Training in Biathlon

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IBU Coach Seminar 2011

General Principles and Special Basics for Training in Elite Biathlon

Jürgen Wick
Institute for Applied Training Science Leipzig
Schedule for today

1. Introduction
2. Biathlon – General Principles of Competition, Performance & Training
3. Basics for Training Organisation in Elite Biathlon
4. Basics for Methodical Structure of Training in Biathlon
5. Practical Exercises for Training planning
• Introduction

• Biathlon - General Principles of Competition, Performance & Training

• Basics for Training Organisation in Elite Biathlon

• Basics for Methodical Structure of Training in Biathlon

• Practical Exercises for Training planning

Institute for Applied Training Science (IAT) Leipzig

- Diagnostic centre
- Office building
- Workshop
- Swimming flume
- Gym & laboratories

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Facilities at the IAT Leipzig

swimming flume

gym & laboratories

duration diagnostic centre

technology workshop

library

sports medicine
Competencies

- Executing benchmarks of world-class performances
- Regulating and optimising training
- Assuring health and load tolerance
- Individualising technique & renewing training methods
- Developing measuring systems and databases
- Sportscomprehensive masterminding
- Transfering knowledge & information
Biathlon has its origins in the ancient hunting practices of northern Europeans. An Olympic event since 1960, biathlon today combines cross-country skiing with small-caliber rifle marksmanship.

What's Biathlon?

Complex Biathlon Performance

cross-country skiing

small-caliber rifle marksmanship

Biathlonleistung

Laufleistung

Aufenthaltsdauer an den Schießständen

Schießzeit

Schießergebnis

Zeit für Laufen der Strafrunden

Gesamtergebnis

Nitzsche (1998)
What's Biathlon?

**Competition System**
- C. duration
- C. rules
- C. frequency

**Complex Competition Performance**

**Individual**
- Sprint
- Pursuit
- Mass
- Relay
- Mix

**Olympic Games**
- World Championships
- Continental Championships
- IBU World Cup
- IBU Cup
- National Championships
- Regional Cup's
- National competition's
- ...
Changes in Competition System since 1998

Group-, Mass-Start, tactical running, against sportive counterpart
Leg Distances max. 2.5 km

Training Methodology
Single Start (all 30 s), continuous running, time
Leg Distances 3.0-4.0 km

Team/Mix  Mass  Pursuit  Relay

Sprint  Individual

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Changes in Competition System since 1998

The graph illustrates the changes in competition distances and shots over the years from 1993/94 to 2011/12. The red line represents competition kilometres, and the blue line represents competition shots.

Key observations:
- A significant increase in competition kilometres and shots in 1998/99.
- Fluctuations in both competition kilometres and shots post-1998.
- A decrease in both categories in recent years, notably from 2009/10 onwards.

Overall, the graph highlights the dynamic changes in the competition system over the past two decades, with a notable peak in 1998/99.
What's Biathlon?

**Performance Structure of Sport / Discipline**

- C. duration
- C. rules
- C. frequency

**Competition System**

- Complex Competition Performance

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Leistungsstruktur / Performance Structure

Der innere Aufbau (das Gefüge) der sportlichen Leistung aus bestimmenden Elementen und ihren Wechselbeziehungen (Kopplungen).

The inner structure of athletic performance consisting of decisive elements and their interrelations (connections).

Schnabel, Harre & Krug (2011)
Performance Structure in Biathlon

koordinative Fähigkeiten

technisch-koordinatives Niveau

konditionelles Niveau

wettk.-spez. Ausdauer

Grundlagen -ausdauer

Schießtechnik

Handlungs-schnelligkeit

Handlungs-genaugigkeit

psychische/ psychomotor. Leistungs-voraussetzungen

Ausprägung der Technik

Handlungs-schnelligkeit

Wettkampfeigenschaften

Psychische Persönlichkeitsvoraussetzungen

taktisches Niveau

Schnelligkeit

Kraft

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What’s Biathlon?

Biathlon becomes more and more popular!

Biathlon is present all over the world!

Biathlon is captivating from start to finish line!

Biathlon is increasing in the Olympic program!

Biathlon has a lot of components!

Biathlon is an Elite Sport!

Biathlon needs a high amount of training sessions!
Athletic Training (Definition)

**Sportliches Training / Athletic Training**

Im Wettkampfsport das komplexe, planmäßige und zielorientierte Einwirken auf die sportliche Leistungsfähigkeit und Leistungsbereitschaft durch Trainingstätigkeit des Sportlers sowie Führungs- und Lenkungsmaßnahmen von Trainern mit dem Ziel, die Leistungsfähigkeit zu steigern bzw. zu stabilisieren.

In competitive sports the complex, systematic and goal-oriented influence on the athletic performance ability and commitment through athletes’ training as well as through leading and controlling measures of coaches with the goal to increase or stabilize the performance ability.

Schnabel, Harre & Krug (2011)
Performance development

„effects of training“

Adaption of organism to new and higher requirements through training

Temporary discrepancy between training requirements and the current performance ability

Training stimulus
- volume
- movement quality
- intensity
- workload
- recovery
- methods
- periodisation
- altitude

current performance level
**Athletic Training (Coaches main activities)**

- **ANALYSIS**
- **PLANNING**
- **EXECUTION**
- **EVALUATION**

of TRAINING or rather TRAINING EFFECTS

Planning of Training:

Determination of goals, contents, structures and methods for training to modify the athlete’s performance level in a defined period

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Athletic Training (timeline)

- **Long-term: 4 years and more**
  - long-term performance built up
    - (basic-, built-up-, follow-up-, high-performance Training)
  - Olympic Cycle

- **Medium-term: 3-4 weeks – 1 year**
  - Annual training
  - Macrocycle (half a year, year)
  - Mesocycle (3-4 weeks)

- **Short-term: 1 day – 1 week**
  - Weekly training
  - Microcycle (3-4 days)
  - Dayly training
  - Training session
## Long-term performance built-up (Biathlon)

<table>
<thead>
<tr>
<th>Basic Training</th>
<th>Built-up Training</th>
<th>Follow-up Training</th>
<th>High-performance Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>School children</td>
<td>Youth</td>
<td>Junior men</td>
<td>Men / Women</td>
</tr>
<tr>
<td>12 - 15 years</td>
<td>16 - 18 years</td>
<td>Junior women</td>
<td>&gt; 21 years</td>
</tr>
</tbody>
</table>
Organisation of Training (basic elements)

- Training goals
- Training contents
- Training methods
- Training means

- Introduction
- Biathlon - General Principles of Competition, Performance & Training
- Basics for Training Organisation in Elite Biathlon
- Basics for Methodical Structure of Training in Biathlon
- Practical Exercises for Training planning
Training goals

▷ Basic- and built-up Training
  • Inspire pleasure in regular training
  • Development of basic, sport depending and sport specific performance prerequisites
  • Continuation of health and load tolerance
  • Proof of performance ability in competitions

▷ Follow-up Training
  • Advancement of basic and specific performance prerequisites for skiing and shooting
  • Development of the complex biathlon performance
  • Proof of performance ability in competitions

▷ High-performance Training
  • Perfection of the complex biathlon performance
  • Proof of performance ability in important competitions
Ausdauer / Endurance

- Konditionelle Fähigkeit
- Widerstandsfähigkeit gegen Ermüdung bei sportlicher Belastung

- Physical ability
- Resistance to fatigue during athletic exercise

Thieß & Schnabel (1987)
Grundlagenausdauer / Basic Endurance

- Konditionelle Fähigkeit
- Widerstandsfähigkeit gegen Ermüdung bei lang dauernden Belastungen in aeroben Stoffwechselzuständen
- Physical ability
- Resistance to fatigue during continuous loads in aerobic metabolic situation

Thieß & Schnabel (1987)
Training contents

Basic Endurance

- approx. 50% of total training volume
- basic, semi-specific, specific training means
- continuous method (with constant intensity or changing intensity)
- ski / rollerski: approx. 2 h / 40 km bike: 3 – 5 h
- partly as complex training (skiing/rollerskiing/biking/running & shooting)

<table>
<thead>
<tr>
<th></th>
<th>running velocity (%)</th>
<th>lactate (mmol/l)</th>
<th>heart rate (1/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development zone (EB)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 3</td>
<td>90 – 95</td>
<td>5 – 7</td>
<td>160 – 180</td>
</tr>
<tr>
<td>Zone 2</td>
<td>85 – 90</td>
<td>3 – 5</td>
<td>140 – 160</td>
</tr>
<tr>
<td>Stabilisation zone (SB)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 1</td>
<td>75 – 85</td>
<td>&lt; 3</td>
<td>120 – 140</td>
</tr>
</tbody>
</table>
Kraftausdauer / Strength Endurance

• Komplexe konditionelle Fähigkeit
• Widerstandsfähigkeit gegen Ermüdung bei Wettkampf- und Trainingsbelastungen mit hohen Kraftanforderungen

• Complex physical ability
• Resistance to fatigue related to competition and training loads with high strength requirements

Thieß & Schnabel (1987)
Training contents

Strength Endurance

✓ approx. 8 % of total training volume
✓ basic, semi-specific, specific training means
✓ continuous method (with constant intensity or changing intensity)
✓ ski / rollerski: approx. 1 – 1.5 h / 15 – 20 km
✓ Training session: [(2.2 km EB + 1.2 km SB) x 2 = arms; (1.2 km EB + 1.2 km SB) x 3 = legs; (1.2 km EB + 1.2 km SB) x 3 = total]
✓ in connection with basic endurance training

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Wettkampfspezifische Ausdauer / Competition-specific endurance

- Konditionelle Fähigkeit
- Widerstandsfähigkeit gegen Ermüdung beim Anstreben sportlicher Höchstleistungen im Wettkampf und beim Bewältigen wettkampfspezifischer Trainingsbelastungen

- Physical ability
- Resistance to fatigue when striving for athletic top performances in competition and coping with competition-specific training loads

Thieß & Schnabel (1987)
Competition-specific endurance

- approx. 40% of total training volume
- basic, semi-specific, specific training means
- repetition method, interval method, competition method
- ski / rollerski: approx. 1.5 – 2 h / 35 km (15 km GB, 3 km EB, 18 km SB)
- Training session: 4 km SB – 3 km EB – 7.5 km GB (4 times shooting) – 6 km SB – 7.5 km GB (4 times shooting) – 8 km SB
- complex biathlon training (skiing/rollerskiing & shooting)

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<th>running velocity (%)</th>
<th>lactate (mmol/l)</th>
<th>heart rate (1/min)</th>
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</thead>
<tbody>
<tr>
<td>Extreme zone (GB)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 5</td>
<td>95 – 105</td>
<td>8 – &gt; 10</td>
<td>&gt; 180</td>
</tr>
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<td>Stabilisation zone (SB)</td>
<td></td>
<td></td>
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</tbody>
</table>
**Schnellkraft / Speed strength**

- Konditionelle Fähigkeit
- Leistungsvoraussetzung, um Widerstände mit hoher Bewegungsgeschwindigkeit zu überwinden
- Physical ability
- Performance ability to overcome resistances with a high movement velocity

Thieß & Schnabel (1987)
Training contents

### Speed strength

- **approx. 2 % of total training volume**
- **basic, semi-specific, specific training means**
- **repetition method, interval method**
- **ski / rollerski: approx. 1 h / 20 km (2 km GB, 18 km SB)**
- **Training session: 50 – 200 m sprints in uphill and/or crossing area**
- **in connection with competition-specific endurance training**

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<thead>
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<th>Running Velocity (%)</th>
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Trainingsmittel / Training means

Trainingsmittel sind Instrumentarien, die … genutzt werden, um sportmethodische, psychische, pädagogische und didaktische Prozesse realisieren und Trainingsziele erfüllen zu können.

-Training means are instruments for the realisation of sport methodical, psychological, pedagogical and didactic processes and performance of training goals.

Schnabel, Harre & Krug (2011)
<table>
<thead>
<tr>
<th>General Training means</th>
<th>Specific Training means</th>
</tr>
</thead>
<tbody>
<tr>
<td>- cross running</td>
<td>- cross-country skiing</td>
</tr>
<tr>
<td>- bike / mountain bike</td>
<td>- roller skiing</td>
</tr>
<tr>
<td>- canoeing</td>
<td>- shooting under physical stress</td>
</tr>
<tr>
<td>- rowing</td>
<td>- cross-country skiing/roller skiing</td>
</tr>
<tr>
<td>- inline skating</td>
<td>and shooting under physical stress</td>
</tr>
<tr>
<td>- swimming</td>
<td>- imitation exercises</td>
</tr>
<tr>
<td>- athletics (running, jumping)</td>
<td>- gymnastics</td>
</tr>
<tr>
<td></td>
<td>- sports games</td>
</tr>
<tr>
<td></td>
<td>- general strength exercises</td>
</tr>
<tr>
<td></td>
<td>- functional strength training</td>
</tr>
<tr>
<td>- basic shooting (without physical stress)</td>
<td></td>
</tr>
<tr>
<td>- alpine skiing (with cross-country skis)</td>
<td></td>
</tr>
<tr>
<td>- imitation exercises</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- shooting under physical stress</td>
</tr>
<tr>
<td></td>
<td>- cross-country skiing/roller skiing</td>
</tr>
<tr>
<td></td>
<td>and shooting under physical stress</td>
</tr>
</tbody>
</table>
Trainingsmethode / Training method

Im sportlichen Training einzusetzendes Verfahren, um mit Trainingsübungen und zielgerichtet dosierten Belastungsanforderungen Fortschritte in Leistungsvoraussetzungen bzw. der komplexen Wettkampfleistung zu erzielen.

Procedure in athletic training to achieve progress in performance preconditions or in the complex competition performance through training exercises and goal-oriented dosed load requirements.

Schnabel, Harre & Krug (2011)
## Training methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Continuous method</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Duration/intensity</th>
<th>Effectiveness</th>
</tr>
</thead>
</table>

**Intensity:**
- maximum = above competition velocity
- very high = 95-100 %
- high = 90-95 %
- medium = 80-90 %
- low = 75-85 % of competition velocity
Continuous method

% of Training Ability (TA)

Total fatigue

Number of Repetitions in one Time Unit

End of Training Activity
Training methods

**Method**
- Continuous method
  - Continuous training
  - Change training
  - Complex Biathlon training

**Duration/intensity**
- Continuous method: long/low
- Long/low
- Long/medium
- Long/high
- Long/change
- High-medium

**Effectiveness**
- Regeneration
- Basic endurance ability
- Specific basic endurance ability
- Strength endurance ability
- Competition specific endurance ability

Intensity: maximum = above competition velocity; very high = 95-100%; high = 90-95%; medium = 80-90%; low = 75-85% of competition velocity
Training methods

Method

Continuous method

Interval method

Continuous training

Change training

Complex Biathlon training

Duration/intensity

- Continuous method: long/low
- Interval method: short/very high

Effective-ness

- Regeneration
- Basic endurance ability
- Specific basic endurance ability
- Strength endurance ability
- Competition specific endurance ability
- Specific speed ability

Intensity: maximum = above competition velocity; very high = 95-100%; high = 90-95%; medium = 80-90%; low = 75-85% of competition velocity
Extensiv interval method

% of Training Ability (TA)

Total fatigue


End of Training Activity

Number of Repetitions in one Time Unit

S = Series, SB = Series Break
Training methods

**Continuous method**
- Continuous training
- Change training
- Complex Biathlon training
- Long-term interval training

**Interval method**

**Duration/Intensity**
- Long/low
- Long/medium
- Long/high
- Long/change high-medium
- Continuous method: long/low
- Interval method: Short/very high
  Break: shooting
- Total: long
  Stage: short/maximum
  Break: long/low

**Regeneration**

**Basic endurance ability**

**Specific basic endurance ability**

**Strength endurance ability**

**Competition specific endurance ability**

**Specific speed ability**

**Specific strength ability**

**Intensity:** maximum = above competition velocity; very high = 95-100%; high = 90-95%; medium = 80-90%; low = 75-85% of competition velocity
Intensiv interval method

% of Training Ability (TA)

Total fatigue

S = Series, SB = Series Break

End of Training Activity

Number of Repetitions in one Time Unit

1. S  1. SB  2. S
Repetition method

L = Load, RB = Regeneration break

% of Training Ability (TA)

Number of Repetitions in one Time Unit

End of Training Activity

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**Training methods**

**Method**
- Continuous method
  - Change training
  - Complex Biathlon training
  - Long-term interval training
  - Circuit training

**Duration/Intensity**
- Continuous method: long/low
- Interval method: Short/very high
- Break: shooting

**Effectiveness**
- Regeneration
- Basic endurance ability
- Specific basic endurance ability
- Strength endurance ability
- Competition specific endurance ability
- Specific speed ability
- Specific strength ability
- Basic strength ability

**Intensity:**
- Maximum = above competition velocity
- Very high = 95-100%
- High = 90-95%
- Medium = 80-90%
- Low = 75-85% of competition velocity
Junior elite and high-performance training in Biathlon

- Introduction
- Biathlon General Principles of Competition, Performance & Training
- Basics for Training Organisation in Elite Biathlon
- Basics for Methodical Structure of Training in Biathlon
- Practical Exercises for Training planning
Long-term performance built-up (Biathlon)

<table>
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<th>Basic Training</th>
<th>Built-up Training</th>
<th>Follow-up Training</th>
<th>High-performance Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>School children 12 - 15 years</td>
<td>Youth 16 - 18 years</td>
<td>Junior men 19 - 21 years</td>
<td>Men / Women &gt; 21 years</td>
</tr>
</tbody>
</table>

Biathlon Rahmentrainingsplan

FRAMEWORK TRAINING PLAN
Total training volume in long-term performance built-up (Biathlon)

- S 12/13: 2 – 3 training sessions/week
- S 14: 4 training sessions/week
- S 15: 5 training sessions/week
- Youth: 5 – 8 training sessions/week
- Juniors: 8 – 10 training sessions/week
## Total training volume in long-term performance built-up (Biathlon)

<table>
<thead>
<tr>
<th>Age class</th>
<th>Total training volume [hours/year]</th>
<th>Training weeks [number/year]</th>
<th>Training frequency [number/week]</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 12</td>
<td>200</td>
<td>44</td>
<td>2 - 3</td>
</tr>
<tr>
<td>S 13</td>
<td>220</td>
<td>44</td>
<td>2 - 3</td>
</tr>
<tr>
<td>S 14</td>
<td>270</td>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>S 15</td>
<td>320</td>
<td>44</td>
<td>5</td>
</tr>
<tr>
<td>Y 16</td>
<td>370</td>
<td>44</td>
<td>5 - 6</td>
</tr>
<tr>
<td>Y 17</td>
<td>400 - 470</td>
<td>47</td>
<td>5 - 7</td>
</tr>
<tr>
<td>Y 18</td>
<td>450 - 520</td>
<td>47</td>
<td>6 - 8</td>
</tr>
<tr>
<td>Jun 19</td>
<td>450 - 570</td>
<td>47</td>
<td>6 - 8</td>
</tr>
<tr>
<td>Jun 1</td>
<td>570 - 640</td>
<td>47</td>
<td>8 - 9</td>
</tr>
<tr>
<td>Jun 2</td>
<td>700</td>
<td>47</td>
<td>10</td>
</tr>
</tbody>
</table>
Relation between general and specific training
## Training volume per training session for different training means

<table>
<thead>
<tr>
<th>Age class</th>
<th>Ski / Roller ski [km]</th>
<th>Cross Running [km]</th>
<th>Bike / MTB [km]</th>
<th>Shots [number]</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 12</td>
<td>6 – 8</td>
<td>6 – 7</td>
<td>20 – 50</td>
<td>40 – 60</td>
</tr>
<tr>
<td>S 13</td>
<td>7 – 9</td>
<td>6 – 8</td>
<td>30 – 60</td>
<td>40 – 60</td>
</tr>
<tr>
<td>S 14</td>
<td>8 – 12</td>
<td>7 – 9</td>
<td>30 – 70</td>
<td>50 – 80</td>
</tr>
<tr>
<td>S 15</td>
<td>10 – 15</td>
<td>8 – 10</td>
<td>30 – 80</td>
<td>50 – 80</td>
</tr>
<tr>
<td>Y 16</td>
<td>12 – 25</td>
<td>8 – 12</td>
<td>40 – 80</td>
<td>80 – 100</td>
</tr>
<tr>
<td>Y 17</td>
<td>15 – 30</td>
<td>9 – 15</td>
<td>40 – 90</td>
<td>80 – 100</td>
</tr>
<tr>
<td>Y 18</td>
<td>15 – 35</td>
<td>10 – 18</td>
<td>50 – 100</td>
<td>80 – 120</td>
</tr>
<tr>
<td>Jun 19</td>
<td>15 – 35</td>
<td>10 – 18</td>
<td>50 – 100</td>
<td>80 – 120</td>
</tr>
<tr>
<td>Jun 1</td>
<td>20 – 40</td>
<td>10 – 20</td>
<td>50 – 120</td>
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</tr>
<tr>
<td>Jun 2</td>
<td>20 – 40</td>
<td>10 – 20</td>
<td>50 – 130</td>
<td>100 – 140</td>
</tr>
</tbody>
</table>
## Training regulation and control by heart rate and/or blood lactate

<table>
<thead>
<tr>
<th>Training means</th>
<th>Heart rate (% of HR\text{ max})</th>
<th>Blood Lactate concentration (mmol/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SB (Stabilization zone)</td>
<td>EB (Development zone)</td>
</tr>
<tr>
<td>Ski</td>
<td>70 - 85</td>
<td>85 - 95</td>
</tr>
<tr>
<td>Roller Ski</td>
<td>70 - 85</td>
<td>85 - 95</td>
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<tr>
<td>Cross running</td>
<td>65 - 80</td>
<td>80 - 90</td>
</tr>
<tr>
<td>Bike / MTB</td>
<td>55 - 75</td>
<td>75 - 90</td>
</tr>
</tbody>
</table>
Methodical structure of training (annual planning)

8 important steps

in the correct order!
(1) Determination of time and number of competition peaks per year
## Methodical structure of training (annual planning)

<table>
<thead>
<tr>
<th>Competitions:</th>
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<tbody>
<tr>
<td>April</td>
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<td>50</td>
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</table>

- **NCH**
- **OW**
- **G**
Methodical structure of training (annual planning)

Competitions:

April  May  June  July  August  September  October  November  December  January  February  March

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
### Methodical structure of training (annual planning)

#### 1. MACROCYCLE
- Duration: 25 weeks
- Competitions:
  - April
  - May

#### 2. MACROCYCLE
- Duration: 27 weeks
- Competitions:
  - June
  - July
  - August

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</tbody>
</table>
Methodical structure of training (annual planning)

(1) Determination of time and number of competition peaks per year

(2) Specification of performance targets and subgoals within a training year
„At the beginning of the season, ask each swimmer on your team to fill in the blanks of this sentence: ’I want to achieve a time of 50 seconds for 100 meters freestyle on (date) May 15, 2007‘.“ (Goldsmith, 2006)

„Your job as a coach is to plan a program that gives each swimmer the opportunity to achieve his or her stated goal. Having your swimmers state their goals makes planning the program easy.“ (Goldsmith, 2006)
# Methodical structure of training (annual planning)

## 1. MACROCYCLE
25 weeks

### Competitions:

<table>
<thead>
<tr>
<th>April</th>
<th>May</th>
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### Performance goals

1. Participation on OWG an WCH
2. Participation on BWC

### Partial goals

1. Qualification for world-cup team
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

## 2. MACROCYCLE
27 weeks

### Competitions:

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<th></th>
<th>WWW</th>
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<th>NCH</th>
<th>WWW</th>
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<th>WWW</th>
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</table>

### Performance goals

1. Participation on OWG an WCH
2. Participation on BWC

### Partial goals

1. Qualification for world-cup team
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

### Performance standards

- % behind (winner) in total time
- % behind (winner) in running velocity
- Shooting result; shooting time

- Running velocity at lactate 3.0 mmol/l
- Result for 60 shots prone/standing

---

Jürgen Wick • IBU Coach Seminar 2011 • Pokljuka/Slovenia
(1) Determination of time and number of competition peaks per year

(2) Specification of performance targets and subgoals within a training year

(3) Tasks, contents and methods of training in single periods
Methodical structure of training (annual planning)

1. MACROCYCLE
   25 weeks

   Transition-Period Prepar-Preparation-Comp.-Preparation-Competition-Period
   TP

   Competitions:
   CCCC CCC

   April May June July August September October November December January February March

performance goals
1. participation on OWG an WCH
2. participation on BWC
partial goals
1. Qualification for world-cup team
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

performance standards
1. % behind (winner) in total time
2. % behind (winner) in running velocity

Jürgen Wick • IBU Coach Seminar 2011 • Pokljuka/Slovenia
Methodical structure of training (annual planning)

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<td>Transition-Period</td>
<td>Preparation-Period</td>
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<td>semi-specific/specific training means (Roller Ski; Ski)</td>
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<td>gen. TM</td>
<td>general training means</td>
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**Competitions:**

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**Performance goals**

1. Participation on OWG an WCH
   - ... place in a single discipline; ... place in relay
2. Participation on BWC
   - ... place in total World-cup
   - ... place in discipline World-cup

**Partial goals**

1. Qualification for world-cup team
   - Place 1 - 5 in national trials
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

**Performance standards**

- ... % behind (winner) in total time
- ... % behind (winner) in running velocity
- Shooting result; shooting time
- Running velocity at lactate 3.0 mmol/l
- Result for 60 shots prone/standing
- ...
### Variant annual structure

#### 1. MACROCYCLE
25 weeks

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<tr>
<th>Transition-Period</th>
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<th>Comp.-Period</th>
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**Competition:** WWW WWW WWW WWWW

**Period:** NCH

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#### 2. MACROCYCLE
27 weeks

**Competition-Period:** NCH

<table>
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<th>25 weeks</th>
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#### MACROCYCLE
52 weeks

**Competition-Period:** NCH

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</table>
(1) Determination of time and number of competition peaks per year
(2) Specification of performance targets and subgoals within a training year
(3) Tasks, contents and methods of training in single periods
(4) Training courses and altitude training courses in the yearly training plan
Methodical structure of training (annual planning)

<table>
<thead>
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<th>1. MACROCYCLE</th>
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<td>Preparation-Period</td>
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<td>Comp.-Period</td>
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<tr>
<td>Training with general training means</td>
<td>Training with semi-specific/specific training means</td>
</tr>
<tr>
<td>(Bike; Cross; Athletics; Swimming; Canoeing, ...)</td>
<td>(Roller Ski; Ski)</td>
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<tr>
<td>sem. TM</td>
<td>Comp. sem. TM</td>
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<td>general training m.</td>
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**Performance Goals**

1. Participation on OWG an WCH
   - ... place in a single discipline; ... place in relay
2. Participation on BWC
   - ... place in total World-cup
   - ... place in discipline World-cup

**Partial Goals**

1. Qualification for world-cup team
   - Place 1 - 5 in national trials
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

**Performance Standards**

- ... % behind (winner) in total time
- ... % behind (winner) in running velocity
- Running velocity at lactate 3.0 mmol/l
- Result for 60 shots prone/standing
- ...
Methodical structure of training (annual planning)

(1) Determination of time and number of competition peaks per year
(2) Specification of performance targets and subgoals within a training year
(3) Tasks, contents and methods of training in single periods
(4) Training courses and altitude training courses in the yearly training plan
(5) Control competitions and performance tests
**Methodical structure of training (annual planning)**

<table>
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</table>

**performance goals**
1. participation on OWG an WCH
2. participation on BWC
3. Quantitative and qualitative fulfillment of training indices

**performance standards**
1. % behind (winner) in total time
2. % behind (winner) in running velocity
3. % behind in total World-cup
4. shooting result; shooting time
5. running velocity at lactate 3.0 mmol/l
6. Result for 60 shots prone/standing

**partial goals**
1. Qualification for world-cup team - Place 1 - 5 in national trials
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices
Methodical structure of training (annual planning)

(1) Determination of time and number of competition peaks per year
(2) Specification of performance targets and subgoals within a training year
(3) Tasks, contents and methods of training in single periods
(4) Training courses and altitude training courses in the yearly training plan
(5) Control competitions and performance tests
(6) Performance diagnostical checkup
Methodical structure of training (annual planning)

<table>
<thead>
<tr>
<th>1. MACROCYCLE (25 weeks)</th>
<th>2. MACROCYCLE (27 weeks)</th>
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</thead>
<tbody>
<tr>
<td>Transition-Period</td>
<td>Preparation-Period</td>
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<td>Comp.- TM</td>
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<tr>
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<tr>
<td>recov. Tr.</td>
<td>gen. TM Tr</td>
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</table>

**Training courses:**
- Shoot
- Bike
- Bi/Ro/Ski
- Ski
- Complex
- Compl

**Altitude:**
- 6
- 7
- 9
- 15
- 9
- 7
- 9
- 19

**Competitions:**
- W W W W W W W W W W
- C C C C C C C C C C
- G

**Diagnostics:**
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- D
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- D
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- D

**Periods:**
- 1. MACROCYCLE
- 2. MACROCYCLE
- Transition-
- Preparation-
- Competition-

**Performance goals:**
1. participation on OWG an WCH
   - place in a single discipline;
   - place in relay
2. participation on BWC
   - place in total World-cup
   - place in discipline World-cup

**Partial goals:**
1. Qualification for world-cup team
   - Place 1 - 5 in national trials
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices

**Performance standards:**
- % behind (winner) in total time
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Methodical structure of training (annual planning)

(1) Determination of time and number of competition peaks per year
(2) Specification of performance targets and subgoals within a training year
(3) Tasks, contents and methods of training in single periods
(4) Training courses and altitude training courses in the yearly training plan
(5) Control competitions and performance tests
(6) Performance diagnostic checkup
(7) Planning of training in the phase of direct competition preparation (DCP) for the annual competition peak
Methodical structure of training (annual planning)

### 1. MACROCYCLE
- 25 weeks

<p>| Transition- | Preparation- | Comp.- | Training with general training means | Comp. | Competition- | recov. Tr. | gen. TM | general training means |</p>
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**performance goals**
1. participation on OWG an WCH
2. participation on BWC
3. Qualification for world-cup team
4. Proof of performance ability in competitions
5. Quantitative and qualitative fulfillment of training indices

**performance standards**
1. % behind (winner) in total time
2. % behind (winner) in running velocity
3. shooting result; shooting time
4. running velocity at lactate 3.0 mmol/l
5. Result for 60 shots prone/standing

### 2. MACROCYCLE
- 27 weeks

<p>| Transition- | Preparation- | Comp.- | Training with semi-specific/specific training means | Comp. | Competition- | recov. Tr. | gen. TM | general training means |</p>
<table>
<thead>
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**partial goals**
1. Place 1 - 5 in national trials
2. Proof of performance ability in competitions
3. Quantitative and qualitative fulfillment of training indices
(1) Determination of time and number of competition peaks per year
(2) Specification of performance targets and subgoals within a training year
(3) Tasks, contents and methods of training in single periods
(4) Training courses and altitude training courses in the yearly training plan
(5) Control competitions and performance tests
(6) Performance diagnostic checkup
(7) Planning of training in the phase of direct competition preparation (DCP) for the annual competition peak
(8) Consideration of the performance and personality development of the athlete
Methodical structure of training (annual planning)

1. Determination of time and number of competition peaks per year
2. Specification of performance targets and subgoals within a training year
3. Tasks, contents and methods of training in single periods
4. Training courses and altitude training courses in the yearly training plan
5. Control competitions and performance tests
6. Performance diagnostic checkup
7. Planning of training in the phase of direct competition preparation (DCP) for the annual competition peak
8. Consideration of the performance and personality development of the athlete
Methodical structure of training (Meso- and Microcycle)

2 different ways!

Seiler & Kjerland (2006)
Methodical structure of training (Mesocycle)

**Intensity (% max)**

- **Basic endurance**
  - GA
  - GA

- **Basic endurance**
  - wsA

- **Competition specific endurance**
  - WT
  - WK

- **Change Competition training**
  - 100%

**High intensity**

- Low intensity

**Intensity (% max)**

1. 100%
2. 90%
3. 80%
4. 70%
5. 60%
6. 50%
7. 40%
8. 30%
9. 20%
10. 10%

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Methodical structure of training (Microcycle)

4 Types

- Basic endurance + Strength endurance (lower intensity)
- Basic endurance + Strength endurance (higher intensity)
- Competition-specific endurance + Speed strength (high intensity)
- Change training (intensity individual)

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<tr>
<th>Intensity (% max)</th>
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Biathlon is hard work for athletes and coaches!
(1) Tell us something about your / your national training concept!

(2) Which ideas you can use for your work - please give us an example!

(3) Design a training plan for a 3 week training course with the main focus on „Development of basic endurance with general training means“ in the preparation period!

(4) Design a training plan for a 3 week training course with the main focus on „Development of competition-specific endurance with special training means“ in the pre-competition period!

(5) Design a training plan for the phase of direct competition preparation (DCP) in the last two weeks before the Olympics!

(6) What’s your training-methodical problems to develop Biathlon in your country - please give us an example!
Thank you
for your attention!

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