Performance explosion
in sports
An Anti-Doping-Concept

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Results of a survey by SALUTO
35,150 persons
space of time: 1994 - 2011

50% Inactive persons,
with several kinds of diseases
20% Athletes,
„just for fun“ training
once a week
15% Athletes with
ambitions,
training four or five times a week
15% Professional
athletes
of all sports
### Difference in sport activities

<table>
<thead>
<tr>
<th>sport</th>
<th>soccer</th>
<th>handball</th>
<th>basketball</th>
<th>tennis</th>
<th>athletics</th>
<th>marathon</th>
<th>tricke</th>
<th>further sport activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>players</td>
<td>5150</td>
<td>2129</td>
<td>312</td>
<td>439</td>
<td>769</td>
<td>420</td>
<td>179</td>
<td>670 (hockey, rowing, judo, etc.)</td>
</tr>
</tbody>
</table>

- 447 soccer junior national players from Europe: Germany, Netherlands, France, Spain
- 2870 professional soccer players, 867 handball players
- 371 professional tennis players
- 89 champions of Olympia, World-, European-, and German Championships

### Result of our research

70% of peak and leisure performance athletes stop training/competition for several weeks/months because of

- Injuries of soft tissue structures (ligament, sinew, muscle, cartilage)
- and infections (cold, weaken immune system...)
Results of our investigation

An optimal energy supply guarantees:

- improved concentration and optimization of physical ability
- extended training capacity
- improved regeneration
- decreased risk of infection and injury

Europe-wide unique prevention concept
period of 2006 - 2011
Aims of the long range project

- maintenance of health
- improvement of physical abilities about 30 %
- optimizing training
- prophylaxis of injuries
- analysis and integration in training period

Development junior national player
Europe-wide unique prevention concept, summary 2006-2011
World championship in 2009 and 2011
Europe-wide unique prevention concept

Every human being has an individual energy supply
Demand for a good nutrition behavior

600 - 800g fresh food and vegetables per day

Mental abilities

by an optimal supply with amino acids of brain metabolism

Example: daily supply of tryptophan
3-6 mg/kg body weight
Competitive athletes: up to 7 mg/kg

Effect depends on other micro nutrients for example B-vitamins, Mg.
Phytochemicals at too high cellular B6-vitamin concentration could block.
Even with a good nutrition behaviour it is difficult to keep up with the brain and body demand for tryptophan.

**Food with high content of tryptophan**

<table>
<thead>
<tr>
<th>Food</th>
<th>Content of tryptophan (mg/100g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>nuts, cashew</td>
<td>450</td>
</tr>
<tr>
<td>cheese</td>
<td>400</td>
</tr>
<tr>
<td>germ of wheat</td>
<td>330</td>
</tr>
<tr>
<td>oat flakes</td>
<td>186</td>
</tr>
<tr>
<td>peas</td>
<td>100</td>
</tr>
<tr>
<td>nature yoghurt</td>
<td>45</td>
</tr>
<tr>
<td>meat/fish</td>
<td>ca. 200 – 250</td>
</tr>
</tbody>
</table>

For the peak athlete, the position is more difficult.

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**Decrease in trace elements due to the greenhouse effect**

(Percent change)

During the experiment wheat plants in a greenhouse received twice as much CO₂ as in open land ("Trends of Ecology & Evolution", 2002)

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Research: Higher CO₂-production than ever
2011 record level of 390 ppm

Scientific Institute of Commonwealth
Scientific and Industrial Research Organisation

Measurement of
individual energy supply
Simplified energy system

- Protein: 15 - 20%
- Carbohydrates: 55 - 60%
- Fats: 20 - 30%

Degradation path:
- Anaerobic oxidation: lactate, ammonia, carbon dioxide etc.
- Aerobic oxidation: citric acid cycle, respiratory chain

Use of body own protein structure:
- Muscles, organs, immune system

Blocking of enzymes and/or by:
1. Insufficient supply of EIM
2. Deficit of important micronutrients

Finding the individual energy / micronutrient supply

- Special intracellular analysis of micronutrients
- Functional metabolism of energy
- Concentration of amino acids (collagen peptides)
- Use of body own (autologous) protein structure
- Worldwide data base
- Time of training period
  (intensive training, competition, regeneration)
Results of 32.540 blood analysis serum/ery.
No conclusive information regarding micronutrient concentrations in the blood from routine serum blood tests

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Plasma %</th>
<th>Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>Potassium</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Calcium</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>Magnesium</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>Copper</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Iron</td>
<td>1</td>
<td>99</td>
</tr>
<tr>
<td>Zinc</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Selenium</td>
<td>35</td>
<td>65</td>
</tr>
</tbody>
</table>

Summary and outcomes
Meeting individual needs with simple nutritional focus is not possible for peak athletes

- Result of clinical study with active women
- Result of blood investigation of 89 champions
  (Olympia, world-, vice world, European in all sports)
  Concerning soccer, handball, judo, athletics...
- 4350 competitive athletes without taking individual micronutrient recipe
- 1150 competitive athletes taking individual micronutrient recipe

Important:
We need to adopt good eating habits, BUT also make sure we complete the picture with personalized screening, to optimize individual needs
Reality

There exist no physiological data testing the clinical relevance of present dose.

Present recommendation is the result of thinking about relation between consumption and supply of micronutrients.

(From „Sportmedizin für Ärzte 2009“)

Individual therapy in future

World on Sunday,
19. September 2010
Enough energy supply is the guarantee for

- continuity of training
- reducing infections
- optimal development of endurance
- improvement of mental fitness (brain metabolism)
- optimal maintenance of function concerning tissue (sinew, cartilage, muscles, ligament)

Optimal energy improves the endurance ability

Development of endurance ability by athletes taking magnesium (n=40) and no taking (n=52) after 3 months training (4 x 60 min per week) considering individual recommendation

- Athletes with Mg-value < 44 mg/L:
  - Start: 3.70 ± 0.10
  - End: 3.81 ± 0.19

- Athletes with Mg-value > 55 mg/L:
  - Start: 4.11 ± 0.12
  - End: 4.47 ± 0.11
Optimal energy metabolism stabilizes the immune system and reduces the risk of infection

rate of infection in %
period: 2 years

An optimal micronutrient supply helps preserve function of many connective tissue structures

Example: the knee joint - frontal view

Don’t eat your own structure: feed the structure!
From an urgent need (dark blue line) to rapid resolution after supplementation (light blue line)

399 athletes taking individual recipes, age 44.7 ± 17.3
Biomechanical tracer of body own protein structure concerning the energy metabolism

Influence of an optimal micromineral concentration by the pyridinium crosslinks without individual micromineral recipe

345 athletes taking individual recipes, age 62.6 ± 17.3
Biomechanical tracer of body own protein structure concerning the energy metabolism

References
Analysis of nutrition behaviour by Ocotrophologue

1. group: 591 athletes without taking individual micronutrients
   - Age: 22.0 ± 17.3 years
   - Average supply of calories: 3305 ± 464 kcal
   - Nutritional behaviour was 94% of the recommendation of DGE
   - Total supply of energy: 50% carbohydrates, 20% fat, 24% proteins
   - Supply of liquid: 3.3 ± 1.1 liter

2. group: 557 athletes taking individual micronutrients
   - Age: 6.7 ± 15.5 years
   - Average supply of calories: 2405 ± 526 kcal
   - Nutritional behaviour was 80% of the recommendation of DGE
   - Total supply of energy: 56% carbohydrates, 23% fat, 15% proteins
   - Supply of liquid: 3.8 ± 1.5 liter

Injury risk for n = 345 athletes
who did not receive customized micronutrient formulations
(amino acids, vitamins, minerals) over a two-year period
JPJ's were computed using formulas of the biomechanic and ligament apparatus, various cartilage structures, and meniscus.

<table>
<thead>
<tr>
<th>345 athletes</th>
<th>481 athletes</th>
<th>581 athletes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training volume: 12 hours per week</td>
<td>Training volume: 12 hours per week</td>
<td>Training volume: 5 hours per week</td>
</tr>
</tbody>
</table>

age (years)
6.5 ± 17.3
Injury risk for n = 359 athletics who received customized micronutrient formulations (amino acids, vitamins, minerals) over a two-year period

(Ophoria without normal force at the muscle and ligament apparatus, various cartilage structures, and immunization)

- 145 athletes
  - Training volume: 12 hours per week
- 185 athletes
  - Training volume: 8 hours per week
- 100 athletes
  - Training volume: 5 hours per week

age (years)
61.2 ± 16.5

=> Small things make a big difference:
  simple can be great!

- every athlete has an individual energy supply
- special widespread analysis adopted
  - training/composition
- housing on a world wide data bank
- => allow an individual recipe
Self report of professional and recreational athletics

After 6 weeks we were able to show:

- training and competition on higher level had been realized
- faster regeneration after training/competition
- feeling subjectively “stronger” in games
- improved resilience against illness
- subjective feeling strength and endurance (risk of overtraining reduced)
- with personalized nutritional intervention we can achieve a dramatic improvement in our physical abilities

Complexity of thyroid hormone regulation

Fig. 65
Example

58 year old athletic (400/1500m)

Mental state:
- increase of tiredness, subjective lack of mental power
- sweating during night
- great variation of physical abilities during season
- several little injuries of different tissue
  (ligament, muscle, sinew)

Example

58 year old athletic (400/1500m)

3 months after taking individual micronutrient recipe:
- no tiredness, no sweating during the night
- constant physical abilities, no variation in season
- phenomenal player
Example of recipe

Amino acid concentration

<table>
<thead>
<tr>
<th>Amino acid</th>
<th>Content by taking 50 g of an AM-Formula-mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Arginine</td>
<td>4.6</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>3.0</td>
</tr>
<tr>
<td>Glyoxylate</td>
<td>1.5</td>
</tr>
<tr>
<td>Glycine</td>
<td>10.3</td>
</tr>
<tr>
<td>Histidine</td>
<td>0.5</td>
</tr>
<tr>
<td>Hydroxybutyrate</td>
<td>2.4</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>0.8</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>1.7</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>1.7</td>
</tr>
<tr>
<td>L-Methionine</td>
<td>1.9</td>
</tr>
<tr>
<td>L-Phenylalanine</td>
<td>1.1</td>
</tr>
<tr>
<td>Proline</td>
<td>6.7</td>
</tr>
<tr>
<td>Serine</td>
<td>1.6</td>
</tr>
<tr>
<td>Threonine</td>
<td>0.9</td>
</tr>
<tr>
<td>Threonine</td>
<td>0.9</td>
</tr>
<tr>
<td>Threonine</td>
<td>0.2</td>
</tr>
<tr>
<td>Valine</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Components of your DNA
Result after supplementation

58 year old athletic (400/1500m)

Functional energy unsatisfactory bars (deviation of median value in %)

- Chloric acid
- CD-Formul
- Alpha-lactalbumin
- Lactic acid
- Fumaric acid
- Malic acid
- Pyruvate

- Red bars show energy limitation of special enzyme
- Light blue bars indicate energy limitation of special enzyme
- Dark blue bars after taking individual measurements on limitation of special enzyme
58 year old athletic (400/1500m)

**Concentration of micronutrients (calculation of muscle tone in 5G)**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Intracellular</th>
<th>Serum</th>
<th>Whole Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vitamin B6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vitamin B9</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Folate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Potasium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiamine B12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pantothen酸</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Optimal Levels**
- Clear deficit
- Optimizing supply
- Optimal supply

1. Investigation: lowest deficit of important muscle tone in minimal supply
2. Investigation: optimal intracellular nutrient concentrations after 8 hours exercise

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**Stabilization of the energy system**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Clear deficit</th>
<th>Optimizing supply</th>
<th>Optimal supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomato</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Special assistance of neurotransmitter (calm and activating) concerning the brain metabolism**

<table>
<thead>
<tr>
<th>Phospholipids</th>
<th>Clear deficit</th>
<th>Optimizing supply</th>
<th>Optimal supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyrosine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Investigation: highest deficit of important muscle tone
2. Investigation: control after 8 hours optimal muscle tone concentrations by balanced meals