

Theory of Sport Training

Lesson 3

Adaptation to sport performance
Training load

Adaptation

- ◉ Natural
- ◉ Intentional
- ◉ Desadaptation
- ◉ Maladaptation

Bio - social adaptation

- ◉ Morpho – function adaptation
- ◉ Motor learning
- ◉ Psycho –social adaptation

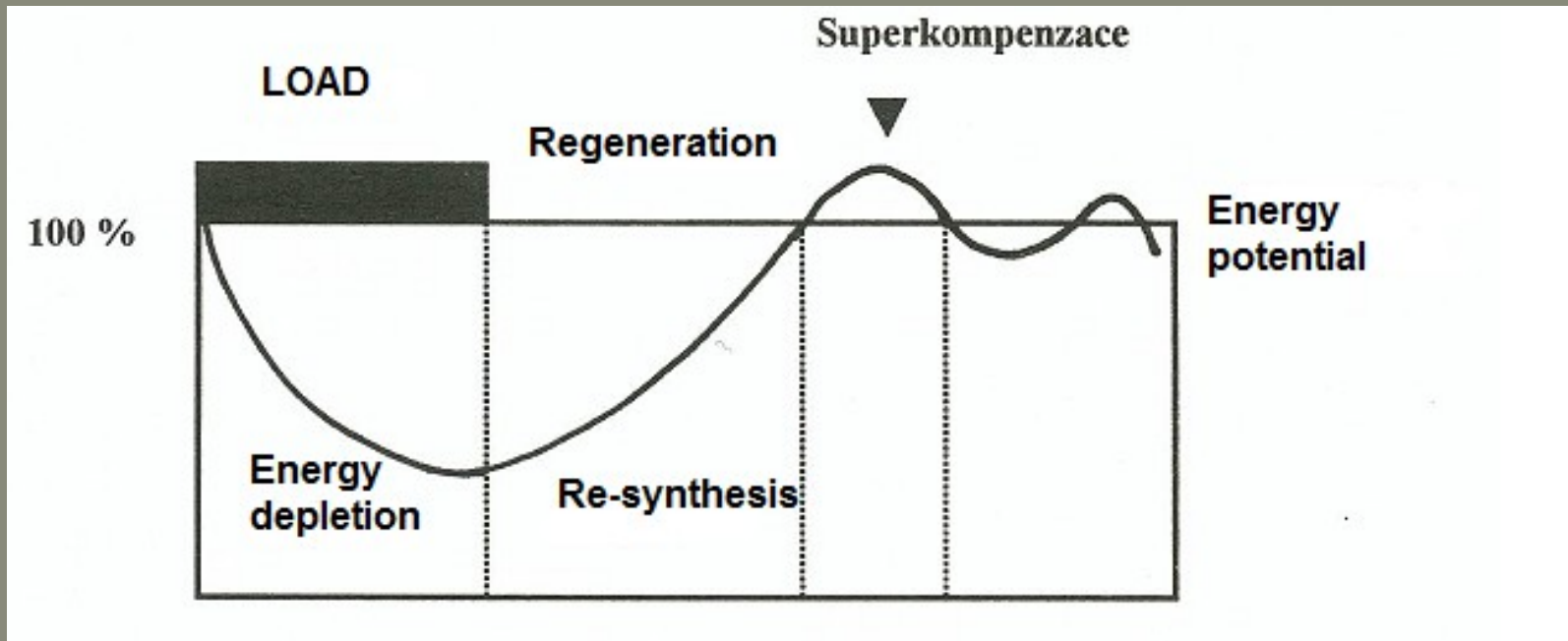
Adaptation

- Basic cause of change – stimulus
- Homeostasis
- General adaptation syndrom
- Supercompensation

Adaptation

Organ, function	increase	decrease
Muscle mass	+	
Count of ATP, CP, glycogen	+	
Myoglobin	+	
Density of capillaries	+	
Heart mass and capacity	+	
Max. heart volume per minute	+	
Rest heart rate		+
Max. oxygen consumption	+	
Rest respiratory volume	+	
Breath frequency during rest		+

Supercompensation



The time of adaptation along the Neumann 1993

- **First stage** - after 7-10 days of training – management and correction of movement
- **The second stage** - after 10-20 days of regularly training occur to increasing of energy store
- **The third** - after 20-30 days - optimization of partial movement activity management (neural-muscle activity)
- **The fourth** – after 30-40 days- synchronization and improvement of coordination of all involved component, start of the of cells and body organ function restructure and the body get to the higher level of rebuilding, higher level of fitness, performance.

Training load

- Type of movement, exercise
- Intensity of load
- Volume of load
- Frequency of load

Type of movement or exercises (trainings means)

- **Race exercises**, content and structure of movement are the same as during competition
- **Specific exercises**, content and structure of movement are on the high level of unity with the movement during competition
- **General or universal means**, every others exercises with low or no concordance with competition movement

Volume of training load

- The volume is characterized with the help of all exercises stimulus's sum and introduces **quantitative part of trainings load**.
- **General** parameters as the number of training days, trainings units, number of race, time of regeneration
- **Specific** parameters as the time of load, number of jumps, throws, repetitions of exercises etc.

Intensity of training load

- Intensity of load is the **stimulus power**, which is the exercise realized with, or the **rate of effort (stress)**
- Qualitative variable

Simple criterions of intensity

- Various strength effort and various weight of load
- Various speed (run) and frequency of movement (strength-endurance training etc.)
- Various pace of game
- The level of HR or LA accumulation

Zone of training intensity

Intensity of load	Metabolism
Maximal intensity	Anaerobic alactic energy system (ATP-CT)
Submaximal intensity	Anaerobic lactic energy system (LA)
Moderate (medium) intensity	Aerobic- anaerobic energy systems (O ₂ -LA)
Low intensity	Aerobic energy system

Zone of training intensity

- **Zone 1** – sphere of AT, low intensity,
LA 2 – 3 mmol, VO_2max 50 -75 %
 HR_{max} 60 (50) – 80 %
Development or maintaining of basic fitness
- **Zone 2** – sphere of ANT, moderate to submax.
Intensity, LA 3 – 8 mmol, VO_2max 75 – 85(90)%,
 HR_{max} 80 – 95 %,
- Development of specific long term endurance, strength, development of aerobic power (VO_2max),

Zone of training intensity

- **Zone 3** – stimulation of maximal oxygen consumption, accumulation of LA, VO_2max 85 – $\text{VO}_{2\text{peak}}$, HR_{max} 90(95) – 100% specific performance
- **Zone 4** – speed, explosiveness
LA – depends of time ,
Intensity over 100%

Frequency of training stimuli

- Depends on:
 - years training period
 - performance level
 - age
 - sex
 - aim of the training process

RECOVERY

- **Approximate time for recovery after various type of load:**
- After hard training of maximal strength..48-72 h
- After hard and long aerobic training 48 h
- After easy aerobic training 24 h
- After hard anaerobic – endurance training.48 h
- After easy anaerobic – endurance training.24 h
- After demanding speed training.....24 h
- After easy speed training12 h