

“Acido Lattico & Sport: Teoria & Pratica”



FIDAL

**Comitato Regionale
delle Marche**



13 Ottobre 2006, Sala CONI Regionale, Ancona

Acido Lattico nell'Esercizio Fisico & Sport: Che significato Attribuirgli?

Relatore: Carlo Castagna



FIDAL

**Comitato Regionale
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13 Ottobre 2006, Sala CONI Regionale, Ancona

Molecola ATP





ATP Muscolare:

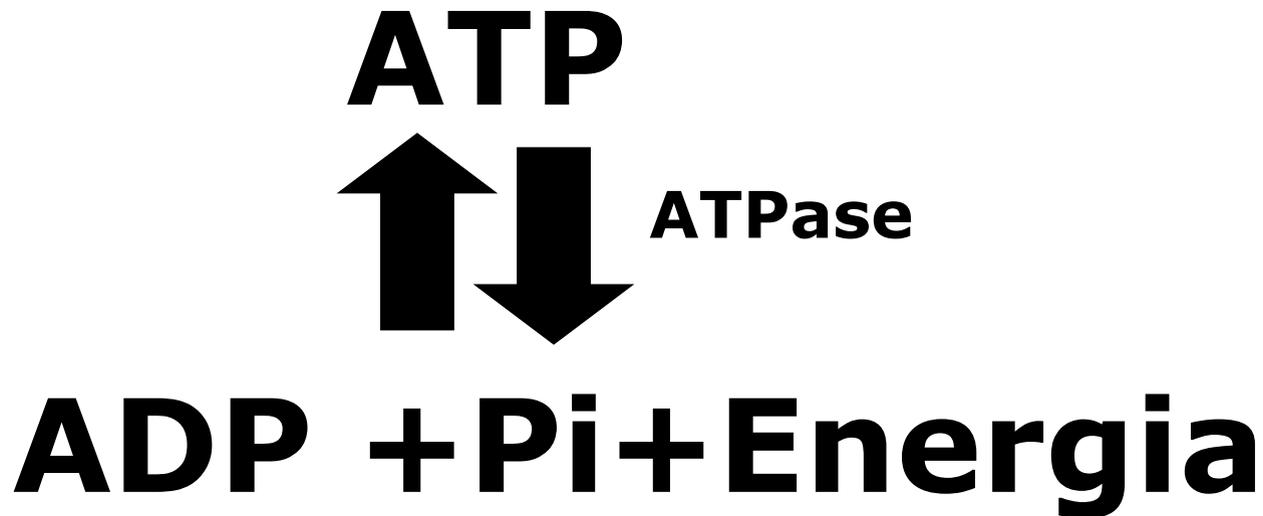
1-2s Contrazioni Max

Bassa Capacità



Adenosina Trifosfato (ATP)

Idrolisi ATP



 **Fornisce 1-2 s Lavoro Max**

Adenosina Trifosfato (ATP)



ATP Muscolare:

Ricarica Energia

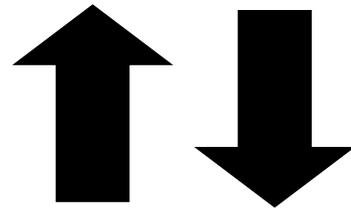
Fonti Energetiche



Fonti Energetiche



Fosfato-Creatina (PCr)

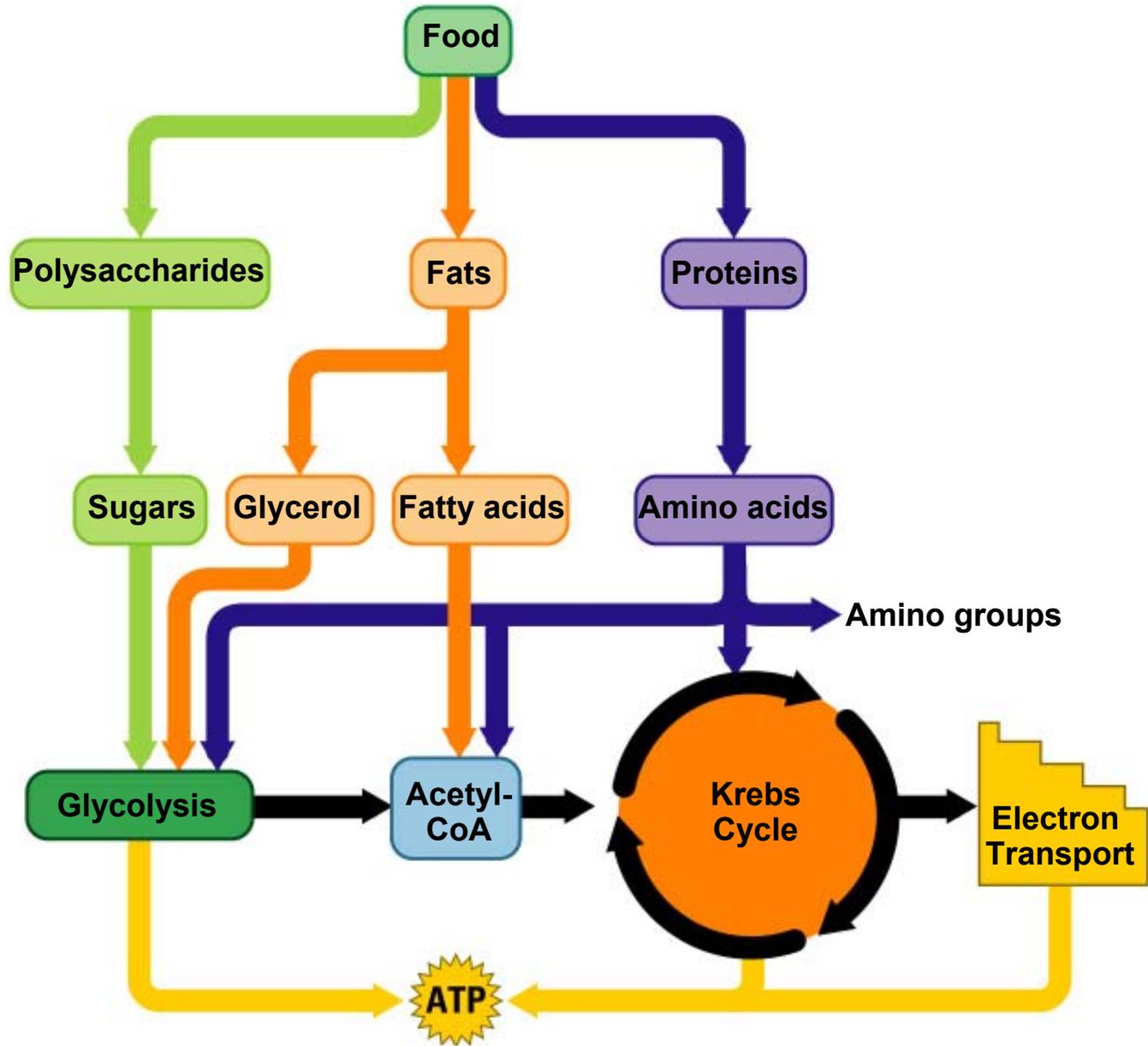


Creatina Kinasi



Sostiene ~10 s Lavoro Max

Fosfato-Creatina (PCr)



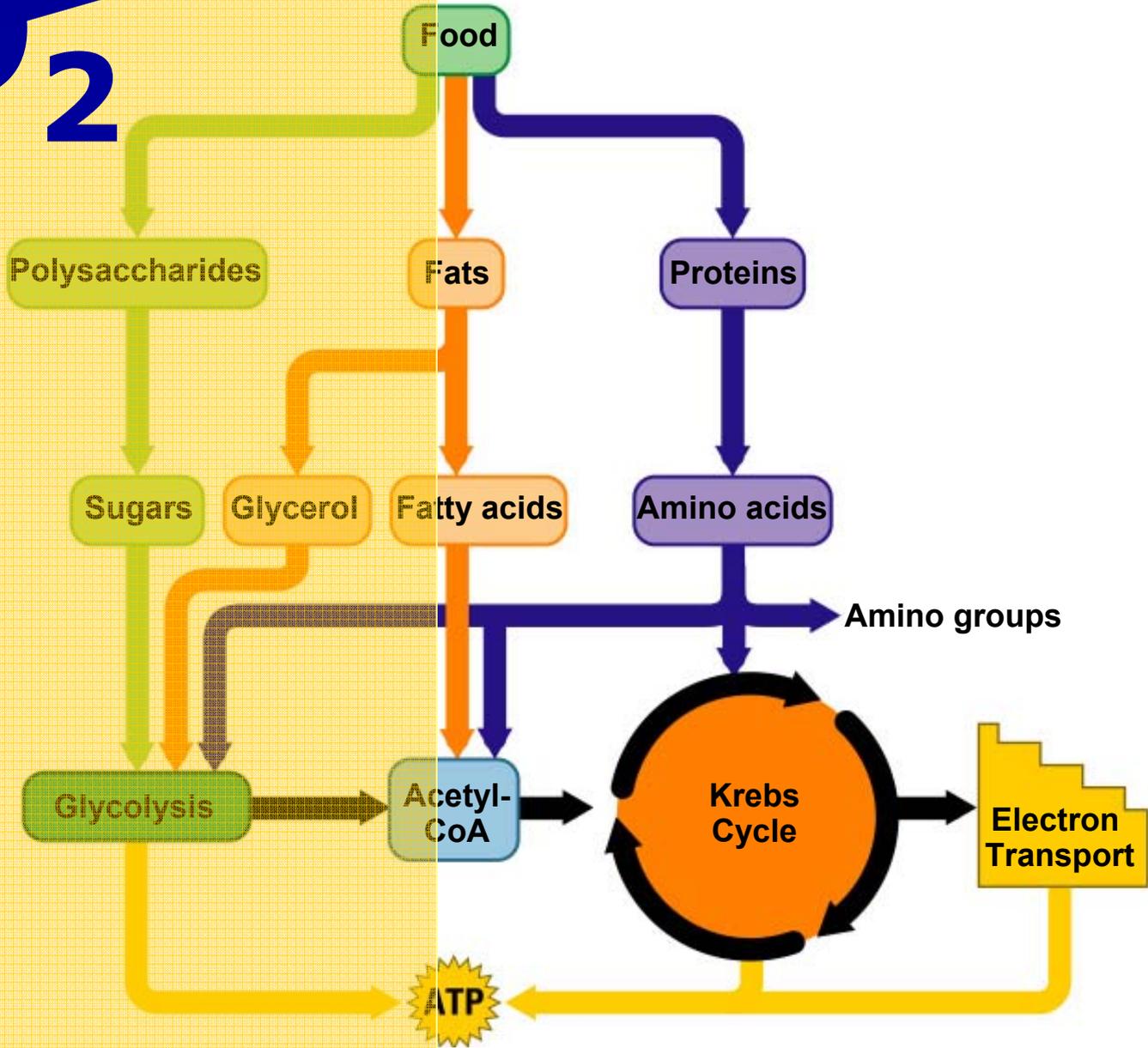
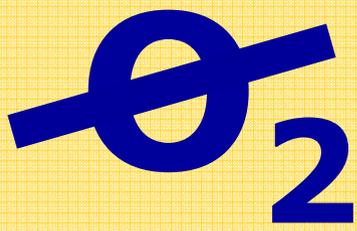


Figure 6.13

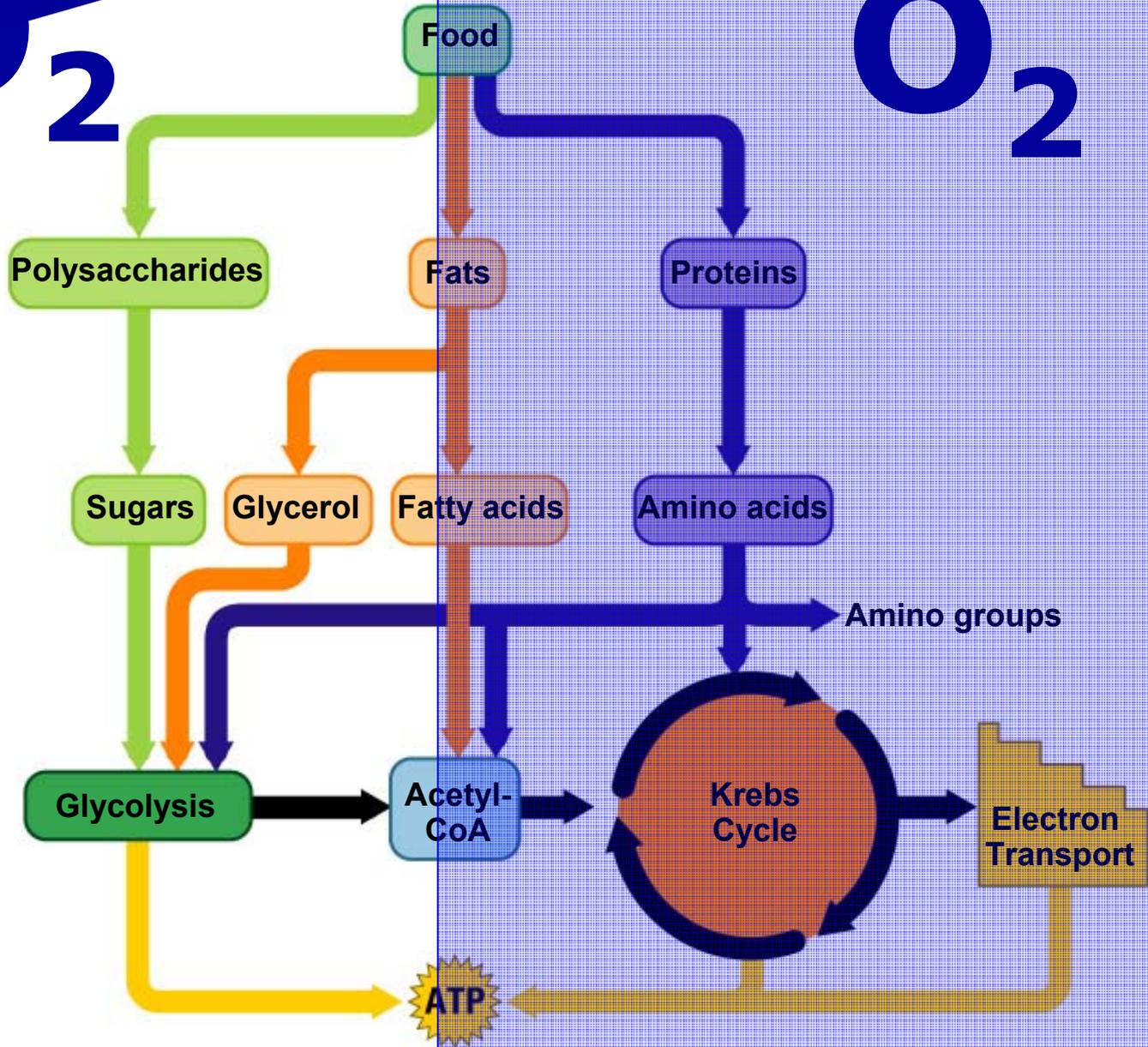
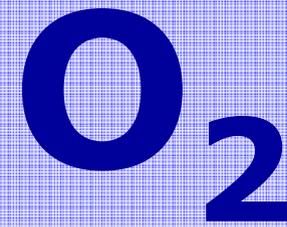
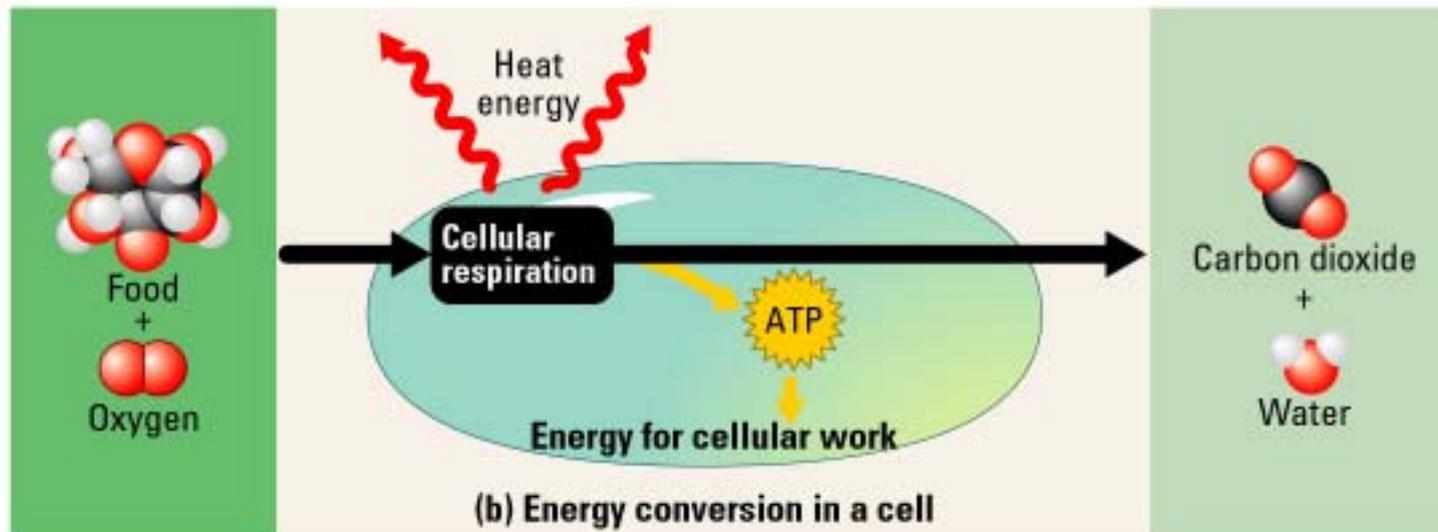
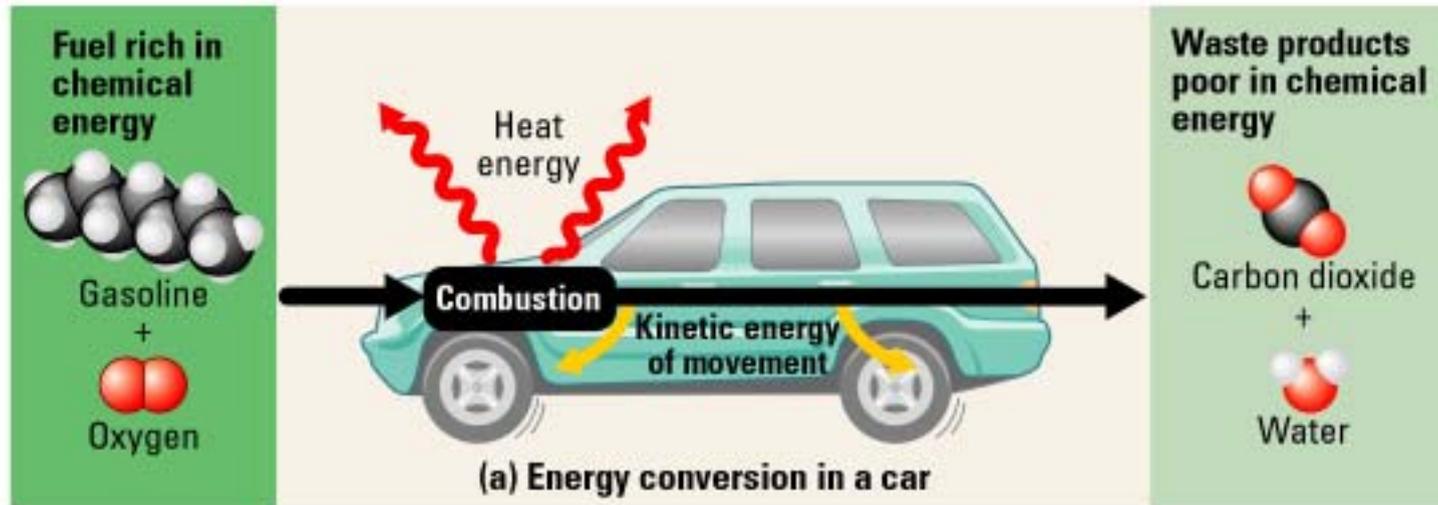
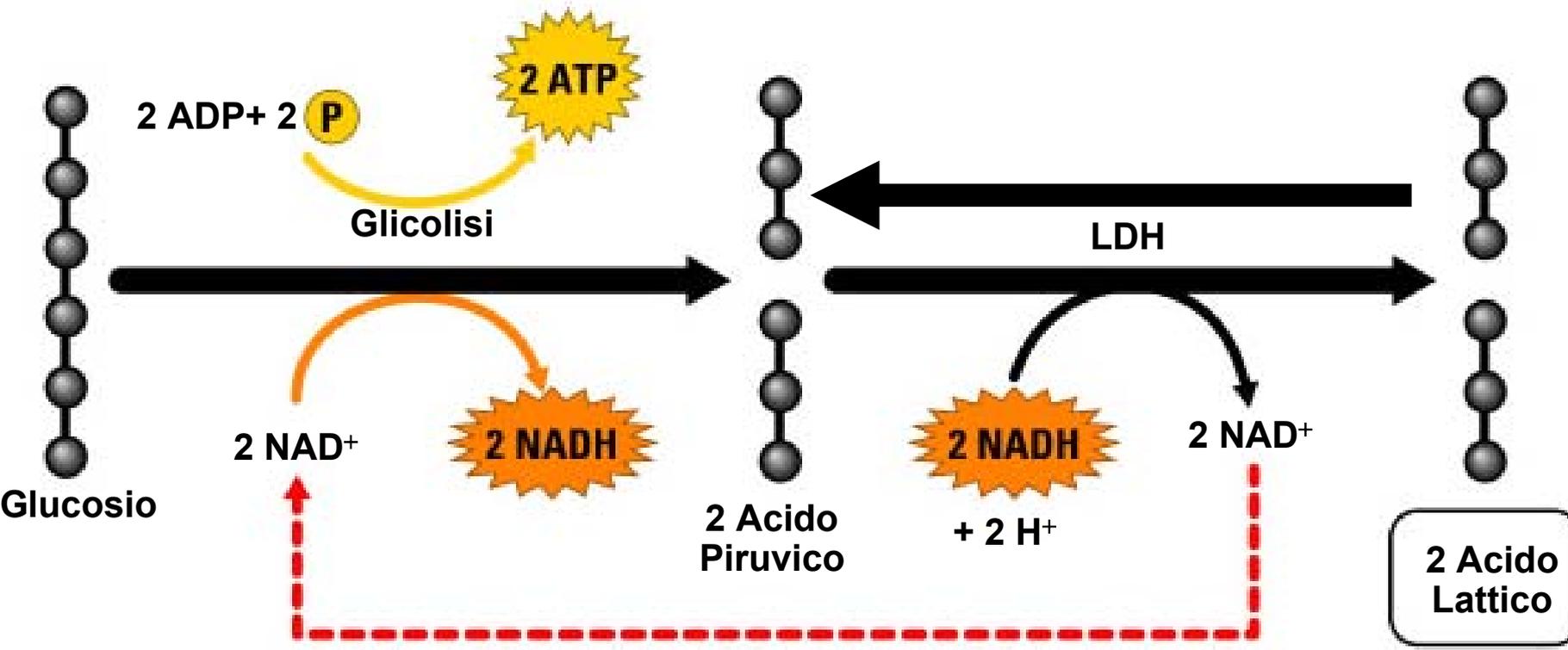


Figure 6.13

Meccanismo Aerobico

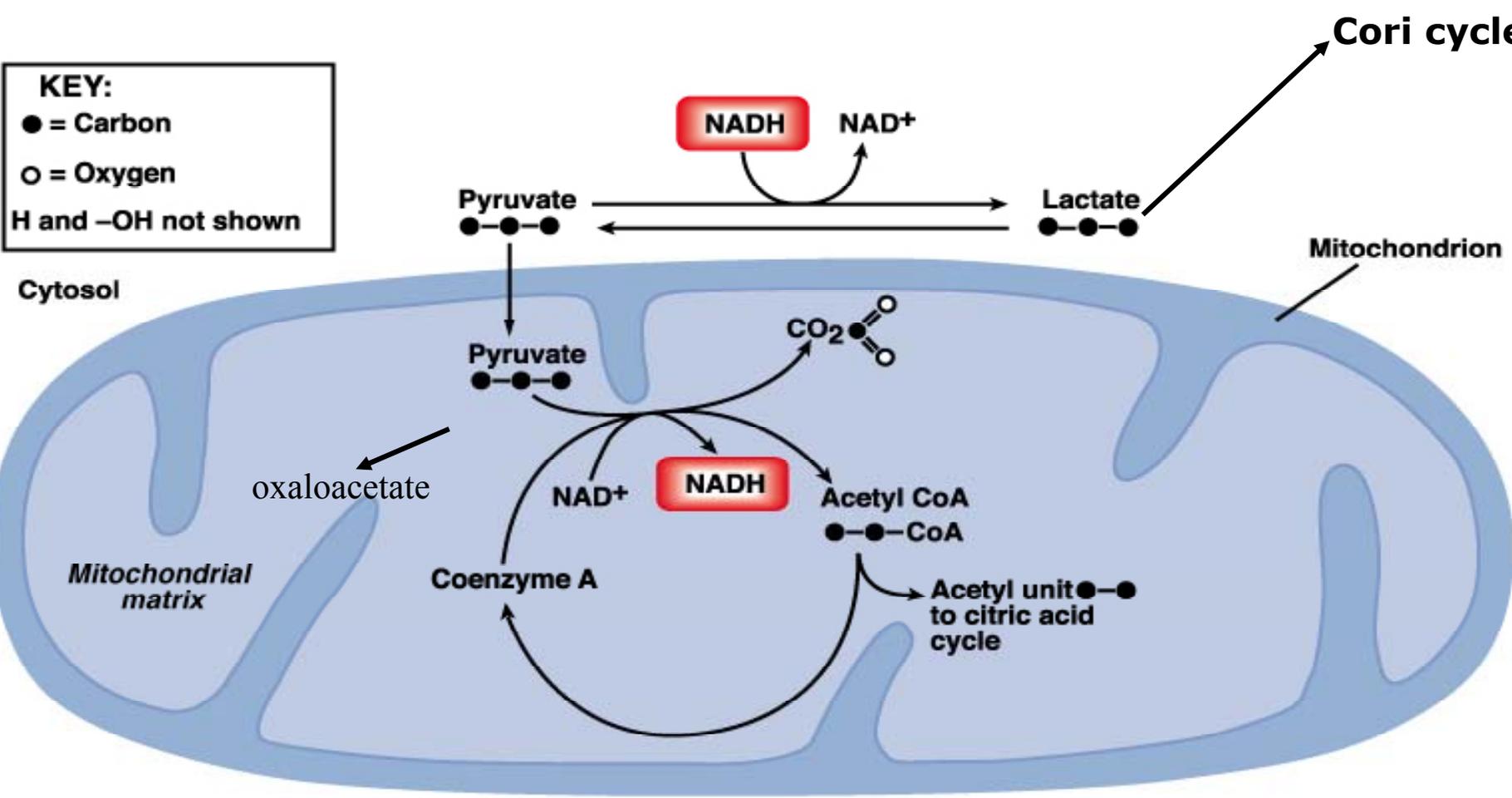


Meccanismo Anaerobico Lattacido



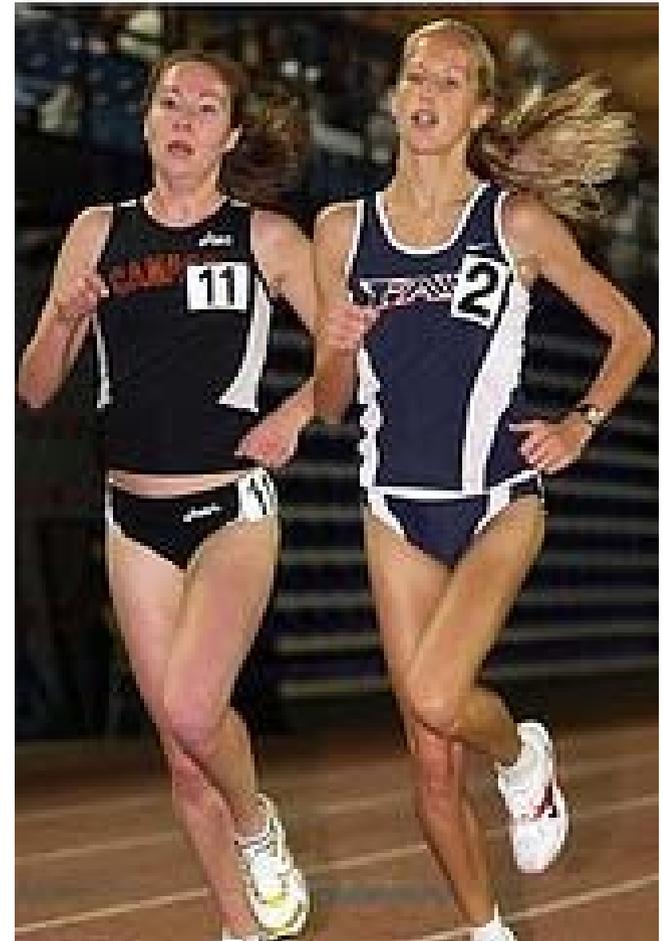
Meccanismo Anaerobico Lattacido

Aerobico & Anaerobico Lattacido



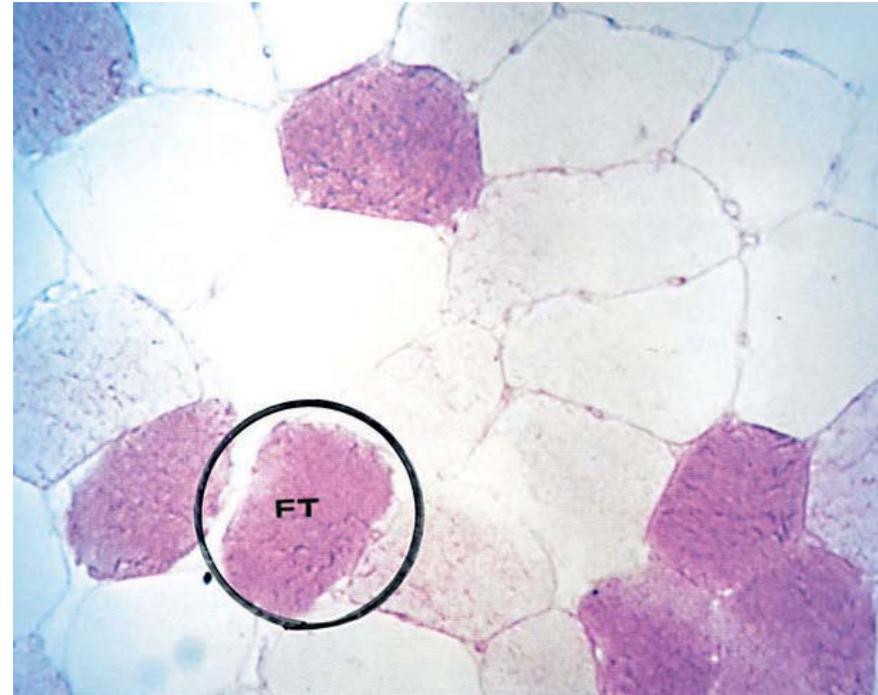
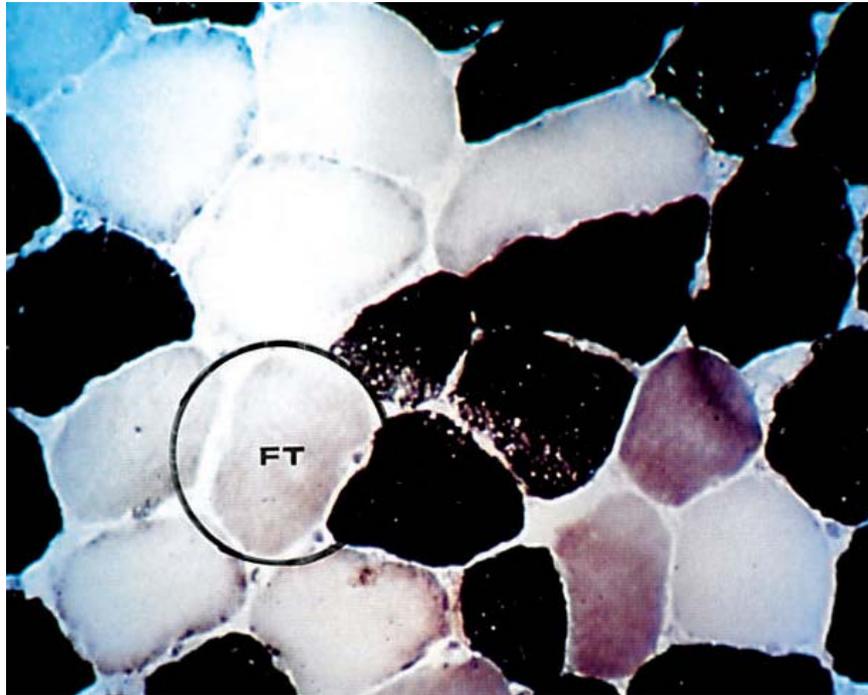
Substrati Energetici

- **Glucoso**
- **Glicogeno**
- **Lattato**



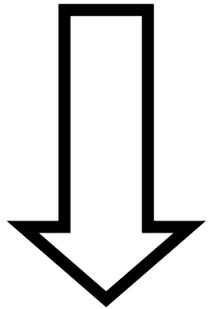
Substrati Energetici

Glicogeno



Glicogeno

Glucoso



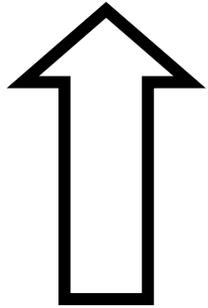
Glicogeno

Fegato-Muscoli



Glicogenolisi

Glucoso



Glicogeno

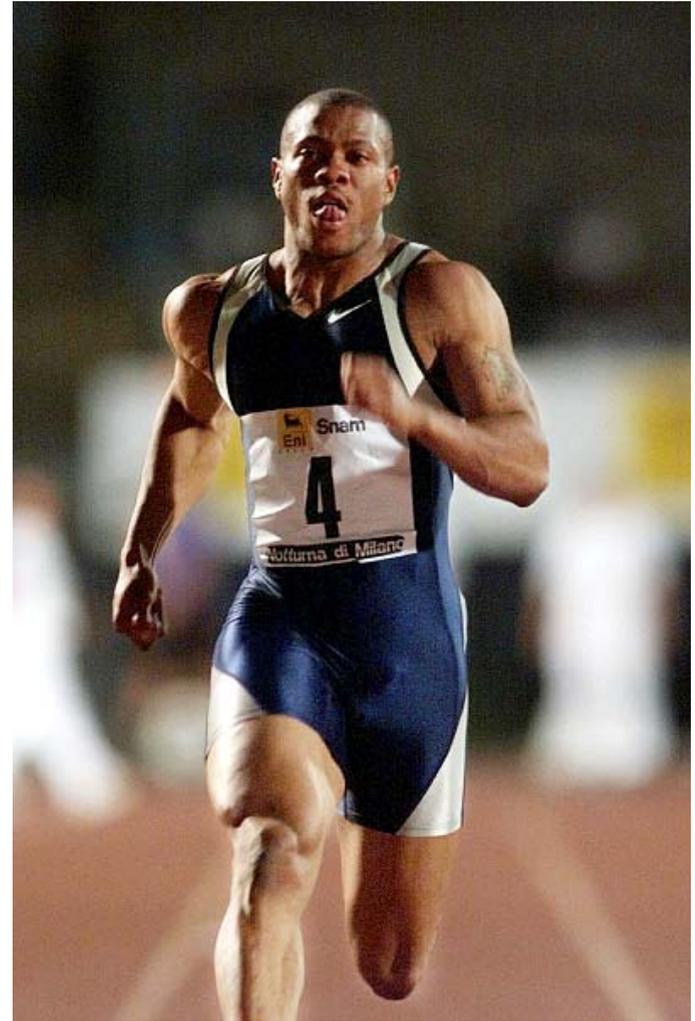
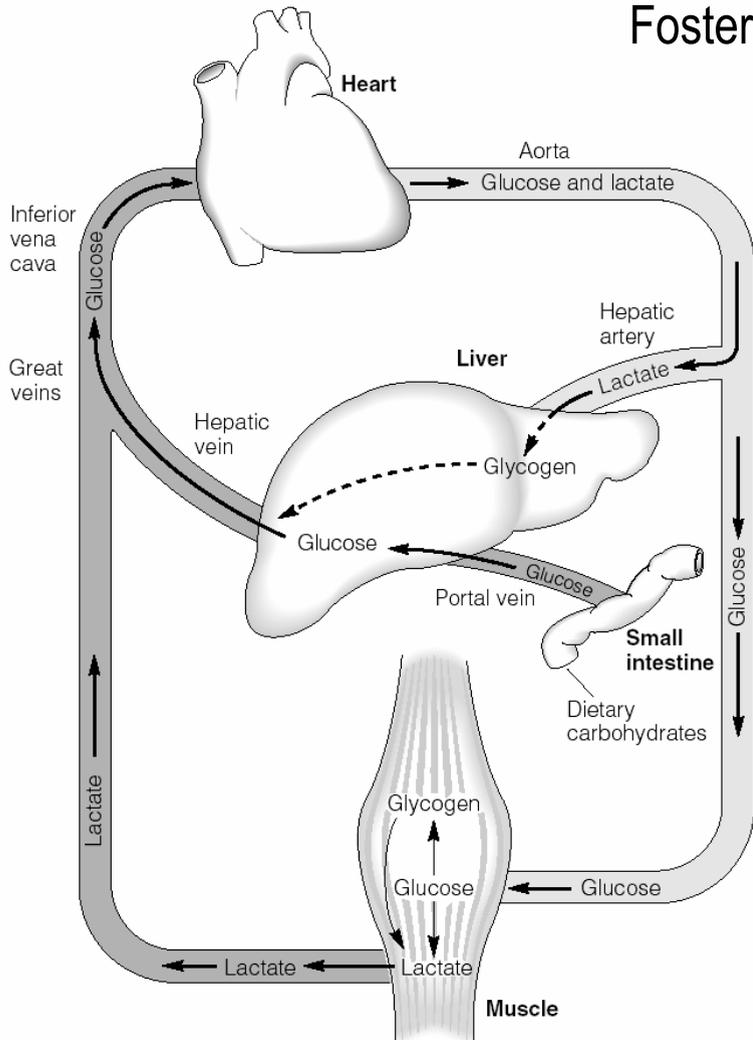
Fegato-Muscoli



Glicogenolisi

Lactate-Paradox

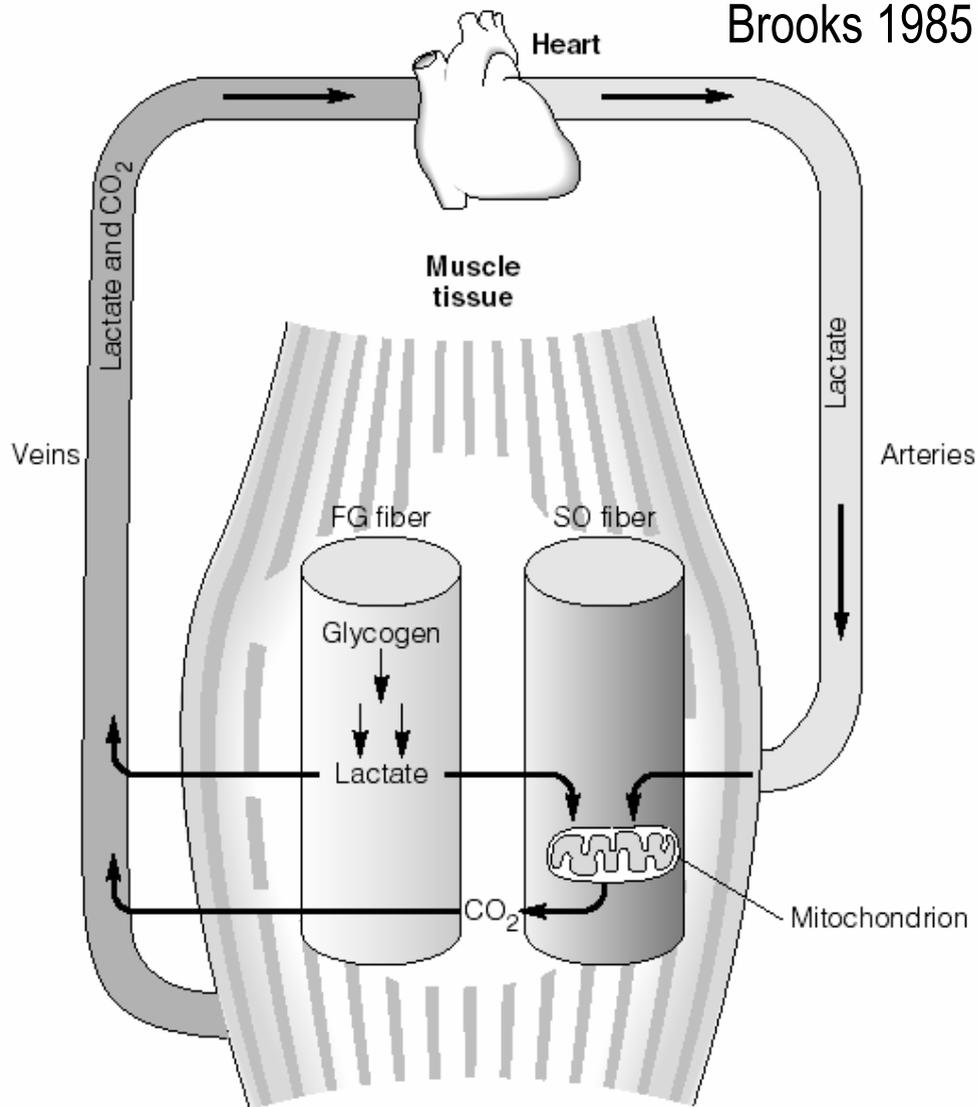
Foster 1984



Lactate-Paradox

Lactate-Shuttle

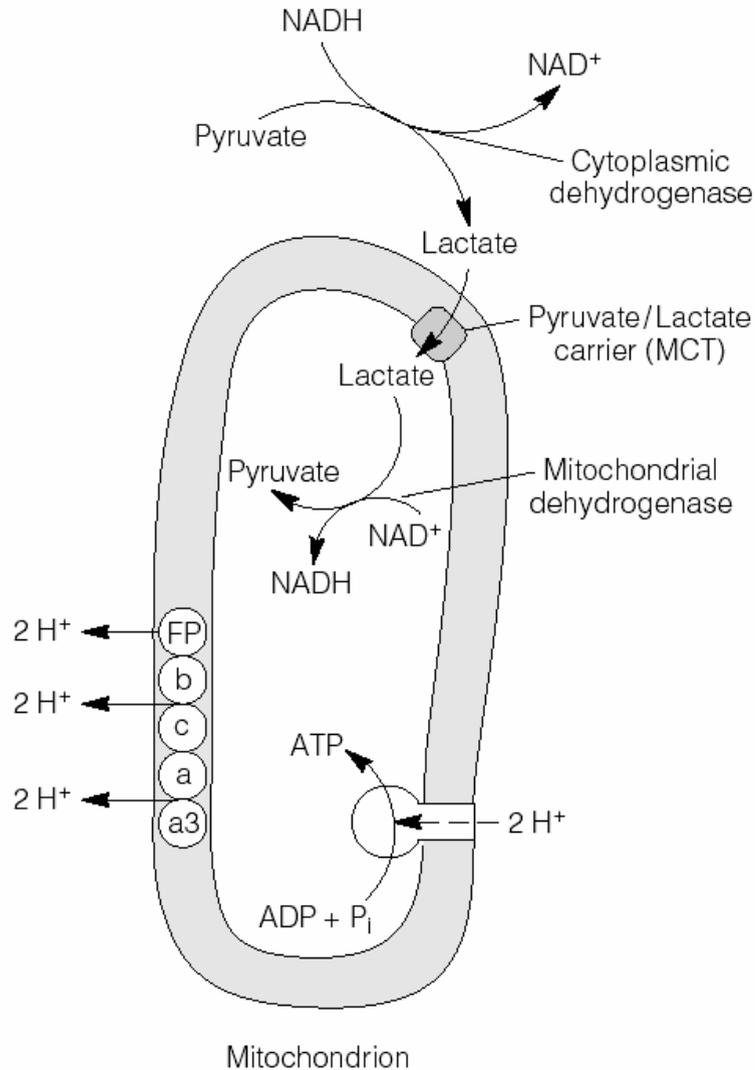
Brooks 1985



Lactate-Shuttle

Lactate-Shuttle

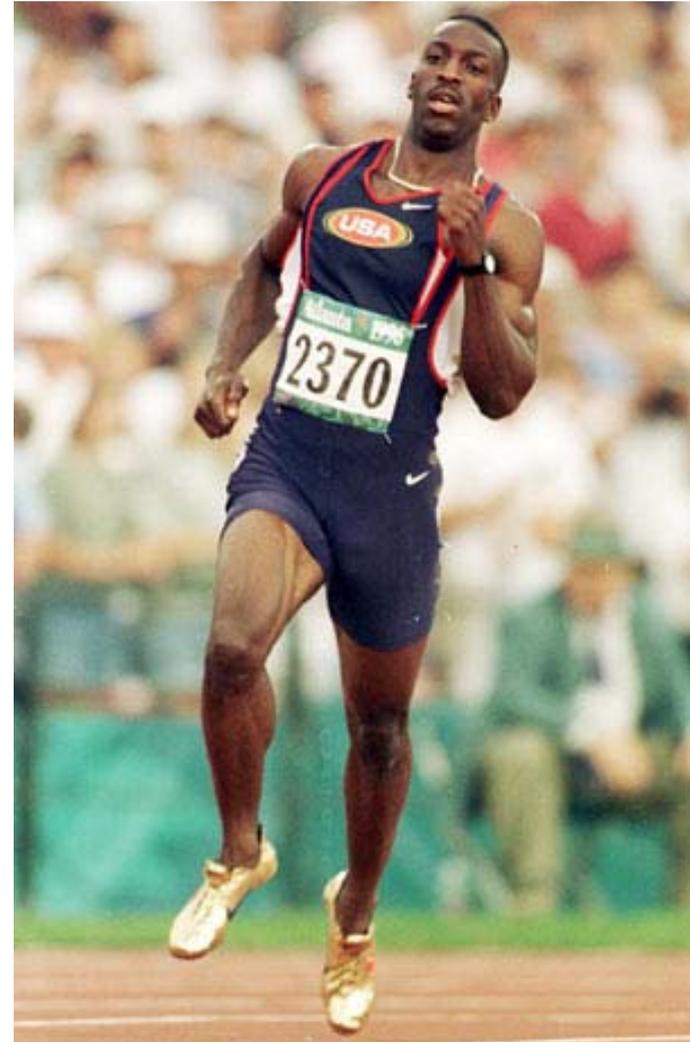
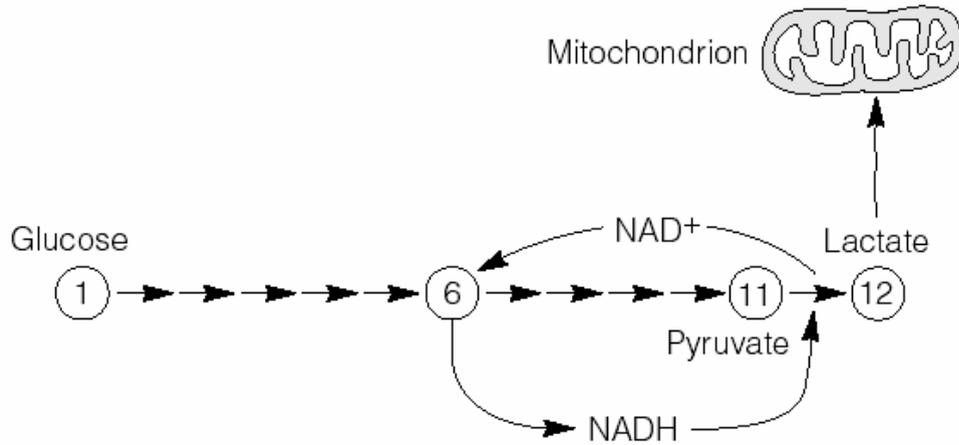
Brooks 1985



Lactate-Shuttle

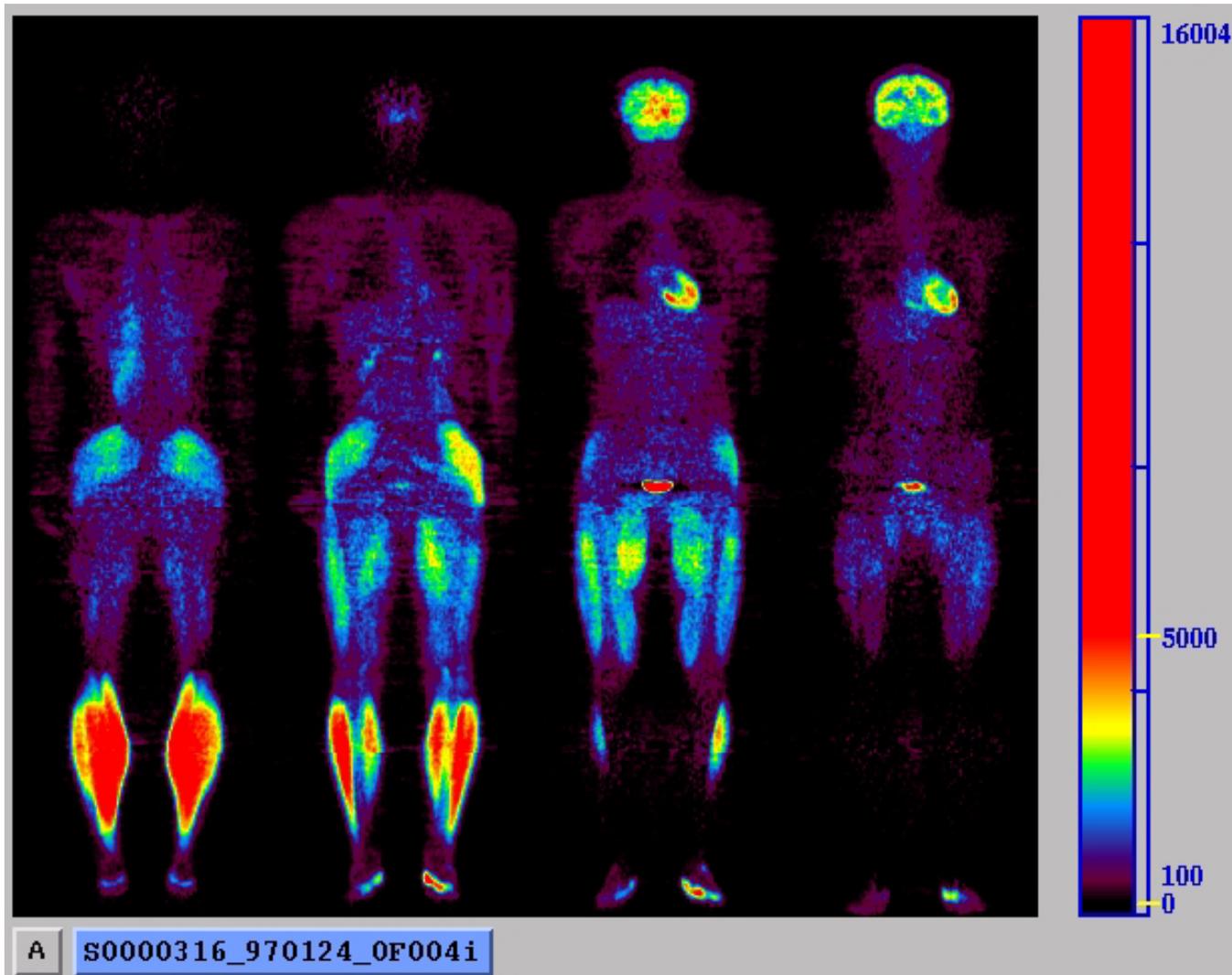
Lactate-Shuttle

Brooks 1985



Lactate-Shuttle

Lattato & Esercizio Fisico

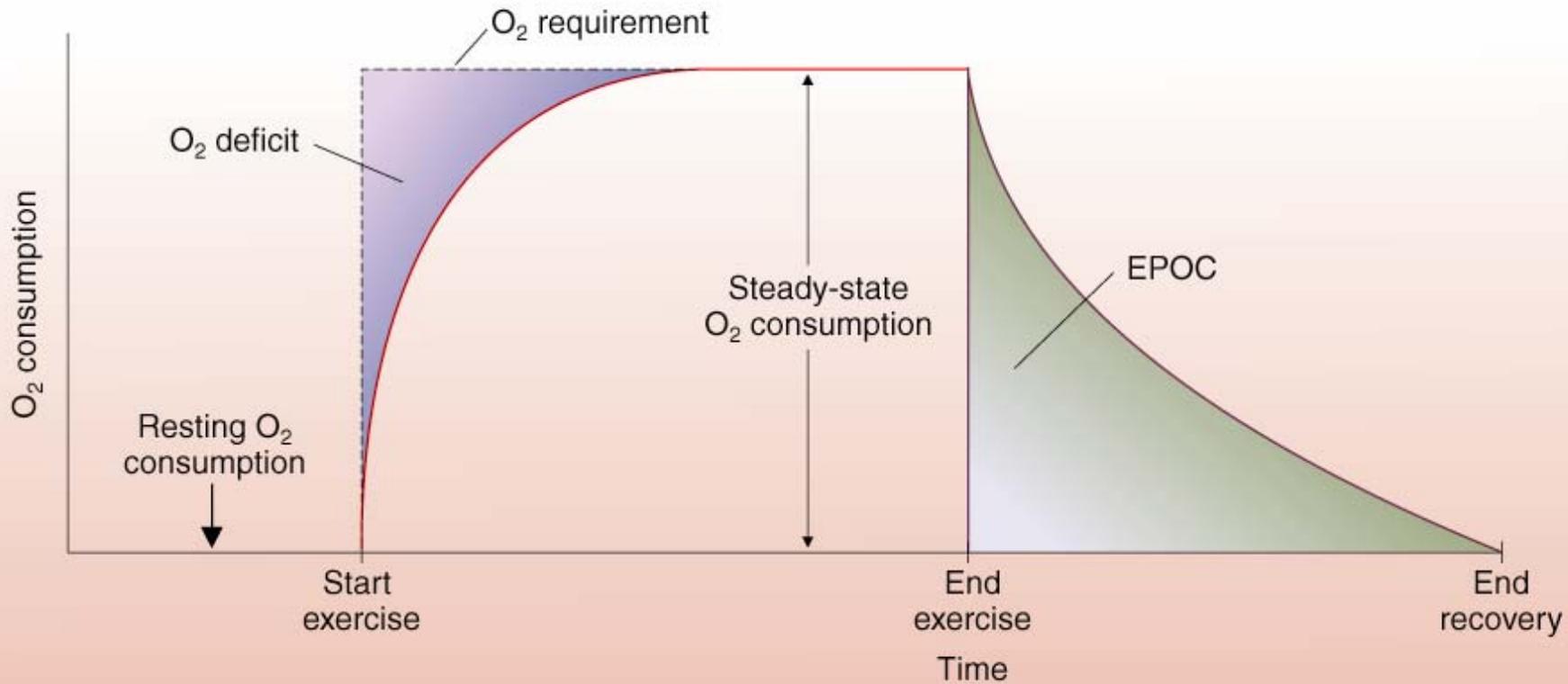


Lattato & Esercizio Fisico

Quando viene prodotto?

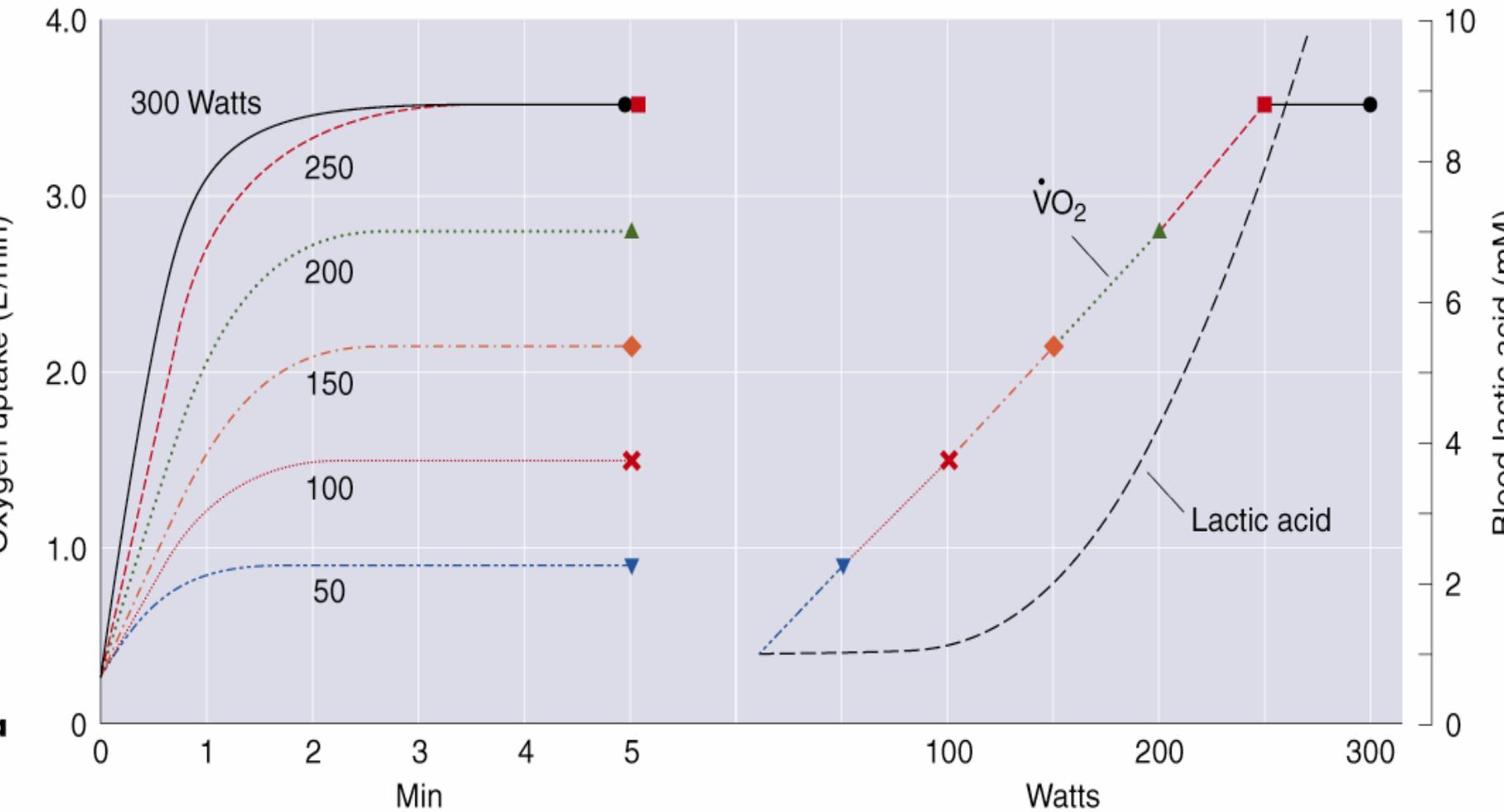
- Dopo 6-8 sec
- Superato VO_{2max}
- Termine prestazione

Lattato & Esercizio



Lattato & Esercizio

Soglia Anaerobica



Soglia Anaerobica

Soglia Anaerobica

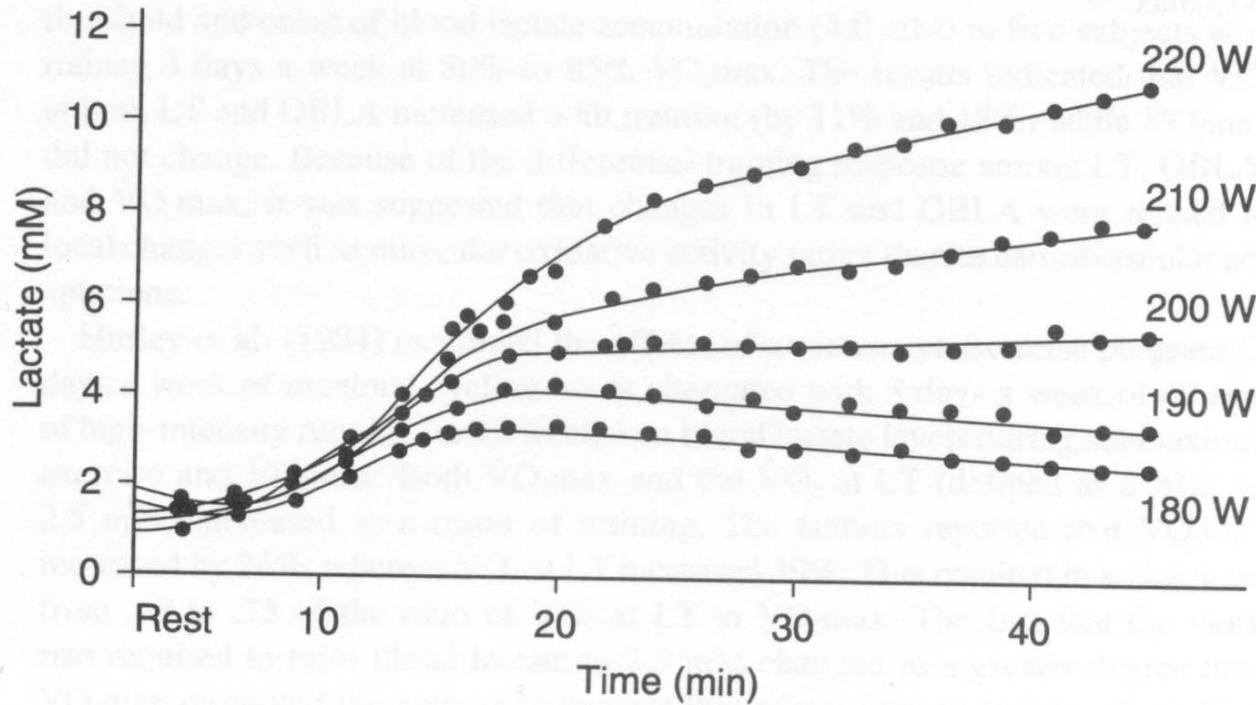
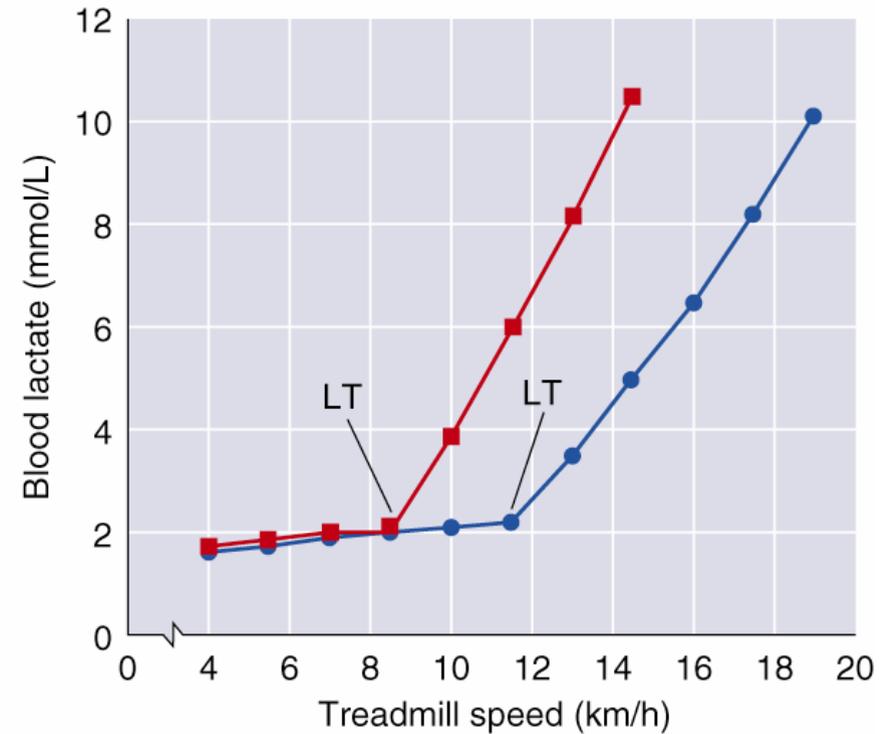
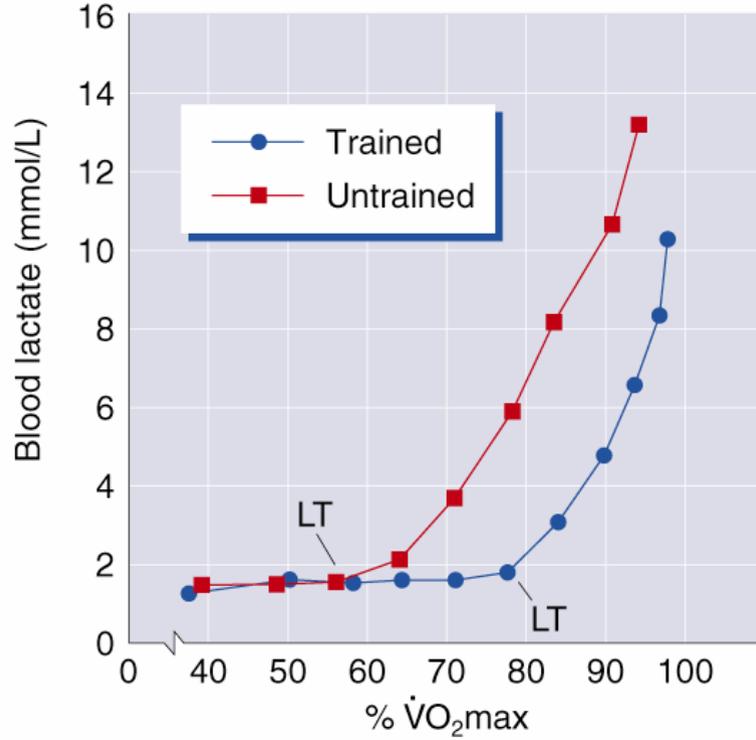


Figure 5.3 Changes in the arterial lactate level at constant work loads on a bicycle ergometer.

Note. From “Die Aerobe Leistungsfähigkeit—Aspekte von Gesundheit und Sport” by V.W. Hollmann, A. Mader, H. Liesen, H. Heck, and R. Rost, 1986, *Spektrum der Wissenschaft*, pp. 48-58. Copyright 1986 by Spektrum der Wissenschaft. Reprinted by permission.

Soglia Anaerobica

Soglia Anaerobica



Soglia Anaerobica

Sprint 30''

**Protocollo
Pedalare 30s All-out**

Fonte Energetica

Aerobica

Anae Glico

ATP & [PCr]

Medbø et al 1999



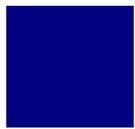
38%

45%

17%

Sprint 30''

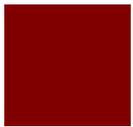
Sprint 12"



Protocollo

Pedalare 12s All-Out

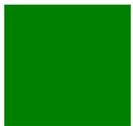
Fonte Energetica



Aerobica



Anaerobico Glicolico



ATP & [PCr]

Medbø et al 1999



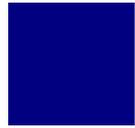
30%

47%

22%

Sprint 12"

Sprint 3"



**Protocollo
Pedalare 3s All-Out**

Fonte Energetica



Aerobica



Anaer Glic



ATP & [PCr]

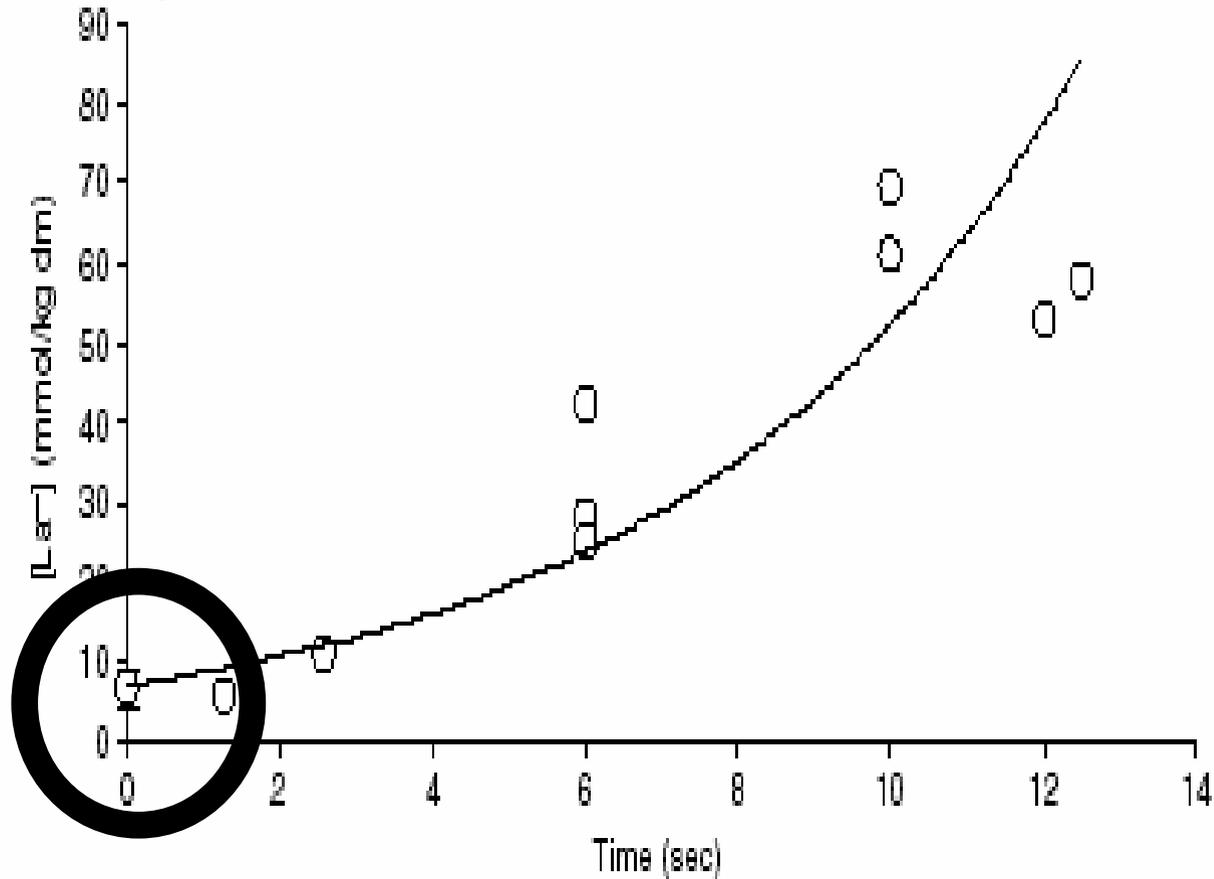
Medbø et al 1999



Sprint 3"

Lattato & Sprint

Spencer et al 2005



Lattato & Sprint

Lattato & Fatica

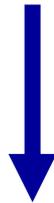


Lattato & Fatica

Acido Lattico



Lattato + H⁺

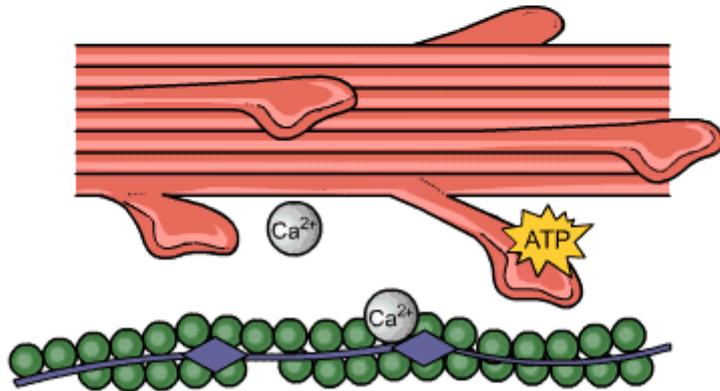
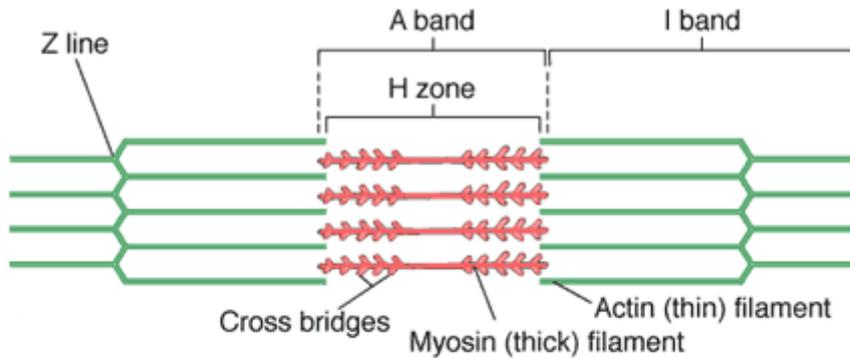


pH



Lattato & Fatica

↓ pH



Lattato & Fatica

Prelievo Sangue

Lobo Orecchio

Polpastrello Mano

Microprelievi

5-50 μ L



Biopsia Muscolare



Prodotto anche in condizioni aerobiche

Substrato Energetico

Aumenta acidità muscolare?

Produzione a partire 1-2s esercizio

