

OLYMPIATOPPEN



# The Norwegian modell: How do the best Norwegian endurance athletes train?



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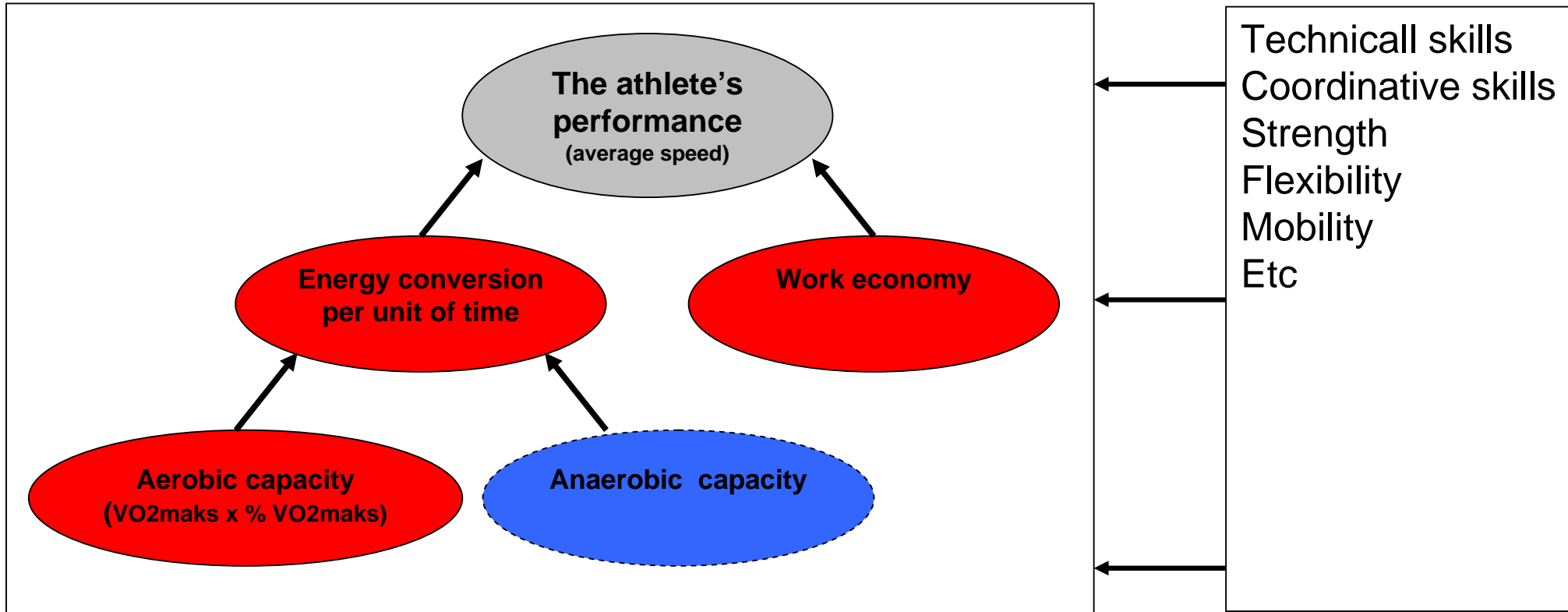
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# The Norwegian model:

- 24 hour athletes (training, studies, friends, etc)
- Olympiatoppen are close to the sports and challenges them!
- Common vocabulary across the sports
- Training and sharing the skills with other sports
- All training is based on the same principles



# What determines performance in aerobic endurance sports?



In endurance sports with competition time of more than 30 minutes, at least 95 % of the energy will derive from aerobic energy conversion (Åstrand et al., 2003)



# Intensityscale for endurance sports:



I-level	% of max HR	Lactate
<b>5</b>	<b>95% – 100%</b>	<b>6.0-10.0</b>
<b>4</b>	<b>90% – 95%</b>	<b>3.5-6.0</b>
<b>3</b>	<b>85% – 90%</b>	<b>2.0-3.5</b>
<b>2</b>	<b>75% – 85%</b>	<b>1.5-2.0</b>
<b>1</b>	<b>55 - 75%</b>	<b>&lt; 1.5</b>

- NB: The more unfit you are, the lower the %-value will be.

# The training process



## 1. Develop an overall plan for training

- Goal
- Analysis of the requirements and of the capacity
- Plans for training with a long term and short term focus

## 2. Daily training, competitions and restitution

- Individualize the training load regarding the athlete's shape and outer circumstances
- Intensity control, focus, internal dialog, etc

## 3. Documentation and evaluating initiative

- Observation and registration of training and restitution
- Analysis of training and restitution

Adjustment



# The Norwegian endurance model:



- **Training the best way, often implies training the most!**
  - **Holistic thinking – physical, technical, mental focus in every work out**
  - **Variation / "Cross-training" → physically and mentally**
  - **Many sessions at intensity levels 1 and 2 (> 80%)**
    - Training of the trainability
    - Many repetitions → good technique
    - Physiological adaptations (fibertypeoverganger) → good work economy
  - **Many sessions at intensity level 3 (> 5%)**
    - Leads to many hours at a high intensity level
    - Basis for developing the capacity at I-zones 4 and 5
  - **Training of the preconditions (5-20 %)**
    - Injury prevention / tolerance for more training
    - developing optimal technique (video Olaf)



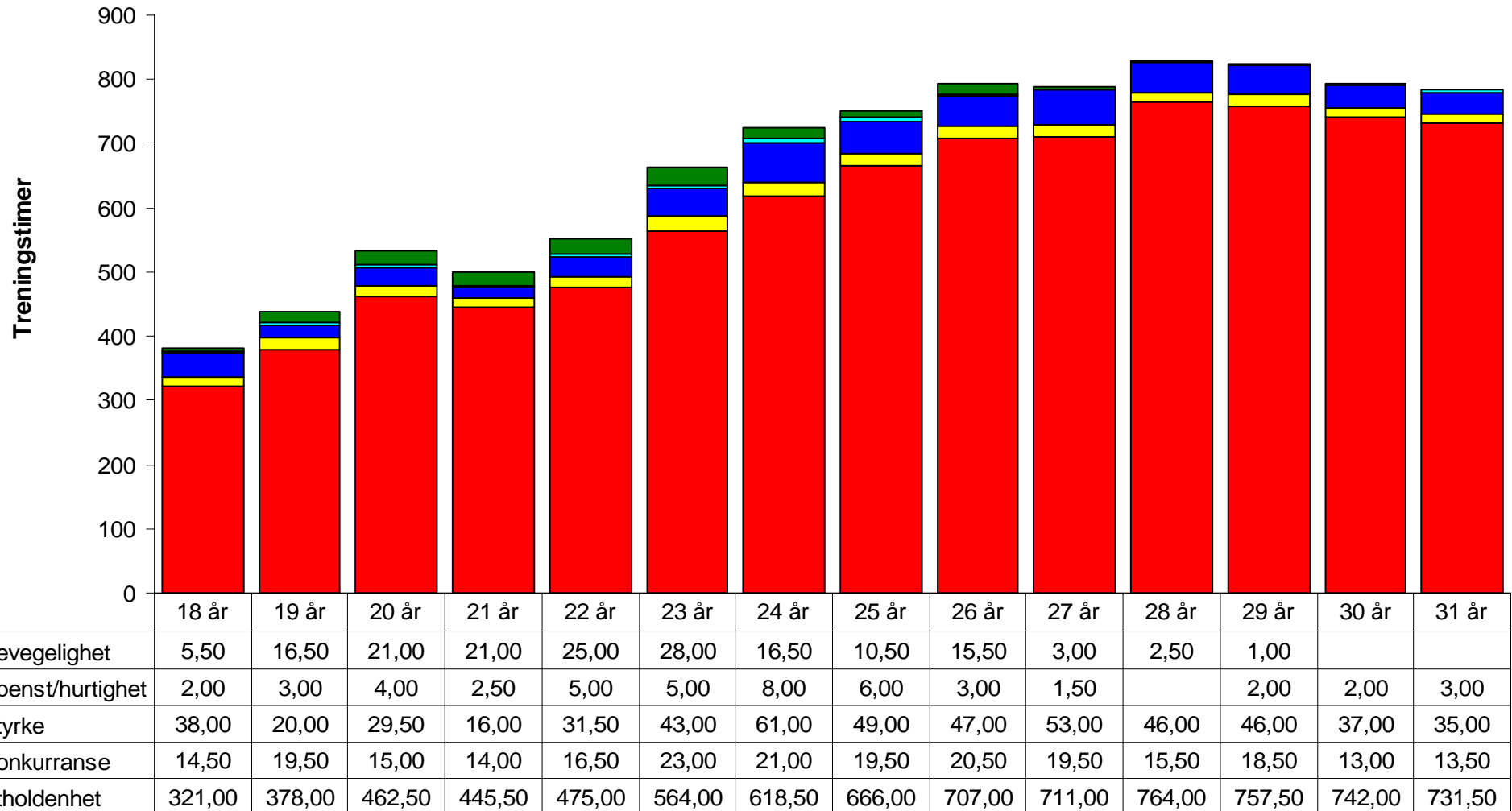


# How did Norwegian elite athletes train?



- Time spent on various forms of training
- Time spent on different intensity levels
- Time spent on activities
- Time spent on training methods
- Training models for different Intensity levels

# • Time spent on various training forms – Bente Skari



# Conclusion – elite athletes:



- Elite athletes train a lot, their workouts are varied and specific.
- Over 80% of the training is endurance training
- They train 60-120 hours at intensity levels 3-5 **(1-4 sessions/week; 1-2 hours/week)**
- Train ca. 80-90% at intensity levels 1 and 2
- At least 70% conducted as specific activity **(ca. 500 hours)**
- Use of interval training varies from sport to sport
  - Ca. 10% in interval influenced sports (running, cross country, etc)
  - Ca. 50% in monotone sports (sculling, paddling, swimming, etc)
- **Regular field testing with heart rate and lactate measurements to develop the intensity feeling for different intensity levels**
- **Large focus on training of preconditions (stability, strength, etc) to develop TECHNIQUE and to prevent injuries - Tufte, Dale Oen, etc. Training is not instead of aerob training, but as a supplement.**
- **FOCUS ON QUALITY WHEN TRAINING**



# For more information:

## Review article on endurance training!

### Seiler & Tønnessen



- [www.sportsci.org/2009/ss.htm](http://www.sportsci.org/2009/ss.htm)

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#### Intervals, Thresholds, and Long Slow Distance: the Role of Intensity and Duration in Endurance Training

Stephen Seiler<sup>1</sup> and Espen Tønnessen<sup>2</sup>

Sportscience 13, 32-53, 2009 ([sportsci.org/2009/ss.htm](http://sportsci.org/2009/ss.htm))

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Endurance training involves manipulation of intensity, duration, and frequency of training sessions. The relative impact of short, high-intensity training versus longer, slower distance training has been studied and debated for decades among athletes, coaches, and scientists. Currently, the popularity pendulum has swung towards high-intensity interval training. Many fitness experts, as well as some scientists, now argue that brief, high-intensity interval work is the only form of training necessary for performance optimization. Research on the impact of interval and continuous training with untrained to moderately trained subjects does not support the current interval craze, but the evidence does suggest that short intense training bouts and longer continuous exercise sessions should both be a part of effective endurance training. Elite endurance athletes perform 80 % or more of their training at intensities clearly below their lactate threshold and use high-intensity training surprisingly sparingly. Studies involving intensification of training in already well-trained athletes have

