

Climatotherapy

and medical effects

at high altitude

Sulden am Ortler



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Project description

2010-2011 Setting of location and project development with Prof DDr. A. Schuh
2012 Concept development of a study on the medical effect of high-altitude locations
2013-2014 Implementation of a pilot study, evaluation and publication of the results

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„A healthy metabolism in Sölden“

The Sölden study

Leptin and triglyceride levels in the blood of people with metabolic syndrome: results of a comparative pilot study on a 2-week hiking holiday at 1,900m or 300m above sea level.

A slight decrease in the oxygen concentration in breathing air possibly strengthens the health-promoting effect of physical exercise for the reduction of risk factors for heart attack and stroke.

In autumn 2013, a pilot study was conducted with the purpose of investigating the impact of a 2-week hiking holiday on typical risk factors measurable in the blood in people with metabolic syndrome, whereby exactly the same exercise programme at a low altitude (300m) was compared with training at altitude (Sölden, 1900m). Metabolic syndrome is a combination of physical abnormalities and those only detectable in a laboratory that heavily promotes the emergence of serious cardiovascular diseases.

Fourteen people aged between 40 and 69 who were diagnosed as being overweight and as having elevated blood pressure, blood sugar and blood fat levels, completed a structured training programme (three-hour, guided hike on four days per week with medium training intensity, 24-hour total training time) during a two-week holiday.

The participants were divided into two groups at random: one consisting of 8 people for residence and training at an altitude of 1,900m above sea level, the other with 6 people for residence and training at 300m above sea level.

As expected, the training led to a decline in the plasma level of total cholesterol, of its „bad“ part (LDL cholesterol) and of adiponectin in the overall group of 14 study participants. In the comparison of the two groups, not only was a decrease in total cholesterol, LDL cholesterol and adiponectin found due to the training in the group at 1,900m (Sölden), but also a significant reduction in leptin (see fig.), an important messenger from the fat cells which, when present at an elevated level, has a damaging impact on haemal health. Triglyceride levels also dropped considerably.

In the group at 300m above sea level, none of these fat metabolism parameters showed a significant change.

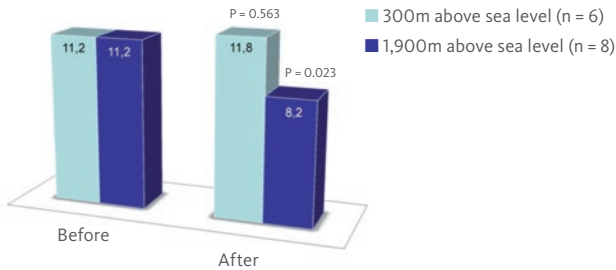


Fig. Plasma leptin ($\mu\text{g/L}$) in people with metabolic syndrome before and after a 2-week hiking holiday

Literature

Gutwenger I, Hofer G, Gutwenger A, Wiedermann CJ. Circulating leptin and triglyceride levels in patients with metabolic syndrome: Pilot study results on a 2-week hiking vacation at moderate versus low altitude. *BMC Res Notes* 2014; 7: in press.

A 2-week hiking holiday at 1,900m above sea level had not only a more favourable impact on the typical blood fat risk factors, but also on the messengers that make one ill in the event of obesity and a lack of exercise.

The results of this pilot study show that a two-week stay in Sulden combined with regular exercise leads to considerably better regulation of abnormal blood fat levels and of pathogenic adipokines in people with the risk factors of metabolic syndrome as equivalent training at low altitudes. A major decline in leptin and triglyceride levels indicates that the metabolic adjustment processes under mild oxygen deficiency lead to an amelioration of metabolic syndrome, at least in the short term. The use of a hiking holiday at an altitude of 1,900m as a non-medical additional therapy for patients with metabolic syndrome represents an attractive new treatment option and should be investigated further and verified in larger studies.





Sulden is precious

Embedded in the majestic alpine world of the up to 3,905 metre-high Ortler massif lies Sulden, a picturesque village with only 350 inhabitants but an incomparable wealth of nature.

Enchanted by colourful mountain flowers in the spring, filled with gushing streams and the scent of the coniferous forests in the summer.

The golden autumn is a paradise for hikers, before the famous Sulden winter entices - with sun, snow, cross-country ski runs and lifts, a unique mountain climate and the quiet of the mountain nights under shining stars.

„A jewel of the Alps“ is the assessment of guests and experts. Surely hardly anywhere else do recuperation stimuli intensify so perfectly with comforts of a village filled with life and offerings: wellness, fun and inner peace.

Sulden lies in the middle of the Stelvio National Park and is surrounded by fourteen 3,000m peaks. The village lies at an altitude of between 1,900 and 2,000 metres, contained in a protective cirque. The tree line rises up to an impressive 2,400 metres.

This makes Sulden so unique in the entire Alpine region.



The fountain of youth effect

„Moderate altitude“ - that is what sport and neurophysiologists call the medium altitude range, in which mild hypoxia exercises a fountain of youth effect on our organism. The low oxygen partial pressure in the air leads to the body exerting itself more even without any fitness training at all. It forms more red blood cells and the thyroid galvanises the metabolism. In this way, not only is muscular tissue activated, but all approximately 70 trillion somatic cells are supplied with oxygen and fresh energy. „Body & mind fitness“ - that is what US Bioscience calls this effect, which already stimulates peripheral cells as well as approximately 400 billion nerve cells on the first day of one's holiday.

Accordingly, holidays in Sulden are not only total relaxation and enjoyment of a splendid environment, but also always a rejuvenating cure for body and soul, as well as optimism, fresh vitalities and new impulses for everyday life. One takes nice memories home - as well as the yearning to come again.



Gushing source of life

„Where clean water ripples, the people are healthy,“ says an old Chinese proverb. Not for no reason have people always resided where the elixir of life in its purest form gushed out of springs and in mountain torrents.

„The water from Sulden taps is as clean and pure as water that comes from the mountains,“ says Dr Walter Huber, former Head of Department of the State Office for the Environment and Energy. „Hygienically and bacterially flawless, neutral to slightly alkaline, due to the low solubility of the minerals from metamorphic rocks. Water from glacial deposits and the permafrost area of the Ortler massif flows via short pipeline routes directly into the Sulden taps.“ This type of water certainly has very positive effects on the skin when used for very normal purposes such as washing, bathing or showering. This applies particularly to people with neurodermatitis or other skin irritations



Fit, slim & young

Sport physiologists of the US Field & Track Association have decoded the stimulating effect of a stay in medium-altitude locations. Where the air is thinner, more is demanded of the organism; it then produces more young, powerful blood cells that transport oxygen into cells. The tissue (e.g. the heart muscle) is „breathed through“ better and more cell energy is produced.



This rejuvenation process is additionally stimulated by the thyroid, which synthesises more of its stimulating hormones thyroxine (T4) and triiodothyronine (T3) in moderate-altitude locations.



Max Kuntner, skiing instructor and farmer in Sölden

For generations, South Tyrol's farmers have been herding their cattle, cows, sheep and goats up onto the alpine pasture. Alpine farming has a very positive effect on the fitness characteristics and health of the cows and young. The animals look for the exact plants that most benefit their health and make them more robust and healthier than their conspecifics in the valley. Natural freedom of movement, the intensive rays from the sun and the altitude also contribute to this. In addition, the cold and the weather influences make them resilient. Cows that spent the summer on the alpine pasture do not need a vet in the winter.



Height training

For top class endurance athletes, training at high altitudes has long been part of the programme. „Permitted and natural doping,“ is what experts call it - simply because in height training the organism synthesises even molecular substances similar to those found in prohibited drug doping. This includes an increase in red blood cells as well as of euphoriant hormones and neurotransmitters such as endorphins, noradrenaline, dopamine or serotonin.



Reinhold Messner, extreme mountaineer and best-selling author:

„In Sulden am Ortler, not only did I begin with the major ice tours - Ortler-Zebra-Königspitze traverse; Königspitze north face; Ortler north face - in Sulden, I also repeatedly trained to climb the eight-thousanders. Mountain jogs on mountains rising above 2,000 metres are ideal for acclimatising oneself in preparation for large expeditions. Sulden was and still is my fountain of youth. For this reason, I also live there from time to time.“



Best stimulating climate

We call the mix of a cool climate, high UVB radiation and reduced oxygen content a stimulating climate. The body reacts to these stimuli with its regulating systems. Climatotherapy avails itself of this effect.

Professor Dr. Dr. Angela Schuh, an expert in medical climatology at Munich University:

The high mountain region with its therapeutic stimulating climate is particularly suitable for patients with skin disorders and respiratory illnesses caused by allergies, such as neurodermatitis, bronchial asthma or hayfever.

Heliotherapy

The shorter the route of solar radiation through the atmosphere, the higher the proportion of short-wave UVB radiation. The UVB content is most important when it comes to the formation of vitamin D3, since only UVB is able to split up the vitamin precursor 7-Dehydrocholesterol photochemically. As an area of pure air, Sulden has optimum UVB radiation, including in the winter months.

A 14-day stay in Sulden - even in the winter months - covers one's entire vitamin D3 needs for a year. Sunlight that contains no UVB (in low-altitude locations or in cities, industrial areas near traffic arteries) not only cannot form any vitamin D3 but can even reduce that which exists.

Testimonials

I have been going skiing in Sulden for more than 20 years. I always immediately feel at ease here: the air and the altitude always provide direct regeneration, both for my body and for my mind. Last year I was able to enjoy this feeling to the fullest, spending two weeks there in the summer. No, it is not the case that one can enjoy Sulden even better in the summer; but as an allergy-sufferer, only then does one really see what else makes up Sulden other than the snow, the food and the wonderful companionship.



As a child, doctors classified me as highly allergic; since I can remember I have been allergic to all types of pollen and grass. It starts in the spring, when hazel, alder and birches blossom.

Then the weather report says: „Allergy-sufferers have probably already noticed that pollination is in full flight“. I actually barely remember a spring or summer in which I did not suffer from heavy colds and constant sneezing, respiratory complaints, swollen, itchy eyes and tiredness. These symptoms are particularly strong in my case because I react allergically to almost all pollens from March to August.

I have already tried so many things to alleviate the symptoms: I have gone through so-called desensitisation, taken globules (homoeopathic medicine), prescription allergy tablets, cortisone spray for nose and mouth, cortisone tablets and when it was really bad I also received emergency syringes.

However, often even that does not help. And the consequence is: the allergy hinders my general condition and leads to immense immunodeficiency, so I become an easy victim of infections of all types. Particularly in the summer, my everyday life is very restricted; after all, I can barely enjoy nature. However, there is an exception... Sulden!

As I already said, I spent two weeks here last summer. Although I still had strong symptoms the day before I arrived, after my arrival they were suddenly gone. I could breathe freely again! I ventured on long walks up to the Tabaretta Hut and also to the Düsseldorf Hut, without feeling any indications of allergies.

I even practised yoga outside on the pasture in the fresh air each morning, which otherwise would have been completely impossible. In short, I really had no symptoms at all and thought: I must move to Sulden; then everything will be fine!

Anna Rosa Thomä

My wife Edith, who suffers from some severe allergies - house dust, early flowering plants and trees - was able to leave the associated complaints, restrictions and medicine at home.

I myself suffer from neurodermitic skin problems and experienced significant improvements after a short period of time and recently, after increasingly long stays, my symptoms have been disappearing.



Our sports activities - hiking, hillwalking, snowshoeing, alpine skiing - provide us (we are now both over 60) with outstanding fitness and endurance today.

This was also confirmed to us in medical checks by astonished doctors: blood values, bone density, cardiovascular endurance levels in the most optimum ranges.

For us, Sulden has become a second home of sorts. Finding such a „fountain of youth“ in this fascinating mountainous landscape has granted us an extraordinary perspective for our life.

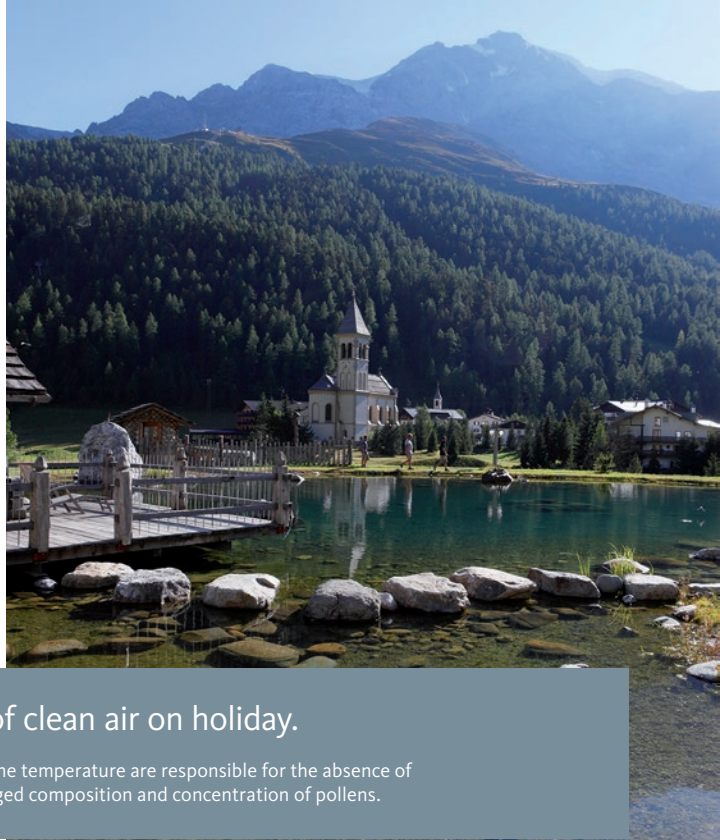
Edith & Peter Bergmann



Environmental contribution from Suldén

A large part of Suldén's energy supply comes from the local power plant, fed exclusively by pure water from the Ortler Alps - an important contribution to environmental protection.

93% of households in Suldén are connected to the bio-heating plant. This minimises domestic fuel and we have minimal fine dust pollution.



At least one week of clean air on holiday.

The dry and clean air as well as the temperature are responsible for the absence of house dust mites and for a changed composition and concentration of pollens.

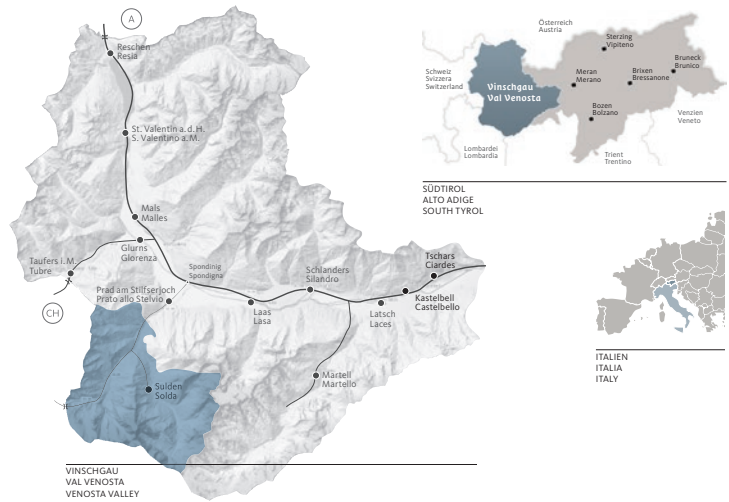
Pollination calendar for SULDEN

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alder	■	■	■	■	■	■						
Hazel	■	■	■	■								
Poplar	■	■										
Birch	■	■		■	■	■						
Common ash	■	■		■	■	■						
Willow	■	■		■	■	■						
Cypress/yew plants	■	■		■	■	■	■					
Hop hornbeam	■	■		■	■	■						
Oak	■	■										
Pine family	■	■		■	■	■	■	■				
Manna ash	■	■		■	■	■	■	■				
Grasses	■	■		■	■	■	■	■	■			
Plantain	■	■		■	■	■	■	■	■			
Nettle family	■	■		■	■	■	■	■	■			
Knotweed family	■	■		■	■	■	■	■	■			
Spanish chestnut	■	■				■	■	■				
Mugwort	■	■						■	■			

Pollen concentration: □ absent-very low □ low □ medium □ high □ detection station out of commission

Source: Biological Laboratory of the State Agency for the Environment, Autonomous Province of Bolzano





A piece of the cultural region of Vinschgau

The Ortler region,

located in the middle of the Stelvio National Park,
surrounded by fourteen 3,000m peaks.

Ortles, Cevedale, Gran Zebrù, fascinating, majestic alpine world.
Hiking in the summer, skiing in the winter, experience culture,
experience tranquillity.

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Ortler - Stelvio National Park

Ortler Tourist Association
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