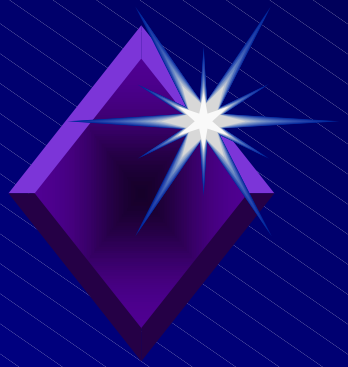


# Performance Profiling of the Standardbred Athlete

By

Dr Michael Ponchard

# Aims of Presentation

1. To explain how exercise physiologists or sports scientists can contribute to the running of a successful stable, by implementing a scientifically devised performance profiling system

2. To demonstrate how exercise physiologists can provide trainers with additional physiological information to help with exercise prescription and talent identification

# Why Performance Profile ?

## 1. Training

- Set training objectives
  Which energy system needs more attention
- Individualisation of training
  Prescribe ideal training speeds
- Increase training efficiency
  Train strengths - minimise weaknesses
  Measure, modify and monitor training

# 2. Talent Identification

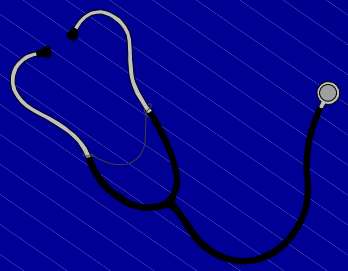
- Identify aerobic capacity
- Identify anaerobic capacity
- Assess overall performance potential
- Select the most suitable race distance

# Introduction

- Significant role
- Simple Talent ID
- Sophisticated Talent ID
- Screen large numbers
- Sydney Olympics

# Types of Profiling ?

- Medical or clinical profile
- Biomechanical profile
- Psychological profile
- Physiological profile



# Sports Science Profile

- Height/Weight/Girths
- Somatotype
- Body composition
- Proportionality
- Posture

# Sports Science Profile (cont)

- Strength
- Speed
- Power
- Flexibility

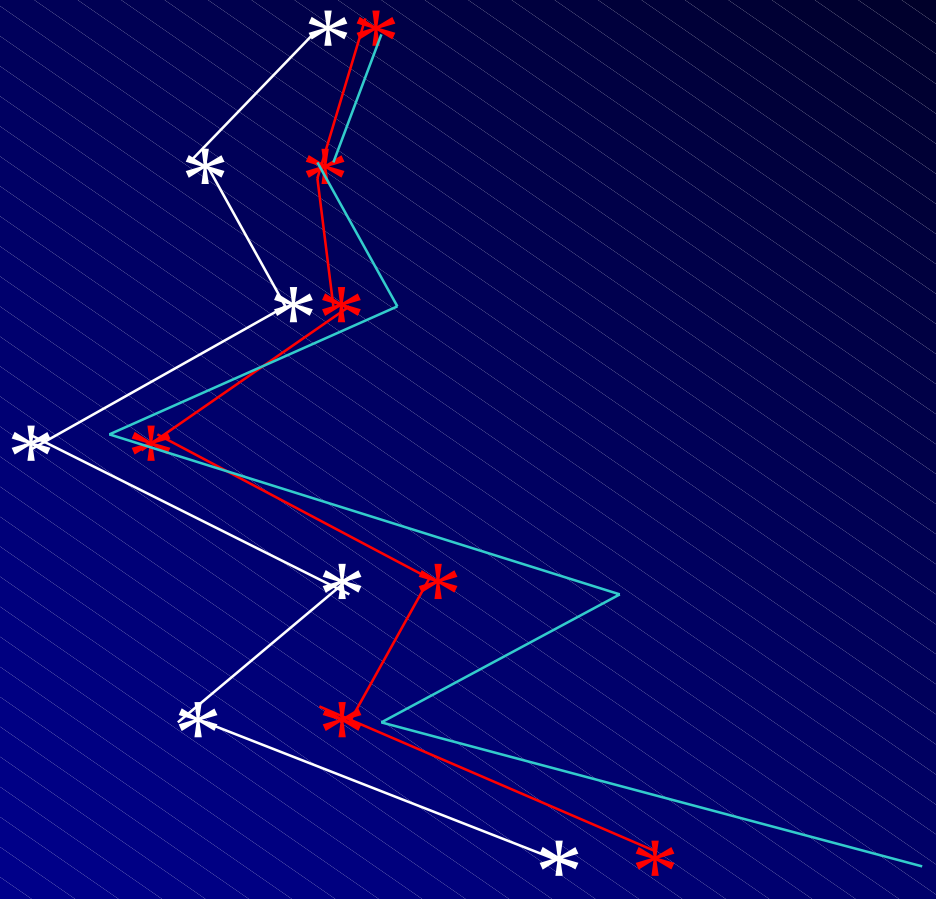
# Sports Science Profile (cont)

- Aerobic energy system
- Anaerobic energy system
- Health status
- Biochemical & blood tests

# Typical Profile

Test components 10 20 30 40 50 60 70 80 90 100

- Height
- Weight/Body fat
- Proportionality
- Flexibility
- Strength
- Aerobic capacity
- Anaerobic capacity



# Interpretation of Results

- Identify strengths & weaknesses
- Monitor changes in fitness status
- More precise exercise prescription

# Equine Performance Laboratory

- High-speed treadmill
- Lactate analyser & heart rate meter
- Computer facilities & software
- Variety of tracks and swimming pool

# Characteristics of the Aerobic Profile

- 4 work intervals
- 3-minute work intervals (2400 m track)
- 5-minute active rest periods
- 10-min warm-up & 5-min warm-down

# Preparation for Profiling

- 2-week familiarisation program
- 2-day diet & exercise program
- Standardisation of protocols is essential

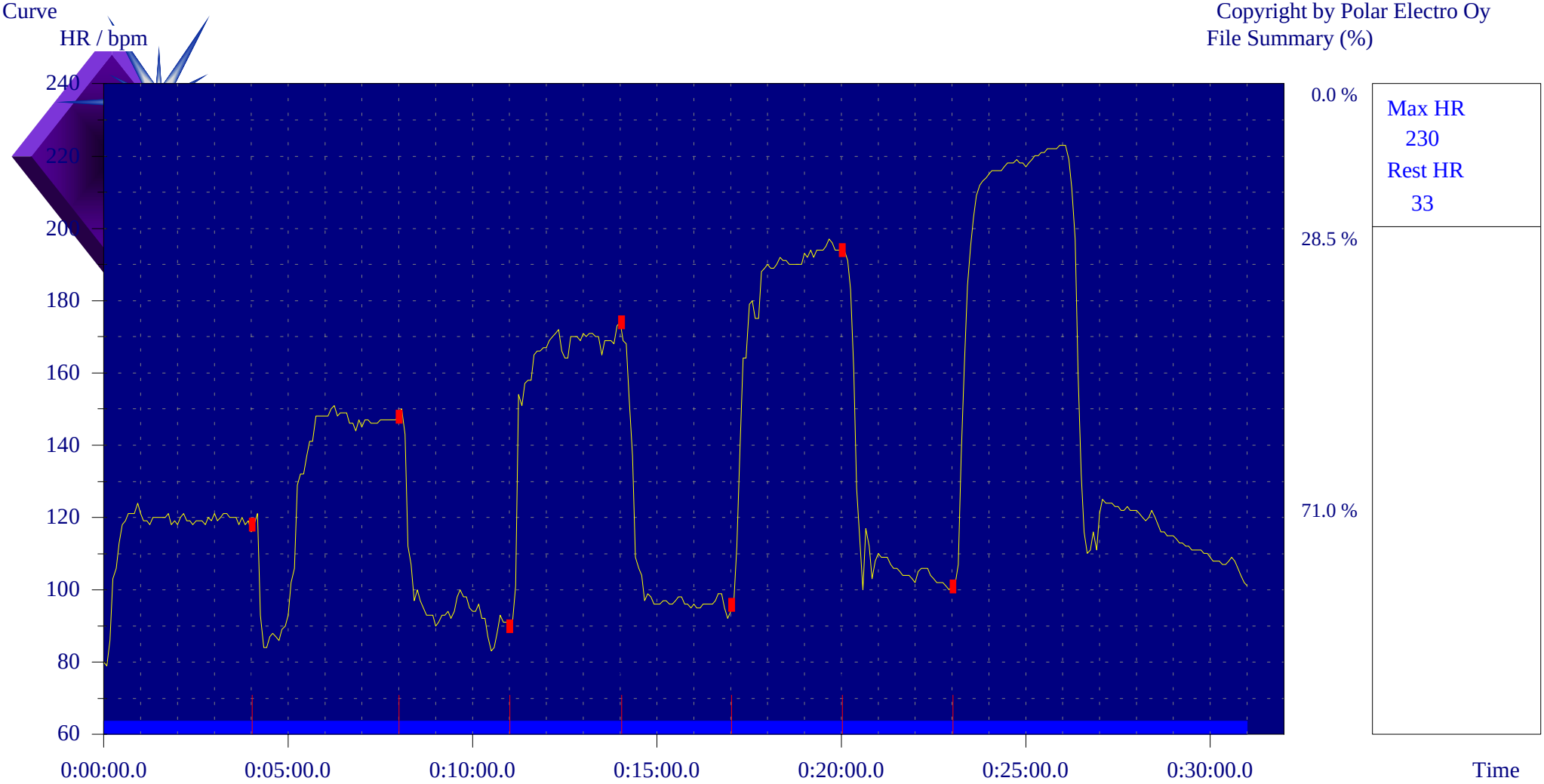
# Performance Variables

- Heart rate - V200
  Velocity associated with heart rate of 200 $b.min^{-1}$
- Plasma lactate - VLa4
  Velocity associated with a plasma lactate of 4 $mmol.l^{-1}$

Curve



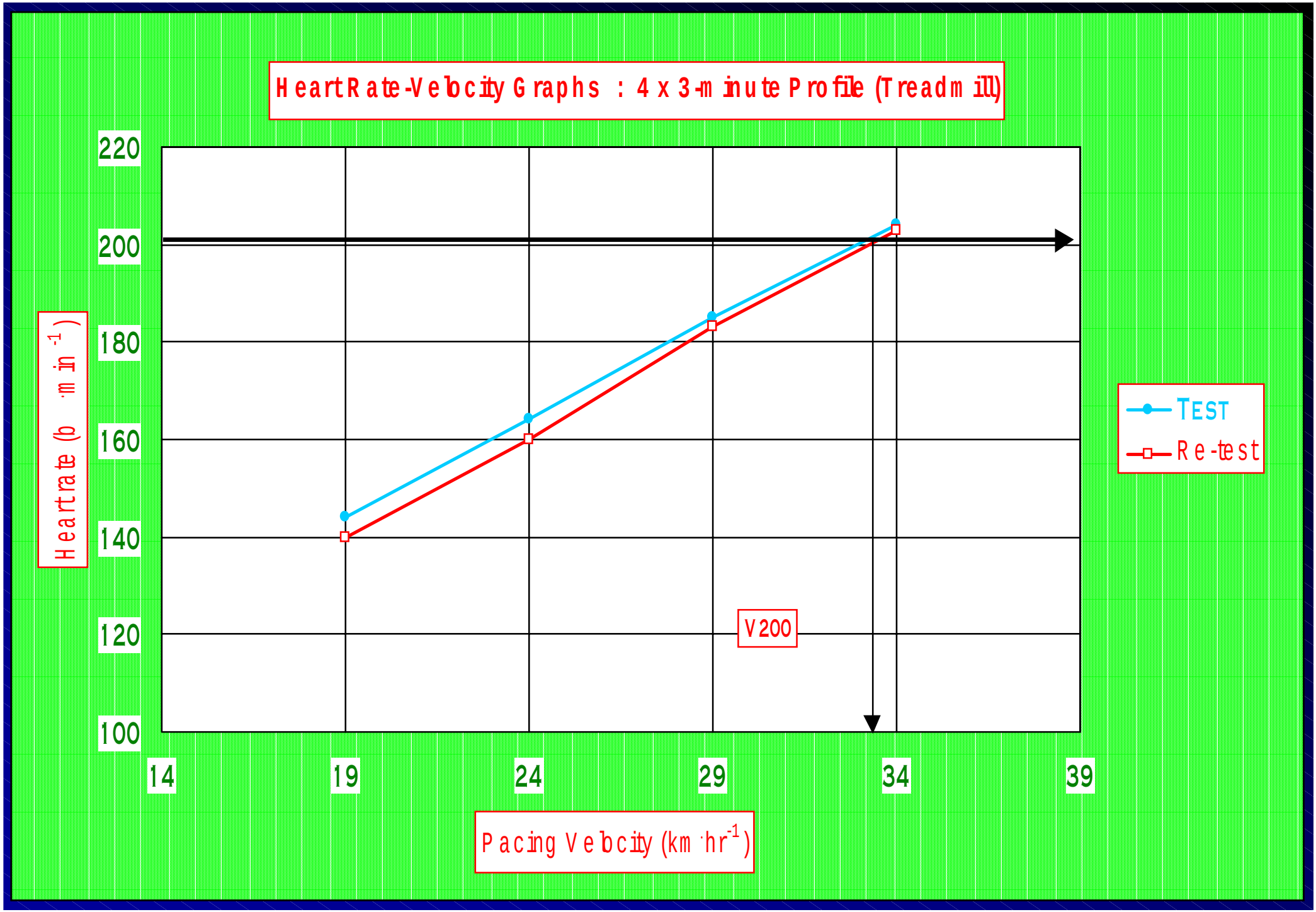
File Summary (%)

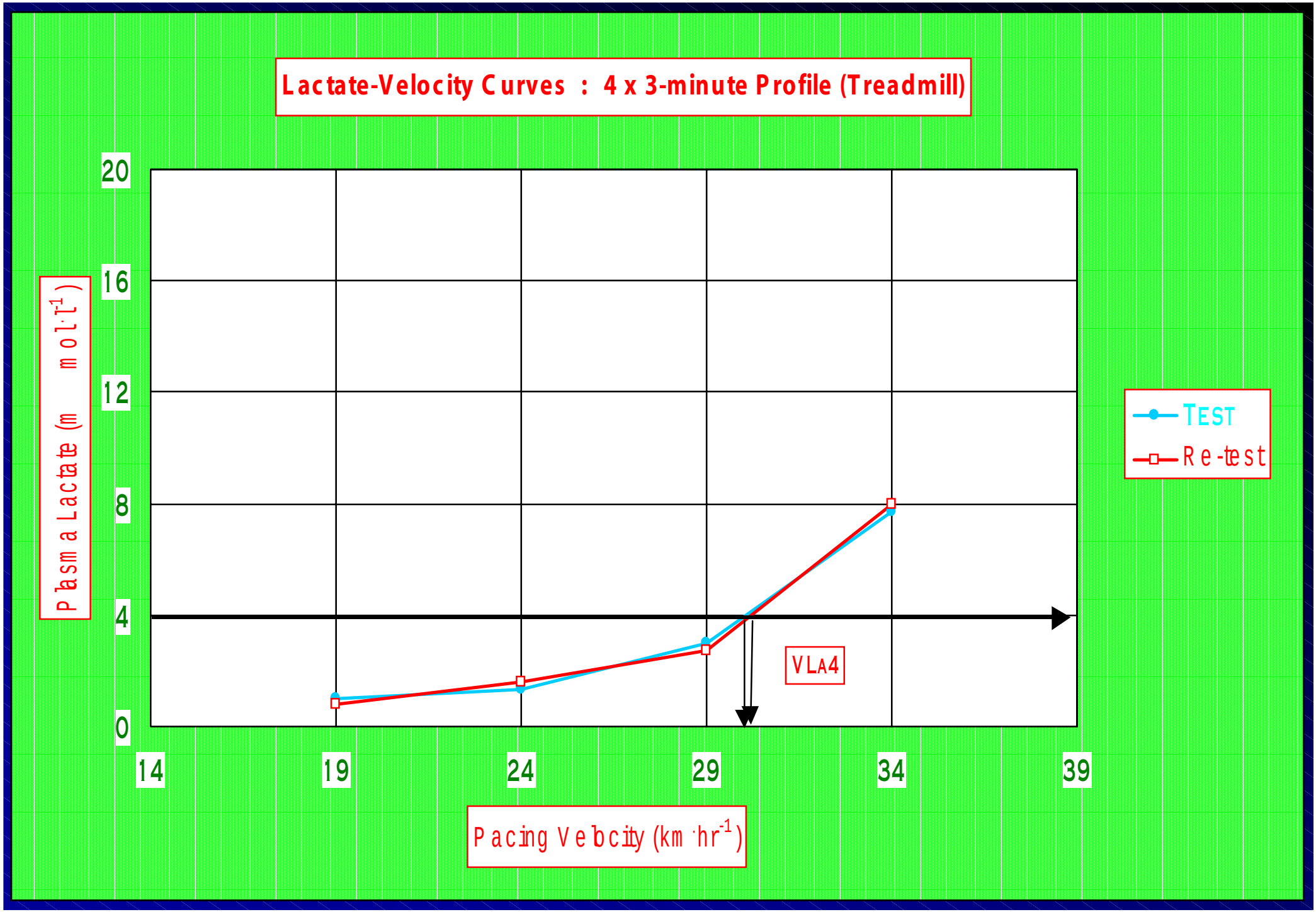



HR: 80 bpm

Time: 0:00:00.0

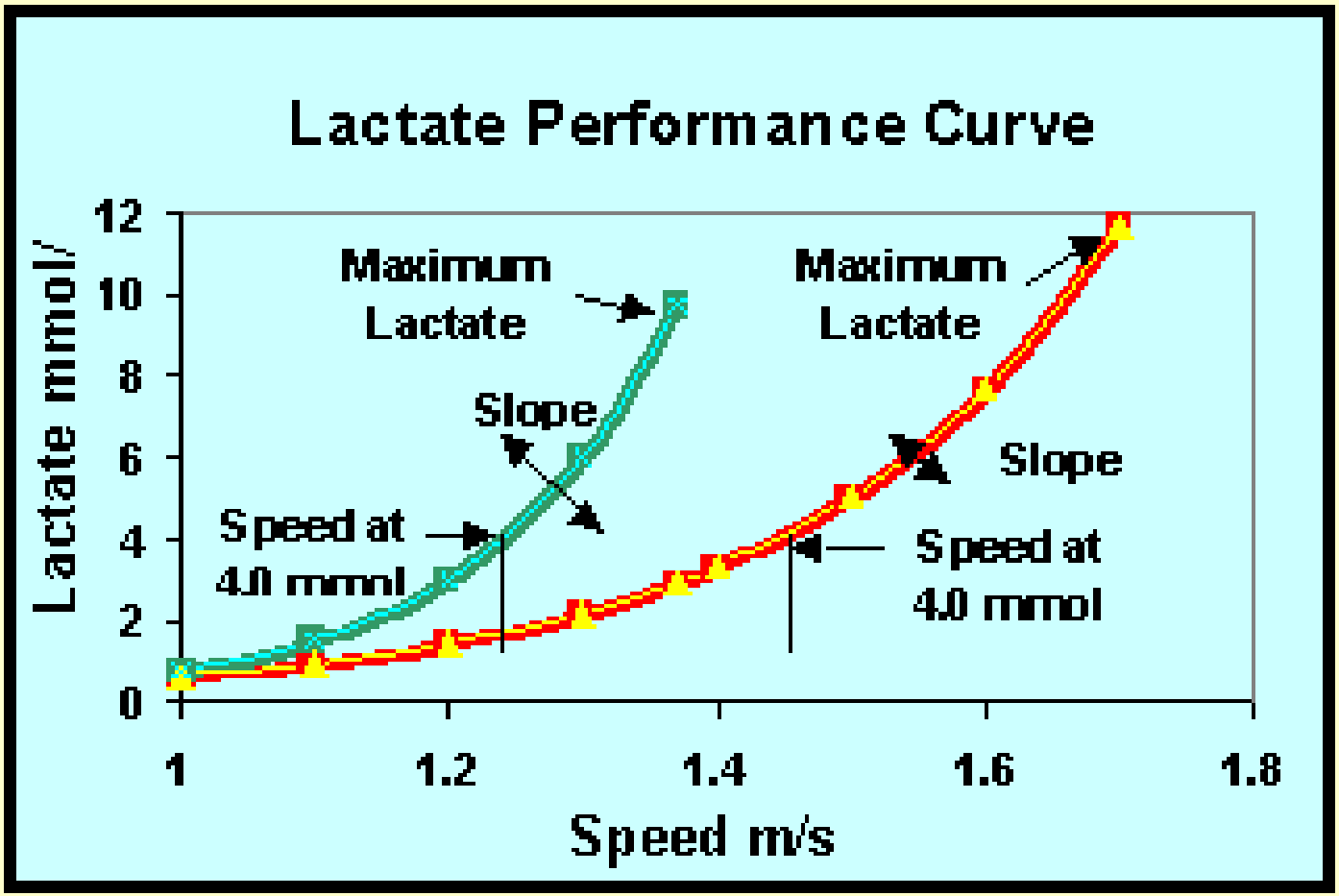
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Animal | Sarg | Date | 21/05/1999 | Average | 135 bpm | Recovery | -21 bpm |
| Exercise | 21may99 | Time | 3:08:12.0 PM | Duration of exercise: 0:31:02.1 | | | |
| Note | 12,15,18,21 | | | Selected period: 0:00:00.0 - 0:31:00.0 (0:31:00.0) | | | |


Heart Rate-Velocity Graphs : 4 x 3-minute Profile (Treadmill)
220
200
180
160
140
120
100
Heartrate (b·min-1)
14
19
24
29
34
39
Pacing Velocity (km·hr-1)
V200
TEST
Re-test


Lactate-Velocity Curves : 4 x 3-minute Profile (Treadmill)
Plasma Lactate (m mol·l-1)
20
16
12
8
4
0
14
19
24
29
34
39
Pacing Velocity (km·hr-1)
VLA4
TEST
Re-test

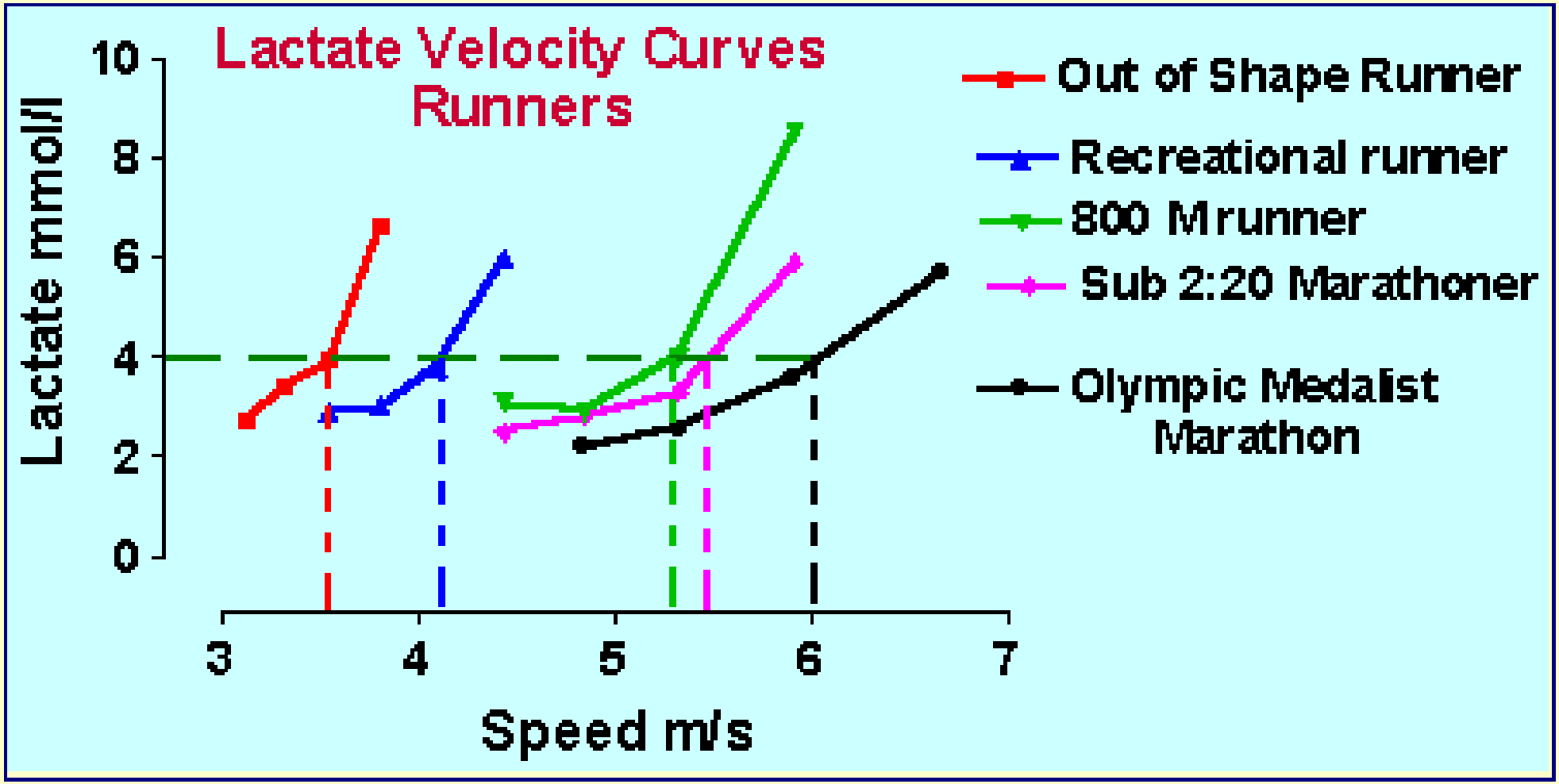
# East German Protocol

- Each parameter reflected a different aspect of conditioning




*Lactate and Performance in Sport*

# Lactate and Test of Aerobic System

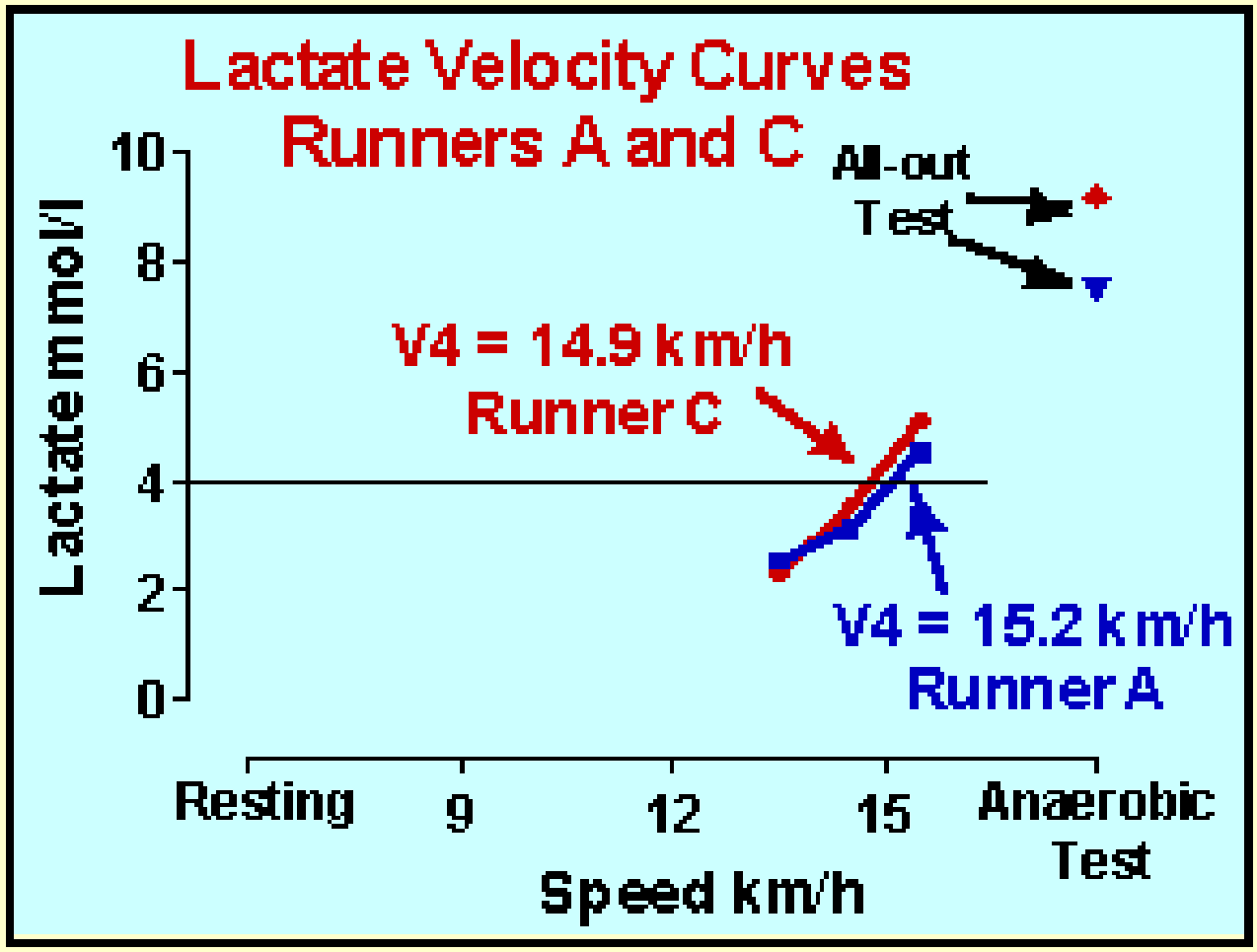



*Lactate and Performance in Sport*

# Conditioning Assessment

**SLTP Test Running**

| | Runners | |
|---|---|---|
| | A | C |
| Speed (km/h) | Lactate mmol/l | Lactate mmol/l |
| 13.5 | 2.5 | 2.3 |
| 14.5 | 3.1 | 3.5 |
| 15.5 | 4.5 | 5.1 |
| Anaerobic Test | 7.5 | 9.2 |




*Lactate and Performance in Sport*

# Characteristics of the Anaerobic Profile

- 45-90 seconds - maximum effort
- Time for 800m & collect  blood samples 2 4 6 and 8 minutes post-exercise
- The faster the time, or the higher the maximum lactate concentration,  the higher the anaerobic capacity
- Sectional times each 200m - speed rating

# Performance Classification

| Performance Ratings & Classifications | | Aerobic system VLa4 Sec/400m | Anaerobic system 800 m Sec |
|---|---|---|---|
| 3 | Poor | 43 | 61 |
| 4 | Fair | 42 | 60 |
| 5 | Average | 41 | 59 |
| 6 | Good | 40 | 58 |
| 7 | Very good | 39 | 57 |
| 8 | Excellent | 38 | 56 |
| 9 | Superb | 37 | 55 |

# Example 1

5/5 = Total performance score of 10

"The horse is no good"

Average performance rating for aerobic
Average performance rating for speed

# Example 2

8/5 = Total performance score of 13

“This horse is a good stayer”

Excellent performance rating for aerobic
Average performance rating for speed

# Example 3

5/8 = Total performance score of 13

"This horse is a good sprinter"

Excellent performance rating for speed
Average performance rating for aerobic

# Example 4

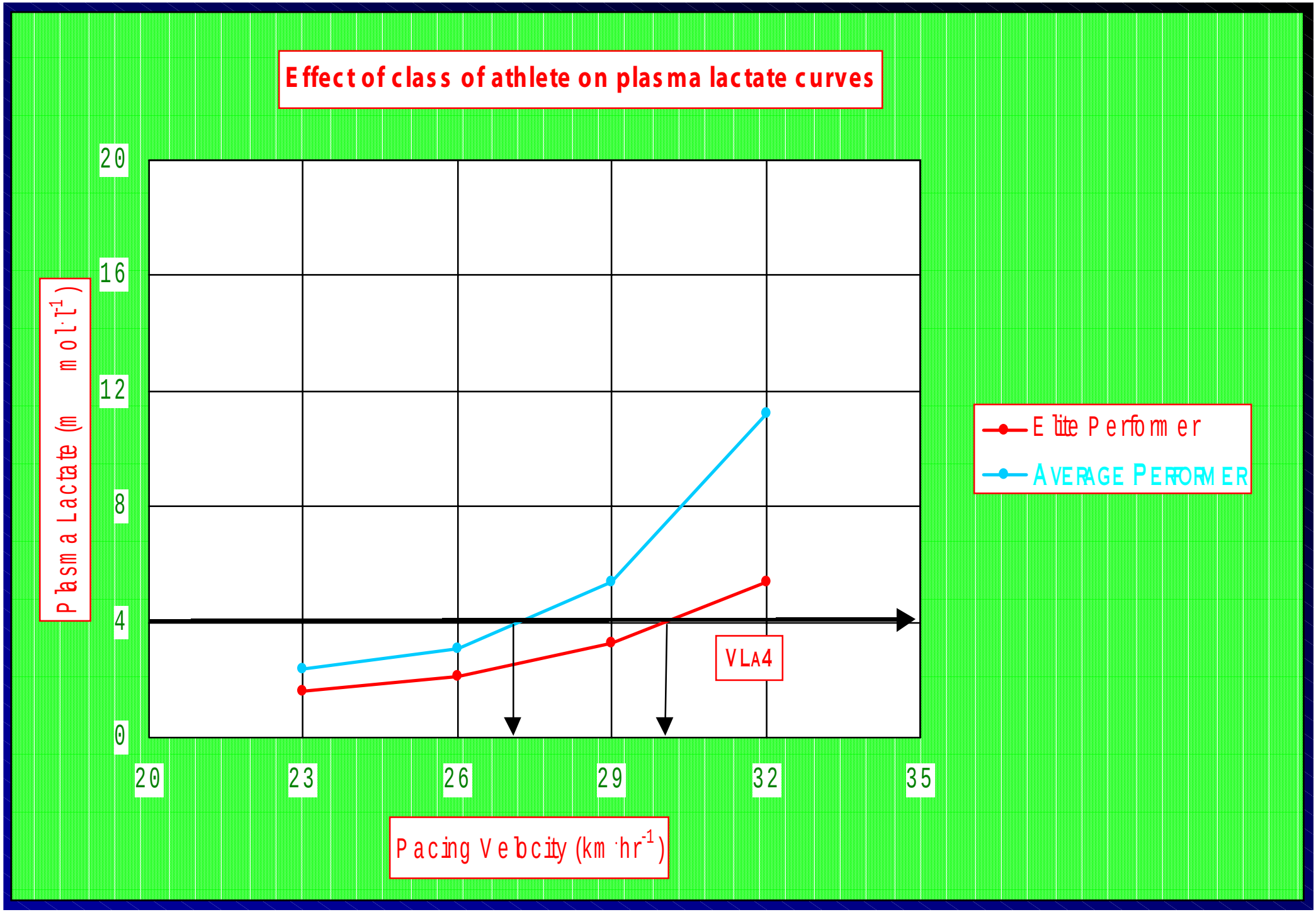
9/9 = Total performance score of 18

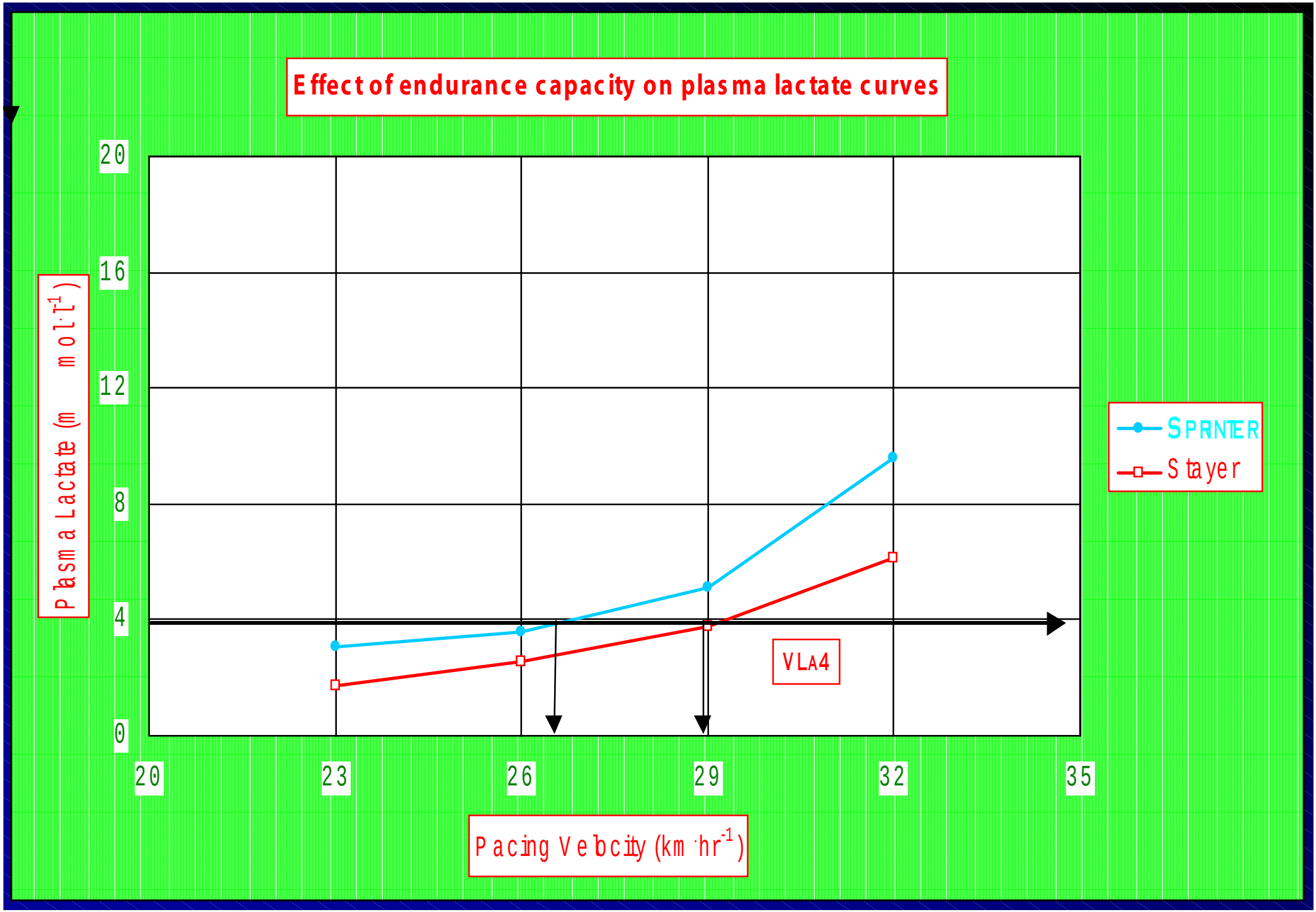
"Grand Circuit Horse"

Superb performance rating for aerobic
Superb performance rating for speed

# Talent Identification Programs

- Elite
- Sprinters
- Stayers
- Non-athletic


Effect of class of athlete on plasma lactate curves
Plasma Lactate (m mol·l-1)
20
16
12
8
4
0
20
23
26
29
32
35
Pacing Velocity (km·hr-1)
VLA4
Elite Performer
AVERAGE PERFORMER


Effect of endurance capacity on plasma lactate curves
20
16
12
8
4
0
Plasma Lactate (m mol·l-1)
20
23
26
29
32
35
Pacing Velocity (km·hr-1)
VLA4
SPRINTER
Stayer

# Sequence of Events

- Fitness profile & ideal training velocities
- Develop “strengths” & “reduce weaknesses”
- General guide regarding trainability
- Select suitable race distance
- Determine performance potential

# Conclusions

- Still plenty of applied research required
- Add more performance variables to the profile
- Lactate profiling is very informative

# Acknowledgements


- Fred Kersely
- Harness Racing Council