

Racing Drivers benefit from Spirovitalisation

Expert Report: Univ.-Prof. Dr. med. Klaus Jung, Mainz

Background:

As a doctor for internal medicine, sports medicine and complementary therapies with extensive scientific experience in performance sport and popular sport and because of my 25-years as Head of the Department for Sports Medicine, Prevention and Rehabilitation at the Johannes Gutenberg University in Mainz, I was asked to give an expert opinion on the process that is described in more detail below.

With its spirovitalisation the company Airnergy innovated and established in complementary medicine a process that promises holistic benefits for competitive athletes in the areas of fitness, endurance, concentration and regeneration and that expressly does not fall under the forbidden methods outlined in the doping guidelines.

From my own research and from the experiences from several million uses, many of these by professional and amateur athletes, these positive effects were confirmed again and again by the athletes themselves and by their diagnosticians and medical supervisors. These effects have been recorded and passed on to the company.

The usual fitness training regimes and special nutritional programmes for racing drivers are exclusively dedicated to the “mechanical” advantages and proper functioning of their sports equipment. In addition to this conventional training the aim is to give them a method that not only supports and improves their individual efficiency and concentration but also serves and protects their health and safety and therefore represents the prerequisite for better performances in their particular sport.

Introduction:

After analysing extensive data from the Airnergy company I was motivated to evaluate their process scientifically, although initially I was very sceptical.

Statements from former motor racing drivers and their physios:

1. The use of Spirovital therapy after a serious aquaplaning accident with corresponding physical and primarily psychological consequences. Rapid physical and mental healing process under the effects of Spirovital therapy. Ease of going to sleep and good sleep quality, rapid regeneration and increase in performance well above the initial range (F.S.).
2. During the course of spirovitalisation considerable improvement in concentration before and during long-distance races. Noticeable acceleration of regeneration after fitness training, significantly quicker return of pulse rate to starting value. Increase in general well-being, significantly more energy and motivation over the day. Markedly reduced susceptibility to infections (P.K.).
3. Clear acceleration in regeneration after fitness training since using the Spirovital device. Lowering of resting pulse rate. No more colds. More energy over the course of the day, quicker falling asleep (S.H.).
4. Improvement in concentration, increase in physical performance since use of Spirovital therapy. Getting to sleep more quickly, better sleep quality, waking up refreshed. Greatest success with spirovitalisation approximately 1 hour before the start (O.M.).

5. Better recovery from jetlag with Spirovital treatment. Fit and concentrated at the start. Improvement in concentration during the race, especially long-distance races, despite change in time zone and lack of training. Quicker return of heart rate to resting value after exertion, better subjective regeneration, overall improvement in general well-being (M.W.).
6. And Balbir Singh, the Formula 1 physiotherapist summarises his experiences with spirovitalisation:
“Airnergy helps the body to draw more energy out of the respiratory air. There are many more reserves in the air than we can imagine. The gentle effect has a natural basis and for me it is comparable with other complementary therapies, in particular homeopathy. Spirovitalisation does everything that is to be expected from a holistic therapy: providing each individual cell of the body with more energy.”

Photograph: Balbir Singh

This awakened my scientific and practical curiosity. The questions that automatically come to mind are:

- What is the physical-psychological loading profile of racing drivers?
- What happens in the body during spirovitalisation?
- What could spirovitalisation do for racing drivers in this context?

Physical-psychological loading profile of racing drivers

In addition to the ability to concentrate very hard and for a long time, motor racing requires all of the five main forms of motor loading generally described in sports medicine: coordination, flexibility, strength, speed and endurance. In addition to this there are the psychological requirements and together these produce a comprehensive loading profile – also in the context of suitability criteria, fitness checks and training recommendations.

Apart from recording general health status (basic internal and orthopaedic examination, postural analysis, blood tests, ECG, lung function, anthropometry and stress status) a physical performance diagnostic is required for all five main forms of loading including regeneration behaviour, a psychological performance diagnostic (concentration, reaction, alertness, anticipation, mental resilience, relaxation ability, overcoming stress, sensory-motor response and multitasking) as well as an analysis of the individual personality and team structure (aggression, risk-appetite, expression of will, motivation, stress management, competitiveness), such as is offered, for example, by the “Emberger High Performance Centre” and by “HEIDFELDRACING”.

Fitness training for racing drivers includes strengthening and flexibility training of the neck, shoulders, neck and back muscles, a general endurance training (cardiovascular system, metabolism, musculature), increasing the ability to concentrate and reaction speed, increasing resistance to mental and physical tiredness, strengthening colour vision and depth of field, and additionally in motorbike racing optimum neuromuscular coordination, sensitising the vestibular system, training the rapid transition from static effort to movement and stabilisation against vibrations and sudden jolts caused by the terrain. In earlier times Formula 1 racing drivers were mostly seen as adventurous “hard men,” for whom cigarettes and alcohol were more important than carefully-tailored fitness programmes. But nowadays these are the key to success. During the two hours of the Formula 1 race the drivers are exposed to extreme stresses, comparable with those of fighter pilots. According to the drivers themselves and their physios, “without the appropriate level of fitness you have no chance in this sport”.

Racing on particularly demanding high-speed courses places extreme stresses upon the drivers. Neck, shoulders, arms and legs cope with a load of approximately 40,000 kg during

a race, which means extremely hard work not only for muscles but also for ligaments, tendons and joints.

Few other types of sport place such high stresses on their participants as does Formula racing for example. Braking at high speeds and super fast curves increase the weight of the helmet for example by 5 times. However, the leg muscles are also stressed, each full braking manoeuvre equates to a force of approximately 80 kg. On high speed courses where the front and rear fins produce a maximum force, approximately 40 kg must be applied to cramp the wheels. In a Grand Prix there are on average 2,600 gear changes.

It is difficult to breathe strapped tight into the seat by the 6-point belts. The heart rate increase to peak values of up to 180 beats/min and above (Fig.).

Temperatures of up to 60 °C are reached under a racing suit. According to Erwin Göllner, fitness trainer for Jacques Villeneuve “a long distance runner who was not trained for it could not endure a Formula 1 race”.

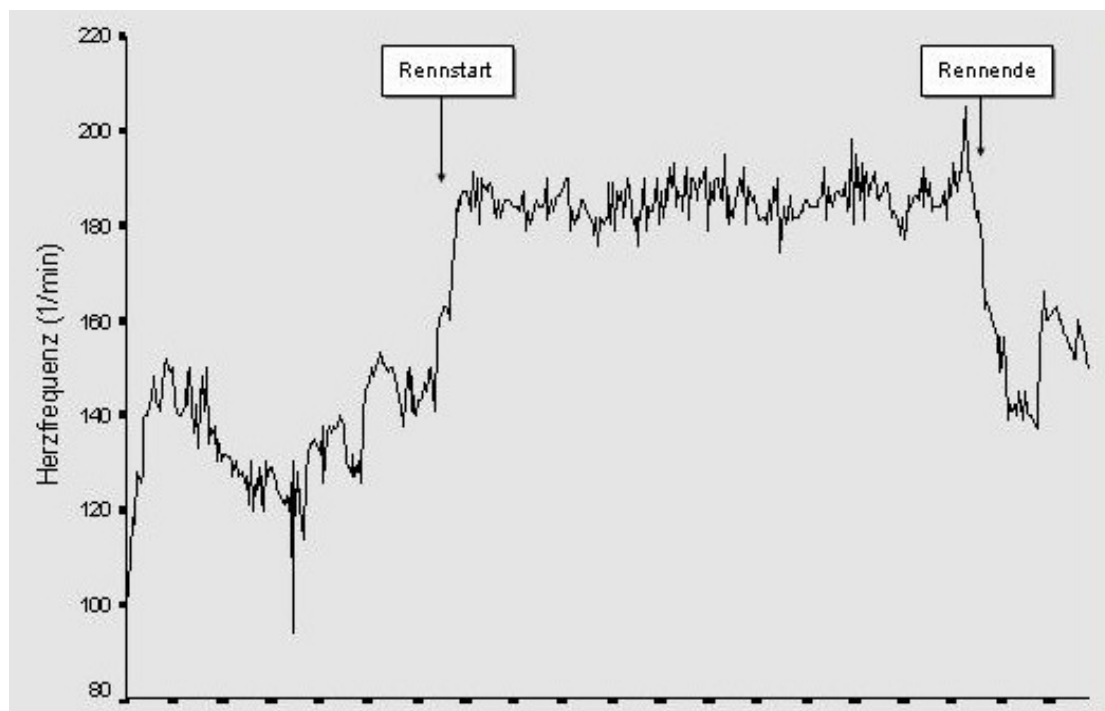


Figure: Heart rate profile of a racing driver during a race. Heart rates are constantly between 180 and 200 beats/min, demonstrating the extreme loading on the cardiovascular system (from Emberger, G., 1999)

This kind of fitness for such high performances has to be acquired and does not come automatically (weights room, treadmill, cross-country runs, simulation of cockpit loadings). That means training hard all year round, in the preparatory phase 4 – 5 times/week for 4 – 5 hours per day and in the main season still 3 – 4 times/week for 2 – 3 hours per day.

In summary a racing driver requires a high degree of physical and mental fitness (acquired by active training). However, good-quality sleep, good vision, extremely good concentration, fast reactions, rapid regeneration and optimum immune status are also very important and most of these attributes correlate closely with optimum oxygen supply to and oxygen utilisation by each individual cell in the body and the intercellular stroma, combined with perfect neutralisation of the increased oxygen radicals produced under stress conditions.

Mechanism and consequences of spirovitalisation in the body:

Spirovitalisation brings about a short-term transition of the oxygen in the ambient air from its basic state (triplet oxygen, $^3\text{O}_2$) to a higher energy level (singlet oxygen, $^1\text{O}_2$) due to the action of light of a specific wavelength in the presence of a specially selected photosensitiser (Airnergy) (Fig.).

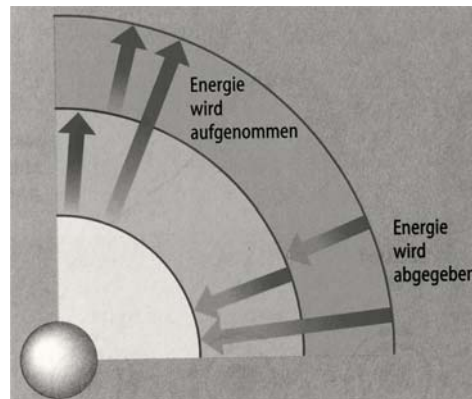


Fig. : Elevation of electrons to a higher energy level and reversion to the original basic state (according to Campbell and Reece, 2003)

However, this higher energy level of oxygen “only” lasts for fractions of seconds until the energy that is released on reversion to the basic state is released to the water molecules in the air (law of conservation of energy) and is inhaled together with the “normal” atmospheric oxygen in the ambient air (water-vapour-saturated respiratory air).

The further steps of spirovitalisation are not yet completely known and corresponding studies in university institutes are not yet completed. However, on the basis of numerous reports from people concerned, from case descriptions by therapists and from the results of clinical studies, it can safely be said that important processes initiated by the Spirovital treatment take place particularly in the mitochondria (the power stations of the cells) and in the stroma (extra-cellular and inter-cellular matrix).

These relate primarily to five vital, energy-dependent metabolic areas (increase in the release of oxygen, increase in the utilisation of oxygen, harmonisation of the parasympathetic nervous system, activation of protein synthesis, stabilisation of oxidative equilibrium). Three of these areas have been researched in more detail and are summarised here:

a. Increase in oxygen release:

Apparently Spirovital therapy brings about an increase in 2,3-biphosphoglycerate in the erythrocytes, which moves the oxygen binding curve to the right so that at the same partial oxygen pressure in the erythrocytes, oxygen saturation drops or the release of oxygen to the tissue, i.e. also in the individual cells of the body and there into the mitochondria, the place of ATP production, is improved (Fig.).

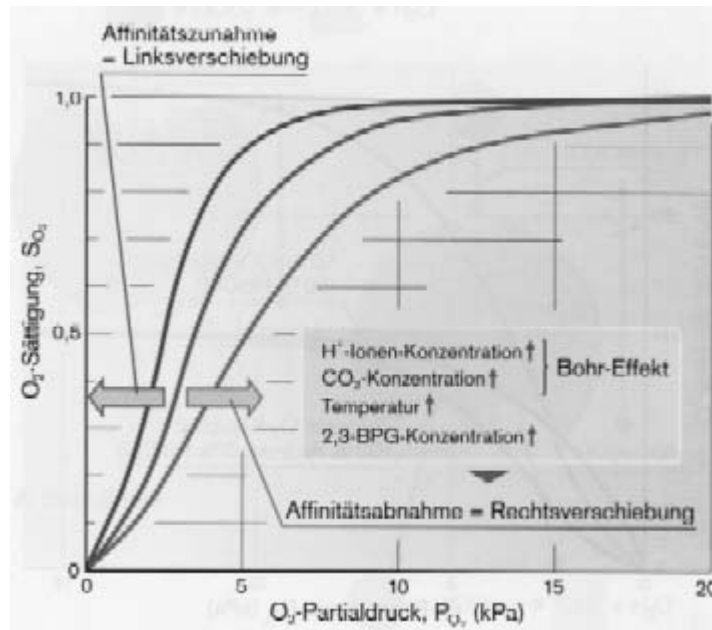


Fig. : Relationship between oxygen saturation and oxygen concentration as a function of 2,3-BPG concentration (according to Klinke and Silbernagl, 2000)

b. Increase in oxygen utilisation:

Cellular respiration is taken to mean the functional complex of glycolysis, citrate cycle and respiratory chain. In the first step of energy production glucose and fat are gradually broken down (conversion of energy-rich substrate into energy-poor CO_2 and water). Whilst 2,3 biphosphoglycerate activates glycolysis (breakdown of glucose to form pyruvate), ubiquinon Q and cytochrome C are active within the respiratory chain, in that they transfer the liberated electrons to an enzyme complex, cytochromeoxidase where they react with oxygen and reduce it to water (chemiosmosis). This process sets in train oxidative phosphorylation (conversion of energy-poor ADP into energy-rich ATP). There is much to suggest that cytochromeoxidase is activated by Spirovital therapy.

c. Stabilisation of oxidative equilibrium.

Cellular metabolism (energy production, elimination of toxins) increases the requirement for O_2 . This results in an increased supply (with the inhaled air) and release (metabolically determined) of reactive oxygen species, which under normal conditions perform an important function in the body, for example destroying phagocytised foreign bodies (such as bacteria and viruses). NADPH-oxidase acts as a catalyst for this. Although the production of oxygen radicals is important in defensive reactions, it can be harmful when too much is inhaled or produced as a result of stress, illness, ageing or environmental damage, in particular in endothelial cells, smooth muscle cells, myocardial cells and fibroblasts (NO-inactivation, decrease in endothelial reactivity, precursor to heart attack and other vascular diseases). Spirovital therapy decreases the activity of NADPH-oxidase and thus results in reduced formation of oxygen radicals or in their neutralisation, in other words the antioxidative capacity of each individual cell increases. This is in clear contrast to traditional oxygen therapies such as, for example, von Ardenne's multi-step oxygen therapy.

From all of the experience and knowledge so far it would appear that spirovitalisation represents a complex intervention in the bio-cybernetic and bio-energetic functional sequences of the organism, which, via harmonisation of the basic regulation in the cells and in the extra-cellular matrix, results in an improved oxygen supply in all structures and there to

increased O₂ utilisation and therefore activates the cell's own energy production (ATP) and contributes to regulating the cellular metabolism in the organism as a whole.

Both preventatively and curatively spirovitalisation activates and supports necessary bio-regulatory processes in the sense of a holistic and universally-applicable treatment. As a basic treatment it accompanies and supports prevention and rehabilitation, performance optimisation and acceleration of regeneration, clinical treatment concepts and conventional medical interventions.

Fields of application of spirovitalisation for racing drivers:

The three main mechanisms (known so far) of a Spirovital treatment consist of reinforcing oxygen release, increasing oxygen utilisation and decreasing the release of oxygen radicals. This equally affects the extra-cellular matrix and all cells of the body and therefore all organs with the focus on particularly metabolically-active, oxygen-dependent structures (such as the brain, heart, eyes, kidneys, immune system, liver and muscles).

It is these metabolically-active organs in particular that are challenged during physical and psychological loading and this constitutes a continuously high physical and mental stress situation. In this context spirovitalisation serves to relieve the heart by facilitating comparatively lower heart rates, sensitisation of the vestibular system due to better oxygen supply, quicker and deeper regeneration after loading, improvements in falling asleep and sleeping through, optimisation of the immune system and optimisation of vision, in particular depth of field and colour vision. It also brings about an increase in concentration, alertness and reaction capacity, an increase in motivation and mental resilience, an acceleration in relaxation and overcoming stress, optimised performance in multitasking and an increase in resistance to tiredness.

These effects were impressively confirmed by a survey carried out to scientifically record experiences with spirovitalisation in a selected random sample of the population at large. A positive assessment was given for energy status (performance, activity, concentration, resilience, strength, motivation), well-being (sleeping patterns, mood, breathing, digestion, pain, immune status), regeneration (deepening, accelerating, relaxing, pulse lowering) and the sensory system (smell, sight, skin, dizziness). According to the therapists the treatment had a favourable effect in particular upon a drop in performance, reduced concentration, sleep disturbances, immune system weaknesses and poor vision.

In evaluation of the patient documents available at Airnergy for burnout syndrome it appeared that the subjective experience of activation of the body's own forces by inhalation of energised respiratory air fits well with the objective knowledge about harmonisation of the stroma and activation of the cellular metabolism. Similarly the impression of many therapists and end users, that spirovitalisation has a strongly harmonising impact upon the neuro-autonomic-hormonic-immunological control system and therefore represents a basic therapy, so to speak, on the foundation of which a targeted, conventional medical treatment has a much better chance of success. The one therapeutic method builds on the other, extends and supplements it, each having its own value.

In **sleep disturbances** there are often cerebral circulation disturbances present, especially of the *formatio reticularis*, such as often occur during stress. The result is a delayed, weakened or suspended sleep-wake-autoregulation in the vagotonic night phase. Spirovitalisation results in better blood circulation and an increased local oxygen supply with simultaneous reduction in O₂ radicals in the highly-oxygen-dependent areas of the cortical sleep centre. A third mechanism is also discussed. It is known from Indian yoga teaching that energy can be taken into the body from outside via the nose (breathing), whereby the nerve endings in the

upper nostrils should serve as “receptors”. The energised respiratory air would then transfer its energy to the nerves, which then transport it directly into the brain centres, in particular into the autonomic control and switching centres, and thereby induce the oft-described harmonisation processes in the autonomic-harmonic-immunological area.

As metabolically-active, high-performance structures the **eyes** and **vestibular system** are highly oxygen-dependent or are impaired by oxygen during stress and illness. The macular (yellow spot, the most sensitive part of the retina) is responsible for important visual functions such as reading, facial recognition, distinguishing detail, stereoscopic (spatial) vision and perception of colours. At the same time intermediate and end products of metabolism (including O₂ radicals) are taken up and passed on or disposed of locally. Numerous cases have been reported where there has been significant improvement in vision and in balance with consistent Spirovital treatment.

Prerequisites for **optimisation of performance** in a physical and also psychological sense are a maximum increase in the supply and utilisation of oxygen, harmonisation of biological-cybernetic functions and their stabilisation and optimisation of the milieu (inter-cellular substance). In the foreground here are the body’s own control system, which must be maintained or restored, in any case optimised and stabilised as far as possible for the individual case. Important prerequisites for this are an energy supply and utilisation to cover respective needs and a well-functioning self-cleansing of the milieu (“decoking” of the inter-cellular stroma, neutralisation of oxygen radicals). The bio-cybernetic influencing of the body’s own control systems uses certain selected stimuli (such as e.g. energisation of the respiratory air) to activate desired responses (microcirculation, oxygen supply, metabolism, elimination). The organism should be stimulated to produce “expedient” reactions. As it has been possible to demonstrate using evidence-based methods of measuring heart rate variability (HRV method), spirovitalisation clearly leads to a saving in cardiac load (decrease in heart rate, to harmonisation of the autonomic nervous system (decrease in sympathetic tone, increase in parasympathetic tone), to an increase in the regulation band of the whole organism, to optimisation of metabolic processes (increase in energy status, increase in energy reserves, accelerated cell regeneration, shortening of healing times after injuries and overloads) and to a reduced stress response of the cardiovascular system and of the whole organism under the same loading), in summary to an increase in and stabilisation of basic health.

From all of the theoretical knowledge and practical experience of spirovitalisation to date, it is clear how this method can be used to energise the respiratory air with its effect upon optimisation and harmonisation of cellular metabolism as an universal basic measure, both for prevention and rehabilitation, for support, increasing efficacy and neutralisation of undesirable side-effects from the use of other methods. This innovative spirovitalisation treatment is finding increasing recognition especially in sports circles, primarily for highly intensive loadings such as in motor racing.

After they had learned about the physiological-biochemical aspects of spirovitalisation, the NADA (National Anti-Doping Agency) and the WADA (International Anti-Doping Agency) decided not to classify it, as initially intended, as a forbidden method, giving the reason that ambient air is irradiated with UV light and then inhaled via a nasal cannula but that the energised oxygen only lasts for fractions of seconds so that when the air is inhaled it has the same composition as the ambient air.

The positive effects of breathing energised air were impressively confirmed by physios and administrators involved but primarily by the racing drivers themselves, as can clearly be seen from the closing statements from some of today's successful racing drivers.



Airnergy Drivair Plus

Airnergy Avand Garde

Airnergy Travel Plus (Akkubetrieb)

Statements for some of today's successful racing drivers:

Jenson Button: “I use the Airnergy system on a regular basis over a race weekend. It's used before all practice sessions, qualifying and races in order to facilitate my performance. I feel it's an essential part of my race preparation this year and take it with me all over the world. I also use it following tough training sessions to aid recovery and aid my next day performance.”

Marco Werner: “Thanks to Airnergy my concentration during the race improved, despite the negative effects of time zone shifts and lack of training. One cannot overestimate lack of training however it was less than during last season. In connection with intensive monitoring of my pulse rate I was able to establish that Airnergy had improved my heart rate – in particular resting pulse – or that I could be active again more quickly. Especially for long-distance races, sometimes driving stints of more than two hours, these aspects are also important from the safety point of view. That means that I was able to improve my concentration during the course of the race. My summary: better concentration – better fitness – better pulse values – better general well-being.”

Uwe Meissner (Ferrari-Clienti Team Leader): “As regards fitness I experienced Airnergy in May of this year. Although I was aware of my improved fitness, I was still very surprised by the improved condition curve. Neither on the demanding race track in Monaco nor in the Spa did I suffer any loss of condition after 45 minutes. The positive effect of regular use should not be underestimated.”

Mike Collier (Formula 1 physiotherapist): “Formula 1 is the pinnacle of motor sport, always striving for advancements in technology to gain performance over one another’s competitors. As the physiotherapist and sports scientist to Jenson Button I am responsible for his human performance and am always interested to hear about new training principles, approaches and technologies that can improve the driver’s performance. As such the use of the Airnergy system was appealing for many reasons, mainly however for its documented effects on alertness, recovery and the immune system. While the product is still in its infancy as well as our application of the system, the initial consensus is a positive one and we continue to use it at all race events. As the equipment is more widely used, its research will demonstrate how Airnergy will be beneficial for you.”

Nothing can be added to this assessment as is evidenced by the positive experience of many **other racing drivers and their physios**: Rubens Barrichello, Dani Clos, Sven Heidfeld, Balbir Singh, Frank Stippler, Olaf Manthey, Klaus Ludwig, Pierre Kaffer, Joey Kelly, Timo Schneider, Frank Biela, Steve Jenkner, Ellen Lohr, Uwe Alzen, Rene Rast, Satoshi Motoyama, Stefan Prein, Robbie Maddisson, Thomas Jäger, Elmar Guelen, Bernd Schneider, Vitantonio Liuzzi.

Summary:

My initial scepticism on finding the first Spirovital user observations of racing drivers in the Airnergy archive was soon overcome by theoretical considerations, the carry-over of experience with healthy and sick people of an average population and further opinions from currently successful racing drivers. On the contrary, I became increasingly convinced that the energisation of respiratory air (spirovitalisation) represents an extremely effective, completely harmless, easily useable and regulation-compliant method for individual optimisation of mental and physical performance and for harmonious, complete and rapid regeneration following extreme physical exertion. In summary the conclusion that the following parameters are positively influenced by the regular use of Airnergy of spirovitalisation appear to be completely justified:

concentration, alertness, reaction speed, vision, equilibrium, mental resilience, multitasking, motivation, handling of stress, resistance to tiredness, sleep behaviour, immune status, regeneration, relaxation ability, stress management.

As a critical scientist and practising sports doctor, I am convinced of the effectiveness of spirovitalisation and I support the company Airnergy in its efforts to establish spirovitalisation as a standard for health, safety and performance for racing drivers and to establish it in the minds of athletes in this sport.

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Gleishorbach

Translator’s Key to diagrams:

Herzfrequenz	Heart rate
Rennstart	Start of race
Rennende	End of race
Energie wird aufgenommen	Energy is taken up
Energie wird abgegeben	Energy is released
Sättigung	Saturation
Affinitätszunahme	Increase in affinity
Linksverschiebung	Displacement to left

Affinitätsabnahme Rechtsverschiebung	Decrease in affinity Displacement to right
Ionenkonzentration	Ion concentration
Konzentration	Concentration
Temperatur	Temperature
Bohr Effekt	Bohr effect
Partialdruck	Partial pressure