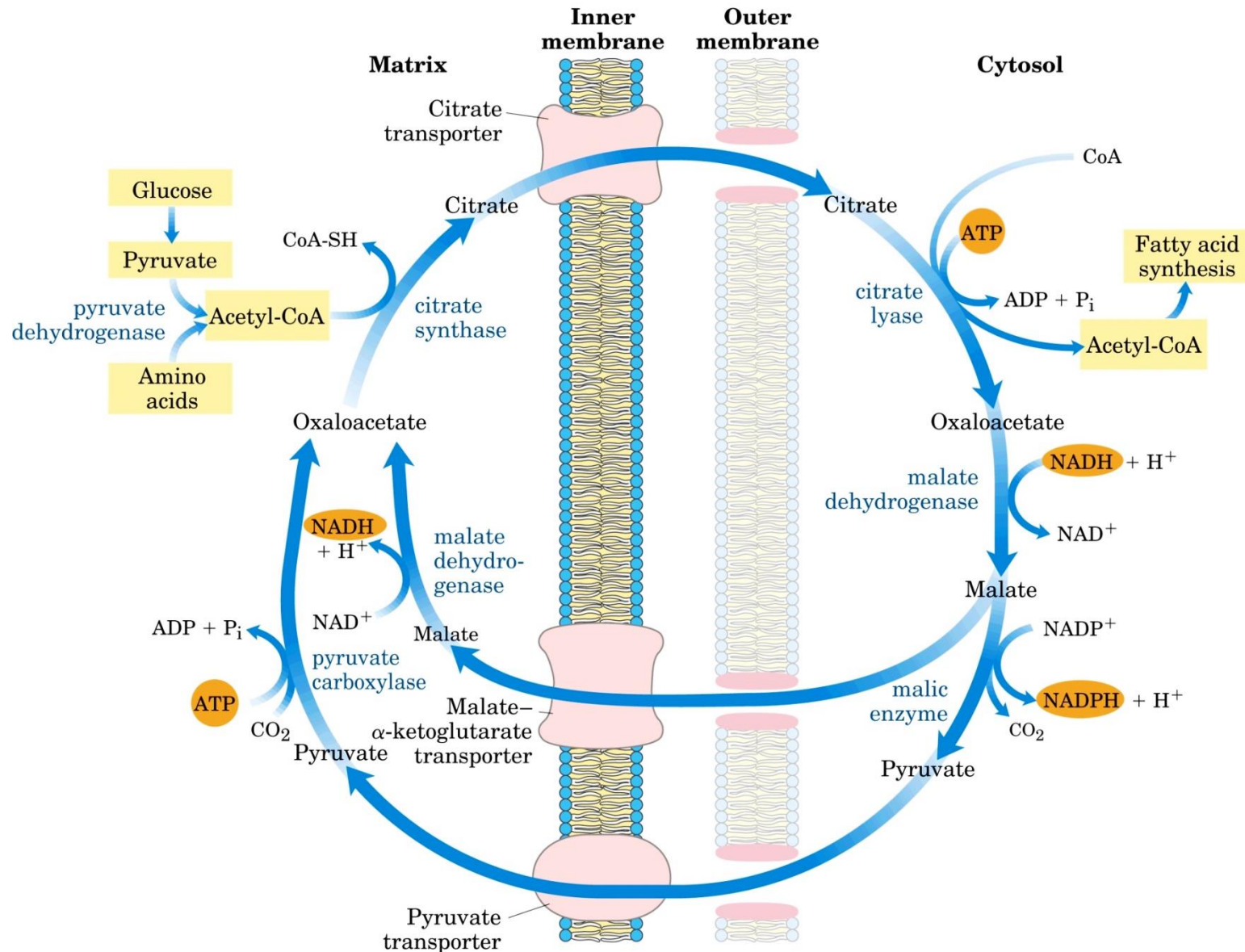


# Acetil-CoA Mitocôndria → Citosol



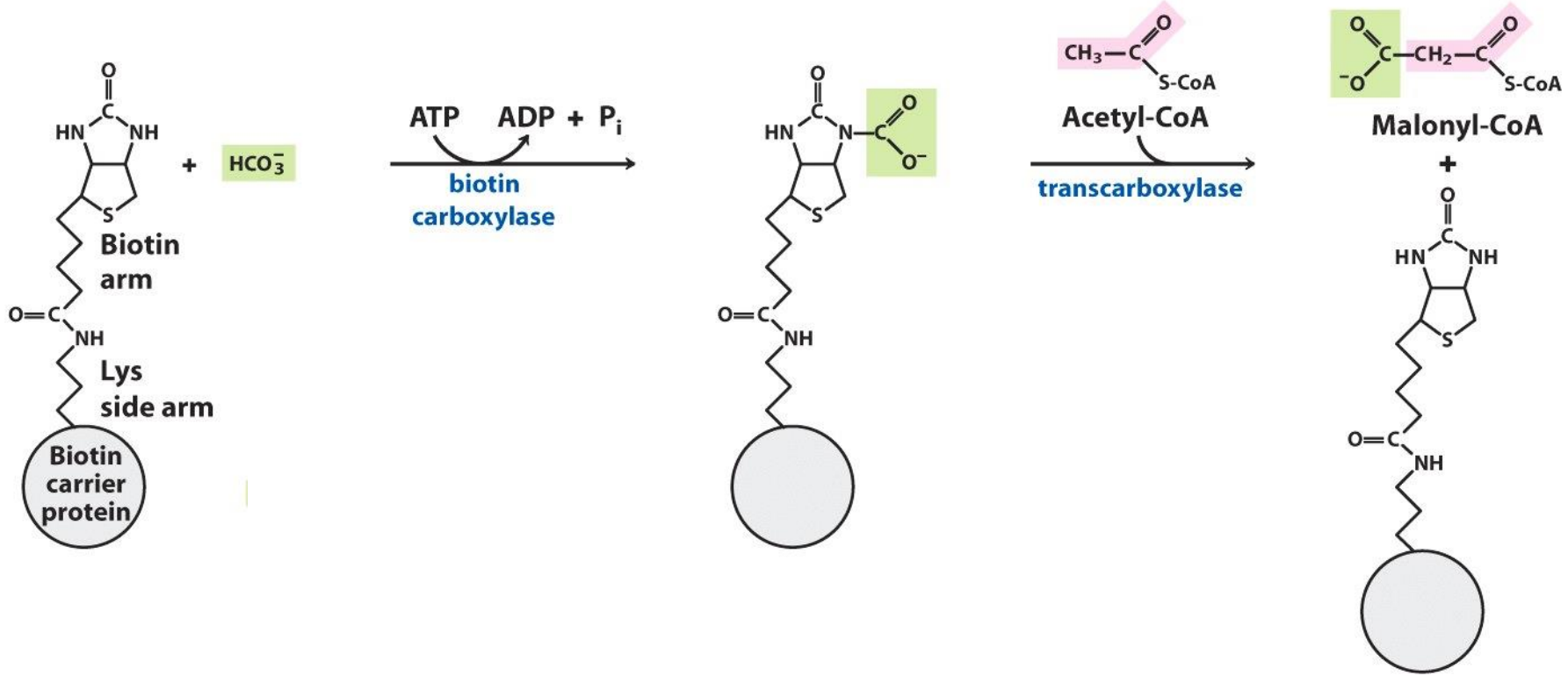


# Acetil-CoA Mitocôndria → Citosol

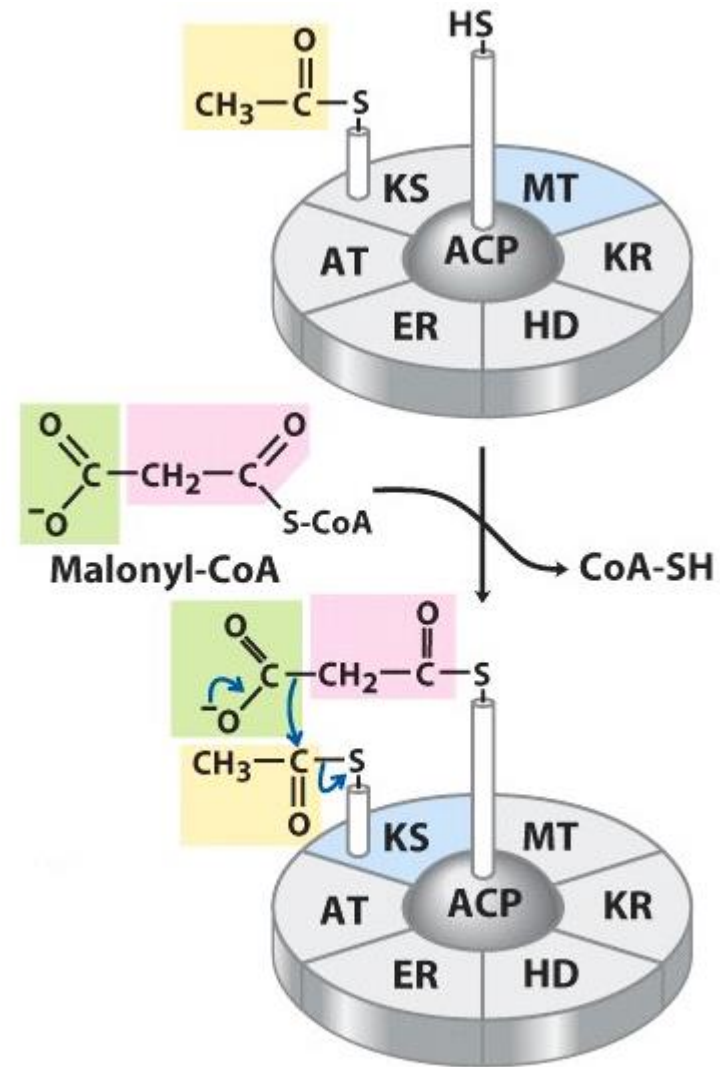
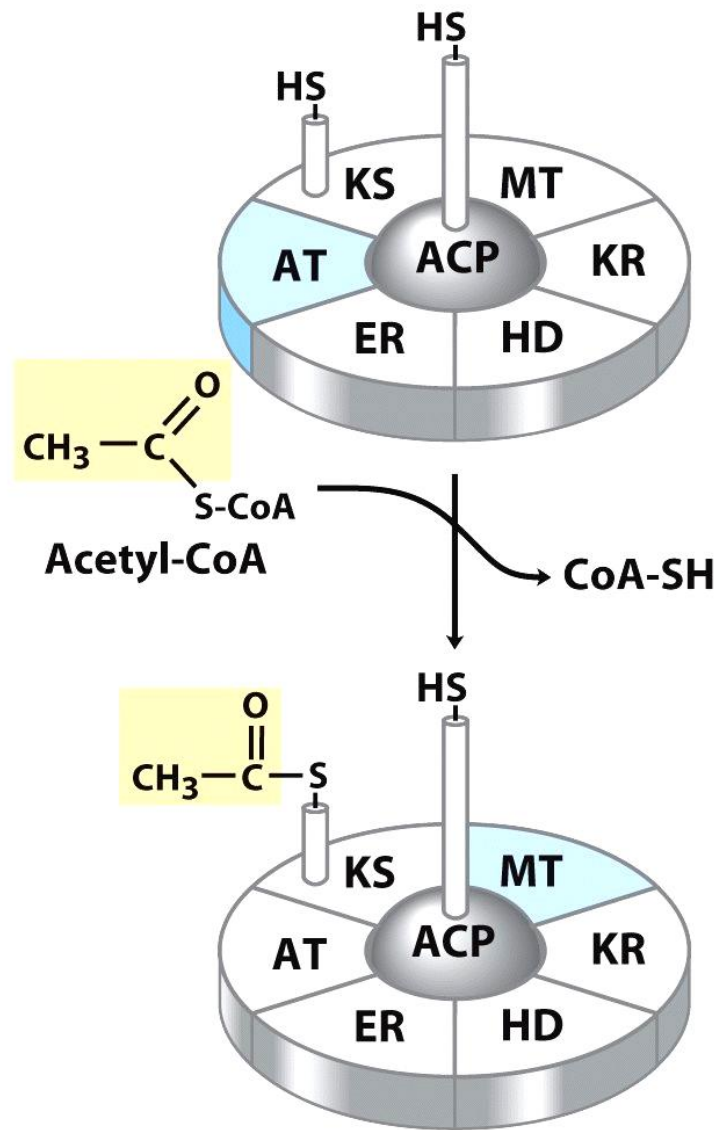


# Formação de Malonil CoA

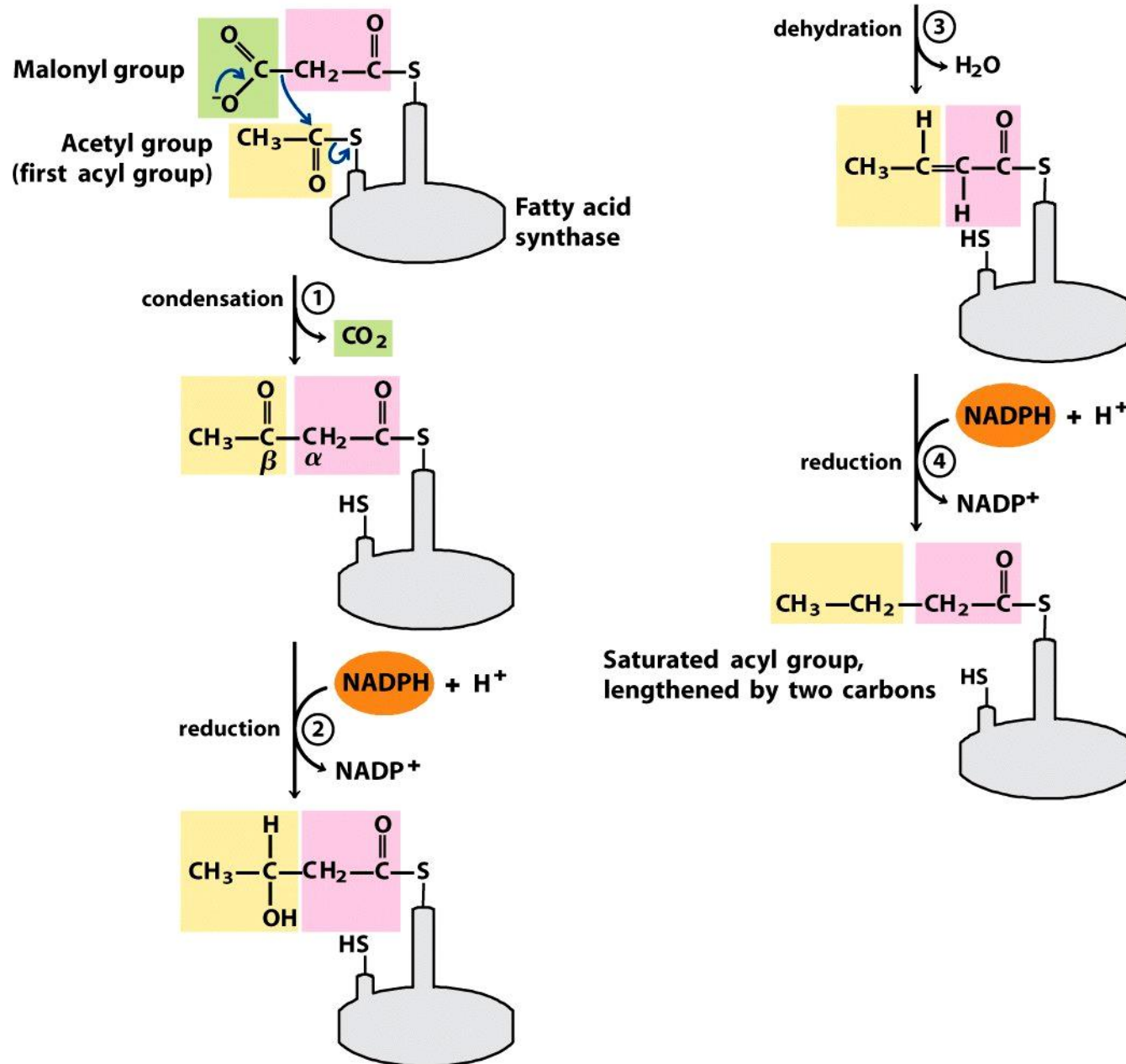
## Acetil CoA Carboxilase



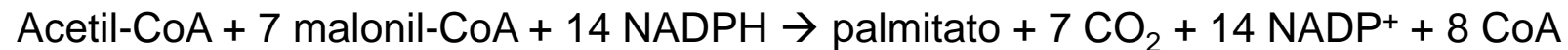
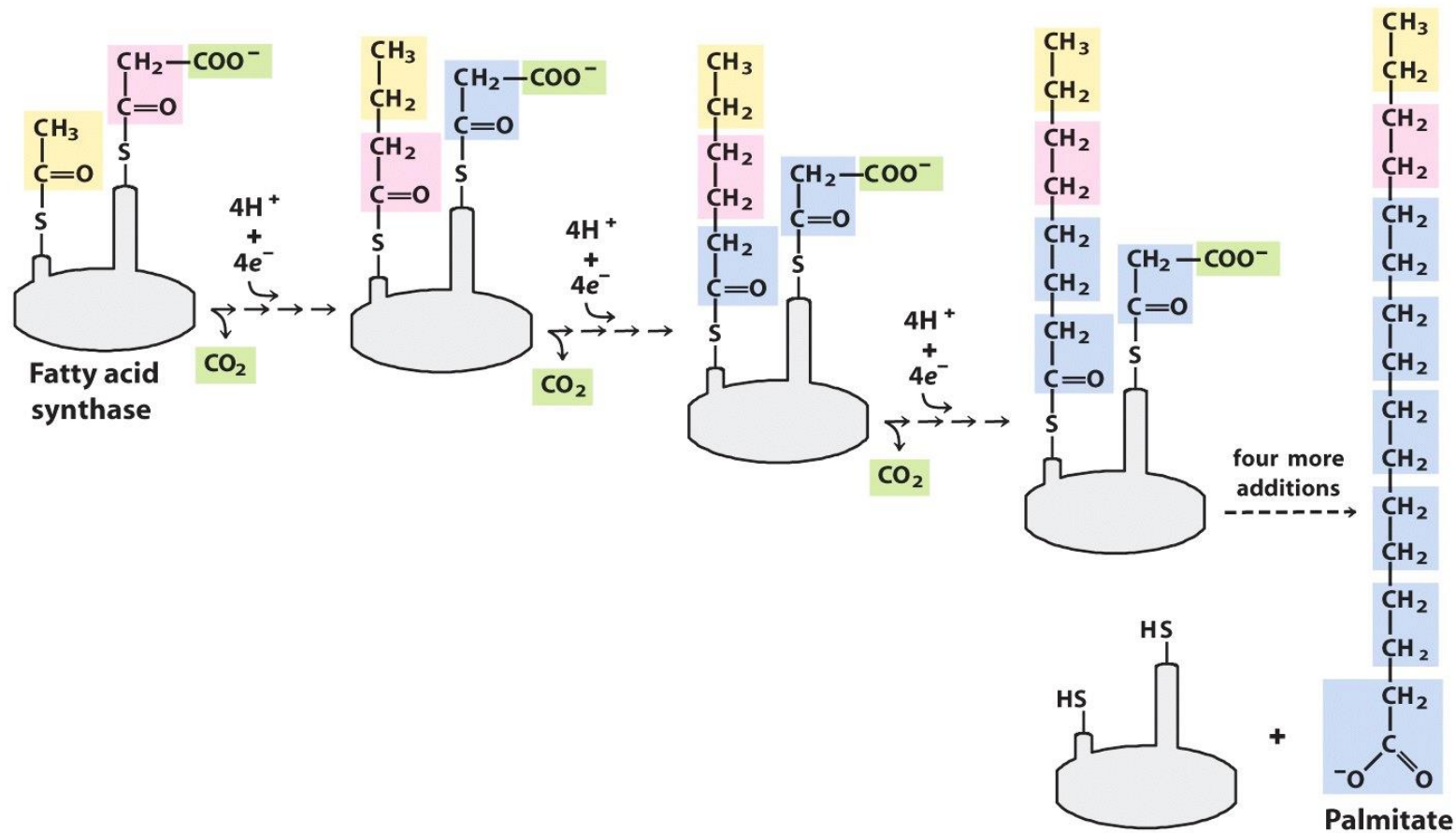
# Sintase de Ácidos Graxos



# Sintase de Ácidos Graxos

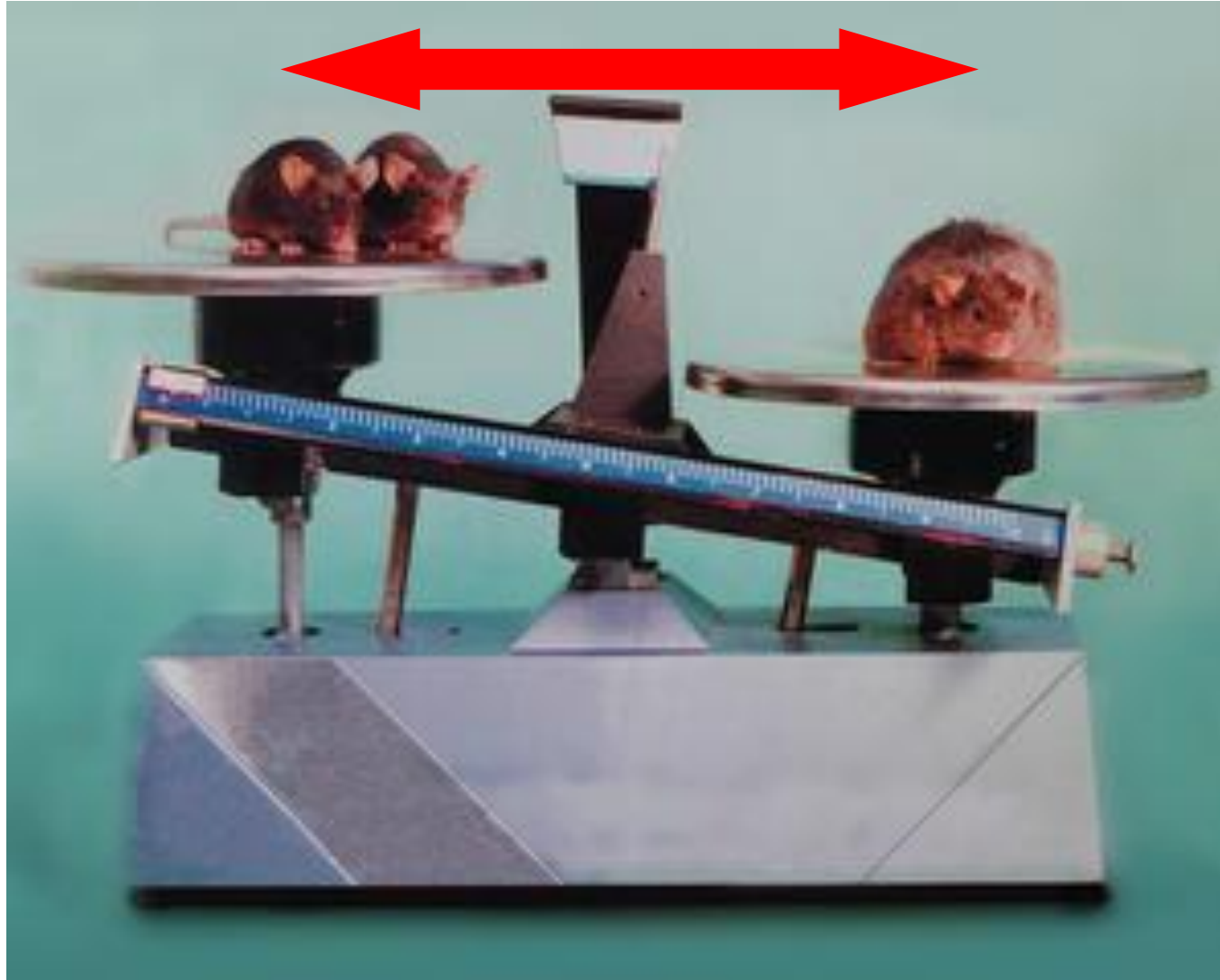


# Sintase de Ácidos Graxos





# Regulação



# Regulação do Metabolismo de Ácidos Graxos

- Degradação:
- conc. mitocondrial acil-CoA
  - oferta de NAD<sup>+</sup>, FAD
  - **malonil-CoA ↓ carnitina acil transferase**

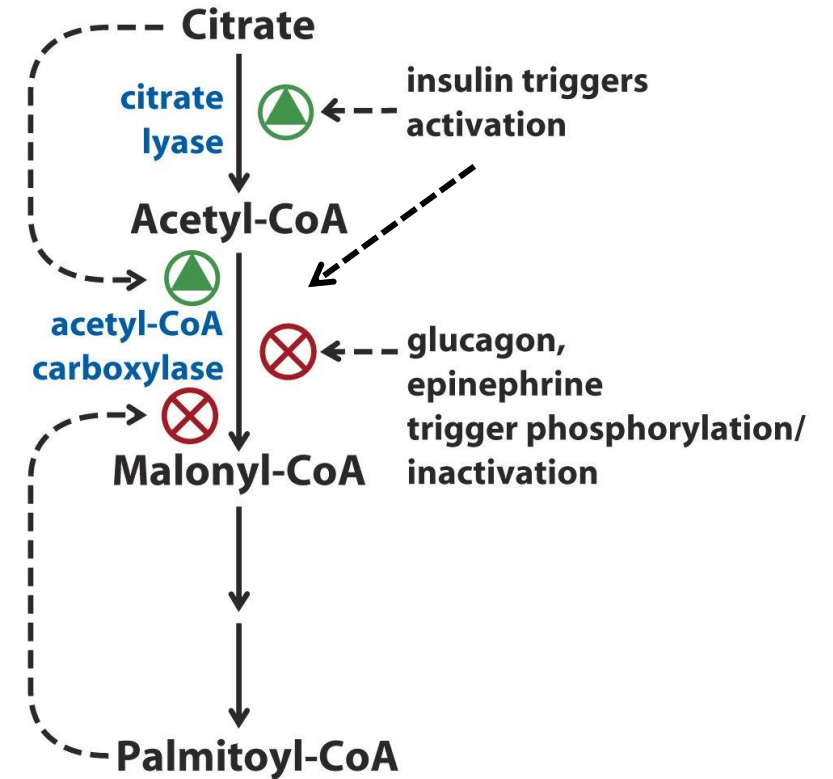
# Regulação do Metabolismo de Ácidos Graxos

Degradação:

- conc. mitocondrial acil-CoA
- oferta de NAD<sup>+</sup>, FAD
- **malonil-CoA ↓ carnitina acil transferase**

Biossíntese:

- **citrato ↑ acetil-CoA carbox.**
- **palm-CoA ↓ acetil-CoA carbox.**
- insulina ↑ citrato liase, AcCoA carb.
- glucagon + adrenalina ↓ AcCoA carboxilase



# Regulação do Metabolismo de Ácidos Graxos

