BIO ENERGETIK VERLAG

Ernstfried Prade

A VISION BECOMES REALITY

A forward-looking technology enables us to act in an economical and ecological manner for the benefit of humans, animals and the environment

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Contents

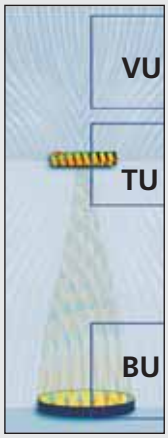
The Penergetic technology

The technology of information transfer, as being used by Penergetic today, has been in existence for approximately 20 years now. The young Plocher generation, daughter Birgit Wilhelm with her husband Robert Wilhelm as well as Birgit's brother Daniel Plocher, has decisively advanced this method. It is based on the quantification of information of original substances. This technology can in many respects be compared to classic homeopathy.
If we take, for example, the active substances of chamomile: within both alternative and conventional medicine it is known, beyond doubt, that chamomile has useful health-promoting properties. A realistic example might illustrate this. If 15 % of the population in Europe suffered from acute influenza and if just twenty percent of those people made use of the tried and tested household remedy camomile, then supply shortages could arise. Package sizes of 100 g are popular and because such illnesses nearly always become epidemic, a supply of 5 million kilograms (5'000 tons) would have to be available on the market at very short notice - an absolutely astronomical quantity. This is where the exceptional method of vitalisation agents comes into play. It is not the original substances themselves which are processed specifically to their area of use and then applied, but rather so-called "information carriers" (IC) or carrier substances. These ICs are always available in sufficient quantities and consistent quality without having to touch the supply of the original substances.

"Information" in this instance means the entirety of active parameters of the original substances.
What is truly remarkable is not this phenomenon, which actually has been observed, says science journalist and physicist Klaus Engelhardt PhD, but the process technology that brings about such a transfer of active processes from the original substance to the information carrier. Engelhardt continues: "Strictly speaking, the principle of modulation in electronics or radio technology is applied in this case; a common physical method to imprint information, for example spoken words or music, onto a carrier wave. Penergetic has selected a number of substances based on years of laboratory experiments and field trials in order to make systematic use of their known active parameters. Some of these substances are vital trace elements (the earth's crust contains, for example, 64 such elements), some

Process technology

For market strategic reasons, we will not deal with the production processes involved in any detail here. However, we will give a brief description of the general layout.The production equipment essentially consists of three processing units: volume unit, transfer unit and base unit. The schematic representation reflects the essential components.



Volume unit VU

Here two rotation-symmetrical bodies are arranged with a defined volume between them. The space between the bodies is filled with process specific materials at a defined total density. One of the bodies is made of metal and therefore conducts electricity.

Transfer Unit TU

It consists of a sample holder (for original and test substances) that can be adjusted horizontically and vertically, and a grouping of coils for the creation of an electrical field.

Base Unit BU

It is made up of a horizontal conveyor path with an integrated, vertically adjustable holder for different amounts of IC (up to 75kg at a time) and a coil grouping for the creation of a further magnetic field.

Overall layout

The special design of volume unit and base unit allows for the creation of an electrical field between them. The production equipment at Penergetic headquarters reaches a height of several metres.

www.penergetic.com

are chemical elements (like oxygen). These original substances are modulated onto carrier materials such as calcium carbonate or so-called AquaKat tubes. The tubes are simply attached to the main water pipe somewhere after the water meter. In this way their frequency patterns of oxygen and other original substances are transferred onto the water pipe. The water flowing past gets into resonance and changes its molecular behaviour and its properties to those typical of spring water. The effects can be recognised in changed crystallisation behaviour (dissolution of calcifications), a better absorbency (dissolving capacity) and even improved taste."

The powdered minerals or other carrier materials used are applied mostly by dissolving in water or by

other methods such as mixing dry into animal feed as a supplement. Many large feed mills have already started to mix Penergetic-t for animals into their products in exact doses. This saves the farmers the work of measuring and mixing feed and supplement.
The Penergetic products are, as already mentioned, not chemical substances like those that are usually mixed into animal feed, but a carrier material that carries so to speak very particular information into the animal feed.

Without wanting to divulge the proprietary nature of the Penergetic technology, I would like to point out a selection that Birgit Wilhelm has put together in her function as a naturopath for animals. It is apparent that the plant-specific information, now inherent in the Penergetic substances, plays a crucial role in their effectiveness. As an example, the following information of original substances is modulated onto the carrier material for Penergetic-t for cows: dandelion, bloodroot, swallow-wort, goose tansy, mullein, borage, valerian, nettle, wormwood, woundwort, parviflorous rose-bay, ribwort, neem, veronica and marigold.
Listing all information would go beyond the scope of this book, but I would like to point out that, apart from the basic substances such as oxygen, the oscillations and information of the original substances are crucial for success in the treatment of mastitis, for example. In this sense, the comparison with homeopathy is absolutely justified, because with it too, after succussion only the information of the original substance remains in the (usually liquid) medium. It is only this information that leads in the affected organism, be it man, animal, plant or water, to microorganisms restoring the system that has fallen into disarray. So far during the first years of Penergetic products, it has primarily been farmers and persons with an ecological consciousness who have gained familiarity with the exceptional results possible.
At a later point institutions, for instance the National Institute of Nutrition and Physiology, at Bangalore, India, started research. Here under the direction of Mr. Shridhar a large-scale, controlled trial was conducted to test Penergetic products with dairy cows. His comprehensive study demonstrated that Penergetic was able to dramatically improve on cases of mastitis, hoof rot and other conditions in the test animal population.
In Brazil, where large tracks of land are now routinely farmed using Penergetic products for crop production, farmers have demonstrated that they are able to increase production while reducing the quantity of farm inputs (e.g. synthetic fertilizer). Here under the direction

of the Ma Shou Tao Group (one of the country's largest distributors of soybeans, corn, sugar cane and other crops), quite exceptional results have been realized with Penergetic products. Over the past seven years, their field trails and usage, involving hundred of farms and thousands of hectares, have contributed greatly to the advancement of Penergetic technology in Brazil and globally. Examples of some of their trial results are described starting on page 51.

Notwithstanding the broad-based acceptance and success the Penergetic approach is achieving internationally, equally important are the annual increases in use domestically, in its home country of Switzerland. In Switzerland, the birthplace of Penergetic, keen supporters swear by the effectiveness of these products. Here, I would like to briefly cite two examples: Kurt Henauer, who grows table grapes and fruit, and August Sager, whose cherries have become famous throughout the country and are known as a "temptation on a stem". Articles of these two farmers' experiences begin on page 36/40. Time and time again, it is the Penergetic product users, working in new, unthought-of areas of product application, who send in enthusiastic letters to company headquarters. For example, Michael Schwarzmaier, who caught the attention of the German media as the first master baker to run a carbon neutral bakery. He has shown that the Penergetic's AquaKat is able to give his bread an unsurpassed freshness and extended shelf life. At this point, I would like to point out that I bought a Schwarzmaier loaf to be tested by my family of eight.
We found that even after 10 days this bread was fresher and tastier than any other bakery products we had ever had before. Ordinary bread tastes stale after just a few days. Not so with the Schwarzmaier bread. It really seems to have an inherent vitality that, aside from the unusually long shelf life, is also responsible for its freshness and its taste. He attributes this to the use of the AquaKat. His story is on page 148.

Also fascinating are the reports of 35 trade companies, the majority of which confirmed good to very good results for the AquaKat in a large plumbing periodical. Under the headline "Humbug or a new perspective?" this specialized trade publication provide an independent third party assessment of this water revitalization device and reports on its success in improvement the quality of water on a number of parameters including physically removing lime from plumbing fixtures and appliances. Refer to page 140 for more on this topic.

We have to welcome the fact that tests of this kind strengthen the respectability of Penergetic, because since this information transfer technology came onto the market there has been an enormous flood of imitations whose effectiveness has not yet been put to the test, which has led to considerable skepticism by consumers.

In a time where the overuse of the "eco-" prefix has rendered it practically meaningless, it is all the more reason for new and effective methods to gain broader use, which place priority on natural means without any chemical supplements or electromagnetic processes, in areas where nature itself is struggling. In this context I would especially like to draw your attention to the partial transcript of the lecture given by Prof. Hoffmann PhD (April 2008 in Interlaken, Switzerland) entitled "Food for life", which follows on page 13. In it Prof. Hoffmann describes, in an impressive manner, several important implications associated with food quality and, by correlation, the effects that using an AquaKat can potentially have for human health.

Personally having witnessed the impressive transformation and success of the Penergetic information transfer technology since the early days, as documents in my early book "Insight to Change", it is now my pleasure to share with you this latest collection of articles on very promising results involving the use of the Penergetic technology with case studies from around the world. I wish the Penergetic Technology and the people behind it a productive and prosperous future.

Kinsau in June 2008
Ernstfried Prade

What makes water the food of life

Prof. Manfred Hoffmann PhD

Prof. Manfred Hoffmann PhD has been working for many years on electrochemical food quality. Since all food consists to a large extent of water, water quality is also a scientific concern of his. As part of a conference, he gave a talk on this topic on 11. April 2008 in Interlaken, Switzerland. In the following section we present excerpts from his lecture.

The famous French doctor Doumoulin said on his deathbed: "I am leaving two great doctors behind: simple food and pure water."
From the point of view of nutritional science, this sentence is absolutely correct and also highly topical.
Even though Doumoulin wanted to document simply his experiences as a physician in Napoleonic times, we can interpret his statement in a more scientifically exact way today.
No doctor can heal; he can only prescribe remedies that stimulate self-healing processes. Only the order within the patient's organism itself can heal that organism!
I would like to describe briefly how this works.

What does "health" mean?
In physics, we know two types of systems:
- closed systems and
- open systems.

For scientific experiments we need closed systems. However, in real life we usually deal with open systems, and therefore we have to discuss open systems at this point because with food we work with living things. An open system means that we have an input and an output and often a black box, i.e. something unknown, within the system itself. So let's start with the beginning of life in our black box.

At the start, everything is organised perfectly and we are healthy. Soon, however, the original order in our black box, in our open system is disrupted by a number of influences (e.g. bad diet and stress). And the bigger the potential for disruption gets, the harder the self-regulating mechanisms have to work to restore order. In order for us not to suffocate on the self-inflicted disorder, we have to excrete the disorder back into the environment (e.g. via excrement, urine, sweat, exhalation).
What is health, then? Health is perfect order. What is sickness? Sickness is a state of individual disorder.

What is death? An irreparable state of disorder.
How long can an organism therefore keep healing itself? As long as the internal regulation mechanisms still work properly. And to strenghen those, all this French doctor Doumoulin recommends is simple food and pure water. Simple food and pure water are therefore the two best natural remedies. The better the quality of the input, the better the ability of the regulation mechanism to restore order in the system quickly.

What really makes food the food of life?

We can look at an apple in two different ways. On the one hand it is a calorie store, but on the other hand also an eco-battery. If you stick two different types of metals into an apple, you can run a mini radio with the electrical energy that is produced. Therefore we are dealing with two systems within an apple, a chemical one and an electrical one. Let's transfer this insight to the human body. Our body too has a chemical component that can be analysed chemically. But it is also an electrical system that can be analysed electrochemically, which is illustrated by a look into a modern doctor's practice with its many electrical diagnostic apparatus. We cannot think a single thought, cannot have a heartbeat, cannot move a muscle without a triggering electrical impulse. The only question is: Have you ever looked at your food and your water from an electrical point of view? That's what we want to do now.

Primary and secondary ingredients

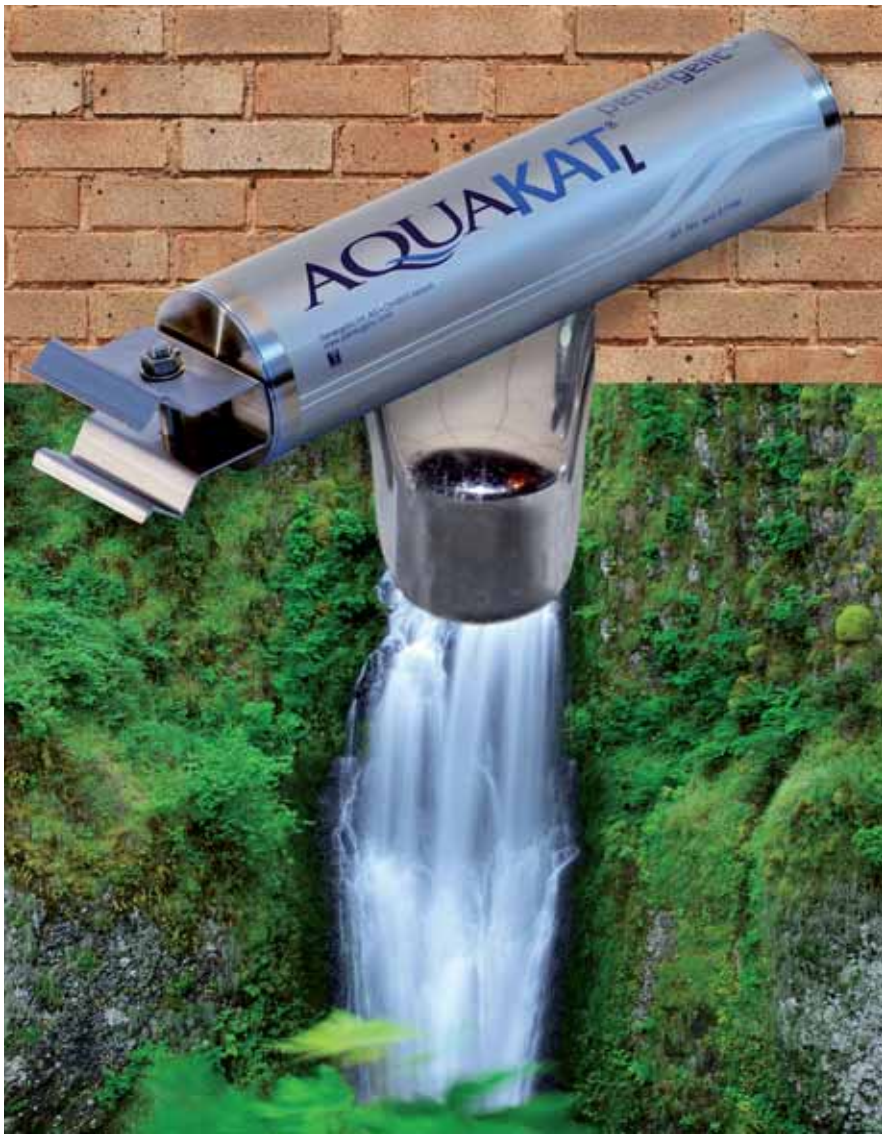
Everybody knows the integral components that make up our food: carbohydrates, fats, proteins etc. They are absolutely necessary to produce energy and warmth. We also have, and these have only been recognised recently, secondary or bioactive substances that play a crucial role in maintaining good health. For about the last 15 to 20 years we have been doing substan-

tial research into these substances. Even though they have always been in our food we never acknowledged them in the past. They are the colourings, the bitter principles and the flavouring substances in our food. We believe that there are approximately 100'000 of these substances in the world that are found in minute amounts. In Germany we estimate that we have about 250 to 280 of these substances in our food. However, from chemical analysis we only know 115 to 120 that have a chemical formula and that we can describe, for example, by their function within our bodies. Our popular sauerkraut, for example, contains 47 such substances. The only reason why sauerkraut is so beneficial for health is because 47 substances work together like cogwheels. It is not the quantity that is crucial but, and this is important, the optimal combination. You might ask: "does this have any physical foundation?" All of these substances have one thing in common. They are all major suppliers of electrons to our bodies. Therefore they have healing and helpful functions in nature. If we just look at the large group of polyphenols, for example, we will see that they have anti-carcinogenic, anti-microbiotic, anti-oxidative, anti-thrombotic, immune enhancing properties etc.

We are used to having a specialised medicine for every illness. With the bioactive substances in our food we have this medicine on our tables three times a day!

Bioactive substances as radical scavengers

Just how do these bioactive substances work? During ordinary daily metabolic processes and enhanced by our modern environment (exhaust fumes, residues in food, water pollution, stress etc.) so-called free radicals are formed in our bodies. These are chemical compounds that are lacking one or two electrons for saturation. They are free radicals, because these compounds want to electrically neutralise themselves again and in doing so tear away electrons from other intact compounds. But what are the consequences? These "electron robbers" leave in turn "electron gaps" in the intact compound and the process starts all over again. This causes a domino effect that only comes to an end once a compound with a large electron supply becomes available: i.e.our bioactive ingredients in food. Now the damaged cells for example can stock up sufficiently on electrons and the dangerous domino effect is stopped. This is a process that continuosly goes on in our bodies, with thousands of regulatory processes every second!
In this context we understand food as calorie supply on the one hand, but also as electron supply on the other hand.



If there is not sufficient good, electron-supplying food being made available to the body, specific illnesses are the result. They all have a common name "radical illnesses". Therefore it does not matter if we call them, for example, Alzheimer's, Parkinson's, impotence or allergy. They all have this common cause.

Food as electron supplier

Simple food has many electrons. An apple picked straight from the tree contains many times more electrons than a comparable amount of apple juice. For water, it is the same: mountain spring water that has not yet been exposed to a lot of pollution and many disruptive technical

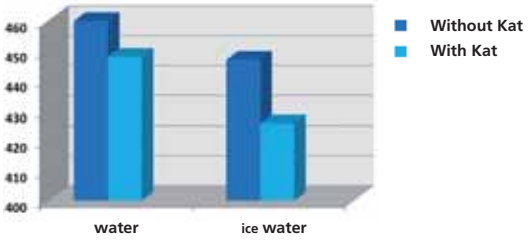
elements has a much higher integration value than water from the tap. As KOLLATH already said, in the 1930s:
"Food that has lost its reduction potential is dead".

What does that mean for us? Food that has lost its ability to pass on electrons is useless for the body in that regard. And now we can measure precisely that. Every housewife knows that whole grains contain a lot of mineral substances, vitamins and plenty of secondary or bioactive ingredients.
However, when we take away the husk during grinding, a lot of important substances in the bran are lost for our bodies and the flour is less valuable. If we now measure the grain with regard to its reduction potential we will find that the value for white flour is 400 mV (milli-Volts) and that for wholemeal flour is approximately 280 mV.
However, we have to take into consideration that the lower the measured values are, the higher the reduction capacity and the "gain of order" (as discussed later on) are.

What is the electrochemical significance of water for our health?
Each day we take in more or less health-beneficial electrons via our food, and exactly the same is true for water. The quality of water is a question of the availability of electrons and, in all likelihood, of the quality of information that is made available to the organism by the water. The electrochemical redox test does not just enable us to evaluate the electron supply for the neutralisation of free radicals, but also the ability to create order in the system, i.e. to calculate the "order gain". SCHRÖDINGER describes this situation as negative entropy gain. Every food and all types of water are qualified to a different degree to create order in our bodies.
We therefore have to fight a constant battle against disorder within our bodies.
And we will loose this battle more easily the worse the input for order into our bodies is via food and water.
At the moment there is a big dispute within scienctific circles as to whether water is also an information store and information system or not. For our considerations this is totally irrelevant. We are only looking at the provable effects of reduction capacity for the neutralisation of free radicals and the calculable "order gain" on the basis of a water analysis with and without the AquaKat.

Electrochemical tests for the AquaKat
The EQC laboratory received an AquaKat from Penergetic and firstly determined the redox potential in ordinary tap water and then in melted ice water.

The test results:



The AquaKat achieves a difference of 12 mV in redox voltage with ordinary drinking water. Since a difference of 18 mV theoretically doubles the redox capacity, the AquaKat achieves an improvement of 66 %. With ice water we already have an improved order structure resulting from the freezing process; the voltage is 447 mV, which is at the same level as the Kat-treated water. With a 21 mV difference after AquaKat treatment we have an improvement of 120 %. These are the numbers that we now use to calculate the negative entropy or "order gain" for the body of the person who drinks this water.
The "order gain" of water increases from 96 watt seconds/kelvin x mole to 100 Ws/K x mol and that of ice-water from 100 to 105 Ws/K x mol. These differences are significant, with an effect probability of 2,5 % for the water and 0,3 % for the ice water. These results can be reproduced at any time with a specialised meter that has no memory effect in its metal electrodes.
Via a long scientific digression about food quality we have now finally arrived at the AquaKat!

Healthier plants

Penergetic-p is used in the area of plant treatment, often in combination with Penergetic-k. Very small amounts are needed that are mostly mixed in with water and then applied. The majority of users state that Penergetic-p enables the plant to cope better with stressful situations.

- Better quality
- Lower costs
- Increased root growth

Field crops, grasses,
vegetables, trees, shrubs

Effect

- Increased yields
- Improved development of fine roots
- Need for pest control decreases
- Increased nutritional value of fodder plants
- High biological and energetic quality
- Reduction in fertilizer use (at least 20 % based on experience)

Application

- Agriculture
  200 g Penergetic-p per hectare
  Treatment: 20 g Penergetic-p per 100 kg of seeds
  Dry application (dusting, dressing): 1:10 premixed with powdered mineral, sand, saw dust etc.

- Home and Garden
  2 g Penergetic-p per 10 litres of irrigation water

Mycorrhiza

A special symbiosis between plant and root

Albert Ruchti,
CH-Oberuzwil

Albert Ruchti has known the Wilhelm family since 1983. His extensive knowledge of plants was a crucial factor in the development of Penergetic-p. He calls Penergetic the gentle force of energy that polarises opinions like no other technology before it. The effects of Penergetic are based on the laws of nature and always stimulate plant organisms (microbes) in their entirety. Any deficiency of certain trace elements, only determinable by lengthy tests, has its origin in a dysfunction and it has been shown that the use of Penergetic-p brings visible results.

For more than 100 years scientific research on mycorrhiza has been carried out and Dr. Heinrich Propfe was one of the pioneers of mycorrhiza application. He coined the phrase, "the more we understand about the nutrient supply of plants, the harder it actually becomes to fertilize appropriately according to need and environment. Some people tend to think that all we have to do is to supply the soil sufficiently with mineral nutrients and everything will grow splendidly." However, this is not the case. More parameters have to be considered to achieve an optimal use of nutrients. The biological activity of the soil is the best premise for good and healthy plant growth. To meet nutrient requirements, the roots of plants excrete an acid that then is able to make use of the existing stored liquid nutrients. The excretions originate from bacteria or the fauna-edaphon, which can be optimally converted in conjunction with Penergetic-p.
The presence of mycorrhiza at the same time offers an additional supply of plant nutrition through better fixation of nitrogen from the air. Especially higher plants (fruit and forest trees) are dependent on this extra supply.
Penergetic p is a plant tonic.
The carrier material of Penergetic-p Montmorillonite (or bentonite) positively influences water metabolism, absorption and nutrient content in the soil. Furthermore, the combination of Penergetic-p frequencies and bentonite increases the ion-exchange capacity.
When Penergetic-p is added to compost dung or manure, it holds in the liquid nutrient and makes it available to the plants for their growth. In addition, mycorrhiza have a special plant-hygienising effect and the soil is opened up following the application.
This gives the oxygen access to to

Mycorrhiza facts

Mykes = fungus and rhiza = root

Mycorrhiza (definition according to Allen 1991)

Mutualistic symbiosis between a higher plant and a fungus located in a root or root-like structure in which energy or organic substances flow from plant to fungus and anorganic substances flow from fungus to plant. Mycorrhiza is a widespread symbiosis of fungi and plant roots. The symbiosis supported the plant as long as 410 million years ago in conquering dry land. Today approximately 80 % of all plants benefit from the coexistence of various fungi in their roots.

Compared to plants, the mycorrhiza fungi have a significantly higher ability to remove mineral substances and water from the soil. Often the water, nitrogen and phosphate supply of the "infected" plants is improved; furthermore mycorrhisation offers a certain protection against root pathogens and generally increases the drought resistance of the plants, which can be of advantage especially in extreme environments.

Ectomycorrhiza (fungi of the forest)

Fine root of a higher plant that is is connected to a so-called ectotrophic mycorrhiza forming fungus. Exclusively found in ligneous plants (especially forest trees). Morphological and anatomic characteristics:

- no root hair
- thickening of short-root
- fungus coat wrapped around fine roots
- so-called Hartig net (inter-cellular in-growing of the fungus into the root)

the root system and this can have healing effects: protection from diseases, formation of aromatic compounds (e.g. sugar), etc. and this leads to ever increasing yields. Conclusion: All you need is air and Penergetic-p!

Approximately 130 million years ago, during the Cretaceous, when dinosaurs experienced their last period of glory, coniferous trees conquered vast areas of the earth's surface. These forests presented the common mycorrhiza forms with a problem: the fungi were no longer able to break down the organic waste or litter and make it available to the plants.

This problem was addressed via the development of the ectomycorrhiza – a group of fungi that develops a symbiotic relationship with a plant forming a sheath around the plant's root tip. The fungus then forms a Hartig Net, which means that there is an inward growth of hyphae (fungal cell growth form) which penetrates the plant root structure and makes the exchange of nutrients between fungus and plant easier. The fungus gains carbon and other essential organic substances from the plant and in return helps the plant take up water, mineral salts and metabolites. It can also fight off parasites, predators such as

Other mycorrhiza forms
Morphology, classification, identification

Endomycorrhizae	Fungus partner
VA-mycorrhizae (VAM) Mostly in year-old plants, agricultural crops	Endogonales (Glomus)
Mycorrhizae of ericales - Ericoid - Arbutoid - Monotropoid	Ascomycetes (Pezizella ericae) Basidomycetes / Ascomycetes Basidomycetes / Discomycetes
Mycorrhizae of orchids Partly fungus species that are known as pathogens in other plant species	Basidomycetes (Armilleria mellea, Rhizoctonia sp.)
Ectendomycorrhizae Widespread in conifer seedlings in the plant garden	E-strain fungi (Ascomycetes, Pezizales)

Of the approximately 120'000 species of fungi known today (there are probably significantly more), about 5'000 are known as mycorrhiza fungi. Of those, approximately 50 species are endo- or ectendomycorrhiza; the remaining majority are ectomycorrhiza.

nematodes and soil pathogens.
The mycorrhiza form is typical of trees from the birch, beech, pine, willow and rose families.
In the face of the large number of mycorrhiza forming fungi and host plants (approx. 200'000), we can also expect a large morphological diversity in appearance. Only rarely can ectomycorrhiza be identified, i.e. classified as belonging to a particular fungus type. Therefore we speak of mycorrhiza types (= manifestations defined according to differentiating morphological and anatomical characteristics).

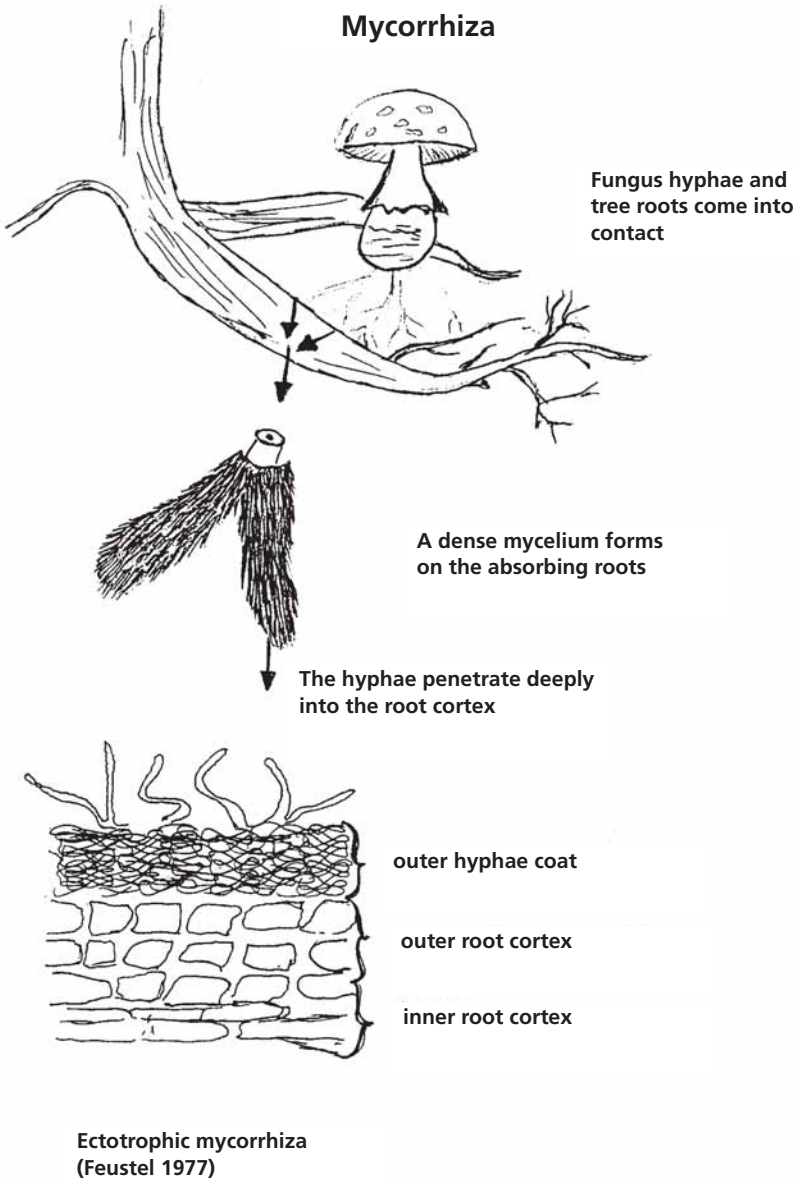
Nourishment of mycorrhiza fungi

A fundamental precondition for the materialisation of a mycorrhiza is C*-heterotrophy, i.e. the inability to produce certain vital C-containing substances and therefore a dependence on external C-sources.
Mycorrhiza fungi are different from other C-heterotrophic fungi in that they:
- are always biotrophic (in contrast to saprobe fungi)
- live in a mutualistic, symbiotic relationship (in contrast to parasitic fungi)

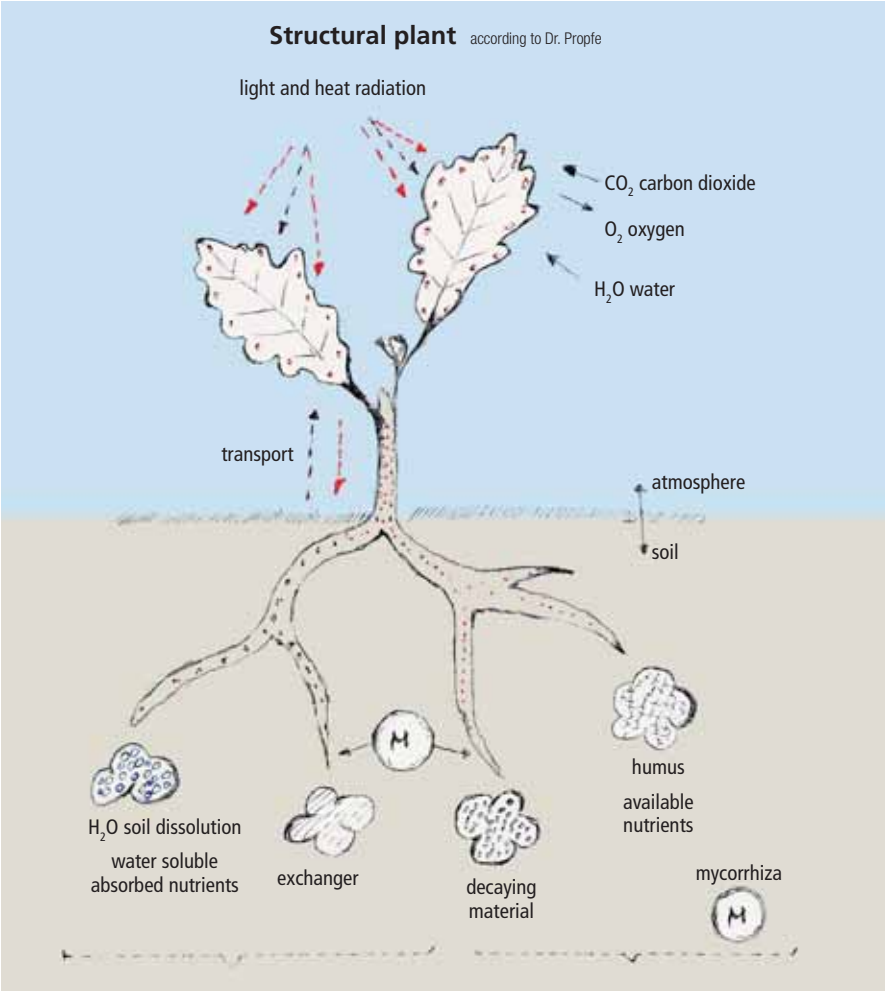
Effect of the mycorrhiza on the tree

- improved water and nutrient absorption
- increased absorption capacity of the root system through a better spatial accessibility of the soil sub strate by the fungus mycelium

* C = Carbon



Ectotrophic mycorrhiza
(Feustel 1977)



Terminology

- biotroph = organisms that feed on living plant or animal substances
- saprobe fungi = so-called "decay eaters" (from greek for decayed, rotten)
- cell organelles = "the organs of the cell"
- vacuole = cell organelles, specialised "cell organs"
- Hartig net = part of the fungus cell's external skin (cell membrane)
- rhizomorphs = roots of a fungus
- rhizosphere = rooting zone
- root exudate = root liquid, root excretions
- antagonistic = hostile (antagonist = opponent, „enemy")
- tannins – tanning agents
- phenolic substances = slightly acidic substances

- storage of phosphates (especially in vacuoles of fungus coat and Hartig net)
- possibility of nutrient transport and exchange from plant to plant via mycelium/rhizomorph.

Phytosanitary significance

- excretion of antibiotic substances by the fungus
- stimulation of antagonistic microflora in the rhizosphere by root exudations
- formation of tannins and phenolic substances in the root induced by mycorrhiza fungus.

Growth substance production

- growth substances produced by the fungus stimulate the growth of the host plant
- increase of plant's tolerance against pollutants, especially heavy metals
- filter effect by deposit of certain heavy metals in fungal tissue.

Occurrence of mycorrhiza

Mycorrhiza occur anywhere in the world. Ligneous plants in temperate zones are mostly associated with ectomycorrhiza fungi; in the tropics mostly with endomycorrhiza fungi (VAM). Practically all higher plants (approx. 98 % of all known plant species) form mycorrhiza in one form or another. Only very few plant families have species in which mycorrhiza cannot be detected (e.g. some nettle species, malvaceous plants, tropical grasses, etc.)

Host specificity

- Endomycorrhiza
  Few fungus species with a very wide host spectrum and a narrow host specificity, occurrence in approximately 95 % of all known mycotrophic plant species.
- Ectomycorrhiza
  Many fungus species with narrow host spectrum and sometimes distinct host specificity; only on certain ligneous plants of the Pinaceae, Fagaceae, Salicaceae, Betualceae families; rarely on Leguminosae and Rosacaeae (in the tropics in particular on Myrta ceae, Dipterocarpaceae) and others.

Many ectomycorrhiza fungi also show specificity in regard to the physiological age of the host plant (so-called early-stage/late-stage-fungi). This leads to typical successions of mycorrhiza fungus species during the growth of a tree.

How does a plant feed?

At the beginning of germination, the seed feeds from its own nutrients, which are stored within it. The seed-bearing plant is sub-divided into root system and sprouting organs. The root system serves the purpose of holding the plant in the ground and of water and nutrient absorption. The plant is composed of the chemical elements (including carbon, hydrogen, oxygen, nitrogen, phosphorus, magnesium and iron). Trace elements can be effective even

in small quantities (Penergetic-p is a particularly good carrier for them). A number of plants, e.g. Leguminosae, are able to assimilate their nutrition (atmospheric nitrogen) and utilise it. Penergetic-p is especially adept at opening the soil tilth and thereby gives increased access to atmospheric nitrogen. This stimulates the soil organisms that move in the continuous cycle of recirculation. Soil loosening by mechanical tillage still has its value. Many trials have shown this.

Soil communities / plant communities

The different environmental conditions are so varied that they can only be partially illustrated.

Organisation and biology of weeds

Biologically, weeds often grow in land dedicated primarily for crop production. Economically, the presence of weeds in a farm field is viewed as undesirable and perceived as the potential source of economic loss. Yet, the question can be asked:

"Do weeds provide some benefits to an agricultural crop (or the soil)?"
A decision concerning weed control and the method used is primarily dependent on extent of the infestation, type of species, their characteristics (including reproduction), weed control options available and cost.

Weeds persist because of their hardiness which has enabled them to thrive. Some produce thousands of seeds, they are easily distributed (by wind, water, animals and people) and many weed seeds have a dormancy

1. The following cases may occur:

1.1 Weeds may become crop plants
Known examples for this are rye, oat, buckwheat, mustard and some vetch species. Also ruderals such as hemp, beets and poppy, that followed humans and spread around the earth with them, have become crop plants.

Bristle-pointed oat

1.2 A former crop plant is degraded to weed. A good example for this is bristle-pointed oat that is still cultivated in its country of origin (the Iberian Peninsula). From there it spread to the light mountain soils of Europe and is today classified as a weed.

1.3 One and the same plant species is simultaneously weed and crop plant depending on the variety.
Some examples are white sweet clover, white mustard, hairy vetch, lamb's lettuce, corn spurry, chicory, wild carrot, common parsnip.

1.4 Undesirable foreign crop plants also have to be classified as weeds, e.g. barley in wheat, oat in rye, winter barley in rye or hairy vetch and horseradish from previous cultivation.

1.5 Environmental influences might also determine if a plant becomes crop plant or weed. There are many cases of plants that might not be regarded as crop plants but as useful plants. This is because they have a certain occasional or permanent use, which is mostly offset by the damage that they do.

2. Potential uses

2.1 Medicinal plants: camomile, coltsfoot, ribwort, horsetail, mistletoe

2.2 Tea: mint, camomile, blackberry, couch grass

2.3 Spices: mugwort, black cumin

2.4 For a multitude of technical purposes:
nettle, common heather, common broom, molinia, rushes

2.5 As an emergency foodstuff: nettle, orache, dandelion, wild pea, sorrel-species

2.6 Economically: animal feed, bee pasture, fuel, green manuring

Common broom

The dividing line between weeds and crop plants or useful plants is not clear-cut.

characteristic which enables them to live for years awaiting suitable conditions to germinate.

Despite their bad reputation, weeds do serve several useful functions and can be indicators of environment deficiencies. Consequently, in many respects they act much like the infamous "canary in the coal mine" able to foretell of potential problems.

Beneficial aspects of weeds include their ability to anchor soil and limit erosion, aeration the soil (through their deep roots), provide habitat for wildlife and when they die and decompose weeds add to the humus and nutrient content of the soil. Also, depending on the type of weeds present in a field, they can provide signals about the soil's condition, such as: a lack of nutrients (i.e. nitrogen), too much or too little moisture and soil acidity or alkalinity. While the identification of specific weed species in different regions of the globe is beyond the scope of this article (or book), learning to recognize the "indicator characteristics" of weeds in your area can make any gardener or farmer more cognizant of how to improve soil conditions.

One thing is certain, by helping to create healthier plants Penergetic p can play a role in weed control by helping to create healthy, more vigorous plants better able to compete against weed species.

Seedling weeds

Seedling weeds reproduce exclusively through seeds. This include:

annual, winter annual or biennial plant species. They are able to spread extremely widely through great amounts of seeds, some of which are very resistant.

After the germination stage we have to differentiate between:
a. autumn and spring germinating plants:
cornflower, field poppy, wind grass, field larkspur, cleavers, speedwell, pansy, ragwort
b. spring germinating plants:
field mustard, wild radish, wild oat, corn marigold, knotgrass-species
c. scrab-grasses, white goose-foot, sheep sorrel, gallant soldier.
However, the properties are not the same under all circumstances, but depend more or less on the state of maturity of the seeds, on the weather during maturing, on winter frosts and other factors.

Rhizomatous weeds

These are wrongly called rootstock weeds, reproducing from seeds as well as rootstocks (rhizomes) and are therefore perennial or remontant.

Depending on the depth of their rootstocks we have to distinguish between
a. shallow-rooting: common couch, Yorkshire fog, common yarrow, goose tansy, field mint
b. deep-rooting: field bindweed, creeping thistle, common horse-tail, bulbous chickling vetch, rose bay

Further subgroups to be mentioned are
a. weeds with rootstocks, such as plantain species, sorrel species, dandelion
b. bulbs: leek and star-of-Bethlehem species, meadow saffron, crocus

The weeds are subdivided into the following groups according to their nutrition:
a. non-parasitic plants
These are plants that build their substance from mineral salts in the soil and carbon dioxide (CO_2) from the air.
b. semiparasitic plants
Plants that assimilate the carbon dioxide from the air normally, but extract the mineral salts and the water from the vessels of their host plants. The roots of semiparasites are therefore partly remodelled into sucking organs. Cow wheat, rattle species, lousewort, euphrasy species all belong to this category.

Weeds as indicators for various soil substances

Nitrogen indicators

Chickweeds, water-grass, petty spurge, Dog's mercury
a. annual or perennial nitrogen indicators such as dandelion, plantain, yarrow, white clover, rye-grass, red clover, prunella, carrot, common couch grass
b. seedling weeds
corn-cockle, field brome, rye brome, bearded darnel, hardy rye-grass, Lainlolch, Venus's-looking-glass

Stagnant moisture indicators

1. Almost exclusively on sometimes waterlogged or wet, badly aereated soils: buttercup species
2. Predominantly common on meagre soil, but also grow on better soil, for example the field sowthistle group
3. Predominantly on soils that are well aereated but supplied with plenty of water: veronica species, fumitory, purple dead-nettle, field forget-me-not
4. Predominantly on soil that is loose, never waterlogged, but not very dried out either: larkspur, adonis, night-flowering campion, hairy finger grass
5. Predominantly on soil that is loose, porous, sometimes dried out: Venus's-looking-glass, heron's bill, sickleweed
6. Indifferent species such as corn-flower, couch grass, shepherd's-purse, black bindweed

Lime indicators
Wild pea, hemp-nettle, bugle, hare's-ear mustard, sickleweed, knapweed, sweet clover, spurge, poppy family, speedwell, dead-nettle, bindweed, sowthistle, corn buttercup

Acid indicators
Camomile, Lady's mantle, meadow grass, four-seed vetch, corn-spurrey, sorrel, Yorkshire fog, pansy


purple dead-nettle


Yorkshire fog


meadow saffron

Higher yields for cotton

Instead of 1719 kg/ha, Penergetic achieved 2340 kg/ha

MISEREOR**-partner organisations published studies in India that prove that the cultivation of genetically modified cotton, so called Bt-cotton, has negative consequences for farmers. Contrary to positive statements on the part of the industry, the new studies now prove that the farmers had to suffer great financial losses by cultivating Bt-cotton. The cotton fibres are too short and therefore their market value is lower, the plants got re-infested with cotton bollworm after a short time which for the farmers meant double costs for expensive seeds and pesticides as well as yield losses.
In Andhra Pradesh, farmers who grew conventional cotton made an average profit of 5'368 rs/ha, while those who grew genetically modified cotton made a loss of 1'295 rs/ha.
During the same period, the Research Institute for Cotton and Cotton Fibre-containing Plants in Tay Nguyen, Vietnam, carried out an extremely interesting trial with Penergetic-p. Engineer Nguyen Van To wanted to find out which influences the Penergetic agent would have on the resistance of cotton plants to diseases and on the yield of the winter-spring crop in the Gia Lai province.
This trial, carried out according to best scientific practice, was carried out and observed meticulously, with a significant time and personnel investment. Fertilizers are an important factor in the yield of the cotton plant. Engineer Nguyen explains:

"Apart from elements such as nitrogen, phosphorous and potassium, the cotton plant requires a multitude of other minerals to produce the enzymes that play an important role in nutrients absorption.
To establish the effects of Penergetic-p, trials were carried out in the dry season of 2002 with the aim of establishing the influence on the whole growth process and the yield for the winter-spring crop, as well as on the resistance of the cotton plant against diseases and insect infestation."

Trial location

The trial was started on 25.11.2001 in the Phu Can municipality, Krong pa district, Gia Lai province on a trial plot of 500 m².

Trial variations

Variant 1: Two times 800 g Penergetic-p, mixed with other fertilizers.

**MISEREOR: One of the largest relief organisations for the third world, founded in 1954 in Germany, has so far supported projects with more than 5.4 billion Euro in countries of the Third World. *1 quintal = 100 kg

Variant 2: Penergetic-p is mixed with water and an equal amount as in the first variant is sprayed onto the fields at the same time
Variant 3: Control field, farmed using habitual methods and conventional fertilizers

Seed variety: VN01-6 variety (good resistance against diseases and insect infestation)

Measured variables

The plant height is measured 90 and 120 days after planting.
Growing period until 50 % of the plants bear their first fruits.
Number of insects (insects or worms per 100 plants) that damage plants externally. Number of insects (insects per 100 leaves) that damage plants internally.
Percentage of diseased or insect-infestated plants.

Results
The cultivation methods were applied according to the regulations of the local branch of the institute in the Gia Lai province. During the entire trial period five sprayings with plant protectants were carried out, one immediately after planting and a further four until harvest.

Influence of environmental conditions on the behaviour of pests
The weather conditions for the winter-spring crop 2002 were not ideal. There was hardly any precipitation which effected the growth and reproduction of pests in the cotton plantation.

Pests
So-called "green beetles" were found in all three fields in more or less equal numbers. Here, we can say that there was a relatively low density of green beetles. A bug, which had a damaging effect mainly on the blossoms, was also observed in all observation periods. Even though the number of insect eggs is relatively high in all observation periods, the number of insects is low. This is proof of good resistance of the seed variety against diseases and insect infestation.
The average number of green beetles

and green beetle eggs is also similar to the statistics in all three variants.

Influence of trial parameters on growth and development of the cotton plant

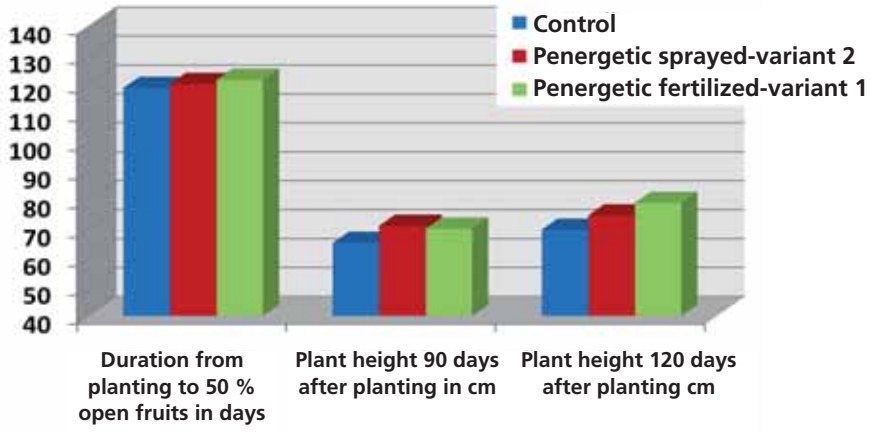
We learn from the table that timing of infestation readiness - in both variants fertilized and sprayed with Penergetic-p - is the same. In variant 1, sprayed with Penergetic-p, the period of readiness is longest (121,6 days), much longer than with the control group (118,8 days). This variance has statistical significance. The height of the plant 90 and 120 days after planting is greater in both trial variants than in the control field. The results of table 2 show that the number of fruits per plant is 7,85 (highest value) for variant 1 and 6,77 (lowest value) for the control field. This difference has statistical importance. Also with regard to the index of theoretical yield versus number of fruits per m² similar results were achieved.

As far as the actual yield for our trial is concerned, the yield for variant 1 was highest (2,23 tons/ha). Table 3 clearly shows the efficiency of Penergetic-p application.

Variant 1 proves to be the most effective (7'754.- VND*/ha), which is 2'910.- VND/ha more than for the control group. Variant 2 also

Table 1

Growth development is much better for both Penergetic-variants (fertilized and sprayed) than for the control group.



performed better than the control group. Engineer Nguyen concludes that "With Penergetic-p (fertilized) it is possible to extend the period of fruit growing, which increases the number of fruits per plant and the actual yield. By using Penergetic-p, the highest economical efficiency is achieved."

(*VND = Vietnamese currency)

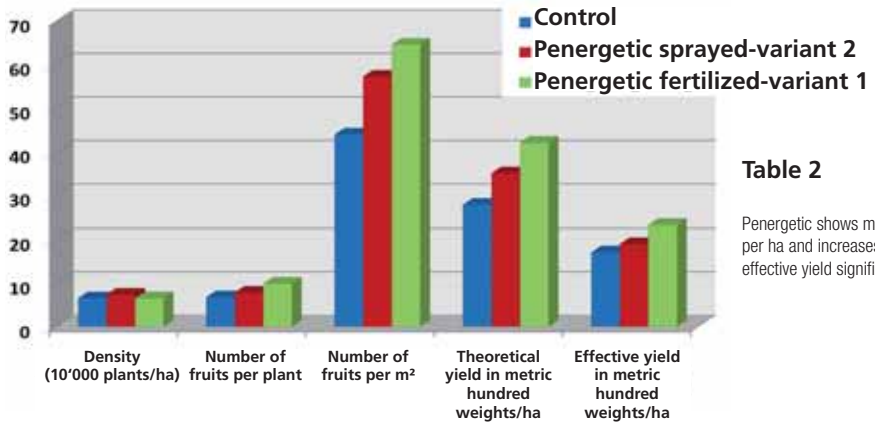


Table 2

Penergetic shows most fruit per ha and increases the effective yield significantly

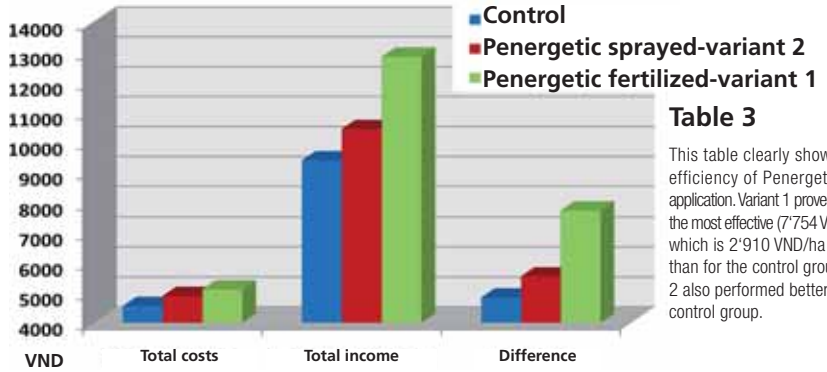


Table 3

This table clearly shows the efficiency of Penergetic-p application. Variant 1 proves to be the most effective (7'754 VND*/ha), which is 2'910 VND/ha more than for the control group. Variant 2 also performed better than the control group.

Soil – root – plant

All eyes are on the soil

Kurt Henauer uses Penergetic treated compost

It is quite obvious that Kurt Henauer loves to grow plants. He very willingly shows us his neat farm and talks passionately about his growing methods. All his attention is on the soil. A good fruit needs a good plant and this in turn can only grow when everything is well in the soil, he explains.
His starting point is the compost. He achieved excellent results by mixing Penergetic-k into his compost, which he then spread on his orchard before the growth period.
The region around Lake Constance is in particular danger from fire blight because of its many orchards. Every producer does the utmost to protect their crop from the constant threat. Here too the Henauers took early action. If the plant is able to get sufficient nutrients and the necessary substances for its health from the soil, it is to a large extent immune against diseases. We walk along several rows of carefully planted fruit trees. Henauer states that, thankfully, he only very rarely, if at all, has to treat a small infestation of fire blight. He shows us such a spot, which is the only one with an infestation of just approximately seven leaves within a radius of more than 100 metres.
Listening to Henauer explaining the cultivation of the soil reminds me of the old fairy tale of the wine-grower who, on his deathbed, told his three sons that he had buried treasure in his vineyard. After their father's passing, the sons dug in the vineyard for weeks without success. At harvest-time, they got a big surprise: they found twice as many grapes as usual in their baskets!

Infestation with woolly aphids or American blight

Fire blight

Kurt Henauer checking trees in his plantation

"The soil has to be looked after and hoed, of course." But Kurt Henauer thinks that the Penergtic compost agent works in the soil in a manner that is similarly effective to the work which the sons of the wise wine-grower caried out in their vineyard."The organisms in the soil are stimulated and convert the important minerals to make them available to the plants. In this way the plant absorbs more nutrients from the soil." Mr. Henauer approach is basically to use the compost mainly to compensate for extreme environmental conditions. This means that soil improvement through compost has a balancing effect during drought periods but also during periods of excessive rainfall.
But a second effect was also noticed: During autumn and early winter he applies compost mixed with Penergetic-p and -k directly onto the leaves that are lying on the ground. With this he find he achieves a quicker conversion and the entire soil life is activated. We can also safely say that because of this, fewer mildew spores occur.
All in all, mildew is a common fungal disease with conventional cultivation methods as well as with organic ones.
While in conventional growing mildew can be tackled with a number of fungicidal sprays, in organic cultivation thes are not permitted. Therefor the basic principle is to keep the plant as healthy as possible from the start.

Protective hedges offer shelter for birds and other animals

In the greater Romanshorn area Mr. Henauer processes approximately 1’600 tons of compost from green matter annually. Of this, about three hundred tons are further processed separately by adding humus and Penergetic-k. In Switzerland farmers are not allowed to exceed 25 tons of compost per hectare annually. This precautionary measure was put in place mainly to avoid heavy metals pollution. However, there is a very low incidence of these in green matter anyway. It would be more difficult with sludge, but they do not use any.

With his wine cultivation by conventional methods, Kurt Henauer stands out from the bland majority by growing a few varieties with a great variety in taste.
The application of Penergetic-p results in healthier plants with reflects in higher quality produce.

Grapes in Thailand

Quality results in better selling price

In Thailand, table grapes did not just show significantly better growth where size and colour were clearly distinguishable from the control group, but also a much higher yield. Due to the better quality of the Penergetic grapes, a much higher price could be achieved on the market.

Grapes	Production	Price/kg USD
Control group	6,0 tons/ha	0,625
Penergetic group	7,5 tons/ha	0,750

Temptation on a stem

The finest cherries and pears

Sager's cherries are famous as far away as Japan.

August Sager has been making a name for himself over the years with his high quality cherry cultivation. Tanned and with white hair, he stands in the midst of his magnificent cherry trees. People say that the best of the cherries sell for one Swiss Franc a piece in Japan. I do not know if that is true, but one thing I am certain of: I have never held such big, magnificent looking cherries in my hands in all my life – not to mention their sweet flavour.

So, August Sager quite obviously knows his trade! His attention is also very much on the soil and the compost mixed with Penergetic-p. It is used to fertilize the plants. In addition, he uses a so-called wheel sprayer from England.

It is used to roll along the rows and spray Penergetic-k exactly where it is needed, at the root area. To grow cherries it is not enough to have the required knowledge; one also needs to install an indispensible netting and tarpaulin system to protect the fruit from birds, rain, hail, excessive sun and also wind. The bigger the cherries grow, the thinner their skin gets. They can easily burst and the aim is to prevent that. Right beside his cherry plantation, August Sager has a one and a half hectare pear orchard.
For pears on average the fruit yield is 35'000 kg per hectare in Switzerland. August Sager achieves on average 50'000 kg per hectare. With each spraying he uses 200 g of Penergetic in 280 litres of water per hectare. He is also convinced that a good soil with enough soil life is the right prerequisite to stem the spread of the dangerous fire blight. When he aqcuired some extra land a few years ago, he found out that plant stock that had not been treated according to his knowledge was significantly more infested with fire blight.

Growing pears is another complex topic; it starts with the cut. Long shoots are to be avoided because they draw out the much-needed water and the calcium contained therein from the fruit. This means: the fewer long shoots the better the fruit. In the rows, the trees are bound in such a way that the sunlight reaches the entire area of fruit-laden shoots wherever possible. Sager is also convinced that standard commercial fertilizers might be cheap, but that they are very concentrated and cannot be easily absorbed by the plants.
What would be important are amino acids that improve the plant's ability to absorb nutrients.

August Sager carried out a series of tests using Penergetic products. For example he did tests on mulching. He used grass mowings for mulching: ten rows unsprayed for control purposes and ten rows sprayed with Penergetic-k. The clear result he observed was that the Penergetic-k mulch rotted considerably faster.

Picturebook pears. While for the whole of Switzerland the yield is on average 35 t/ha, August Sager's plantation achieves on average 50 t/ha.

Golf course, Uruguay

A particularly successful trial took place on the golf course of the Sheraton Hotel in Montevideo. To separate the test area on the large golf course clearly from the control area, high walls were erected and a mixture of 2g Penergetic-p per 10 litres of water was sprayed onto the lawn within them. This allowed for a clear distinction between the treated and untreated areas. The result is astonishingly clear. The Penergetic area clearly showed improved growth even under stressful conditions (in this case drought) and therefore an optimal green, which should be the calling card of every golf course.

Thinking in terms of cycles

How to juggle children, working on the farm, living with animals and modern ice cream production

Mrs Pia Braun

Mrs Braun lives with her family on an idyllic farm in the Swiss mountains.
Natural methods have been an important concept for years in domestic life as well as in farming. Thus she came to use Penergetic early on and started at first by treating liquid manure. Smiling and with great gestures she explains her philosophy, which is thinking in terms of cycles: "You see, slurry is applied onto the fields and meadows. There are fewer burns, the soil organisms work better and we would be perfectly right to say that a certain energy comes back to the animals through the grass. They benefit from the effects of Penergetic in three ways: through the grass, through Penergetic-t mixed into the feed and through several AquaKats that ensure that humans and animals alike drink tasty and energised water."
She uses the milk that results from this treatment to produce a fantastic ice cream.
Fruity ice cream, produced on a farm, is not really a rarity anymore in Switzerland. Besides seeing logic in the biological cycle, Mrs Braun, established, that she can make childeren and passing hikers happy with her sumpuous ice cream. Available in 32 varieties directly at the farm. The ice cream is carefully stored in large chest freezers and

freezing cabinets in the production room. It is obvious that Mrs Braun is in her element among the production devices of her own ice cream factory. Everything is as cleanly organised as in a laboratory: there are shiny silver stirrers, big metal bowls and cooling devices. In short, everything the heart desires to make an excellent ice cream from the farm's own milk. Proudly she explains to us the great variety of fruit that also mostly originate from the farm or from the local area. If you are ever near Gibswil, you should call into Dorf-strasse 5 and enjoy Mrs Braun delightful ice cream. Feel free to pass on this insider tip!

Tea plants – yield improved by 18 %

Vietnam, formerly a part of the French colony Indochina, looks back on a long tradition of tea cultivation. Because of the turmoils of war, the consequences of which have put a heavy burden on the country for the past 50 years, a once prosperous Vietnam was turned into a poor country. Since the early 1980s, the impoverished situation has been stabilised and the re-cultivation of the traditional growing regions has begun. The north of the country can look back on a traditional, more than 800 year old, tea culture, based on classic green tea varieties. At the old Imperial court of Annam (old name for Vietnam), tea was consumed a long time before the French arrived. The tea gardens where the Imperial tea was cultivated were located in the mountainous regions behind Hanoi. The most famous of those imperial green teas was one by the name of Thai Nguyen - its gardens were one of the treasures of of this once prosperous country. The beautifully shaped, dark green leaves are reminiscent of fine Chinese tea, the scent is that of vegetables, and the cup glows in a pleasant yellow-green. After the Vietnam War, a large-scale recultivation operation of the old fields revived Thai Nguyen.

It goes without saying that after the devastating effects from the us of Agent Orange and other chemicals during the war, the authorities in the region are very sensitive towards chemical protection methods. Therefore it was easy to see why the Office of Pest Control of this historical tea-growing region had great interest in a trial with Penergetic products. The local Thaison Company carried out this very interesting test under the supervision of the Office of Pest Control. In April 2002 the aim was to find out which effects Penergetic-p had on an area of 360 m² of normal tea cultivation as well as on a 250 m² area for the production of cuttings. The entire development, yield and quality of the green tea were observed and analysed. Penergetic-p was applied at a ratio of 25 g in 10 l of water on an area of 250 m² for all cultivation variants. For the cutting production trial, an area that had been planted 80 days before the start of the trial was used. During that time new roots and side shoots had already developed. The observation results were chronologically recorded in 10-day intervals and the following meticulous method shows precisely:

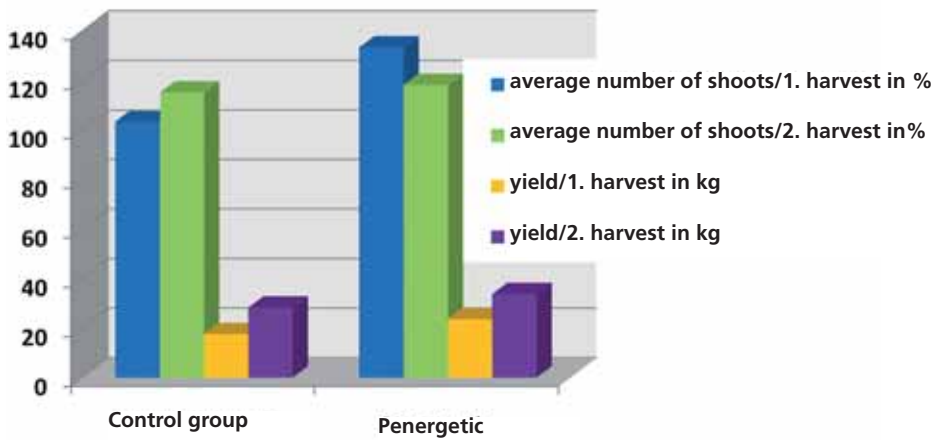
1. Density of young shoots
Counting was carried out using a frame measuring 40 x 50 cm. This was placed on top of the tea shrub and all shoots (leaf buds) within this frame were counted. The small shoots, which have at least one full young leaf, are counted as leaf buds. In each variant the number of shoots was determined with the frame at 5 places and then the average was calculated.

2. Length of leaf buds (in cm)
The length of the 5 longest shoots at a minimum of 5 places within each frame was determined and then the average length was calculated.

3. Yield
(kg per 10 m length of the test plot)
5 places on the test area were selected at random. At each place selected, all shoots on a length of 2 m of the tea bed were plucked. These were then weighed to determine the yield.

4. Quality of the shoots
The number of shoots was counted from 100 grammes of tea leaves. The percentage of first quality is determined from this. The tip-bend shoots and the first to second following leaf belong to the first quality category. These leaves must be soft and have a healthy, green colour.

5. Observation
The effect of Penergetic-p in particular on the behaviour of diseases and insects was to be determined. The behaviour and development of green beetles and spiders, which



are known to be natural enemies of insects that cause damage to the tea shrub, was observed. Again a special method was employed to determine the exact number of those beneficial species. The pests (beetles) per shoot were collected from five different, randomly selected, places, counted and then the average was determined. The same method was used to determine the number of red spiders.

6. Production of cuttings
For the production of cuttings tea plants were planted in bunches. The number and length of roots of those bunches was determined. To do this, bunches at five randomly selected places were cleaned of soil.
The roots were counted and their length was measured, then the average number and length were calculated.

7. Of the selected bunches the average plant length was also measured and recorded.

Result: The effect of Penergetic-p on growth, development, yield and quality of green tea.

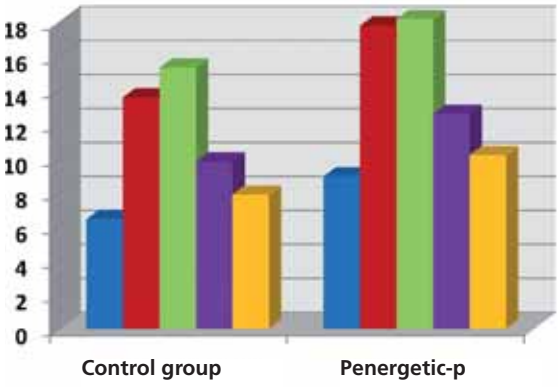
1. The number of new shoots increased on the Penergetic plots by 33,3 % more than on the control field.

2. The shoots on the test field were 34,42 % longer than those on the control field.

3. The yield on the test plot was 19,8 % higher than that on the control field.

After two months with 6 rounds of observations a number of 8,5 new roots per bunch could be determined for the test field, while only 6,03 could be counted for the control areas. With regard to the length of the new roots clear differences could be noticed: 17,9 cm on the test field compared to a mere 14,8 cm on the control field. There were also clear differences with regard to bud length: after two months, the average length for the test field was 12,2 cm compared to 9,48 cm on the control field. During the same period the plant grew on average by 9,8 cm on the test plot, whereas the ones on the control field only gained 7,4 cm in height. For the leaf buds the following values can be noted: within 10 days the shoot grows by 1,64 cm in the test field compared to only 1,26 cm in the control field. It has to be concluded that Penergetic-p, during the trial applied in a water mix, has a very good effect on the entire development of the plant. This is true for the tea in the crop area as well as in plant production. The average yield increase was 19,8 %.

Luu Quang Tuan
Head of the Technology Department.



- number of roots per bunch in February (pieces)
- number of roots per bunch in April (pieces)
- root length (cm) yield/1. harvest in kg
- shoot length after 2 months (cm)
- plant height after 2 months (cm)

Brazil

Land of opportunity

Ma Shou Tao, founder of one of the most aspiring agricultural enterprises in Brazil.

The story of Ma Shou Tao reads like a modern adventure story. Born in China, he emigrated from Hong Kong to Brazil in 1958. At first he worked for two years as a business economist in Sao Paulo until he found an area of a incredible natural beauty on a journey to the deepest South. He recognised then that this fertile piece of land was destined to become a farm. Even though he did not know anything about agriculture, he bought a big piece of land and started to grow soy. The first attempts were so promising that with great willpower he developed a model farm for soy cultivation in the town of Karsaio, located in the utmost south of Brazil. **This was the beginning of Brazilian soy!**

During the 1960s he refined his soy cultivation technique and produced seeds of such a high quality that customers travelled from as far as Sao Paulo to buy them. In 1973 he was offered a very big farm in Conquista, near Uberaba in the federal state of Minas Gerais. Again, having, by now, become an expert farmer, could see that this land had very fertile soil and bought the 1'700 hectares farm outright. The name of the farm meant "good luck". He renamed it "Boa Fé" which means "good faith", because Ma Shou Tao is a deeply religious man living according to Christian principles. Within two years he managed to cultivating soy on the entire farm. Today, he works many thousands of hectares of land and has 80 employees on his own six farms. In the last years he leases another 3'500 hectares of land. In a factory Ma Shou Tao produces bakery products and biscuits from the soy. On a constant search for new technologies that could be used on the model farm, the agricultural engineers of the Ma Shou Tao Group heard about Penergetic. Because Ma Shou Tao thought very favourably of biological agents, he started a comprehensive test programme with Penergetic products on large crop areas in 2000.
It is no coincidence that he has won 1st prize (agricultural prize) of Brazil several times.

Large trial fields (16 ha) for the agricultural fair on the territory of the Boa Fé farm

Trials – Penergetic in practice

In Brazil corn and soy have been cultivated for years with a permanently upward trend. Naturally, the infamous GMO*-corn has arrived here too. Here, the demand dictates clearly what is being produced. It is therefore all the more welcome that the Ma Shou Tao company, in spite of the enormous demand for resistant genetically modified plants, still cultivates around half their crop by conventional methods without any genetic manipulation. In a large annual trade fair in Brazil, many internationally renowned companies present their newest accomplishments. In an area of approximately 16 ha, shaped in a circle, seeding, plant growth and all necessary information can be inspected. On the entire 16 hectares of test fields Penergetic is, in a manner of speaking, part of a kind of basic equipment. This means that during recent years successes in cultivation but also a stabilisation of the growth process and therefore resistance against pests have convinced agricultural engineers about Penergetic, so much so that Penergetic has now become a must. Approximately 4'000 experts from as far away as China, North and South America and of course from the producing regions of Brazil travel annually witness this compelling presentation.

*GMO=genetically modified organisms

Agricultural engineer Ernesto has carried out scientific tests with Penergetic since 2002

Great care is taken with the soy cultivation in Brazil. Radical variations in the weather are the cause of growing concern also for farmers in Brazil. Dry periods alternate with periods of heavy rainfall. During the period from 2002 until 2007 the following properties of Penergetic were confirmed scientifically, in large-scale cultivation:

1. Nutrients in the soil are more easily available for the plants.
2. Better nutrient absorption leads to improved root growth and therefore to a more robust plant.
3. Pests are repelled or overcome more easily.
4. Especially during drought periods a more stable growth occurs.

The pictures opposite show graphic evidence of the effects of Penergetic-p and -k in drought periods. While the control field shows actual gaps in the crop (picture 1), the Penergetic field next to it is still standing with dense leaves that show some yellow discoloration, but all in all have survived the dry period very well. Because of their better vegetation, the Penergetic plants have of course many more production days.
This means that in the end the total productivity of the plant must be better.

We can also see how irregular the effect of the drought is on the contol field. It has to be emphasised that both trial fields have been planted on exactly the same soil.

The soy bean is an agricultaral crop of the pulse family (Fabaceae or Leguminosae), subfamily Papilionoideae (Faboidea). Within the family it belongs to the plant tribe Phaseoleae as, for example, the green bean.

However, the soy bean is also an oil plant. Its main value lies in its high protein (approximately 39%) and oil (approximately 17%) contents. The latter is unusual for beans. For a large portion of the world production, the oil is extracted first and the leftover mass (soy bean meal) is used as animal feed, but also as a meat replacement or milk replacement food in the vegetarian cuisine.

The best-known soy protein products are probably tofu and soy sauce. The fresh green pods are eaten as fresh vegetables.


While soy survives the drought very well with Penergetic (right picture), the drought period has clearly left its mark on the control field.

Here we see the plants fertilized with Penergetic on the left; they are noticeably greener and fuller. On the right is the control field.

Sappier and stronger plants – the result with practically every trial. On the left the control plants, on the right plant growth with Penergetic -k and -p, with just 240 g/ha each. Clearly noticeable here too: the roots are not only stronger but they are also more branched out. The leaves are fuller and the plants are taller.

How does a farmer present his test results? We think the "Brazilian method" is very persuasive. The farmer simply stands in his field and the relationship between plant height and the farmer's body height shows that practically all "Penergetic fields" show higher plant growth in comparison to the control field. Picture 1 and 2 capture the necessary data of the trial. If we have a closer look at picture 4, we notice the much denser plant growth.

While the ground is clearly visible between the plants in the middle of the control field, it is mostly covered on the Penergetic field. The trial fields are checked regularly from sowing to harvest.
What the Brazilian agricultural engineers notice most is not just the stronger plant; they emphasise mainly the increased productivity of the plants.

right: dense plant growth on the Penergetic field

Surprise at corn harvest

Marcel, a technician of the Ma Shou Tao group, drove to a farm to carry out a final inspection of a growth trial with corn. There he met another technician who was sent by a different company, which had supplied the seeds for this trial. This technician was surprised that the seeds he had supplied and the corn plants developed in a totally different manner. What had happened? Both fields, which are located very near to each other on the same site were infested by pests. However, they had mainly affected the control field. The grain on the control field appeared weak and showed little pigment. The Penergetic area in comparison was able to develop the maize fully with the characteristic fullness of the coloured crop.


Agricultural engineer Marçal

This trial demonstrates impressively the power Penergetic holds to promote plant growth. While the control field was clearly weakened from the moment the pests arrived and therefore had considerably fewer production days available, the plants in the Penergetic area could realize their full productive potential. Here the entire growth cycle was completed in the best possible way.

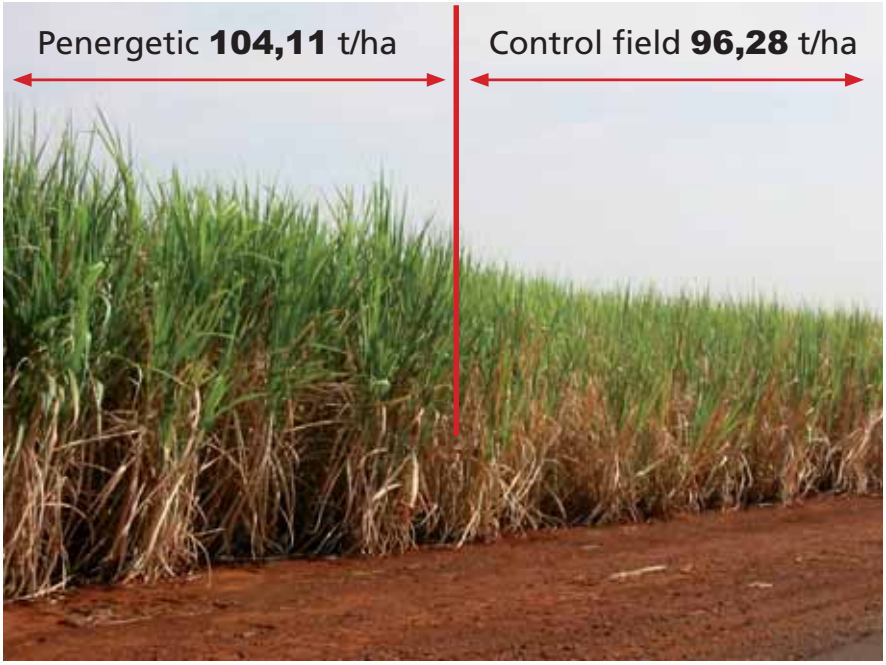
Remakable results in sugar cane trials

Such impressive differences in growth have not been achieved with any other plant

The history of sugar cane stretches far back. There is evidence of its existence in Eastern Asia as early as the 5th century B.C. In the first century A.D. it appeared in the Middle East.
It was discovered that sugar cane juice kept much longer and was easier to transport in crystalline form. Back then, because it was difficult to process, sugar was very rare and very expensive; it cost the buyer (middle class citizen) two full months' wages per kilogram. It took many more centuries before the only known sugar producing plant at the time found its way to Brazil and established itself there. Today, sugar cane is the raw material source of 56% of all sugar produced. Sugar cane can be harvested in large quantaties in a relatively short period of time. Accordingly, cane sugar can be sold on the market cheaply. However, in the EU it can still not compete with subsidised beet sugar.
Sugar cane is cultivated using cuttings, pieces of stalk with two to four nodes. Depending on the level of technology on the farm, these cuttings are placed in rows close together into the ground and ridged up so that they are lightly covered with soil.
The first harvest - cutting of the cane - can take place 9 to 24 months after planting. The time of harvest depends on the sugar content and the grade of maturity. The stalks are cut directly above the ground and at a height below the sugarless leaf apparatus. The stalk stumps sprout again and after a further 12 months the next harvest can be cut.
Up to 8 harvests can grow on a sugar cane field. In Brazil usually 5 cuts are achieved (compared to only two in India). A sugar cane plant can grow up to 20 years old.

Jônadan Ma, one of the brothers and also Chief Executive Officer of the group visits test fields time and time again to see what happens there for himself.
On 15.06.2005 he took this photograph below the land of the Lyra group. Even though the picture slightly misrepresents the actual growth situation, because the Penergetic area on the left is nearer to the viewer than the control area on the right and therefore appears bigger, it is, on close inspection, still cleary evident that the growth on the left is much more dynamic. We can see longer green shoots in the upper part while on the control field, these shoots are smaller and significantly more leaves are shrivelled up in the lower part. Sugar cane is usually cut in five consecutive years. The first cut achieves a yield of approximately 130 tons per hectare. What we see here is therefore one of the subsequent cuts.

Jônadan Ma, one of the Ma Shou Tao brothers, and Chief Executive Officer of the group



Large scale sugar cane trial

6,92 % additional yield

In 2008 the Ma Shou Tao Group presented a very convincing result. Its agricultural engineers, who at that stage were looking back on several years of experience with Penergetic-p and –k, wanted to determine exactly how much additional yield Penergetic could deliver. So they decided to carry out and record meticulously 21 tests in different regions of Brazil. On the one hand this would illustrate the differences that occur as a result of the varying soils. On the other hand, they wanted to find out where and under what conditions Penergetic-p and –k would bring maximum performance. Laboratory tests of the soils showed that they are often overfertilized. Several trails showed, that Penergetic does not performe optimally under those conditions. The engineers welcomed that feature since the high fertilizer costs reduces profits. Therefore fertilizer used, was reduced by 20 % for the Penergetic test group. Nevertheless, it was possible to increase yield significantly with Penergetic.
The average yield increase with Penergetic was 6,92 %.
The following are the results of the 21 sugar cane trials.

1 - Rogério Fraga Rizzo - Trial A

Control	96,40 t/ha
Penergetic	111,51 t/ha
Penergetic increase	15,11 t/ha
Total increase	15,7 %

2 - Rogério Fraga Rizzo - Trial B

Control	119,79 t/ha
Penergetic	131,20 t/ha
Penergetic increase	11,41 t/ha
Total increase	9,5 %

3 - Rogério Fraga Rizzo -Trial C

Control	101,03 t/ha
Penergetic	107,64 t/ha
Penergetic increase	6,61 t/ha
Total increase	6,5 %

4 - Usina Moreno

Control	88,45 t/ha
Penergetic	101,63 t/ha
Penergetic increase	13,18 t/ha
Total increase	14,9 %

5 - Copercana

Control	131,46 t/ha
Penergetic	135,56 t/ha
Penergetic increase	4,10 t/ha
Total increase	13,1 %

6 - Alexandre Saqui - Trial A

Control	116,19 t/ha
Penergetic	119,44 t/ha
Penergetic increase	3,27 t/ha
Total increase	2,8 %

7 - Alexandre Saqui - Trial B

Control	78,05 t/ha
Penergetic	81,24 t/ha
Penergetic increase	3,19 t/ha
Total increase	4,1 %

8 - Danilo M. Dutra

Control	111,56 t/ha
Penergetic	118,78 t/ha
Penergetic increase	7,22 t/ha
Total increase	6,5 %

9 - Flavio Lamonato

Control	85,69 t/ha
Penergetic	94,90 t/ha
Penergetic increase	10,75 t/ha
Total increase	10,7 %

10 - Eng Agr Arnaldo Pieri Vercesi - Trial A

Control	65,76 t/ha
Penergetic	71,04 t/ha
Penergetic increase	5,28 t/ha
Total increase	8,0 %

11 - Eng Agr Arnaldo Pieri Vercesi - Trial B

Control	74,28 t/ha
Penergetic	78,10 t/ha
Penergetic increase	3,12 t/ha
Total increase	4,2 %

12 - Eng Agr João Carlos Mazoni

Control	74,88 t/ha
Penergetic	78,10 t/ha
Penergetic increase	3,12 t/ha
Total increase	4,2 %

13 - Usina São Luiz / Grupo Dedini - Trial A

Control	80,39 t/ha
Penergetic	89,16 t/ha
Penergetic increase	8,77 t/ha
Total increase	10,9 %

14 - Usina São Luiz / Grupo Dedini -Trial B

Control	65,46 t/ha
Penergetic	73,39 t/ha
Penergetic increase	8,93 t/ha
Total increase	13,6 %

15 - Destilaria Pignata - Trial A

Control	102,47 t/ha
Penergetic	112,01 t/ha
Penergetic increase	9,54 t/ha
Total increase	9,3 %

16 - Destilaria Pignata - Trial B

Control	120,30 t/ha
Penergetic	121,40 t/ha
Penergetic increase	1,10 t/ha
Total increase	0,9 %

17 - Eng Agr Roberto Costa Rossetti

Control	74,68 t/ha
Penergetic	85,89 t/ha
Penergetic increase	11,21 t/ha
Total increase	15,0 %

18 - Usina Colorado

Control	105,92 t/ha
Penergetic	109,37 t/ha
Penergetic increase	3,45 t/ha
Total increase	3,3 %

19 - Décio Sandoval de Moraes - Trial A

Control	55,37 t/ha
Penergetic	60,20 t/ha
Penergetic increase	4,83 t/ha
Total increase	8,7 %

20 - Décio Sandoval de Moraes - Trial B

Control	80,10 t/ha
Penergetic	84,41 t/ha
Penergetic increase	4,31 t/ha
Total increase	5,4 %

21 - Antonio Paula Acra

Control	68,76 t/ha
Penergetic	74,54 t/ha
Penergetic increase	5,78 t/ha
Total increase	8,4 %

Control field for the guests

A Penergetic user takes measures

For five years Mr. Hanselmann has been using Penergetic on his farm to his full satisfaction. Word has gotten around about his excellent results and plenty of guests have visited to see his fields for themselves.
Mr. Hanselmann does not need any proof for himself anymore, but what should he show to his visitors? His sugar cane stood splendidly and it became clear to him that he would need a control field. No sooner said than done – the control field was created. No Penergetic products are used on it and Mr. Hanselmann now has obvious proof of his success. Once again it shows: Penergetic creates balanced growth and reduces failures in stress situations. We can see clearly not just weaker plants on the control field, but, above all, the gaps in the rows.

Next to the Penergetic test field: the control field that was especially planted for demonstration purposes for guests

Test field: with 250 g / ha Penergetic-p and -k and a 20 % reduction of fertilizer

Control field: 100 % of fertilizer and without Penergetic-p and -k

A bird in the hand

is worth two in the bush

Marco Fernandez, a hard working agricultural engineer with Ma Shou Tao, knows of the difficulties in communicating the benefits of the Penergetic technology. Sugar cane and ethanol production have spread rapidly across the country. Legions of fertilizer and pesticide salespersons promised heaven and earth to the farmers. Expensive preparations were tried but the promised results did not materalize. It is no wonder, that farmers up and down the country, have become more and more cautious about trying something new. Today Marco Fernandez knows that it takes him at least 3 years of uninterrupted trails and positive results to regain the trust of farmers. Here, in order to demonstrate the growth by a comparison of the size, he uses the simple method fo placing himself in the test and control fields within the same distance from the person taking the photograph. Not with standing the visual evidence of theses photographs, many farmers still await hearing indipendent engineers, speak out in favour of the official tests and vonfirm the difference in growth. Only then will Penergetic be used. The photographs below were taken in 2005 on a relatively small test area of the 30'000 hectares of land.

Marco Fernandez is nearly totally covered in the Penergetic plantation, whereas the control plantation allows him to be seen in the picture.

It is the roots that count

The explanation for healthy growth

Apart from the leaf and the flowers, the roots are another important organ of the plant. It has two main purposes. It anchors the plant firmly in the ground and it supplies it with water and nutrients. A well developed root system is the basis for the stem, which translocates water and nutrients through xylem tissue while the products of photosynthesis move down via pholem tissue.

A well developed root system is the basis for the stem, which translocates water and nutrients through xylem tissue while the products of photosynthesis move down via pholem tissue. It appears that the positive effects of Penergetic already begin at this point. We observe not only a clearly increased root growth, but, above all, fine branchings that improve the supply to the plant.

Faz. Bela Vista, Reanto Heidemann Talhâo

Plantation gives an extra year

A 9th cut thanks to Penergetic

Marconi Rodriguez is another enthusiastic Penergetic user. Due to his good soil he already manages to cut his sugar cane plants 8 (!) times before he had to replant it (2 – 5 cuts are average). In 2005 he proudly presented an extraordinary result. His plantatation, that had been treated with Penergetic for several years, looked so well before the eighth cut, that he decided not to take out his plants and set new cuttings as in the control field next to it, but to risk a ninth cut. In this picture he proudly poses in front of the result. Even the ninth cut on the Penergetic plantation was a total success; we can see that the control field next to it is sparser, shows less green on the top and more withered leaves below.
The Penergetic plantation, on the other hand, is covered densely and regularly with healthy looking plants.

Marconi Rodrigues da Cunha

Practically the same picture with all trials: compared to the control cultivation (in this case the picture on the left) the Penergetic area excels with clearly more vibrant colours, growth is stronger, pigmentation better and can thus easily be distinguished from the control field. Furthermore no gaps appear in the crop, which means no losses in stress situations such as water shortages, extreme temperatures or pests.

10 sacks of rice more per hectare

250 g of Penergetic-p have an effect

Penergetic tests are often carried out simultaneously with others, as is the case here. While 250 g Penergetic-p and 250 g Penergetic-k were sprayed on one side, a trial with silicon-based fertilizer was carried out on the test field next to it. This fertilizer also contained magnesium and the considerable amount of 1,2 tons per hectare was used. While 250 g of Penergetic-p lead to an aditional yield of 10 sacks* per hectare, compared to the control field.

* 1 sack of rice = about 50 kg

Root mass and plant height are far better developed in the group treated with Penergetic (right)

More shoots with Penergetic-p

Julio Ajudarte is an agriculural engineer who works in product development and who is very experienced with herbicides and pesticides, which, in his opinion, are the "weapons of defence" of the farmers. Julio Ajudarte was in the habit of excluding pests from the start, because he believed that it was better to "defend" straight away rather than having to pick up the pieces later on. He was all the more surprised when he observed the early stages of development of a coffee plantation in the Ferderal State of Sao Paulo and noticed the big, very obvious visual differences between the coffee plants of the control field and those of the Penergetic-p field. Here two things become clear. On the one hand it is known that Penergetic strengthens the plant and therefore helps it to overcome stress situations during the growth period. On the other hand it appears that this energetic growth-promoting agent must work somehow on the seed itself; how else would such a clear improvement in the shoots be possible?

Julio Ajudarte

Emerging coffee crop:
left picture: control group

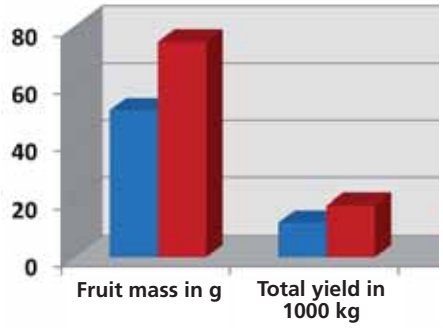
right picture: Fertilized with 6 g Penergetic-p in 10 l water. Clearly more shoots. Penergetic already takes effect at sowing stage.

Better uniformity
and higher quality level

Another characteristic of the Penergetic cultivations is their better uniformity, meaning the crop growth uniformly without big visible differences between the plants. We can oberve this, below int the picture of onions. While the control field had clear differences in growth, quality and size of plants. The onions from the Penergetic field (treated with 200 g / ha) are all of the same size and of the uniform quality. This better vegetal development can already be seen while the crop is in the field. Also as he farm produce manager will confirm when healthy uniform crop is harvested, it is able to command a higher quality grading and price. This suggests another advantage of using Penergetic-p and -k.

Tomato seedlings grow much better

On large cultivaton areas, low growing tomato species are lined up for the industry. On of these enormous fields a very large trial with Penergetic–p and –k was carried out. It is clearly visible in these pictures how the tomato seedlings grows better, stand stronger and bushier and, as was reported, also had fewer failures of plants during the growth period.
The control field on the left showed gaps right from the beginning and it is clear that the crop on that side could not compensate for those failures during the growth period.



Corn trial

Increased resistance in plants observed

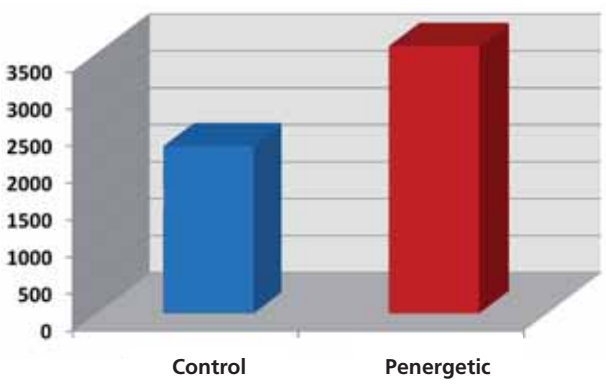
Rudi Balz has tested the Penergetic products extensively.

The Bioenergetic Balz Company in Uruguay examined the effects of Penergetic products in detailed practical trials. For instance in compost production and application as well as in vegetable cultivation in Frey Benitos showed exellent results.
In evaluating a product's effectiveness the following parameters were analysed.

1. A better efficiency with non-renewable nutrients
2. An increase in the natural quality of resources
3. The integration of natural cycles
4. An improvement of the farmer's quality of life and, as a result, quality of life in society as a whole

Possibly the most important argument for the use of Penergetic with corn is to build up resistance. An efficient disease control can only be achieved with a strategy that does not lead to the diseases developing resistances. Experienced growers, who looked for new methods over the years, also had of course other agents that they use successfully. Therefore it was understandable that combinations of growth promoters, biological fertilizers and mineral salts were tested. The aim was always to avoid pest infestation and the reduction of typical diseases in corn growing.
For this reason, Peneregetic-p was used in combination with a biological foliar fertilizer. No further fertilization or other preventative treatment was applied to the trial soil. Irrigation took place until 20 days before flowering. Penergetic-p was applied 4 times in 15-day intervals.
On the control field 5 % of the biological foliar fertilizer (3 l in 100 l of water) were applied. The test field received the same amount and concentration of foliar fertilizer plus 20 g Penergetic-p per application. Both field are treated, on days when

it could be predicted with certainty that no rain would fall for at least eight hours after the application. The seeds were sowed in rows 70 cm apart with a distance of 14 cm between plants. The total number of plants per hectare was 100'000.



This chart shows the yield per hectare in kg.

Data

	Foliar fertilizer & Peneregetic-p = test	only foliar fertilizer = control
Flower setting	63	57
Density of backside	75	63
Density of bunches	57	41
Light permeability:		
Light entry on ground	4,55 %	8,33%
Light entry on cob	81,8 %	92,0 %
corn cob on ground	5,5 %	9,1 %
Residual light:		
Light entry on ground	94,5 %	90,9 %
Light entry on cob	8,1 %	18,2 %
corn cob on ground	94,5 %	90,9 %
Number of kernals per cob	404	367
Weight of 1'000 kernals	28,6	26,2
Percentage of infestation	3,1 %	0,5 %
Cobs infested with caterpillars	1,2 %	10 %
Plant height	2,45	2,10
Total yield	3`400 kg/ha	2`000 kg/ha

Apple trees in Finland

Reach a higher quality level

Paavo Koskelainen, Penergetic Representative Finland

Railo Niemi, fruit farmer and gardener from Hollola, Finland, reports:
"During the last two growing seasons I used Penergetic-p with young apple and pear trees. In 2006 I grew saplings in pots. In this way it was easier to apply the Penergetic mix when watering the plants. One control and one test group each were created with organic watering as per usual practice. In 2007 both groups were evaluated. The chosen base stems for the apples were B396 and for the pears Pyrowarff and Dessertnaja. This procedure was chosen in order for the plants to bear fruit as soon as possible. Why do it this way?

Here in my test gardens I grow over 400 varieties and the area is nearly fully planted with the aim of achieving a resistant, organic production. The varieties were acquired from several tree nurseries in Europe and in the U.S.The selection was made according to requirements here in Finland to guarantee good growth and a plentiful yield.
The saplings grown in pots did not show any difference in stem height but bark and wood structure were clearly firmer.

For the test group I noticed that the saplings definitely grew better. Then I looked at the roots and the difference here was considerable. The roots of the test group that was treated with Penergetic-p were siginificantly thicker and the pots were completely filled with root mass. The roots were well wound and grew along the side walls of the pots.

When these saplings were planted out during the summer the difference was noticeable:
The trees of the test group had clearly grown better. The shoots are visibly thicker. I also noticed that the distance between buds is smaller and that the buds were more viable.

These plants also started "overwintering" earlier and shed all leaves. Growth, development of buds and better bark health will ensure that no winter damage occurs.
Even in the first growing season when the saplings were planted out in rows, visible differences to the control group were noticeable.
The root system that was now able to grow freely really had thicker hair roots. The so-called head roots had also grown very strong.

The joints (from the apple tree branch to the base stem) had grown perfectly into the base stem. The saplings were 20 cm higher and much stronger than those of the control group. The leaves were bigger and much greener and healthier. The distance between buds was clearly smaller.

Penergetic-p has an excellent effect on the roots. This is of particular importance, because for everything that the plant produces, it needs trace elements from the soil.
Now that that the growth of the stem is stronger, the bark structure is healthier and the distance between buds is smaller, I am waiting impatiently for the trees to bear fruit. What will the yield be like now…?"

The row with green leaves was treated with Penergetic-p during the first watering after the saplings were taken up from the basement. (The cuttings were planted in the previous summer and were in the basement during the winter).

This picture was taken in Spring 2007. The saplings behind the frame were treated with Penergetic-p during the first watering. The sapling base is for the varieties B396 and apple tree branches with 1-2 buds. Now, in January 2008, the saplings are 1.5 m high.
These 1-year olds are bigger and stronger than the 2-year old saplings that were grown in pots without Penergetic-p. In Spring 2008 the gardener was able to cut off 10-12 buds from the length for new base stems.

The fruit is obviously going to be top quality
when the saplings are so healthy.
The yield will certainly increase by 10-20 % and that is a lot!

These pictures were taken on 18.05.07. These 3-year old apple trees were treated with Penergetic-p during the first watering. The saplings blossomed very well.

These 3-year old saplings were grown according to the same method and in the same location, but were not treated with Penergetic-p.

These pictures were taken in January 2008.
These are the saplings that were treated with Penergetic-p that can be seen in blossom on the picture on the left.

The lower part grew in 2006 (without Penergetic-p) to a length of 10 cm. The buds are small and weak. The upper part is reddish-brown (growth in 2007) with a length of 25 cm (with Penergetic-p).

The fruit buds grew very well in 2007.

Untreated fruit buds in 2006.
Clearly less development.

Strong growth, powerful roots

Plants cope better with stressful situations

Friedrich Kärcher, enthusiastic Penergetic representative

Werner Schönek oversaw the trials

Friedrich Kärcher carried out a number of trials with Penergetc-p and Penergetic-molasses. These types of trials are very time consuming, because they have to be observed attentively and documented photographically; samples have to be taken, compared and analysed.
Together with Werner Schönek he mixed Penergetic-p and water at a ratio of 2 g of Penergetic-p in 10 litres of water. The mix was applied during a period of eight weeks on Werner Schönek's tobacco plantation. Even in the early stages the Penergetic treated plants exhibited stronger signs of growth that the non treated plants. Their colouring was also better. Similar to the plant trials in Brazil, when the plants were more mature the differeneces became more pronounced. The plant rows in the Penergetic field that had been treated with -p just once at 150 g / ha are denser and stronger in growth, whereas in some parts of the control field areas of lesser density are noticeable. Overall, this trial again showed a stabilising effect of the plant tonic Penergetic-p from root formation to plant development.

Together with Wolfgang Haas and Alois Grammling winter barley that had been treated with 50 g per 100 kg at seed stage and also with Penergetic-molasses in the root area was observed. In this case 150 ml per ha was applied. Once again, the root samples show improved root growth and in particular stronger roots that will later on enable the plant to cope with stressful situations such as droughts but also periods of excessive wetness.

In front, the control group of tobacco plants that grows irregularly; in the background, dense rows of treated plants.

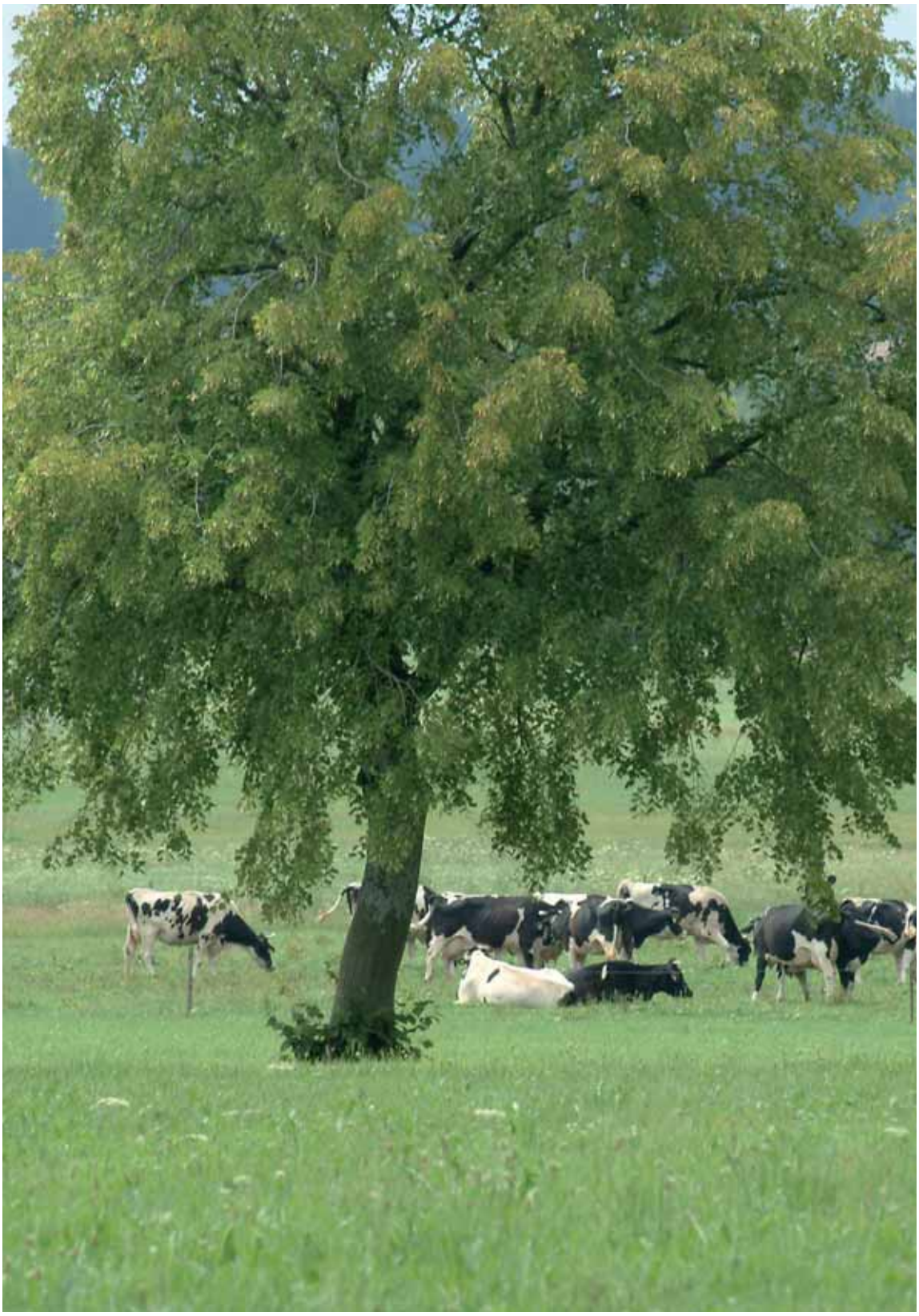
Control group

Treated with Penergetic-p

On the right the strong young tobacco plants compared to their untreated “colleagues” on the left.

These images clearly show that the treated tobacco seedlings exhibit a much stronger root growth.

Growth in the control group is not as dense and the plants are clearly smaller.



Successful animal husbandry

The feed additive Penergetic-t has been tested in many different situations. For individual animals as well as in large-scale trials, in which health, weight and a large number of other variables were measured over several months. With farm animals, in particular, very good results were achieved.

The feed additive for

- Pigs
- Piglet and calf diarrhea
- Dairy cows
- Poultry
- Horses
- Pets

Licenced according to EU regulation
Organic Agriculture '2092/91/EWG

Application

Cattle	1 g per day and livestock unit
Pigs	20 g per ton of liquid feed or
	50 g per ton of dry feed
Poultry	20 - 50 g per ton of feed
Horses	3 - 5 g per day
Sheep	1 g per day per LSU

Please note:
Penergetic-t is not a substitution for veterinary measures.

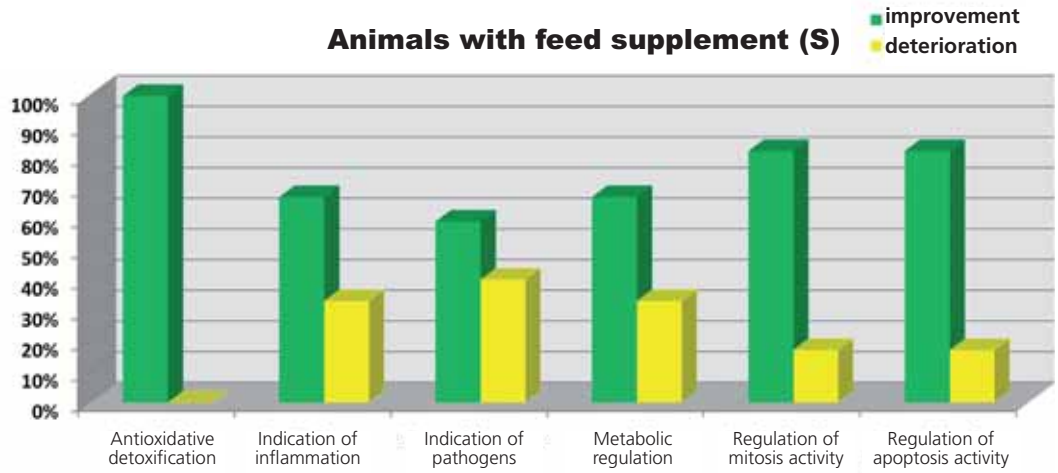
The EU wants happy pigs

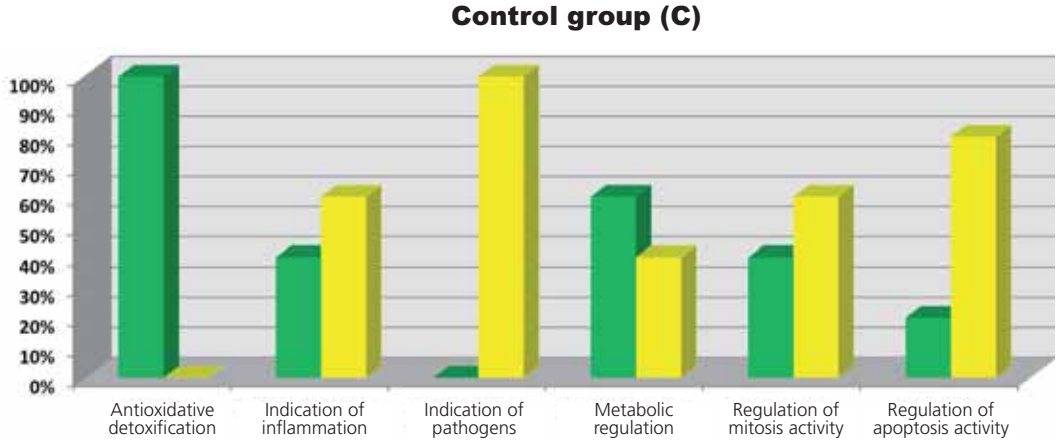
In a new directive, which has been in place since July 2007, the EU demands that pig farmers keep their animals in a more suitable environment. This has been the talk among experts up and down the country. Since the BSE scandals, the demand for pork is greater than ever. In 2007, 48 Mill. pigs were slaughtered in Germany alone. A lot of meat is also being exported, especially to up-and–coming China. In Germany, Austria or Switzerland about 40 kg of pork are consumed per head of population annually. Despite the boom, the price of pork has remained very low. One animal, fattened to a weight of 115 kg in about six months, sells for a maximum of 140 Euro. It is therefore hardly surprising that many of the younger pig breeders and smaller farms are once again inclined to give up the business. In pig farming, as well as in many other business areas, there is a trend towards mass production. Piggeries with more than 60'000 pigs have become common.

It is all the more welcome that the EU has decided to "help out" the pig. Animals that are usually kept on concrete or synthetic floors are frustrated because they can no longer roll in the mud and look for food as would be in their nature. In the Netherlands, one of the most important pig breeding countries in Europe, farmers' associations and scientists have got together with animal rights groups to come up with some methods to brighten up the grey everyday life in the piggeries. Their most important insight: pigs do not just want to be fed but like to actively rummage for their food. A competition was launched inviting inventors to research possibilities into bring a bit of variety to the pigs' lives by means of play materials.

Looking at the issue from a totally different angle shows that Penergetic is also able to provide a very healthy contribution to the pig's welfare. In a large-scale pig fattening trial under scientific conditons in Rostock, Germany, from October 2004 until February 2005, blood serum analysis were carried out on pigs to test the effectivness of Penergetic-t.

Two groups of 25 male and female pigs were compared over a trial period of 120 days. They were divided into two groups, C-group = control group and S-group = group fed with feed supplement Penergetic-t. Blood samples for evaluation were taken from the animals on 27.10.2004, 16.12.2004 and 12.02.2005. The amount of blood taken was 20 ml, of which 6-8 ml serum was tested. The parameters that were measured were:





- Antioxidative detoxification
- Indication of inflammation
- Indication of pathogens
- Metabolic regulation
- Regulation of mitosis activity*
- Regulation of apoptosis activity**

The animals were fed a compound feed containing wheat, barley and soy. Test group S also received 50 mg of Penergetic-t per kg feed mixed into the feed.

The charts show that:

1. The metabolic capacity for anti-oxidative detoxification is the same for both groups, neither of which received any antioxidative/anti-radical or detoxifying medication/active substances.

2. The body's own readiness for inflammatory reactions is repressed or protection improved.

* mitosis activity = nuclear division ** apoptosis activity = formation of new cells

Inflammatory reactions in the gastro-intestinal tract are blocked or reduced.

3. Of particular significance is the immunological boost in the test group, because pathogens (viral, bacterial, mycetic) were reduced noticeably, by 58,3%.

4. The conversion-promoting or -improving properties of Penergetic-t the feed suplement are less significant, but still higher (+ 6,7 %).

5. The regulation of new formation of cells (apoptosis) is particularly noticeable as being positively influenced.
The regulation of orderly new formation of cells shows improvement of 43 %, the regulation of the cell degeneration rate shows an improvement of 63 %.

This means: The stability of the tissue, the elastcity of the biomembrane, the permeability function as well as the regulating information transfer was significantly enhanced in the animals that received Penergetic-t. The S-animals are more stable in the face of all possible adverse influences than the C-animals. The feed supplemented with Penergetic-t led to improved general health in a third (33,1 %) of the animals compared to the control group. It is concluded, that the use of Penergetic-t as a feed supplement is justified, as it produces positive results.

Looking at quality in the right way

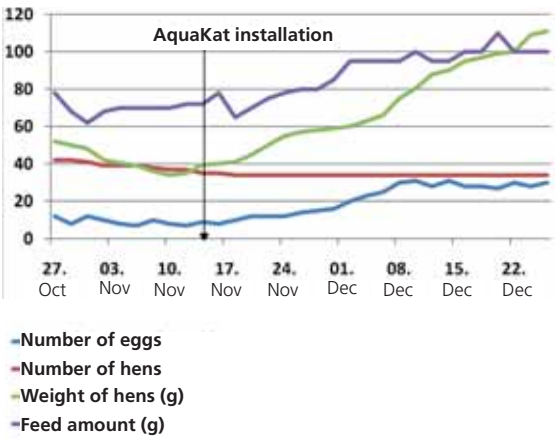
It is not easy for test laboratories that are bound to a physical-chemical testing method to isolate the actual differences in quality in foodstuffs. In the LaboTech Institute in Rostock, Germany for example, a study on Penergetic-t was carried out and in the final report the test and control groups were evaluated more or less equally in regard to physical development, development of systematic functions etc. In a letter to Penergetic, PhD Heinrich emphasises that growth, physical development and development of systematic functions do not follow a homogeneous linear course. The laboratory established, for example, that in the Penergetic group, during the three phases of observation with supplemented feed, the live weight gain was lower than in the control animals. This could mean that the water-binding capacity was lower, but the somatic (=bodily) quality was higher. He comes to the conclusion that the Penergetic group shows an improved metabolic regulation. Furthermore, use of the complex redox difference analysis showed that the regulation of antioxidative detoxification as well as the regulation of mitosis and apoptosis activity were significantly improved, namely by 25 % in group 1, by 30,6 % in group 2 and again by 25 % in group 3. This increase indicated a significantly improved immune regulation and improved renewal of mucosa and tissue. During the final phase (90 – 120 kg live weight) the animals also showed clearly improved redox values.
Distinctly positive results are:
1. The inhibition of inflammatory processes was improved by 51,7 %.
2. Pathogens in the blood of the pigs could be reduced by 36,6 % and metabolic regulation was improved by 51%.
3. Regulation of mitosis-activity was optimised by 45 %.
4. Regulation of apoptosis was increased by 36,6 % compared to the control animals.
The overall tendency was towards a slower weight gain in the Penergetic group. Only during the last phase (90 – 120 kg) did a relative accelaration in weight gain occur.

According to the available test results, a clear improvement in meat quality in the Penergetic group becames evident. Here it is not so much the established feed conversion in relation to weight gain that counts, but rather the bio-parameters of the redox analysis that indicated an intensification of vital functions during the first two phases of the study. This can be equated to a better vitality of the animals and an improved meat quality through an increased cell count per volume unit.

Infectious enterocolitis

Successfully treated with the AquaKat

On one of the farms of the organic cooperative Yamagishi in Brazil, hens contracted infectious enterocolitis. Because there had already been positive trials with the AquaKat, staff at the farm there decided to separate the diseased hens in order to treat them with AquaKat water. Before the treatment they had lost a massive amount of weight and laid fewer eggs. This is illustrated by the graph. It is interesting to note that, from the time when the AquaKat was first used, all variables improved slowly but surely, so that in the end the hens could be re-integrated into the normal production process.



Fewer broken eggs

And a better environment in the chicken house

Florian Räss from Switzerland uses a whole range of Penergetic products.

The Räss family in Hosenruck looks back on many years of experience in egg production. In 2007 they looked after 8'500 laying hens as well as 26 dairy cattle. They have been using Penergetic-g, -p, -t and the AquaKat. Ever since the hens have been drinking the AquaKat water, the Räss family has noticed that they are more balanced.

In 2007 some problems with E-coli bacteria arose. These could be eliminated without any further aids. Generally, very good sorting results were recorded - only 2,5 % broken eggs and 10 to 11 % percent of eggs of lower quality (including broken eggs). On the farm, laying hens of the Loman Selected breed are kept. Over a laying period of 50 weeks (2 weeks of empty houses) the Räss family's hens produced 2,65 m eggs, which means 315 to 325 eggs per hen during that period (50 weeks). The hens are fed from bins: 105 g per day per chicken. Penergetic-t is mixed into the daily feed via an auger system at a rate of 50 g per tonne of dry feed.

The Krekenavos Company (picture of model) with its 45,000 pigs is the biggest piggery in the Baltic States.

Apart from rearing and fattening, the pigs are also processed in the piggery's own abbatoir and processing plant. The company's own feed mill guarantees correct mixing of feed and Penergetic-t.

Pig fattening trial, Lithuania

One of the largest pig farms in the Baltic States, the Krekenavos Company, carried out three independent 30 day trials with fattening pigs. Penergetic-t was applied by mixing it with the feed at a ratio of 50 g per ton of feed. All three trials resulted in a clearly improved weight gain in the piglets. As the charts show, the weight increase for the piglets in the Penergetic-t group was approximately 5,3 % higher than that of the pigs in the control group.

These trials again confirmed the results of other studies that Penergetic has a distinctly positive effect on animals' healthy and productivity. Penergetic-t reduced piglet mortality on average by 26 %.
For the fattening pigs themselves, the weight of the mother sows that fed on a Penergetic-t feed mix increased by 3,8 %.

Table 1

Weight at the end of trial in kg

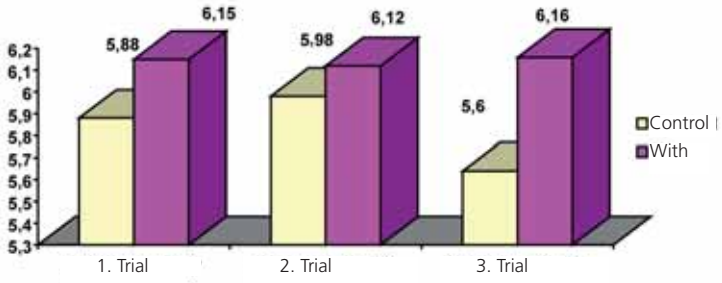


Table 2: Daily weight increase in grams

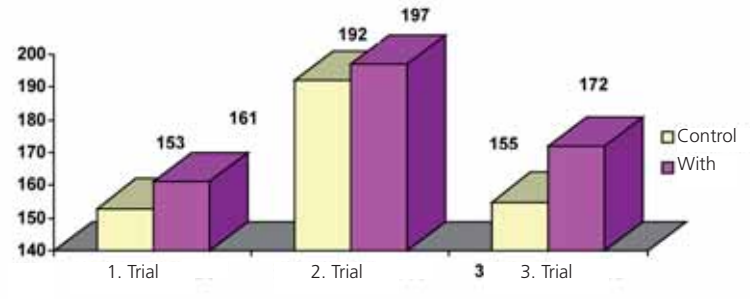


Table 32: Mortality rate in %

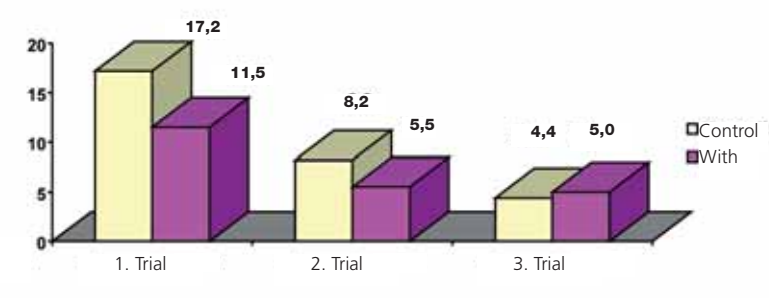
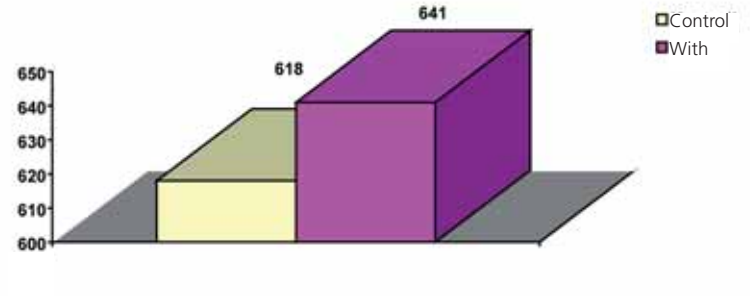


Table 4: Weight differences during fattening in grams



Calf fattening trial, Latvia

More appetite, animal weight increase

Aija Rozenfelde,
veterinary
surgeon

A fattening trial with 20 calves of the breed Latvian Brown was carried out with Penergetic-t at the "Gaitniecki" fattening farm in Upmai in the administrative sub-district of Brenguli in the district of Valmiera, Latvia.
The six month old calves were divided into two groups of 10 animals each and kept in two different grazing enclosures under the same conditions. They were looked after by the same keeper. The base feed used was the concentrated feed that is generally used on the farm. It was prepared and mixed on-site.
Composition:
25 % oats
20 % wheat
25 % ground corn
30 % protein-vitamin-mineral supplement (BVN)

age, weeks	combined concentrate, kg	starter food, kg	milk supplement, litre	Hay, kg
4	0,3	0,2	6	unlimited
5	0,4	0,3	6	unlimited
6	0,5	0,4	6	unlimited
7	0,6	0,5	5	unlimited
8	0,7	0,6	4	0,3
9	0,8	0,7	2	0,4
10	0,9	0,8	-	0,5
11	1,0	0,9	-	0,6
12	1,1	1,0	-	0,7
13	2,3	-	-	0,8
14	2,5	-	-	0,9
15	2,5	-	-	1,0
16	2,5	-	-	1,1
17	2,5	-	-	1,3
18	2,5	-	-	1,5
Total: (7-18 weeks)	**139,3**	**31,5**	**77 (9,7 kg)**	**65,1**

Table 1: Feeding chart for feeding calves of the age of 4-18 weeks
weight increase target 700 to 800 g per day

Table 2: Chemical composition of starter food and milk replacement food

Ingredients	Ingredients	Primo Starter Mure	Primo 1 Mure	Primo Standart
General protein	%	18,3	18,0	24,0
General fat	%	5,0	4,4	15,0
General cellulose	%	6,4	7,7	1,4
Substance	%	7,2	78,5	8,2
Energy	BV/kg	1,13	1,08	17,2 MJ ME
Ca	g/kg	10,1	11,0	7,0
P	g/kg	5,9	6,0	7,0
Mg	g/kg	3,5	4,0	2,2
Na	g/kg	3,5	3,0	-
Mn	mg/kg	63	70	60
Zn	mg/kg	142	143	105
I	mg/kg	5	5	1,5
Co	mg/kg	1	1	1
Mo	mg/kg	0,33	0,30	-
Cu	mg/kg	15	15	15
Se	mg/kg	0,5	0,5	0,3
Vitamin A	IV/kg	13,500	8,000	40,000
Vitamin D3	IV/kg	4,000	2,000	5,000
Vitamin E	mg/kg	-	85	50
Vitamin K3	mg/kg	-	-	4
Vitamin C	mg/kg	-	-	100
Vitamin B1	mg/kg	-	-	5
Vitamin B2	mg/kg	-	-	15
Vitamin B6	mg/kg	-	-	6
Vitamin B12	mg/kg	-	-	25
Lysine	%	-	-	1,45
Methionine	%	-	-	0,30

On the farm the starter food "Primo Starter Mure" and the milk replacement food "Primo Standart" produced by Baldekzid FEED AG are used. The chemical composition and the nutritional values of these concentrates are listed in table 2. Starter food and concentrated feed that was mixed on the farm were fed together.

The milk replacement food mixed with lukewarm water at a ratio of 1:7 was given to the calves until they were 10 weeks old according to the feeding chart. Drinking water was supplied to the animals in automatic drinkers. Additional mineral nutrients were supplied to the animals in their feeders in the form of salt cubes.

In addition to the feed as described above the test group was given Penergetic-t.

The dosage was as follows:
1 g per day at the age
of 7 – 10 weeks
2 g per day at the age
of 11 – 18 weeks

The rations of the additional feeds, weighed electronically, were added every day in the mornings and evenings. During the test period the weight of the leftover feed was deducted and the result was recorded as amount of feed eaten.
The amounts of feed were weighed once a week before and after feeding. The amounts for the other six week-days were calculated from these results. The average feed consumption during the 84 day test was calculated for the group and for each animal.
The growth dynamic was carried out regularly once every four weeks. Here the body weight of each animal was determined individually.
During the test period the animals were weighed at the start (at 6 weeks of age), then at the ages of 10 and 14 weeks and, finally, at 18 weeks old. The weighing took place in the mornings before the midday feed using electronic scales (B1-100 RB CAS). The results of the weighing were recorded as average body weight for the calf groups as well as weight gain in the individual periods and per day.

On the basis of the data on feed consumption (energy and protein values), energy value and costs as well as costs per 1 kilogram of weight gainded were determined individually for the test and control groups. This data was then used as the basis of an evaluation of the efficiency of the feed supplement Penergetic-t with regard to wellbeing of the animals and cost. To take into consideration possible positive or negative effects of the feed supplement Penergetic-t, as well as the influence of other factors on the test results during the test period, the state of health of the animals was checked. All cases of medical disorders such as diarrhea, disease of the respiratory tract, ect. Also the number of vases and when rhy occured was recorded.

Test results on feed consumption

During the course of the test the feed amounts were administered according to the feeding chart. Since the quality of the feed was high and the proportion of concentrated feed was relatively high, the loss of feed, except for hay, was low. The feed consumption during the test was similar to levels consumed before the test.

Data on feed consumption during the test period, protein and energy values as well as costs are listed in table 3. The values concerning the feed were taken from delivery dockets, certificates,

revenue data and feed catalogues (LSH, 1996) - see grey box. The tested supplement Penergetic-t was supplied to the testers free of charge by the client; the cost calculation was only based on the manufacturer's price of 1,50 Ls* per 1kg of feed supplement.

*Latvian currency: Litas

To calculate the nutritional value/NV and the price per kilogram, the following criteria were taken into consideration:

Farm's own concentrated feed mix – 9,41 MJ ME or 1,11 NV, 170 g KR, for the price of 0,15 Ls/kg

Starter-Feed – 10 MJ ME or 1,13 NV, 165 g KR for the price of 0,20 Ls/kg

Milk replacement feed – 17,2 MJ ME or 1,94 NW, 240 g KR for the price of 0,61 Ls/kg

Hay – 7,1 MJ ME or 0,52 NW, 85 g KR for the price of 0,035 Ls/kg.

* NW = Net weight, MJ = Megajoule, ME = Mass unit

Table 3: Data regarding feed consumption during the test period (84 days), nutritional values and average cost per calf in a group

Feed type	Control group				Test group			
	kg	General protein	MJ ME/ NV	Ls	kg	Pro-tein	MJ ME/ NV	Ls
Combined concentrates	136,5	23,205	1284/ 151,5	20,48	136,8	23,256	1287/ 151,8	20,52
starter feed	30,9	5,098	309/ 34,9	6,18	31,0	5,115	310/ 35,0	6,20
Milk replacement feed	9,6	2,304	165/ 18,6	5,86	9,6	2,304	165/ 18,6	5,86
Hay	59,9	5,091	425/ 31,1	2,10	60,4	5,134	429/ 31,4	2,11
Penergetic-t	-	-		-	0,140	-		0,21
Total	236,9	35,698	2183/ 236,1	34,62	237,9	35,809	2191/ 236,8	34,90

We can see from the table that feed consumption during the test period was relatively high (92 to 94 % for hay and 98 to 99 % for concentrated feed). The calves in the test group consumed a little more hay and concentrated feed. Although the difference compared to the control group was small, we can assume that the appetite of the calves in the test group with feed supplement Penergetic-t was bigger.

In total each animal from the test group consumed feed with 236,8 NV or 2191 MJ ME and 35,8 kg general protein worth 34,90 Ls.
This represents 0.7 NV or 8 MJ ME and 0,11 kg general protein more and 0,28 Ls more expensive than that consumed by the control group.
The efficiency of the nutrients and energy consumed in relation to body mass gain is illustrated in the chapter "Growth dynamics of the calves".

Table 4: Changes in calves' weight during the test period (84 days)

Criterion	Control group	Test group	Balance + or -
Average weight at the age of 6 weeks in kg	86,1	86,7	+0,6
Average weight at the age of 18 weeks in kg	152,4	155,1	+2,7
Weight gain during test period in kg	66,3	68,4	+2,1
Average weight gain per day in g	789	814	+25

The values in table 4 show that the weight gain in the test group was better than in the control group. In the end the animals in the test group had gained on average 2,5 kg more weight per calf than the animals in the control group. The difference in the daily increase was 25 g. This amounts to a value of 3,2% (table 5) in favour of the test group.

Therefore the feed supplement Penergetic-t had a positive effect, but the individual qualities of the animals also played a role.

Nutrient consumption in relation to weight gain

In the farming of animals for food production, the effectiveness of nutrient intake on weight gain is a useful variable to determine the efficiency of feeds, feed supplements, preparation processes, diet planning or the method of farming.

The efficiency of nutrient intake in this test was calculated from food energy consumption (feed units, MJ energy conversion unit) and the general protein value per 1 kg weight gain. This data is listed in table 5.

Table 5: Feed energy consumption and general protein value (NV) per 1 kg weight gain during the test period

Criterion	Control group	Test group	Balance +/- natural values	%
Gained weight increase, kg	66,3	68,4	+2,1	+3,2
Feed input, MJ ME / NV, general protein, kg	2183/236 35,698	2191/236,8 35,809	+8/0,7 +0,111	+0.37 +0,31
Used for weight gain 1 kg MJ ME/NV general protein, g	32,9/3,56 538	32,0/3,46 523	-0,9/-0,1 -15	-2,7/ -2,8 -2,8

The values in the table confirm the earlier noted tendency for a faster growth with a better feed and nutrient conversion in the animals of the test group in comparison to those of the control group.

The animals in the test group have for example used 0.1 feed units or 0,9 MJ MU and 15,0 g of general protein less than those in the control group to gain 1 kg of weight under the living and feeding conditions.

Zootechnical and economic evaluation of Penergetic-t

The zootechnical and economic value of the tested feed supplement can be calculated from the efficiency of feed absorption, the growth dynamics of the calves, the nutrient and energy consumption and the corresponding values in the table of the previous chapter test results.
The zootechnical evaluation includes conclusions regarding better appetite, better nutrient conversion and the resulting faster growth of calves from the test group that were fed the feed supplement Penergetic-t.

For the economic evaluation, data relating to feed and feed supplement prices, feed consumption and cost per kilogram of gained body weight was used.

Table 6: Cost and feed consumption per calf for a body weight gain of 1 kg

Criterion	Control group	Test group	Balance +/- natural values	%
Average feed costs per calf, Ls*	34,62	34,90	+0,28	+0,8
Gained weight increase, kg	66,3	68,4	+2,1	+3,2
Feed costs for 1 kg weight gain, Ls	0,52	0,51	-0,01	-1,9

The summary of this data and the data from tables 3 and 4 gives a fairly sufficient acount of the usefulness of adding the feed supplement Penergetic-t to the concentrated feed for the calves. This is illustrated in table 6.
The supplement Penergetic-t fed to the calves in the test group increased the feed costs slightly (by 0,21Ls), but this was exceeded by the increases in body weight. In the end the animals of the test group used the feed 1,9 % more efficiently per 1 kilogram weight gain.

(*Ls-Latvian currency)

Summary:

The following could be established:

1. The appetite of the calves increased. This in turn increased the feed conversion. Over 84 days each animal in the test group ate an

average of 0,7 units of feed more compared to those from the control group.

2. The animals of the test group grew faster during the test period; their average daily weight increase was 25 g higher than that of the calves of the control group (814 g / 789 g).

3. Calves that were given the tested feed supplement could convert nutrients better and thus could convert 3,46 NV, 32,0 MJ ME or 523 g more general protein. Compared to the control group that is 0,1 NV, 0,9 MJ ME or 15 g less general protein.

4. The feed costs for the test group were 0,51 Ls per kilogram weight gain and are slightly lower than the feed costs for the control group (0,52 Ls).

During the test period no diseases of the digestive or respiratory tract were observed in either the test or control groups except for one calf that was diagnosed with a disease of the hind leg by the vet. This animal and accordingly one from the control group were excluded from the test.

Gaitnieki, Latvia,
December 2005
J. Latvietis, A. Trupa, R. Vilcans

Stress in horses

Arja Päivinen, manager Riihihaan Talli

It has been known for quite some time that stress, which is the cause for various conditions in humans, naturally also exists in animals. Especially for riding horses and racehorses that are subject to all sorts of strain and stressful situations. Tests carried out in the Friedrich-Wilhelm University in Bonn, Germany show that horses can benefit particularly well from a therapy with antioxidants. The test proved that by giving antioxidants, oxidative stress could be lowered significantly. According to the test report, agility improved, a healthy increase in appetite occurred and the therapy seemed to have an all-round positive effect on vitality. The following report on a therapy with Penergetic-t-Horse from a stud farm in the Southwest of Finland shows exactly the same results. A direct scientific test as to why Penergetic is able to reduce strain in the animal's body in such an excellent fashion has not been carried out yet, but, from looking at the successful treatments, one thing can be said for certain: Penergetic-t-Horses is a low-cost alternative for the improvement of the animals's wellbeing by natural, or, one could say, by homeopathic-like means. Penergetic-t is a feed additive that contains the information of minerals, trace elements and herbs, which has been modulated onto it, and that mainly promotes and regulates feed conversion and therefore improves the animals' robustness and recovery speed. An additional advantage is the improvement of the stable environment resulting from an improvement of the horses' excrement. Mrs Arja Päivinen reports from the Riihihan Talli stud farm of her experiences with Penergetic-t-Horses: "In our stables in the Southwest of Finland we keep 20 racehorses and trotters, which we also train ourselves. We pay particular attention to training and events for our trainees who have well trained horses available for tournaments. In November 2006 we first heard about and started to use Penergetic. After only 10 weeks of daily feeding remarkable results started to show. We had had, for example, some horses with the influenza A2 virus. A few weeks after these animals were given Penergetic-t-Horses their coat started to shine again and their health visibly improved. During the same period of time one of our trotting horses

travelled from race to race, and, even though the flu was rampant in the South of Finland where we took part in a race, our gelding did not get infected.
At that time the horse had already been fed with Penergetic-t-Horses for 10 weeks.
It also sometimes happens that the influenza virus is accompanied by secondary illnesses. We had to treat, for example, a four-year-old trotter with antibiotics. His coat was dull and one could practically see the flu infection in him. Here, again, we tried the Penergetic agent. After two months his health improved and, as a visible external indicator, his coat started to shine again.

A two-year-old trotter foal had slightly injured his legs, which had gone unnoticed until an abscess formed. But here, once again, it was clear that Penergetic was able to bring back a good general state of health after a short period of time and we could go without giving any antibiotics.

If you work with horses for a long time, you naturally know their strengths and weaknesses. We had known for many years that one of our horses had allergic reactions to mosquito bites and sunshine as well as to grass protein. This horse too had been given Penergetic-t since November 2006. We were absolutely amazed that this animal did not show any symptoms of its longtime impairments during the summer of 2007. After a year of Penergetic-t application we could clearly notice how the animals, which were constantly subjected to physical stress, recovered more quickly, became altogether calmer and were easier to lead. We also observed that horses that returned to grazing after a strenuous racing season showed an increase in musculature resulting from an extraordinary good appetite

after only a month.
Over the summer grazing period, during which the animals mostly feed on grass, the administration of Penergetic was particularly easy, because we just mixed the agent into the drinker water. Looking back on 30 years of experience in keeping horses, we can fully recommend Penergetic-t-Horses. It is economical with really remarkable effects."

Sub-clinical Mastitis – A classic cattle disease

Mr. Surendra Kamat was responsible for conducting the successful trials at the Composite Livestock Farm in Hesaraghatta

Apart from fertility problems, udder disease is the most common reason for the premature slaughter of dairy cattle. The losses incurred by mastitis are estimated to be in the region of 0,75 to 1 billion Euro in Germany alone. The damage caused by sub-clinical masitits leading to acute masitis are far greater because this form of the disease occurs 20 to 50 times more often than the clinical form. Because of the high economic losses, mastitis prevention is of great importance. Time and time again, noticeably increased cell count is observed during the summer.
This "summer-effect" is caused by the combination of several adverse factors. The environmental conditions weaken the immune system of the cows, dirty housing units and bedding and contaminated feed increase the risk of infection, and because of a seasonal work overload milking hygiene is neglected. There is obviously a direct connection between an unkept resting surfaces, dirty cows and mastitis. A field trial by scientists at the University of Liverpool found that the farm with the lowest occurrence of mastitis also had the cleanest cows and best kept cowsheds with straw bedding.
Mastitis is found commonly in two forms i.e. acute and chronic. The first one becomes apparent and can easily be diagnosed. Milk is abnormal, with coagulation and clots forming; the udder is infected with swelling and is sensitive to the touch. However, it is difficult to diagnose and treat sub clinical or chronic mastitis. The milk appears to be normal. Bacteria usually, but not always, can be isolated in milk. Milk yield is reduced and composition may be altered. Subclinical mastitis may become clinical or acute. Good udder health is essential for quality milk production and somatic cell count is the most widely accepted criterion for indicating the udder health status of a dairy herd (Mark et al., 2002).

It is very much appreciated that Dr. N.B. Shridhar, Veterinary Officer and Chief Instructor at the Composite

Livestock Farm and Research Station in Hesaraghatta, India carried out a large-scale trial on the effects of Penergetic-t on health and yield in crossbred dairy cattle. General health of cattle depends on various conditions like nutrition, management fodder quality etc.
Therefore the cattle should be provided with good quality hay and other high quality dry feed. In spite of adequate feed quality and quantity, it may not get fully metabolised for several reasons. For this reason, a range of products that increase digestibility are on the market with moderate to poor efficacy.

Common digestive problems

1. The fodder does not get digested properly and traces of straw and feed is noticeable in the dung.
2. Due to poor fat digestibility, the hair coat will be dull instead of shiny
3. Due to partial digestion and growth of unwanted bacteria, the dung will have a bad smell which hinders clean milk production.

Over the following pages a systematic study is outlined in which Penergetic-t, a new feed supplement, was used with dairy cows in different conditions. It is widely accepted that micro and macro minerals are very important in maintaining the health and production status of the cows. Many of these minerals are not only essential for maintaining the milk production of the cattle, but are also

Mastitis, inflamed udder

essential for a regular metabolism in the cow (Master and White, 1996). Penergetic-t has a unique formula combining extracted elemental properties of beneficial herbs, minerals and trace elements, which are modulated onto calcium carbonate ($CaCO_3$) as a base material.

Material and Methods

This experiment was conducted at the Composite Livestock Farm, Hesaraghatta, Bangalore, India to look at the general performance of the animals including milk yield. Along with this, the efficacy of the Penergetic-t on chronic mastitis was tested at the University Dairy Farm, Hebbal, Bangalore.
The cows were divided into 9 groups according to their state of health. The following categories were defined and the animals were treated accordingly with Penergetic-t and Penergetic-t-Mastitis.
Feeding, watering, environment and maintenance were the same for all cows in the control and test groups on both farms. The experiment was conducted during the months of June to September 2005.

All the animals were fed with hay, green grass and concentrated feed.

Water was given ad libitum to all the groups. No other medication or supportive therapies were used during the trial period.

The experiment was conducted as follows:

1. The cows in group II were selected 40 days after calving. They were in 3rd or 4th lactation. Their milk yield in the previous lactation was taken into consideration.

2. Various changes in body conditions, body weight, milk yield, SNF (solids-non-fat) content, fat content etc. were recorded for both the control and the test groups.

3. A fibre digestibility test was carried out on the cows once before the start of the trial and then once in every 15 days.

4. Blood was taken for function tests on major organs. Haematology and serology are indicative of function of vital organs like kidney, liver, spleen and immune system. Blood was taken from all animals once in every two weeks, up to the 14th week of the trial.

5. These tests were conducted once at the start of the trial, once in 10 days after the start of the trial and then after another 20 days during the trial.

6. Urine analysis, faecal fibres content and rumen pH test were conducted on all cows.

7. In the cows suspected of having mastitis, culture and sensitivity tests, spot mastitis diagnostic tests, e.g. pH-tests, were carried out before and during the trial.

8. Somatic cell counts were determined to diagnose mastitis and the effects of Penergetic-t-Mastitis as therapy in such cases.

9. Any other improvements other than those expected were also recorded.

10. Cows with chronic mastitis were administered Penergetic-t-Mastitis at a rate of 2 g per day orally in diluted form in water and mixed with feed. It was also applied locally after mixing it with white petroleum gel at a ratio of 5 g of Penergetic-t-Mastitis to 50 g of gel (divided into 2 portions and applied two times a day by gently massaging it into the udder).

11. All the cows in groups II and VIII were given Penergetic-t once a day by soaking it overnight in water and mixing it with the feed the next day, while the control group (group I) animals were given plain calcium

carbonate (= uninformed) at a rate of 2 g per day during the entire trial.
The groups were constantly monitored and all clinical signs of recovery, improvement or adverse effects were filmed, photographed and documented. The analysis of the samples was carried out in the National Institute of Nutrition & Physiology, Bangalore and in the Veterinary College Hebbal, Bangalore, India.
In group IX, cows with chronic mastitis were diagnosed based on history, clinical signs, pH-tests and somatic cell count. Penergetic-t and Penergetic-t-Mastitis were administered for both groups at a rate of 2 g per day in the general category and at the rate of 2 g per day per animal with mastitis by soaking the material overnight in water (1 or 2 l) and then mixing the water in the feed / fodder the next day (once a day). It was given for 14 weeks. Recovery from the disease was noted in clinical and laboratory findings.
The data obtained from the entire trial were statistically analysed by oneway ANOVA (Snedecor and Cochran, 1980) using GraphPad Prism,
Trial version 4.01 for Windows by GraphPad Software, San Diego California, USA.

Results and discussions

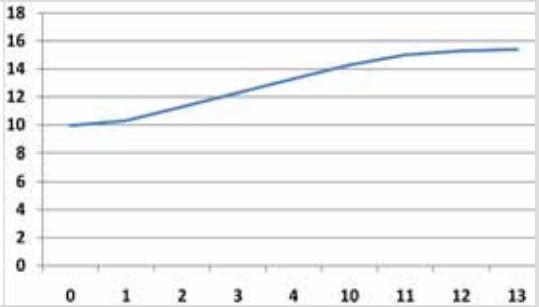
In this study, untreated calcium carbonate was given to the cows in the control group, to find out if calcium

carbonate itself, as the only physical ingredient of Penergetic-t, plays any role in the therapy.
Penergetic-t administration to the test group gradually increased the milk yield during the 13 weeks of the trial (see graph).

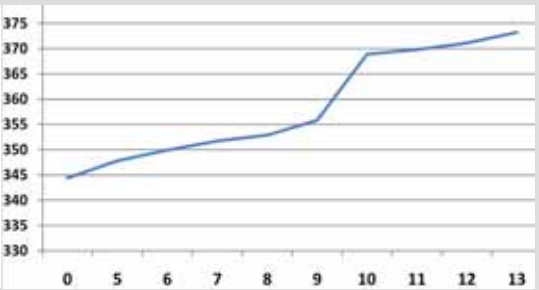
The animals in group III, who suffered from poor growth, showed an increase in body weight and in appetite at the end of the trial.

Stean et al. (2006) observed that feeding propionibacteria to cows increased their milk yield, food intake and body condition. In this study similar findings were made, which may be attributed to the orexigenic information substances of Penergetic-t.

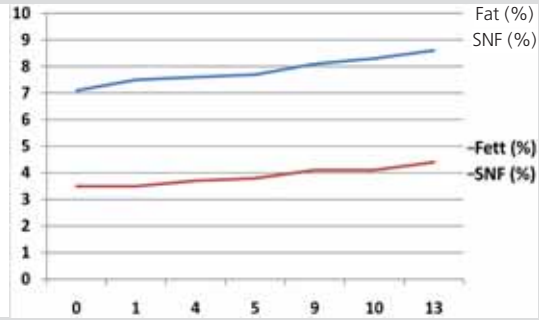
Milk yield litres/day



Body weight (kg)



Fat and SNF (=solids-non-fat)



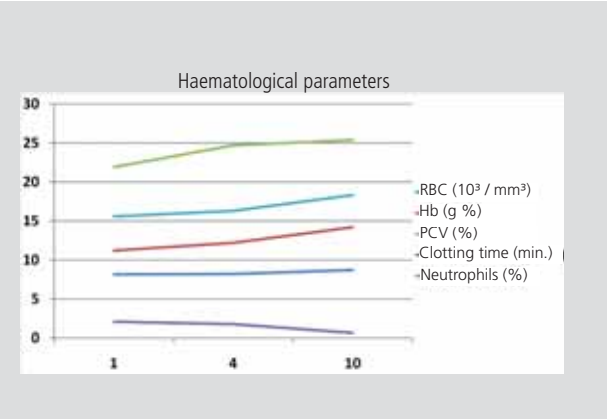
Cows in group IV suffered from a dull coat and alopecia. After six weeks of treatment they started to develop new glistening coats.

Cows in group V, who were generally weaker, started to show an improved health condition after 5 weeks of being treated with Penergetic-t. Their dry matter intake was markedly increased.

In group VI, the solids-non-fat (SNF) content of the milk was checked daily, as the ratio for this group was consistently low at the start of the trial at less than 8 5 %. After 9 weeks of treatment, the SNF had increased significantly. The SNF level remained consistent even after the treatment had ended. There was a gradual and consistent increase in the fat content of the milk during the treatment period. This may be due to a better digestion of fibres and proper utilisation of concentrates (Rao and Sundaresan, 1980).

For group VII fibre digestion was poor. This could be observed by the presence of undigested fibre threads in the dung. This markedly decreased after 5 weeks of treatment.

In group VIII (foul smelling dung), Penergetic-t noticeably decreased the smell after 3 weeks of treatment, which may be attributed to better digestion or to the ability of the dung to reduce the unwanted bacterial



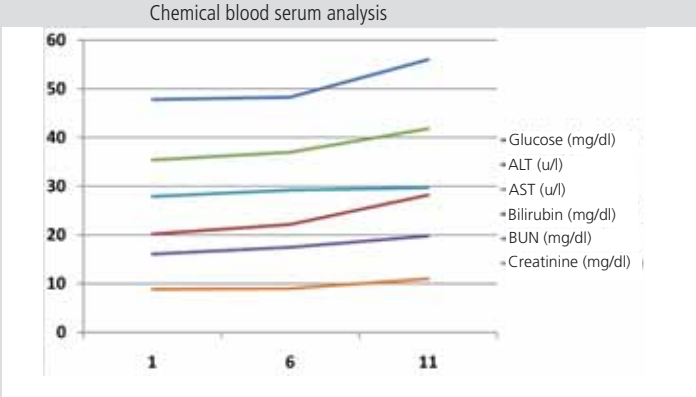
load from the gastrointestinal tract. In all groups Penergetic-t increased the concentration of haemoglobin significantly. However, there were no changes in parameters like red blood cell count (RBC), packed cell volume (PCV), clotting time, total leucocytic count (TLC), lymphocytes, neutrophils, eosinophils, basophils and monocytes during the treatment period.
There were no noticable changes in the biochemical serum parameters like serum creatinine, blood urea nitrogen (BUN), aspirate aminotransferase (AST) and alanine aminotransferase (ALT), which indicates that Penergetic-t is not nephrotoxic or hepatotoxic even after 14 weeks of administration.
There were no marked changes in the concentrations of serum calcium, phosphorus, magnesium and potassium. There were no changes in urine-pH or rumen-pH of all the animals during the entire trial period compared to the control group.

There were no changes whatsoever in any parameters in the calcium carbonate (= not informed) control group compared to the week1

values, indicating that calcium carbonate neither has any beneficial nor harmful effects and therefore did not interfere with the results.
This indicated that all beneficial effects of Penergetic-t originated from its active information substances and not from the calcium carbonate.
For the cows with chronic mastitis diagnosed by clinical examination and laboratory tests in group VIII, the somatic cell count gradually decreased between week 1 and week 6 of the treatment. Therefore Penergetic-t-Mastitis is useful in the treatment of chronic mastitis. It may be effective in combination with antibiotics and supportive therapy.

In group IX cows with lesions of the hoof, which were difficult to heal, were observed beforehand. These wounds were difficult to get healed and the animals had suffered from them for many months.
Interestingly in 12 cows out of 15 cows the wounds healed during the course of the treatment, which was not the case for the rest of the herd. Hence a systematic examination of this is needed.

Chemical blood serum analysis



CONCLUSION

We found Penergetic-t helpful in improving the general health condition of dairy cows. It increased the solids-non-fat content of the milk, fibre digestibility, body weight and coat condition. It cured dermatitis within two weeks, reduced the foul smell of the dung of the animals and improved the haemoglobin content and general health of the cows. It proved to be efficient in the cure of chronic mastitis.

Further research is required to clarify the effectiveness of the individual information substances of the Penergetic product and also with regard to their effect on the hoof lesions. Penergetic-t was proven to be non-toxic to animals over a long treatment period.

Acknowledgements

The author is grateful to the Deputy Director and Assistant Director, Composite Livestock Farm and Research Station, Heseraghatta for the co-operation extended during the field trial. The author is grateful to Dr. M. M. Kailash, Veterinary Dairy Farm, Hebbal, Bangalore, for his co-operation during the study and the author is grateful to the scientists in the National Institute of Nutrition and Physiology, Bangalore for helping to estimate the mineral levels in the blood of the animals. The author is also thankful to Mr. Kamat, S.P., Sanshin Devices Pvt. Ltd, Bangalore (on behalf of Penergetic Int. AG, Switzerland) for the free supply of samples and for bearing the cost of various parameters of the trial.

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A relief for cattle and horses

In times of drought Penergetic is an excellent aid

Ms
Sueli Vieira
Rodrigues

Brazil plays an increasingly important role in the global agricultural economy. The country is the world's biggest producer of coffee and oranges. It is in second place for soy and cocoa. It is also the third largest cattle producer. The climate in the northern parts of the country is predominantly tropical; whereas to the south it is subtropical, where farmers have to endure long periods of drought. It is not unusual not to have any rain for eight to ten months at a time. This results in a number of problems for cattle and horse breeders.
Ms Sueli Vieira Rodrigues from Araçuaí/MG, Brazil has had plenty of experience with these conditions.

She submitted the following report: "When we started cattle and horse breeding in the semi-arid zone in Brazil we knew about the challenge ahead of us: to achieve good economic results in such extreme climatic conditions.
The biggest difficulty for us was to find out which biological additives would help us to create the right food and, of course, good health for the animals in our herd, as part of our already established organic method.
Another important aspect was that the application had to be easy, because the risk of poisoning and metabolic changes was high at such high temperatures and low humidity. From the beginning of the project we treated parasites, verminosis and other diseases using phytotherapy, by adding derivatives of Indian neem, which we gave mixed with salt and applied locally with oils and extracts.
This achieved a satisfactory pharmacological reaction so that a certain stability developed with regard to our animal's diet and health. However, up to then, we had not had satisfactory results regarding vitality and long-term wellbeing of the herds. Mainly because of the adverse climatic conditions, the long rainless periods and the high temperatures with low

humidity, a reasonable supply of food with sufficient water was lacking for many months per year. Nevertheless our cows have always calved easily and developed good maternal skills, but produced too little milk. The calves themselves would act restlessly, were always moving around and fed from the mother several times per day. We really only rarely observed them resting on the ground or ruminating contently. This irritated behaviour of the cows and their calves led to an ever-decreasing base yield, i.e. a decreased weight gain in the male animals that were bred for slaughter and an insufficient and often later willingness in the heifers to get pregnant. Generally, we separated the calves from their mothers after ten to eleven months at an average weight of 120 kilograms.

During that time, we never achieved a weight gain of 500 grams / day for the calves. Not even during the rainy months with a good supply of water and food.

For several years, we have used biodynamic preparations on our farm which have helped us to keep a certain energetic balance, and which have also improved the biological quality of water and food. However, we have to take into consideration that it is relatively easy to look after 50 animals in a shed rather than looking after 500 free-range ones in a large area with watering holes that are sometimes very far away.

I had already known about Penergetic-p through a business partner and decided to use Penergetic-t and also Penergetic-t-Calf-Diarrhea on our farm.

As I mentioned earlier, we had already tested supplements over the years that promised to achieve fast weight gain and sexual maturity by means of their chemical composition. Expensive products that worked quickly at the beginning but, after some time, the old, poor condition was visible again.

Over time, though, we always ended up back at the start with the same problems, e.g. rejection of the calves by their mothers, not enough milk and calves that were nervous and also small and skinny. This time, with the use of Penergetic-t, we wanted to carry out a test that was clear for us so we separated 41 male and female calves as well as a small control group.

Penergetic-t is easy to use; we mixed it with the salt at a ratio of 50 g / 25 kg salt, which we then made freely available to the animals. We observed the test group and the control group for 90 days. Here are the results:

1. The Penergetic-t test group showed an average weight increase of 730 g / day. The control group gained weight at an average of 320 g / day. The milking cows increased their milk production significantly.

2. Most remarkable were the calves. They drank less per day, showed an altogether calmer temperament, rested as well and, best of all, they slept for several hours each day.

3. For the duration of these tests there was no rejection of calves by the mother cows and none of the little calves died.

4. For the test period there were no instances of diarrhea, neither in the calves nor in the mother cows. We achieved this by mixing 10 g of Penergetic–t-Calf-Diarrhea into the drinking water.

Following these positive results we continued the treatment throughout 2007, a year during which we experienced one of the worst drought periods, probably as a result of global warming.

We had no rain for ten months, extremely low humidity and a great scarcity of food. But even even in this unusual weather situation the animals behaved in a calm manner, were generally healthy and only some very weak animals died. The most interesting aspect for us was, that by using Penergetic-t the rearing in general remained constant and even. Another positive that we also have to mention is that the application can be carried out so easily and without any great effort."

Horses

"The results from using Penergetic-t were also for the horses very satisfactory for us. The animals were extremely healthy, showed great robustness and in particular we would like to emphasise the beauty of the animals. We do not breed horses for commercial gain, but for the opportunity to work with an animal and to transform it into a beautiful sculpture and to develop and promote a well-balanced temperament in it.
When I chose the Pampa breed, the reason for my decision was the beauty of these animals, the beauty of their coat and their colour.
I believe that the biggest challenge for a horse breeder is the horse's coat. Total skill is maintain the coat's shine and healthy appearance.
A second challenge is breeding with mares in a manner that produces really good results in adverse food and environmental conditions.
The animals are generally kept outside and they do not get any additional feed when in the field, just mineral salts. We control diseases, injuries and parasites only by phytotherapy, i.e. with by-products of Indian neem, calendula (marigold) or with camomile.
During the critical months of the year we can clearly see how the coat loses its shine and how the animals struggle under stress in the environmental conditions.
The mares do not become pregnant during that time and if they do, they have miscarriages or the foals are very weak when they are born and they need all our attention in order to survive.

Sueli Rodrigues
and Victor Janot
Pacheco Filho

In 2007 our group of horses was treated with Penergetic-t. Again we mixed it with the mineral salts at (approximately) 1 g / day.
We experienced ten months without rain and in October and November there was no green fodder left on the fields. Only a small amount of dry grass was available to the animals. Then it became clear: the animals were of an enviable robustness, they did not become ill, they kept their weight and there were no miscarriages, only strong foals were born. The coat had the desired colour for this breed and the special sheen. Some cases of diarrhea were treated with Penergetic-t-Calf-Diarrhea.
The problem was resolved quickly in all cases."
In July 2008 top prices were achieved for the animals at auction, without the use of expensive and difficult treatments.
Even the competitors' animals that were cared for in a much more cost-intensive manner could not keep up. The use of Penergetic has therefore proven its excellent viability.

Poultry fattening

8,2 % weight increase with Penergetic-t

Sucessful poultry breeding strongly depends on measures taken at the farm. The origin of the animals, feed quality and suitable poultry housing all play an equally important role.
In intensive poultry breeding there is also always the question of achieving a maximum yield with as little feed as possible.
The growth of chicks is closely connected to the feed composition and good feed conversion. Here, the stomach in particular has to be considered.
We know today that large populations of microorganisms (up to 10^{11}/g) live in the chickens' guts. Such a concentration of metabolically active microorganisms has a big influence on feed conversion and feed energy generation.
These microorganisms react very sensitively to changes in environmental conditions. Wrong feed composition, bad digestion or a weak immune system can lead to an increase in harmful bacteria.
By using antibiotics the population of harmful microflora can be reduced and the growth efficiency of the host can be improved.
Several antibiotic preparations are already contained in compound feeds to improve growth and resistance.

Marius Vysniauskas, Penergetic agent in Lithuania with many years of experience. His company also deals in slurry containers and agricultural equipment.

Two parameters are of particular importance for the feed quality:
1. Feed composition, i.e. the right amounts of proteins, mineral substances and vitamins.
2. The feed must not be harmful to either the animal or the consumer.

Often synthetic preparations are used that might stimulate growth but remain in the organism and can become dangerous when they accumulate over certain limits in that allergies or other diseases may manifest. Therefore, nowadays more and more biologically active substances are used in poultry breeding. In this trial the effects of the Penergetic-t preparation on the growth of poulards are examined. The preparation that was mixed into the feed harmonises vital processes in the organism, it improves digestive processes, stabilises health, strengthens the immune system and stimulates the activity of the intestinal flora.

Trial method:

The tests were carried out in 2002 in cooperation with the University of Education in in Vilnius, Lithuania and the company AB Vilniaus Paukstynas. The two test groups contained chickens of the Rosso krosos breed. The trial lasted from 6th November 2002 until 18th December 2002. Each of the two test groups consisted of 100 chicks (50 males and 50 females). The first group was the control group; the second group was the test group.
The control group received standard compound feed with the additive 'Vilzim MFK' (manufactured by AB Biosinteze). The test group received the same standard feed as the control group, but, in addition, they were given the preparation Penergetic-t.

The objective of the trial was to compare the following values:
1. To examine the dynamics of the chick mass, feed consumption, losses (deaths of chicks)
2. Blood samples for protein, nucleic acids, triglycerides and lipids
3. Chemical meat test

All results were calculated using statistical methods for organic substances.
The chicks were kept on bedding and each group of chicks was housed and cared for in the same way. The conditions comply with

Lithuanian zoo-technical requirements and the recommendations of 'Ross Breeders' (Scotland), the company who supplied the chicks.

Test Results
It must be borne in mind that the live weight was small at the beginning of the trial, therefore the level of weight gain recorded is also slightly smaller. The test results show that the test group* grew better than the control group. Following the addition of the Penergetic-t preparation, the weight gain in the test group was 8,2 % higher than in the control group after 42 days (weight gain in the males: 12,37 %, weight gain in the females: 4,04 %). The chickens in the test group also grew better. Their average growth per day and night was better than the control group by 8,33 % over 42 days. The test group needed 3,61 % less feed per kilo of live weight gain. Chick losses were fewer in the test group. However, losses are more

* = group treated with Penergetic

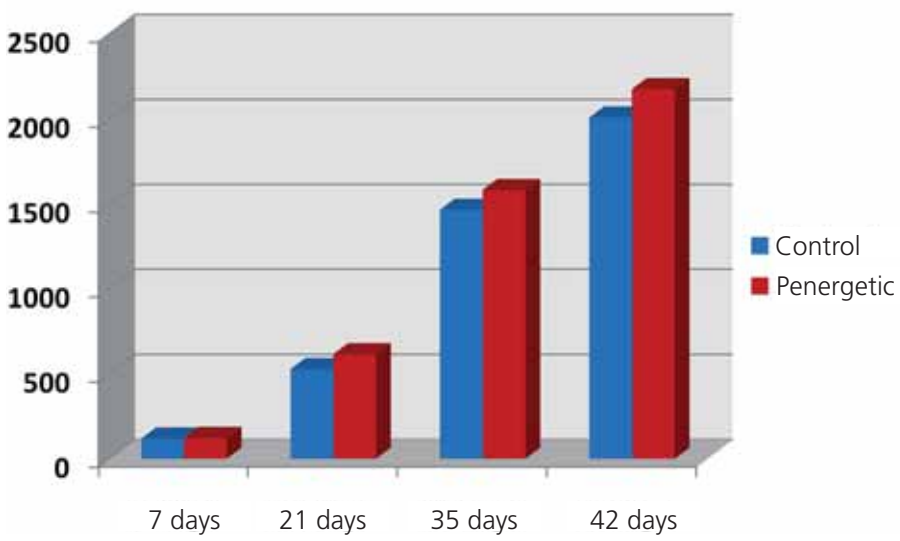
attributable to stress than to bad feeding practice.

Conclusion
The best result for live weight gain was recorded in the test group, to whom the Penergetic-t preparation was given. The effect of Penergetic-t led to an increase of 8,2 % more in weight gain than for the control group over a 42-day period.

The males of the test group weighed in at 12,73 % more than those of the control group.

The feed consumption for the test group was more economical. The animals needed 3,61% less feed per kilo of live weight gain.
There were only 2 % losses in the test group.

Development of the chicks in weight/grams



A natural environment for chickens

Breaking new ground with Penergetic in South Korea

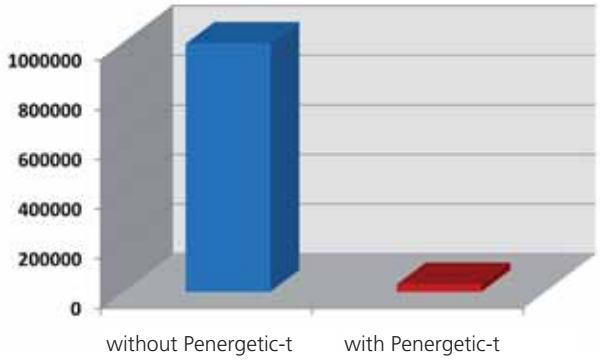
At long last, intensive mass chicken farming is to be prohibited from 2009. At least small aviaries, approximately two and a half square metres in size and in which about 30 chickens can move around slightly more freely than in their current conditions where each animal has a living area smaller than an A4 sheet, will then be used. Apart from these living conditions the feed usually has antibiotics mixed into it as a preventative measure. However, an interesting trial with Penergetic-k and –t on a chicken farm in South Korea carried out by Kunkuk University in Seoul, has proven that there is another way. The trial was to compare the feeding and keeping of two free range test groups whereby the control group was to be fed with conventional feed mixed with the usual antibiotics. For the test group the rice-husk bedding that was used for both groups was sprayed with Penergetic-k mixed into water (7,74 kg) before the chicks were moved in.

As is strongly indicated by the charts, there is a big difference in the quality of test and control groups; for the animals as well as the housing. This trial unambiguously proved the powerful effects of Penergetic-k and –t. However, chicken breeders only use Penergetic products very hesitantly, because it is generally believed that giving antibiotics offers enough preventative protection from diseases. These feeding patterns are so well established that breeders are afraid to change them in case of adverse effects from other methods. Any disease that breaks out can endanger the entire population.

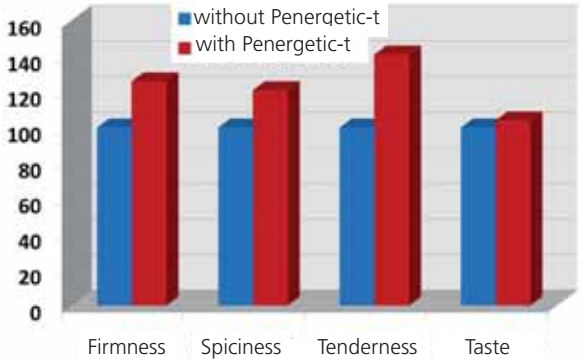
Therefore we can look forward to the changeover when all chickens will be kept in free-range conditions; because then, at last, the more natural conditions will form a healthier basis from which breeders might be more readily prepared to take the risk of using natural preparations rather than feeding antibiotics automatically.

Results:

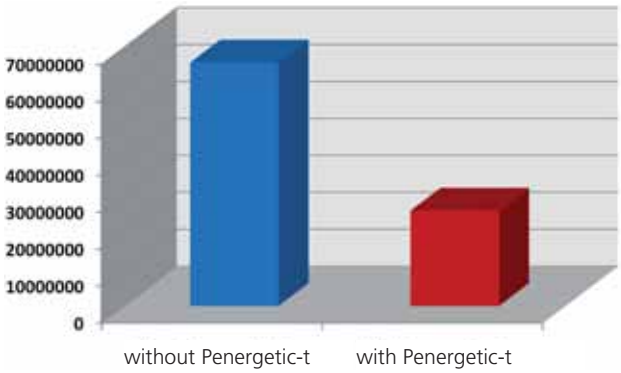
	Control group	Test group
Environment	strong smell, sticky manure	low odour, manure not sticky
Condition of chickens	very dirty, tears	clean, not many tears, slightly better daily weight gain
Meat quality	strong smell of chicken, tough	not so strong smell,tender
In soup	irregular fat droplets, signs of mass produced meat	regular fat droplets, no difference to naturally raised chickens



E-coli count in chicken manure



Comparison of chicken meat



Total number of salmonella in chicken manure

Legal guidelines for keeping chickens

Comparison between organic and conventional

Growing poulards organically

Already, conditions for breeding poulards are starting to improve and consumers, which method has been used to grow the chicken they are buying. Chicken farms in the German Bioland organic cooperative, for example, have to adhere to the following criteria on their fattening farms: Stocking: Max. 580 (Bioland 280) poulards per hectare of useful area Stocking density:
Max. 4'800 birds per house allowed.
Housing area: Max. 10 birds with a total maximum weight of 21 kg per m² Green run: 4 m² green run per bird (with a transition period until 2010).
Bad weather run: Bioland stipulates roofed bad weather run of at least 1/3 of house area.
House design: At least 1/3 of house area as littered scratching area; perches stipulated.
Clipping of beaks is not allowed at Bioland and only with special permission on other organic farms.
Growth period: 70-90 days

Growing poulards conventionally*

Stocking: No limit as such; the amount of slurry/manure that is allowed to be spread per hectare of usable agricultural area is limited by the fertilizer act and thereby indirectly the number of birds.

No limit for stocking density: Commonly 20’000 to 30’000 birds per house.
Housing area: Approx. 20 birds with a total maximum weight of 35 kg per m² Green run: Not specified
Bad weather run: No roofed bad weather run stipulated House design. Bedding and perches not stipulated. Beaks may be shortened or clipped Growth period: 32-56 days, often not more than 35 days.

Good reasons for clever organic farmers

Manure is a valuable fertilizer as long as the ratio of manure production and the demand for it by cultivated plants is balanced.

Overstocking promotes stress and diseases. The stipulated green run and the housing area limit the number of birds.

Bad weather runs enable movement all year round, strengthen the immune system and boost vitamin-D production.

Chickens can behave according to their needs and avoid birds that are higher up in the hierarchy. The available area is utilised more efficiently and in a more structured way with perches.

Conditions have to be adapted according to the needs of the animal and not vice versa. Injuries hinder care for the plumage and feed intake. Bones can develop in proportion to weight gain, preventing damaged joints.

(* 98 % of conventionally grown chickens are from intensive floor management)

An ancient saying

The future of a country is connected to its soil. Optimised soil management is the key for the prosperity of its citizens.

Ana Primavesi

Optimised composting

As with all Penergetic products, influencing microorganisms plays the biggest role. In particular, compost and composting are stimulated, which helps to make important nutrients available to plants. Penergetic-k for compost is ideal to use for fertilization in fruit and vegetable cultivation.

Effects

Field application
- decomposite plant residue
- activate microorgainsms
- unlock fixed soil nutrients

In animal housing
- Pleasant environment
- Reduction of bad smells
- Mucking out is easier

On the dung heap
- Acceleration of rotting process
- Good fertilizer
- Unobtrusive compost smell

Liquid application
40 g Penergetic-k per m³ of dung or 3 g / m² mixed into water and poured over the litter.

Dry application
40 g Penergetic-k per m³ litter or mix 3 g / m² with powdered mineral, sawdust or similar substances at a ratio of 1:10 and scatter.

Field and green composting
250 - 600 g per hectare (crop dependent)

Compost –
The valuable organic fertilizer

Composting is the controlled decomposition / rotting of organic material with oxygen. Microorganisms (bacteria, fungi and similar), called saprophages, break down the structure- forming components (wood cellulose, etc.) of the plants as well as their components such as sugar. Through their metabolic functions they create metabolytes that are further processed by other saprophages. In this way the biomass is broken down into its original components which are then available for use by higher plants as nutrients. The volume of compost that is created annually is interesting in Germany, for example. Per household approximately 8 tons of compostable material are collected from "green bins" and delivered to composting plants as green waste from gardening and landscaping.

From this 8 tons of waste 4 tons of compost is created. Compost is used to supplement the nutrient reserves of intensively used soils. Compost has a high water retaining capacity so that plants can better survive periods of drought. It often has a high content in nutritional substances,in particular phosphorous and potassium. Thoroughly rotted compost is is an excellent fertilizer and soil improver. Depending on the degree of decomposition and maturity it is called either fresh, ready, mulch or substrate compost.

Nowadays, organic agriculture with high quality biological products is increasingly popular. Composting, green manuring and cultivation of intermediate crops is now part of a sustainable and high performing crop rotation.
The specific cultivation of intermediate crops can have very positive effects on soil structure, humus formation, weed control and nutrient mobilisation. This is where the Penergetic products fit seamlessly into the working cycle, for the legume plants as well as pulse crops with a high protein content that have become an indispensable part of organic crop rotation because of the nitrogen-fixing properties of the nodule bacteria.

According to current knowledge, Penergetic products have an effect on the increase of certain cell types and root growth, in number as well as length.
Furthermore it seems to have positive effects on photosynthesis, which is one of the most important biochemical processes there is. Biosynthesis, through the formation of organic substances, drives nearly all existing ecosystems, either directly or indirectly. Many field trials have also shown that, particularly in stressful situations, Penergetic enables plants to balance out energy efficiency and thereby to optimise the use of raw material resources. One can read time and time again in reports by agricultural technicians that Penergetic products lead to an improved nutrient absorption of plants. In this way, quality and health improve and in the end the biological value of the finished product increases.

We also must not forget to mention the optimisation of the soil structure and thereby a certain protection from erosion especially in the case of composting with Penergetic-k.

Someone who knows the ins and outs of commercial composting is engineer Maziotto from Uruguay. Read his interesting short report on the next page:

A terrible smell

Composting plant in Uruguay was nearly shut down

José Luis Dominguez wanted to compost waste originating from his large plant. After a promising start the raw material began to stink terribly, in particular during the warm seasons. It was expected that the authorities would be forced to close down the plant. Now the Zenda Leather Company was looking for alternatives.
They made contact with Penergetic who recommended the use of Penergetic-k for compost to reduce the smell. Almost immediately after the first application the smell was reduced to such an extent that there were no further complaints. This was a fantastic result, but when engineer Maziotto brought the compost to use after the rotting had finished he was even more amazed. In their own trials trials the company achieved an above average plant growth and therefore higher yields. Now, Zenda Leather has has formally established a composting plant and compost process. A spray applicator for liquids was installed on the compost turner that applies Penergetic-k at precise mixing ratio into the compost.
At the start of the composting process all windrows are covered so that the process is protected from the weather. After maturing for 35 days the compost excels with its dark colour and even consitency.

COMPOST TEST
with and without penergetic-k

Materials and methods

Test was done on two piles of manure as follows:
Start date: July 10, 2004.
Pile 1: allowed to decompose based on conventional composting procedure
Pile 2: composed by conventional means with addition of penergetic k (applied at 40 grams/m^3)

Results

Days until completion of composting process
Pile 1: 80 days
Pile 2: 45 days

Parameters	Pile 1: Without Penergetic k	Pile 2: With Penergetic k
Organic matter (%)	47.7	71.2
Ash (5)	52.3	28.8
Carbon (%)	13.5	26.9
Total Nitrogen (%)	1.5	3.2
Relationship of C/N	9.0	12.2
Humic Acid	18.6	19.1
Fulvic Acids	2.3	7.7
CIC	60.8	65.5

Biological Analysis

	Analysis of four samples – 3 untreated and 1 with penergetic k			
Fungi	Untreated Samples			Treated Sample
	Sample A	Sample B	Sample C	Sample K
Aspergillus caespitosus •	6	5	11	1
Aspergillus fumigatus •	52	49	18	5
Aspergillus niger	-	25	-	27
Aspergillus terreus •	2	-	-	-
Emericella nidulans •	1	-	2	-
Fusarium nygamai (104) •	5	9	-	-
Puccinia	5	1	-	-
Penicillium murabile ○	1	-	1	1
Gliocladium Gliocladium ○	-	1	-	2
Actinomycetes ○	-	1	-	1
Trichoderma ○	-	1	1	5

Note:
when tested at 25°C a significant presence of beneficial organisms (Gliocladium, Actynomietes and Terichoderma was observed in the sample from the pile treated with Penergetic k and a low incidence of detrimental fungi (Aspergillus fumigatus).

The fungi, red marked, are benefical for agricultural production.
In particular, Gliocladium, Actynomietes and Terichoderma are favourable fungi (especially Trichoderma), which are often used to create natural fungicides as a means of avoiding or reducing the use of chemical products.
The use of Penergetic k in treating compost promotes the favourable development of these fungi and stimulated their multiplication – thereby essentially offering the same benefits of a natural fungicide.

The fungi (red marked) are considered to be bad for agricultural production. In particular, Aspergillus fumigatus and Fusarium nygamai are two undesirable fungi, especially for field crops such as wheat and sunflowers. Aspergillus fumigatus is also unfavourable for human health and has been shown to be carcinogenic. When untreated compost is spread on the field a farmer runs the risk of spreading these harmful fungi to the crop, which are unhealthy for plants (and the soil) and lead to the application of fungicides. The absence or reduced incidence of these detrimental fungi in Penergetic k treated compost means land application with Penergetic compost significantly reduces the risk of introducing unfavourable fungi to the soil and crops.
The quantity of fungi shown in the table needs to be multiplied by 104 (or 10'000) in order to calculate the total quantity of colonies of that specific fungi identified in a given sample. For example Aspergillus coespitosus in Sample A:
means that 60'000 units of this fungi were identified as alive and capable of creating more colonies of this (undesirable) fungi.

Summary of Study Results

As evidenced by this study, the benefits of using Penergetic k in compost treatment include:

- Increase in organic matter content of compost
- greater carbon and total nitrogen content – due to less loss of ammonia to the air through volatilization during the composting process, as an aerobic (instead of an anaerobic) process is established
- higher Carbon to Nitrogen ratio
- accelerated and more complete com posting process
- reduced odour emission during com posting (as aerobic process prevents putrefaction)
- accelerated production of beneficial fungi – good for the soil regime (and plants)
- reduced risk of spreading fungi detri mental to crops when compost treated with Penergetic k is used

Penergetic k can also be applied in barns/stables to reduce insects, odours and start the decomposition process of spoiled bedding

and animal wastes. Penergetic-k may also be applied on fields: pre-harvest, post-harvest or prior to planting to activate soil nutrients, promote breakdown of dead/decaying matter and releases nutrients locked in the soil.

After the first step of compost production was completed successfully, more trials were carried out. For example, compost was applied to orange trees. It was observed that it contributed to eliminating bacteria that previously invested the falling blossoms every year.

When planting new orange trees, compost is now, routinely used from the start. Then, Penergetic-p is mixed into the compost on site to support healthy sapling growth and development.

Bean trial

Longer bean pods

Another impressive trial took place in the town of Frey Benitos: Penergetic-p was sprayed at a dosage of 400 g per hectare or 20 g per 15 litres of water. The compost and the above mentioned amounts of Penergetic-p were applied to the test field. Only ordinary compost was placed on the control field, approximately 2 kg per square metre on both fields. The previous crop on the trial area was wine growing in 1998; from 1999 to 2005 the area remained fallow.

Parameter

	test group	control group
Number of plants per 500 m²	1'445	1'500
Height of the plants	81,4 cm (**)	69,5 cm
Beans per plant	9 (**)	7
Length of beans	15 cm (**)	9 cm
Beans per shoot	5	4
Weight of beans	92,50 (*)	89,40
Total yield	1'850 kg (*)	1'788 kg (*)
Comparison bean / pod	54%	40%

* Significant differences with 95% satisfaction
** Significant differences with 99% satisfaction

The interesting thing with this trial is that the pods on the test field were 66 % longer than those on the control field.
Once again the results achieved in other countries with the same or similar crops are confirmed: the plants were 17 % higher than those on the control field. The weight of all weighed beans on the Penergetic field was 3.5 % higher, which is an increase of the total yield of 3.5 %. Obviously Penergetic has reduced the number of pods in favour of bigger fruit.

Peas

Significantly higher pea weight

The pea trial also shows that the Penergetic effects are clearly aimed at the fruit. On the same fallow land that had remained unused for six years, 2’800 (Penergetic) plants and 3’500 (control) plants were planted. The parameter regarding cultivation: 85’714 seeds planted at 0,7 m between rows and 6 plants per metre. Again, 2 kg of compost per m^2 were placed on the control field and an additional 400 g Penergetic-p per hectare on the test field.
In this trial the average number of peas per pod is the same for test and control (6).

However, the Penergetic field’s pea weight was 11,89 % more. The table illustrates impressively that the yield increase achieved on the Penergetic field with 55’400 plants per hectare is 10 % higher than on the control field with 70’000 plants per hectare.

Plant improvement through use of Penergetic-k treated compost in combination with Penergetic-p treated peas

Parameter	Penergetic	control
Number of plants per 500 m^2	2.770 (**)	3.500
Height of the plant	65 (**)	51,5
Beans per plant	15 (**)	10
Length of the beans	7,5 cm	7,2 cm
Beans per shoot	6	6
Total yield	1’845 kg (*)	1’650 kg
Comparison bean / pod	92,25 (**)	82,5
Comparison bean / pod	46%	54%

* Significant differences with 95% satisfaction
** Significant differences with 99 % satisfaction

Extrapolated data per hectare

Parameter	Penergetic	control
Quantity of plants	55’400	70’000
Yield kg/ha	1’845	1’650

A pen barn for calves

Excellent results with Penergetic-k

Hans-Ulrich Bigler, working on this trial in a consultative and advisory role

Martin Stucker, from the Schmitte farm in Oberthal, Switzerland, reported in March 2006:
"For four years now I have been using Penergetic products on my farm now. Why?
We are operating under the high quality organic Bio-Knospen label and it is important that farm dung is not just properly used, but also is well processed.
Four years ago we converted from tie barn to pen barn. We wanted to build a pen barn that meets the needs of the animals as closely as possible and that's why we decided to go with a multiple-room barn.

- **Fixed feeding site**
- **Deep litter sleeping area**
- **Fixed run**

We found the dung from the pen barn to be problematic.

1. The dung is very hard and difficult to take out.

2. The dung is supposed to be stored before spreading, so that it rots better and is more readily available for the plants. This means a high input of labour.

3. The dung should be as dry and loose as possible.

All of this made us look for a new product that improves these factors. We found some answers at H.-U. Bigler's in Schlosswil and got a first impression in his barn. I was always of the opinion that I would need a few years of experience to be able to form my own opinion.

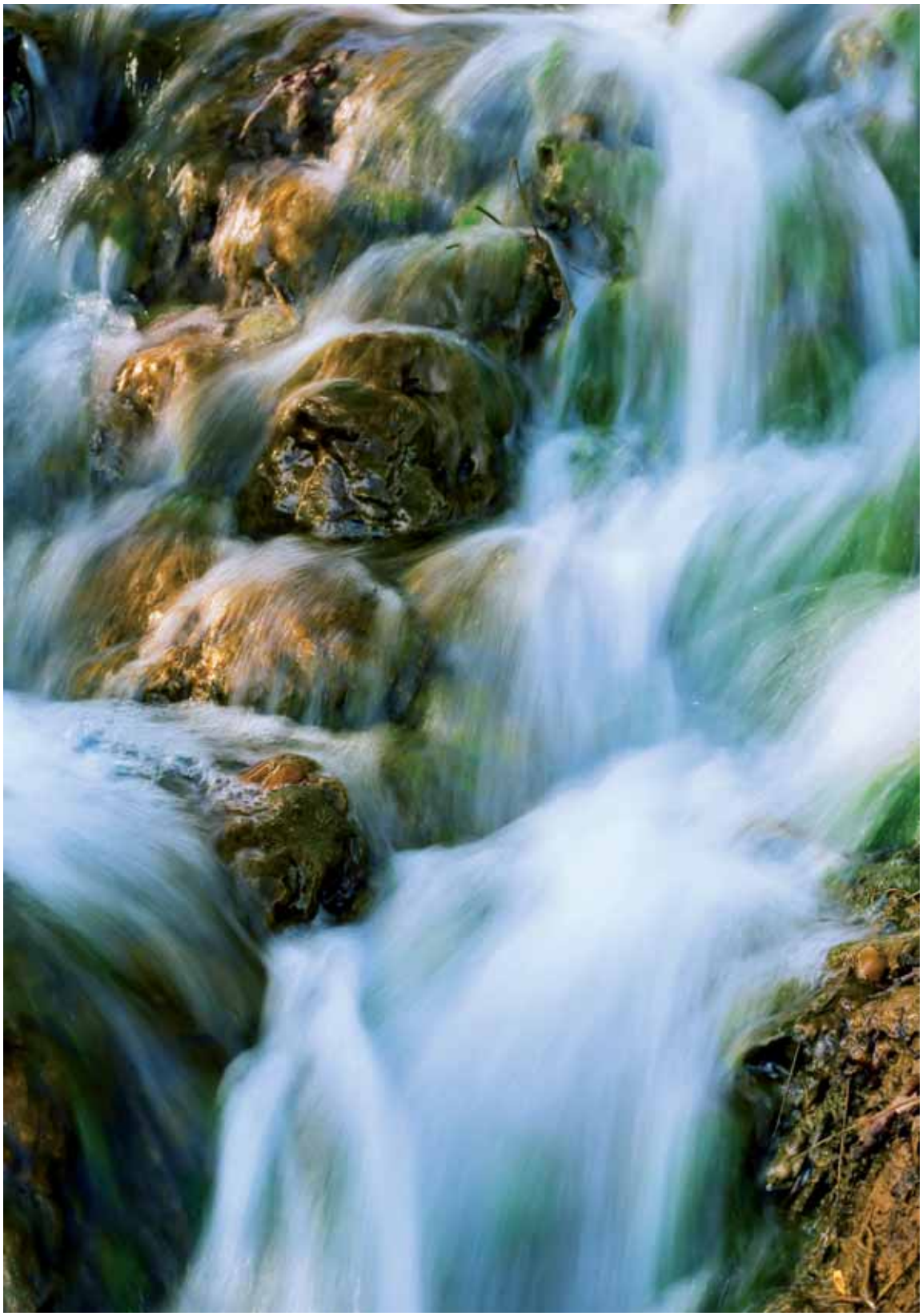
We wanted to build a suitable barn for these little calves

The opposite was the case:
everything ran simply and smoothly in this barn.
I noticed that with Penergetic-k:

- The dung does not get warm, i.e. no reduction of valuable nutrients takes place.
- The dung does not collapse. It does not decay but rots. This clearly improves the smell.
- The dung is not as hard when it is taken out and can be spread more easily.

In my opinion, the dung is available to the plants more readily; we were able to maintain the yields.
The dung was applied to meadow, winter barley and winter wheat.

Important: to pour Penergetic-k over the dung regularly (once a week) with the watering can!
In conclusion I can recommend the Penergetic-k product."



Water vitalisation

AQUAKAT®

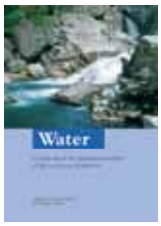
Spring water from your tap is the promise made by Penergetic with the AquaKat. And in fact many users testify that their drinking water has been vitalised by the AquaKat. A welcome additional effect is the influence that the Aqua-Kat has on the lime in water pipes. It becomes softer and clearly easier to remove.

Effect

The AquaKat is a signal emitter (transmitter, catalyst) that passes an information pattern (frequency), which has previously been modulated onto it, on to the water. Therefore it is classified as a physical water treatment device.

Areas of application

Drinking water
Agricultural water
Processing water



Recommended literature:

Gottfried Hilscher

WATER – A book about the phenomenal elixir of life and its re-vitalisation

ISBN 3-929771-09-8

www.penergetic.com

Penergetic AquaKat –

Humbug or new perspective?

In 2004 the well-respected German magazine for the sanitation, heating, air-conditioning and plumbing trade, SBZ, carried out an unusual test. Since the most curious reports about water vitalisation kept appearing in the media and left consumers as well as professional experts confused as to what to make of these praised devices, the trade magazine decided to carry out a large scale field test. While a number of products on the market show an obvious tendency towards the esoteric, Penergetic keeps to clear and comprehensible statements. Their main claim is that there is clear evidence that potential limescale problems in the house, in the heating system as well as in electrical appliances that come into contact with water, can be improved. The SBZ magazine wanted to put these claims to the test themselves. 35 companies from the plumbing trade agreed to take part in this large-scale practical test and to install the AquaKat devices provided by Penergetic.

The results were surprising:

1. Only 4 companies certified the devices to be without any effect whatsoever during the test period.

2. With the remaining 31 installations, positive effects of the most varying degrees and forms were achieved.

3. 28 professional testers reported a taste or haptic improvement. Statements like "the water feels softer, it tastes better and fresher and no bubbles form in the water" were often heard. It was repeatedly noted that the unpleasant chlorine taste was no longer noticeable. With regard to haircare, another group of testers reported that their hair felt softer, and that the water felt more pleasant on their skin (better skin tolerance).

4. Limescale problems: 7 testers said that problems with limescale remained unchanged. 2 testers did not have any problems with limescale before the installation and merely wanted to check for the effect on taste.

5. 26 testers, however, noticed a significant improvement of limescale problems. Their reports outline time and time again that limescale could be removed a lot easier. In cases where traditional cleaning agents had to be used to attack limescale on tiles and fittings prior to the test, it could now be removed by hand or with a soft cloth. Additionally it was said that less limescale built up and that the formation of limescale stains was reduced.

6. 12 testers with severe limescale problems were able to significantly increase (mostly double) the period between descalings on a wide variety of technical devices.

7. In 3 installations, where red discolouration of the water through rust had to be treated, the red discolouration vanished after the Aquakat was installed.

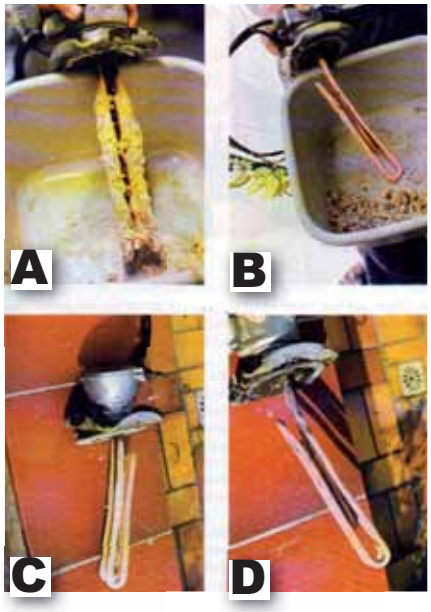
8. Because water is supposed to improve its dissolving capacity through vitalisation, the amount of washing detergent used can, according to the manufacturer, also be reduced. Correspondingly, about half of the households were able to reduce detergent consumption successfully by up to 50%. To be fair, it has to be said that it was not determined if the use of detergent had been optimised prior to the installations.

In the April 2004 edition of SBZ, the trade magazine reaches the following conclusion:
Apart from a few exceptions, the majority of the trade companies who took part in the experiment determined that the Aquakat - in whatever way - works.
The effects found were of a diverse nature and ranged from weak singular effects to baffling problem solutions with regard to taste, limescale and rust. It cannot be deduced from the test results which influential factors lead to which action when the devices are used.
For this, large scale scientific studies will be needed.

"A substantial section of the population is obviously receptive to products with esoteric leanings. This clientele should not be left to the traditional door-to-door sales-people. Inform your clients about the potential effectiveness and non-effectiveness of this device.
If you offer your customers a right to return purchased devices, for example within a three month period, even with devices where the cause of effectiveness can not easily be explained, you can always make a nice turnover in good conscience."
This is the advice of the trade magazine to their readers, the trade professionals.
Because of the significant test results, the advice by the magazine to critical testers and the plumbing trade in general was "not to miss the boat".
This original text from the trade magazine illustrates on the one hand the truly surprising results of the AquaKat test. On the other hands, it becomes clear what kind of problems the tradesmen in the field, as well as scientists, have to overcome to make sure that this new technology of water vitalisation becomes more widely accepted.
If one takes into consideration that neither electrical energy nor any other medium has to be calculated in regard to running costs, it becomes obvious that the device pays for itself in a short period of time. And if we are to believe the doubtlessly neutral trade companies, with this device one achives a truly vitalising

effect on piped drinking water.
A wide range of literature is available on the healing effects of spring water and plenty of tests have been carried out that certify a high degree of vitality in spring water. Self-cleaning properties in the meandering courses of brooks are mentioned in which the spiralling movement of the water plays a role. This means that nature provides for the necessary activity of the water mechanically and, in addition to this, with light and cosmic rays. Penergetic has devised a sophisticated system to modulate etheric resonances, so-called information, onto the water.
The principles are similar to those in homeopathy.
The medium for this is the AquaKat on which, however, these subtle energies cannot be measured directly. The effects can only be perceived during practical use. It can be assumed that water is an information carrier and that therefore frequency patterns can be stored in the water. The structure of the water is modified and the information remains stored in favourable conditions.
"Favourable" in this case means: no high temperatures, little turbulence and the absence of electrical interference. If these basic conditions are achived, the AquaKat is obviously able to supply the passing water with information.
This was perceived by the majority of testers in the SBZ trade magazine and is reflected in the test results.

Excerpt from the report by one of the companies that participated in the SBZ test:



A: Heating rod fefore testing, after 12 months of use: the limescale was hard as stone.

B: The heating rod was descaled with acid before testing commenced.

C: After a three-month run of the system with the AquaKat, limescale has become noticeable again.

D: These limescale deposits were, however, totally soft and could easily be removed with a jet of water.

„At the time of the SBZ test on water treatment devices, we had an AquaKat L installed from 24.06 to 28.09.2004 in our domestic system with the following results: the heating element of the 500 litre storage tank was covered with just a thin layer of soft limescale. It was easily washed off with a jet of water. We continued the test for a year with the following result: calcification was further reduced. We noticed descaling and cleaning of the element to be significantly easier. There was hardly any residue in the inner tank."

Signed: Karl Maierthaler,Stockdorf, Germany

heating rod after 12 months removed from boiler

The limescale is attached loosely and is easily removed mechanically

Heating element after being cleaned with water jet and brush

Water vitalisation with positive side effect

In a Berlin apartment building with 33 flats, an ion-exchanger (salt) that was used as a descaling device for the water system broke down in 2007. The repair was estimated to cost approximately 4'500 Euro. The management company for the building, Köpfle Consult, came across Penergetic in its search for alternatives. Penergetic's local technical advisor, Mr Jerry Letzat, was asked to present his alternative, Penergetic water vitalisation, at the next residents' meeting.
At the information evening it quickly became apparent that most tenants had recurring limescale problems. The water hardness level the area is 4 (very hard, more than 21,3 °dH), which for Berlin is rock-hard indeed. After the presentation of the AquaKat and its effects, which have been proven by neutral trade companies, 32 of the 33 owners who were present voted in favour of the installation of an AquaKat XXL. This is a particularly large version of the device that is able to work on even large amounts of water flowing past it. One of the decisive factors was a return clause, so that there was no risk for the owners. They were advised that a loss of vitality could also occur when heating water in the individual apartments, as some of them are equipped with electric or gas-fired continous-flow water heaters.
Penergetic also offers a solution for this problem: the AquaKat M, which is attached directly after the boiler and before the tap. In early December of 2007 the installation was carried out at the cold-water inlet in the basement. The first feedback from various owners to the management company which came back as early as the first week of 2008, was that limescale could be removed easily from kettles in particular and likewise sinks and toilet bowls could be cleaned much easier.

Hardness level	Total hardness in mole	Total hardness in degrees
1 soft	0 to 1,3 mmol/l	0 - 7 °dH
2 medium hard	1,4 to 2,5 mmol/l	7 - 14 °dH
3 hard	2,6to 3,8 mmol/l	14 - 21 °dH
4 very hard	over 3,8 mmol/l	or > 21 °dH

0,56 °dH (German degree of hardness) are equivalent to 1 °fH (French degree of hardness)

AquaKat L

Easy installation of an AquaKat XXL by Mr Letzat

The residents of the apartments in the Wittelsbacher Strasse 25 also stated that the water was pleasantly fresh and tasted lively. This was emphasised across the board, since the previous salt-based descaling device gave the water a rather insipid taste. By this stage, residents were calling on an almost daily basis to have the small AquaKat installed in their apartments to balance out the vitalisation loss from their water heaters. The management company decided to install the AquaKat in some of their other properties.

Eckhart Ott,
Penergetic representative in Germany

Two wheelbarrows full of limescale removed from water pipes

Mrs Reseda Binder, manager of a company that has been specialising in paraffin rings for the textile industry since 1913, has been using Penergetic water vitalisation technology in the production plant's cooling system since 2004. After a few weeks, due to some blocked jets, it became apparent that limescale deposits seemed to be getting detached from the pipe walls.
A specialist company was hired to check the inside of the cooling pipes under the building with a camera. They found that heaps of loose limescale deposits were lying in the pipes. According to Ms Binder such a thing had never been seen before. Altogether, two wheelbarrow loads of limescale were removed from the pipes. Since then, the water flows freely. Excess limescale now accumulates in the backflow pool after the cooling tower from where it can be easily removed. Ms Binder is very satisfied with the AquaKat and decided to have another one of the devices installed for the heating system.

Improved bread quality with AquaKat water

Michael Schwarzmaier

"The fermentation process in the dough plays an important role for us. We have noticed that the Pen-ergetic AquaKat has a positive effect on this. One could call it an accelerated fermentation process that is achieved by the water influenced by the AquaKat. Since we have been using the AquaKat we are able to produce bakery products, which are suitable for people who suffer from allergies, from 100 % pure varieties of grain (buckwheat, millet, oats, barley etc.). With the AquaKat we can make pre-doughs with spontaneous fermentation from non-raising grain without yeast or sourdough.

Saved time

When making wholegrain sourdough, the first step is sufficient and the sourdough is fully developed with all its aromas and yeasts in 12 hours with 5 % mature sourdough starter. When working the dough further we do not use additional yeast, only salt, rye wholegrain dust and vitalised water. The doughs are generally smoother and "woollier". We were also able to reduce the use of baking agent from 3 - 4 % to 1,5 - 2 %. The doughs can be processed with a better dough yield (or water content), which in turn has positive effects on taste, freshness, volume and appearance. We are of the opinion that a good product will keep its taste for a certain time. Bread becomes stale when starch releases water bound in it from the inside to the outside of the breadcrumb during so-called retrogradation. It will then become soft and the result is stale bread. This process basically starts directly after baking when bakery products have cooled down to 30 degrees. We have noticed now that the AquaKat delays the retrogradation process. In particular, smaller traditional bakeries like us have to bake our products during the night or early in the morning, but they still need to display their typical freshness when they are sold in the shop later on. We achieve this by using a special method that among other things involves milling the grain in a particular fashion. We use so-called zentrofan mills in which the granite millstone stands still and the grain is ground by being blown about in vortexes and crushed against the inside wall.
This is a particularly gentle milling process that is more time consuming but avoids overheating that occurs

with other grinding methods and thereby preserves the valuable components of the grain. Furthermore, we use a special dough making process in which the AquaKat-informed water plays a part. Because of the distribution structure for bakery products in Germany, it has unfortunately become the norm that consumers demand products that are still warm. We do not support this widespread habit because warm bread is not necessarily healthier.

A number of processes in our bakery are more time-consuming because we combine traditional methods with techniques that we developed ourselves and thereby achieve a product quality that is highly praised by our customers. On the whole, we are very proud that our bakery products are a part of a natural cycle. We have been buying our grain, for example, for the past 10 years from a producer who is particularly careful and very close to nature in the way he plants and harvests his grains. Harvesting the ripe grain at a particular point in time, for example, is very important. Equally important is milling at a particular point in time; and we follow these rules. We know that our grain grower enriches his soil, so to say, with certain microorganisms at the beginning of the cycle and keeps the grain mostly free of toxic fertilizers so that, with his grain, we have the best possible basis to work from. Of course, new experiments are also always very interesting for us.

We have, for example developed a new type of gluten-free bread. After some of our customers claimed that they had even developed an intolerance to corn, we stopped using it and now use buckwheat, brown-seeded millet and rice.

However, one must not think that these ingredients are enough to bake bread. Instead, they make up a rather slimy soup. Only with special natural additives and fermentation processes that we have found after many tests can we now bake delicious gluten-free bread. This bread is so popular that we ship it from Bavaria all the way up to Berlin!

We see ourselves as craftspeople, who acknowledge the origins of our trade and thereby also make a point of not using industrial production methods. For us food is "vital" in every sense of the word. To do these ideas justice, we naturally try to produce in an environmentally friendly way. We call ourselves, for example, the first carbon neutral bakery in Germany, since we have developed a wood-burning oven that works with very low emissions."

First carbon neutral organic bakery Schwarzmaier
Mühlweg 11, 82398 Etting, Germany
Shop: Obere Stadt 45, 82362 Weilheim, Germany

Pitztaler Glacier train – Pure air at 2‘800 m

Bad smells under control

The Pitztaler Glacier ski area is frequented by 5’000 people daily. This has led to the formation of unpleasant smells in the train tunnels as well as in parts of the restaurant. It is well known that in highly frequented toilet facilities, bad smells can occur. This is a problem that is not easily remedied, because it is being created anew every day. Typically, dosage systems for chemicals have to be used in order to improve the air. Commonly used systems perform air-cleansing, smell elimination or fragrancing. The often-used fragrancing devices in particular do not clean the air, but simply superimpose further, more or less perceptible fragrances over the existing “fragrance” with the aim of neutralising the nasty smells. Usually, they do not succeed, leaving a special kind of fragrance mixture remaining in the air.

Penergetic AquaKat technology does not treat just the symptoms as other devices do, but tackles the problem the root level. By influencing microorganisms in a well-directed manner, the problem is avoided before any smells can arise in the first place. This has been demonstrated very well at the Pitztaler Glacier train.
In March 2004, 100 g Penergetic-w-waste water were used via the outlet pipe, which improved the strong smell. At the same time an AquaKat L was attached to the main drainage pipe. The bad smells consequently disappeared permanently and guests can now once again enjoy the beautiful views, the relaxing atmosphere in the restaurant and the skiing in comfort.

Pitztaler Glacier Train, A-6481 St. Leonhard, Austria

The experiences of a natural hairdresser

Natural hairdresser Claudia Bader

The façade alone with its appealing natural colours invites passers-by to enter this new natural hair salon. On the inside, one is again pleasantly surprised, because there are no enormous photographs of models with trendy hairstyles that catch the eye; instead tastefully chosen colour themes. These emphasize Ms Bader's concern over rising awareness for the fact that the way things are done in the hairdressing trade can change too. She has made the daring move away from conventional business towards a well-grounded natural range of treatments and products that is more and more appreciated by her customers. "People trust me", she says. "As far back as six years ago after my master hairdresser exams, I started to wonder how ecologically sound the products are that we have to handle daily in the hairdressing trade and that we use on our customers. I don't even want to mention the negative effects such as rashes and allergies on the hands that hairdressers often suffer from. I just want to say that people have become much more conscious about food, clothes and other products in their daily lives. A lot of people think about the ecological aspects of those things, so why not also at the hairdresser's?"

How many chemicals does a shampoo contain? Apart from my new hair colour, what other substances have I rubbed into my scalp? All of these thoughts finally brought me to a point where I decided to fully convert to natural, ecological hair and body care products. Looking back, I am happy that I made this decision. In my salon I exclusively use products free from unnecessary chemical substances. They are characterised by the absence of chemical preservatives, chemical fragrances or colours, chemical emulsifiers, paraffin or its derivatives.

Every product we use clearly states what it contains; international and German ingredient lists show the exact composition of the product in question. I also adhere to a certain modular principle: all of my products can be mixed with each other.

For hair and skin care products, too, I can enhance the effects as well as match particular skin and hair types by adding selected additives. In this way I can do justice to the individual care requirements of each of my customers.

An obvious next step for me was to look for ways to treat the basic substance water energetically. Outside of my business, knew of devices that are able to energise water. I decided to use the Penergetic AquaKat. After six months I can now say the following about it:
In particular for the use of shampoo I noticed that the AquaKat water produces more foam, which means that I can now use less shampoo. This is very advantageous from an ecological point of view. I hope of course that, of the other properties of the AquaKat, the direct water vitalisation is also of benefit to my customers, but I can't really comment on this since I cannot see or measure those effects. All in all, I am very satisfied with the AquaKat that I installed directly under my taps."

Bader Hairdressing and Beauty Salon
Johannisstrasse 1
82418 Murnau
Germany

Cooling systems in Thailand

Two examples of visible labour savings

The fins on the right are visibly cleaner

While in closed systems such as heating systems the effects of the AquaKat with regard to limescale reduction can only be evaluated after opening the pipes or tanks, the effects in a finned cooling system in Thailand are openly visible. The open cooling fins constantly have water washing around them. We are dealing with two coolers with independent water cycles. While the front fin, which is part of the left cooler, remained untreated, an AquaKat was installed on the second cooler with the cooling fins on the right for test purposes. This large surface fin system with water washing around it shows the benefical effects very clearly. After a month of constant use no limescale deposits were noticeable.

At a company in Bangkok, a clear improvement of the cleanliness of the cooling meshes was also noted (see photographs below).

Left: The cooling plant
Above: Dirty mesh
Right: Clean mesh with AquaKat

Cooling lubricant trial with AquaKat on lathes

An AquaKat was installed on a Monforts RNC10 lathe to test the effect on the durability of the cooling lubricant compared to an identical lathe. The AquaKat was attached to a hose on the cooling lubricant pump using two cable ties. After a trial period of six months, two samples were taken from the cooling cycles.

They were sent to Fuchs Laboratories for analysis. As with other trials the different colour of the liquid from the lathe that had the AquaKat attached to it is clearly apparent. While the AquaKat liquid is of a bright colour and homogenous, the cooling liquid of the control lathe is darker and it settles.

Two birds with one stone

Initial scepticism makes way for unexpected success

In an apartment block with 22 units, a problem with the heating system occurred. The individual apartments are heated by in-floor heating that is supplied with hot water from a new central boiler with heat exchanger. The system is run using treated tap water according to industry standards, which means that the tap water is treated in an ion-exchange device before it is fed into the heating system. In this way, the lime content of the water is reduced, so that potential damage and loss of energy from limescale are averted.

The pipe system of the underfloor heating consists of a plastic material, which is not diffusion proof against oxygen. Over time, oxygen seeps into the system, which leads to the formation of sludge in the heating cycle, which can block the system, particularly in the underfloor pipes, which in turn can cause breakdowns or reduced heat conductivity. In one of the apartments such an incident occurred and Strauss Plumbing was called in to remedy the problem. As expected, the water from the heating cycle was sludgy which caused blockages in some of the underfloor pipes of the apartment in question.

The solution

Strauss Plumbing flushed the problematic heating pipes out with tap water on 10. April 2008 to remove the blockages. Then the system was refilled with treated tap water in order to balance out the water loss. Because the entire system was already full of sludge, it was only a matter of time before further problems would occur. A Penergetic AquaKat XXL was supplied to Strauss Plumbing for testing purposes. It was installed centrally on the main heating pipe in the boiler room and was to be tested for four weeks. The owner of the apartment and Strauss Plumping looked at the matter rather sceptically at first.

Result

On 14th March 2008 the heating water was once again checked for sludge in the presence of the apartment owner and Strauss Plumbing. For this purpose the water was emptied from the drain in the boiler room in the basement.

To everybody's surprise the heating water was as clear as tap water and there was no musty smell!

Even after several buckets of water were drained off, the water remained crystal clear.
Currently discussions are taking place among the apartment owners on whether they should install a central vitalisation system.
If gareement can't be reached, the system could be protected from sludge by installing several smaller AquaKat devices on the individual apartment heating cycles.
This solution, however, would be less economical for everybody involved, since the costs of installing two high-performance AquaKat XXL would be far lower.

Finally it has to be pointed out that treated tap water (according to industry standard VDI 2035) does not protect the heating water from the formation of sludge but solely from limescale!
The use of the AquaKat would eliminate both problems.

Boiler with
heat exchanging unit

left: installation of AquaKat XXL in the boiler room
right: drain hose connected to drain cock of heating system

Here again the unambiguous result: after the drain outlet is opened clear water runs from the system

Sludge problem eliminated

AquaKat cleans heating system

In January 2008, a geothermal heat pump system was installed in the Boslet family home in Berlin. Because of sludge in the heating water (caused by magnetite deposits from steel radiators and iron pipes) there was a real danger that the new heat pump system could be damaged and potentially fail permaturely. Even after the system was refilled with fresh water, the same symptoms of sludge reappeared after a few weeks. As a result, a Penergetic ThermoKat device was installed in the heating cycle on 09.05.2008.

To everybody's amazement the water became totally clear after being in the system for jutst six weeks and appeared at least visually, almost equal to drinking water. AquaKat L water vitalisation devices were also installed onto the war and cold water systems to fully benefit from the limescale stabilisation properties in order to protect the water heater, toilet bowls, sinks and appliances as well as to improve the water's taste.

Heating water sample 09.05.2008

ThermoKat installation on the heating pipes directly after the boiler

Heating water sample 26.06.2008
The heating water has become clear after approximately 7 weeks

Additional installation of Aquakat L for revitalisation on warm water pipe after water heating device (top of picture)

Installation of AquaKat L on cold water pipe after back-washing filter

Limescale free operation

saves on cost and labour

Construction project:
Thürmann (bakery chain)–branch, Markstrasse 32-34 (in the Reichelt Supermarket), 13409 Berlin, Germany. QB Plumbing and Heating Technology look after all Thürmann Ltd bakery and confectionery branch stores. Currently about 200 branches are in operation. Fresh dough is delivered to the indivudual branches from the production site and then baked in special ovens in the shops.
Because the ovens operate with steam, there is always a danger of lime deposits building up quickly and, as a result, leading to expensive repairs. To prevent the formation of limescale up to now, conventional water softening systems (ion exchangers with salt/sodium chloride) were installed before each oven. This water treatment method keeps the water totally free of lime. However, this method requires annual servicing, which has associated financial and ecological costs, because the spent salt has to be disposed. Furthermore there are running costs because the systems run on electricity and they are also subject to the usual wear and tear. In the above-mentioned bakery location, two ovens were replaced in September 2007. One was connected to the conventional water softening system. The other oven had a Penergetic AquaKat connected to its water supply for a test period. Because of the strong electromagnetic fields emitted by the oven, an Aquakat L was chosen in order to counteract this negative influence and to guarantee a lasting effect. On 20. May 2008, the ovens were opened by a technician to compare the results. He was visibly surprised, when it turned out, that the nozzle fitting on the oven fitted with the AquaKat L, was totally free of limescale. Only light baking residues caused by the heat could be detected. The baking chamber of the oven, itself, had just a thin layer of limescale

The technician during the opening of the oven, which no longer shows any noticeable deposits

under the covering plate, which came loose immediately after a light tap with a screwdriver. However, this came loose immediately after light tapping with the screwdriver.

The fact that the baking chambers of the ovens undergo a general cleaning during a service and that the limescale layer can be removed by a simple tapping action, because it has become porous from the vitalisation of the water clearly shows that no additional cost or labour will arise. In fact, the opposite is the case, because servicing of the now obsolete, a water softening device is no longer necessary and no more electricity is used. On the same day, the Thürmann management was informed about the result. Here too, there was amazement all round and QB Plumbing and Heating were asked on that day to submit costing to have additional bakery branches retrofitted with AquaKats. Deliberations as to how and when all branches can be fitted with AquaKats are currently ongoing.

Installation of the AquaKat on the water supply before the pressure reducer of the oven

The baking chamber after the covering plates were removed and the nozzle fittings are exposed. Only heat residue and a very light and thin limescale layer are visible on the sides and on the edging at the back.

The nozzle fitting without limescale deposits.
The nozzle holes are absolutely clear.

Scientific experiments with the AquaKat

Dr. Elmar Langenscheidt, Mönchengladbach

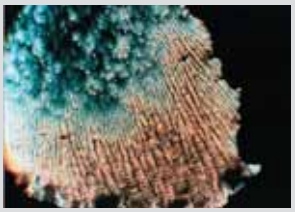
Dr. Elmar Langenscheidt from Mönchengladbach, Germany, has carried out a number of interesting experiments with the AquaKat. It was his intention to find out in which way the AquaKat might influence a liquid medium, mainly water, and how it can pass on the information modulated onto it in such a way that it shows its effects in the medium of water. For this, he uses a polarisation microscope and aqueous solutions of water and calcium carbonate as well as ascorbic acid and water.

In a first step the solutions are prepared and in a second one the solutions are left to evaporate at room temperature (22 °C). What was left was examined under the microscope. This showed that in the conglomerate of microcrystals plays a role. It is known that there is a charcteristic connection between the morphological, physical and chemical properties of the crystals and the crystal structure. When crystallisation from the two mentioned media takes place it becomes clear in which way the AquaKat changes the calcium carbonate in the water. Often at first an increasing quantity of material accumulations shows during drying processes with the formation of crystal patterns, i.e. the beginnings of corners and edges, for example, by smaller crystallites being deposited together and being joined at the grain boundaries. It was shown, for example, that the same substance could appear in various modifications depending on the outer conditions. In the case of the calcium carbonate, the picture shifts from hexagonal calcite to orthorhombic aragonite at temperatures < 30 °C.

Dr. Langenscheidt was able to prove that the use of AquaKat technology brings about a special phenomenon: large crystals of approximately 300 micrometers change in favour of very small crystal forms of 10 micrometers. Of course, the water/calcium carbonate system takes precedence in the tests. In the samples where the AquaKat was not used, crystal structures are hardly detectable. The interference colours that are typical for crystals are also not present. This is very different from the water that has been informed by the AquaKat. There, ideally formed crystals with a clear centre can be found. The crystal-typical interference colours represent a perfectly connected crystal structure.

It also becomes apparent that without the influence of the AquaKat large areas of crystals with connected structures, but also individual crystals, can be found. This means that no useful hardness stabilisation has yet taken place here. This is different for the water that has been treated with the AquaKat. Here, crystal structures that are barely connected anymore can be found.
The crystals are smaller, rounder; instead of the conglomerates.
Now single crystals appear, indicating a good hardness stabilisation.

Dr. Langenscheidt postulates that the change in the crystal shapes explains the beneficial properties of the AquaKat in particular with heating and warm water systems. There, it has been shown that aggressive limescale deposits, which at first could only be removed mechanically, had changed to a soft limescale film. Accordingly, after the treatment, heating coils etc. can be easily cleaned again.



Ascorbic acid test

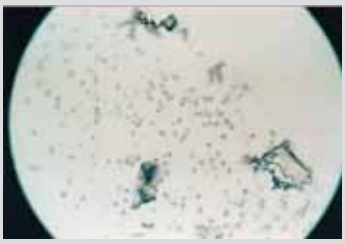
Without AquaKat
The sample without the AquaKat hardly shows any crystal structures whatsoever. The crystal-typical interference colours do not appear.

With AquaKat
In contrast to this, ideally shaped (uniaxial) crystals with a clear central point from which radial beams originate form in the water that is informed by the AquaKat. A polarisation cross is also visible. The crystal-typical interference colours indicate an ideally interconnected crystal structure.

Conclusion
The AquaKat is therefore able to control the properties of the water, and the crystallisation ratios of the substances (minerals) that are dissolved in it, in such a way that the crystals can form in a perfect manner. They behave, therefore, as if they were in a natural medium.

Lime crystallisation test

Without AquaKat
Areas with coagulated (large, connected) shapes were found in the samples as well areas with individual crystals. No useful hardness stabilisation takes place at this stage. Crystal-typical colour effects were not detectable.



With AquaKat
Hardly any coagulated shapes form in the samples of treated water. Instead, there are small, round isolated individual crystals, which indicate good hardness stabilisation.
These individual crystallites provide, analogous to the ascorbic acid test, the typical colour effects that can be seen "glowing" under the microscope. A phenomenon!

"With this we have estabished further proof of the for the vitalisation of water with the Penergetic AquaKat.
On the basis of the results of the physical experiments carried out, I can now confirm that the function of the device as described on the original packaging of the manufacturer, i.e. that good tap water and warm water can be transformed into even better water, like that of a natural spring, is fully met. *So even good things can be improved.*

Scientific conclusion
Based on the test results, we confirm that the AquaKat has a vitalising effect (i.e. restoring the structure of spring water) on the structure and crystallisation behaviour of the substances (minerals) dissolved in the water."

Microscope was used for the tests by Dr. Langenscheidt

Electrochemical test of the AquaKat

The test with the AquaKat was very informative, as we can see from the table. Significant deviations were measured for water with and without AquaKat as well as for ice, whereby the difference for the latter is considerably bigger. For the ice tests, the water was cooled down to –18 °C and measured when thawed again.

Water/ice tests without and with AquaKat
Evaluation of measurements

	pH-value	Redox (mV)	Conductivity (mS)
Water without Kat	7,81	460	0,42
Water with Kat	7,83	448	0,41
Ice without Kat	7,82	447	0,40
Ice with Kat	7,93	426	0,36

07.06.04

The statistical evaluation for the comparision of the two water measurements gives a value of 0,025, which means that, with a probability of 97,5 %, these are two different series of measurement.

For the comparison of the ice measurements, this value is 0,003, i.e. with a probability of 99,7 % this is not the same ice.

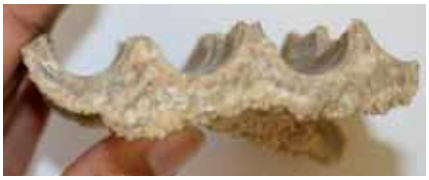
In both cases, the AquaKat achieves an improvement of the electrochemical properties of the water, which is reflected in the reduced redox potential. It is also noticeable that the effects of the AquaKat on the ice are also reflected in a change of the pH-value and the conductivity.
Up to now, only changes in the redox potential were observed.

The differences in the redox potential are clearly shown in the table.

Bernhard Staller (Dipl. Phys.)
Managing Director EQC Ltd.
Weidenbach, Germany

AquaKat changes water structure

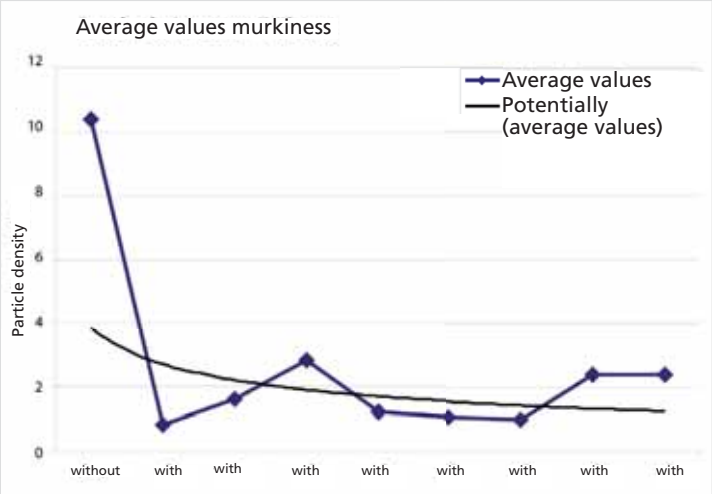
The French Navy has tested the AquaKat technology in their Toulon base. The aim was to stop the massive problem with limescale deposits within the water supply of the naval base, because water consumption was very irregular. Approximately 27 m³ cold water are needed there daily, on average 23 m³ daily plus a maximum of 8 m³ of warm water (5 m³/day on average).
In principle, it has to be said that the AquaKat technology cannot change the chemical composition of water. The AquaKat does not take effect directly in the water, i.e. nothing is added to or taken out of the water. What the AquaKat changes is the water structure. This is reflected in a changed crystallisaton behaviour (dissolving capacity of the water). Still, the AquaKat can change certain parameters in the water in its overall effect. However, this has more to do with substances that are already in the water or deposits from pipe walls being re-dissolved than with a chemical change. Once these re-dissolved substances, which sometimes are reflected in the measured values, are flushed out of the pipe, the measured values go back to normal. It is therefore recommended to flush closed systems from time to time in order to remove the substances that were dissolved form the system by the AquaKat. Only then could an expensive and elaborate crystallisation analysis illustrate which changes, even towards spring water-like structures, the AquaKat has caused. Clear evidence for the improvement of relevant values can be seen in the test carried out by the French Navy. The measurement records also show that temporary re-dissolving occurred in the pipe system, which explains occasional anomalies in the measurements.
As soon as the pipes went back to a "clean" state, the general tendency remains that of improved water.



Without AquaKat : 1 cm lime had to be taken away after 8 month.

With AquaKat : 6 month after installation

1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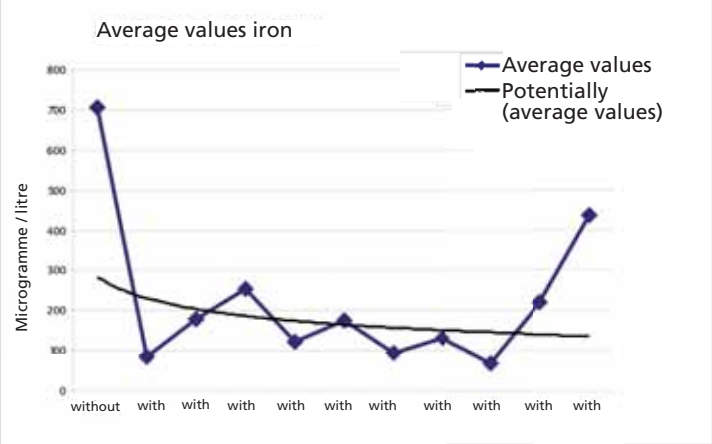
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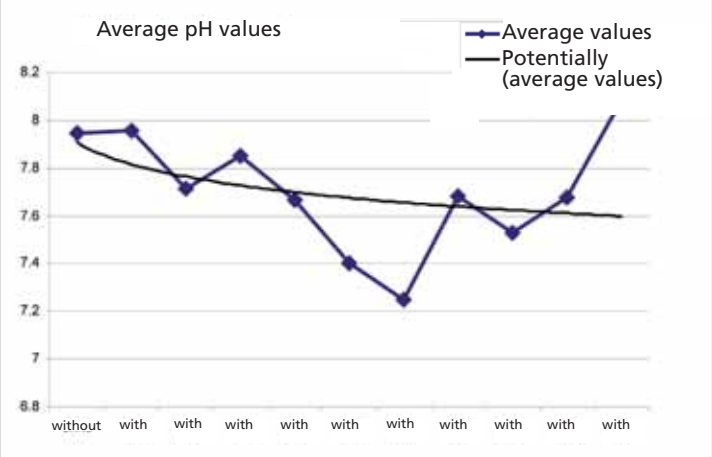
Average pH values
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World-class athlete

Olivier Bernhard drinks AquaKat water

Olivier Bernhard, three-time duathlon world champion

Born in 1968, Olivier Bernhard turned professional at the early age of 17. He has been duathlon world champion three times, was a multiple Ironman winner and has claimed a number of other national titles. For years this world-class professional has been drinking AquaKat water. He says: "I noticed that drinking AquaKat vitalised water speeds up my recovery and also improves the acid-base balance. As a top athlete these advantages are indispensable for me. I would not like to go without this vitalised water anymore."
Olivier Bernhard goes on to say: "As an athlete I have learned to pursue goals. With discipline and persistence. But I have also learned about the power of vision and benefited from the knowledge of others. Exact analysis, a professional evaluation of these and an action plan based on this were the foundation of my development as an athlete. Only in this way was I able to constantly improve my ability to perform even when others called it 'quits'.

Since 2005 Olivier Bernhard has been involved in coaching other athletes. He wants to pass on some of his valuable experience. But ordinary people can learn from him too:

"In my heart I will always stay true to sport and daily exercise in nature. Among other things because sport can serve as an ideal model for many instances in real life:

- *Nowhere is it more obvious that, apart from talent, in order to be successful dedication, passion and the constant strive for improvement are also important.*
- *Nowhere else does defeat offer such good opportunity to find out about the reasons for it (and one's own share in it).*
- *Nowhere else is the need for alternating between stress and recovery more obvious – we always need both for our development."*

It was a total stroke of luck for Penergetic that this sports specialist has been observing the quality of AquaKat water for years.

Olivier Bernhard is not just a professional sportsman and coach;
in his career he also closely considers important issues about energy.
He teaches for example that:

- *Sensitisation of energy levels (physical, emotional, mental and spiritual)*
- *How can I learn energy exchange on an emotional, mental, spiritual, physical level?*
- *How can I control my energy balance in everyday life with my newly trained consciousness?*
- *Stress relief from exercise – how do hormones influence my daily routines?*
- *The power of total dedications*
- *Don't be satisfied with your current status quo – strive for a constant expansion of your comfort zone*

Olivier Bernhard is a happy family man and father and he can see in his children every day that humans are "animals of movement" not "sitting down animals".
Another reason to be active.

My personal experience with Penergetic products

Walter Ruggli

I have been working with Penergetic products since this company was founded. During this time I have had many pleasant and interesting experiences with them. To name all of them would go beyond the scope of this report.
In general, however, I can confirm that the advertised effects, be it for the agricultural, the water vitalising or so-called household products (according to company information) really do happen
During my numerous AquaKat installations, however, I also came across two cases where the customer announced that they felt that the taste of the water had reverted back after a while. At a site visit I noticed in one of the instances that a freezer that was standing close to the AquaKat developed a relatively strong, energetic "interference field" which I could screen off with my harmonising devices and thereby was able to fix the problem. In the other instance, strongly changing subterranean watercourses were affecting the water quality. Here too I was able to fix the problem with an additional harmonisation and it was possible to restore the energetic effects of the AquaKat on the water by using radiesthesy.
From my many years of experience I can confirm that the Penergetic products function flawlessly within their specialised areas of use. If the desired effect does not seem to occur straight away, there is most certainly a cause for it that can be detected.

With Penergetic I have some excellent products available for my customers that are beneficial for humans, animals, water and nature. These products also provide active protection for the environment, because at some stage all of them will return into the groundwater, into the sewage system, into the cycle of nature and do more regenerational work there.

Short description of my harmonising work in the house, on the soil and in water, as well as in my practice for white light radionics for humans and animals:

Humans,
The Earth,
The entire universe resonates
EVERYTHING
IS RESONANCE…

Humans - and in the above mentioned examples water – are, in their deepest, original, atomic structure, energetically dextrorotatory and harmonic. Interference zones are levorotatory or chaotic and therefore disharmonic. With my house and landscape harmonisations, I recreate a harmonic dextrorotatory energy field. In principle, this is also possible in my practice for humans and animals.
However, with them it is a bit more complex.

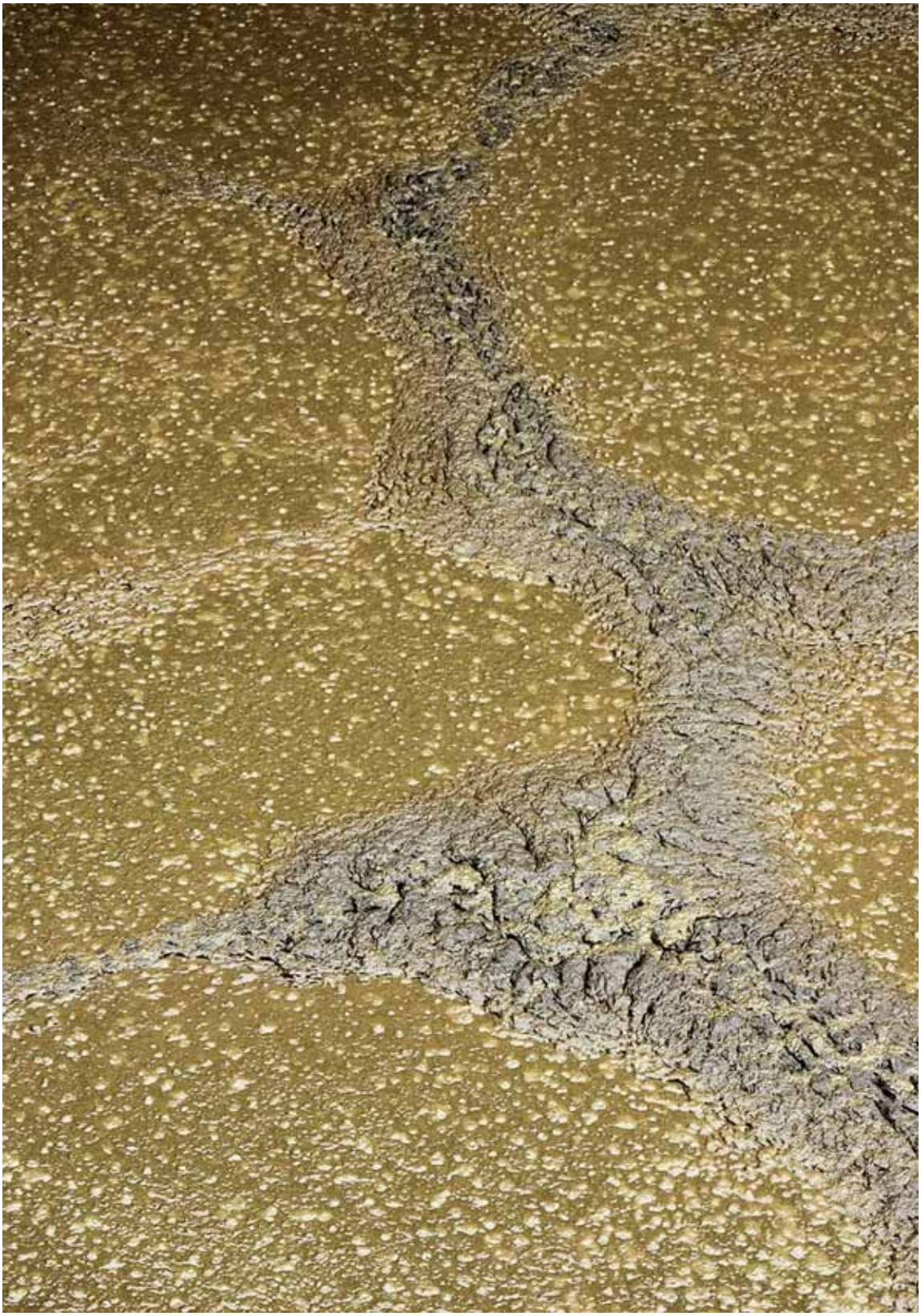
The different sizes of the AquaKat

AquaKat S

AquaKat L

AquaKat M

AquaKat XL



Liquid manure – a valuable fertilizer

A thick floating layer is a common occurrance on a slurry pit or lagoon. This is usually due to a lack of oxygen and microorganisms, that can convert the slurry aerobically into a valuable organic fertilizer. This is where Penergetic-g can help, as it has been proven in thousands of vases, to breakdown this crust, convert ammonia to ammonium and therby minimize smell. The slurry becomes liquid and homogenous.

The optimal treatment for slurry and liquid manure

- Homogenous slurry
- Reduced odour
- Breakdown of sedimentation and floating layers

Possible areas of use

- Pits
- Tanks
- Lagoons

Application

Initial use:
1 kg – 2 kg / 100 m^3 existing slurry

Subsequent use:
5 g / LSU / week or 1 kg / 100 m^3 newly produced slurry

Greatly reduced operating costs

"Bringing life into the slurry": from floating layer (1) to homogenous wholesome fertilizer (4)

Over the years Penergetic has made a great name for itself in liquid manure treatment. What are the reasons for this? The effects of Penergetic products are comparable to the effectiveness of homeopathic preparations. Amplified resonances (information) stimulate biological cycles of microorganisms in a directed fashion. The information of oxygen, for example, leads to slurry bacteria making the slurry homogenous and fluid. The aerobic conversion reduces floating and sedimentation layers and leads to a dramatic reduction of odour emissions. When the slurry is spread there are less scorshing of the plants and the effects of the slurry are optimised. All in all, this process could simply be called "bringing life into slurry" - as is so often the case, the simplest method is the best one.
With a minimum of energy and other factors that could have a negative impact on the environment, the aerobic bacteria are stimulated.

Walser's Head of Sales Franz Lehner (left), passes on his specialised knowledge to the sales representatives in the field. Hans-Peter Barmettler is a member of his dedicated sales team.

Penergetic posesses the active properties of oxygen and starts to work at exactly the point where the processes of life in the slurry can be reactivated. Putrefactive bacteria are reduced and the oxygen in the slurry is aerobically activated. In a short space of time the oxygen-producing and breathing biomass is brought to life. Microalgae are created and change the colour of the slurry towards dark green and the activated bacteria make the slurry homogenous. Naturally, what makes the farmer happy is above all: the existing floating layers and sedimentation layers are broken down. This means that energy intensive agitation can be reduced to a minimum.
One of the nicest side effects is the reduction of odour. In particular, farmers who are based close to residential areas are often asked why their slurry "does not stink anymore". The use of Penergetic-g therefore pays off for every farmer. The resultant well rotted slurry provided a valuable nutrient source for plants, thereby enabling the quanitiy of synthetic fertilizer purchased to be reduced. According to tests by Dr. Prestele, from the Agricultural Department of Laufen (town in Germany), using slurry that is treated aerobically already saves approximately 31 kilogram net of nitrogen per hectare. Fortunately the amounts of Penergetic that have to be applied to achieve these results are extremely low.
After the initial application of approximately 1 kilogram per 100 cubic metres, one can change over to the regular application where just 5 grams per livestock unit and week is necessary.
The value of 1 cubic metre of slurry is 3,83 Euro of which 2,14 Euro are for phosphates, potassium and other mineral substances. The remaining 1,69 Euro concern the entire share of nitrogen, consisting of organically bound nitrogen at a value of 0,72 Euro, ammonia and ammonium at a value of 0,97 Euro.
There are numerous other benefits that could be referenced in support of using the slurry preparation Penergetic-g.

Gérald and Eric Ramseyer

Yet, perhaps the best evidende is derived from an examination of actural en-fram result. For example Ramseyer brothers from Palésieux in Switzerland, have achieved a large number of positive test results using Penergetic. On their 142 hectare farm, they have 210 dairy cattle and approximately 150 beef cattle. In 2002 a new slurry tank with a capacity of 20'000 m^3 was constructed.
In spite of intensive agitation, the slurry had solidified in the centre of the tank. At this point, a representative of the Walser Company, well known in Switzerland as a producer and distributor of fish oils, visited the farm and introduced Penergetic-g for slurry, which had recently been added to their product range. After some more expensive agitation trials did not yield any results, the Ramseyer brothers agreed, in February 2003, to carry out a trial with Penergetic-g with Jürg Beerhalter. To start 400 g of Penergetic-g were mixed with lukewarm water in a milk bucket and poured evenly over the slatted floor.

Penergetic-g was poured in directly through the slats to keep the slurry "alive"

Furthermore, holes were poked into the floating layer with a wooden slat so that the solution could get into the slurry under the crust. A total of 8 kg Penergetic-g were introduced that way. Also, a mobile agitator was used to achieve an even distribution. Towards the end of February / early March the same amount was applied again. And as early as March the floating layers had loosened up noticeably so that the agitator was able to move the slurry effortlessly. From early April on it was possible to stir the slurry properly. The Ramseyer brothers kept detailed records, which reveal that they used to have to stir the slurry for 720 hours per annum. Whereas, now using Penergetic-g this has now been reduced to between 150 and 200 hours per annum.

Liquid manure on winter barley

Penergetic at work holistically

Werner Saurer has been using Penergetic on his farm for many years

Werner Saurer puts his heart and soul into farming. This becomes obvious when walking through his meadows and fields, when looking into his cattle shed and listening to what is important to him. However, he not only loves farming, he is also an expert in all aspects of it, including the business side. Like many others he noticed that the new type of suffers from a few big problems: the low rate of decomposition of the slurry itself, the problem of sedimentation layers forming, perhaps of greatest concern putrefaction and the formation of biogas in the containers which are usually closed tightly.

Up to now, time- and cost-consuming mechanical agitation has been the only solution. However Werner Saurer has discovered another effective method - Penergetic-g-slurry activator. He explains the many advantages that can be confirmed,first hand, by every farmer who uses Penergetic-g.

1. The slurry conversion happens faster, it becomes more liquid and the usual sedimentation layers are significantly reduced.
2. With the cost for electricity constantly on the increase Werner Saurer now saves a significant amount of money, because the cost of agitating the slurry exceeds by far that of Penergetic-g.

A typical Swiss agricultural landscape: lovingly cultivated and looked after by the farmers.

3. From an ecological perspective, the slurry is converted into an outstanding fertiliser. This latter point is demonstrated in a particularly impressive way by Werner Saurer, during early spring he spreads the slurry on his winter barley that was seeded in the previous autumn. At the time of spreading the slurry, the crop already stood 10 to 15 cm high in the fields. the crop did not suffer at all and went on to grow exceptionally well in the following months.

Winter barley stands splendidly in early summer.

Healthy milking cows that, apart from fresh grass, enjoy oats mixed with Penergetic-t.

Picturesque and close to nature - Georg Müller's new farm blends perfectly into the gorgeous scenery around Lake Constance.

A step towards the future

Georg Müller, a vet from Salenstein at beautiful Lake Constance, was facing an extensive renovation and extension of the family farm that he and his brother had inherited. The brothers had come to the decision not to take half measures. As a veterinarian, with his eyes firmly on the well-being of animals and humans alike, Georg Müller had the perfect background for such an undertaking. Being a nature lover, and at the same time having a close connection to the old buildings on the family estate, he wanted to integrate the new building as harmoniously as possible into the landscape. A hill, on the site of the planned new building, seemed to stand in the way of his plans.

In a labour intensive and expensive re-landscaping project, the entire hill was moved so that the new shed for the dairy cattle would blend perfectly into the valley. In Switzerland new buildings are generally checked for compliance with animal welfare laws. Only then will planning permission be granted. For Müller the minimal solution, as stipulated by law, did not go far enough. He wanted to allow his cattle even more space. This is of course not ideal as far as modern cost management is concerned, but when standing in his shed one realises what his motivation is. His priority is happy animals. This was the main aim and everything else was secondary. Keeping animals according to their needs means that the pen barn is divided into feeding, resting and outdoor areas. In the resting area each cow has a resting box filled with straw available to it. Every cow wears a transmitter around its neck on a comfortable collar. This stores valuable information, such as daily milk yield, fertility cycle and the amount of feed concentrate allocated to the animal. So it functions as a "key" to the concentrate hopper where every cow can access and consume its allocated amount of feed concentrate. The transmitter is programmed in such a way that the animal can take its feed in allocated portions during the day. This also prevents a cow from eating the entire feed allocation

Dr. Georg Müller-alternative and commited vet

at one time. The transmitter data is sent to the milking computer via an infrared interface. In this way the cows' performance and their feed requirements can be monitored.
Of course individual data as well as special information or information relating to disease for every single animal can also be stored.
In the pen barn the number of feeding points per animal is not just one as stipulated by law, but two. In this way Müller prevents fighting among the animals.
What stands out in Müller's barn is its unusual cleanliness, everything happens in a clean way. We learn that the animals only have to be groomed once every few weeks, because in such a natural environment the animals clean each other. Nothing more is required. An animal with enough living space allocateds its area on its own initiative and so keeps an area clean for resting.
The cows also do not spray each other with excrement, as is unavoidable in tight spaces.

In the separate milking stand the cows are milked twice daily. The milker stands on level ground while the cows stand elevated and easily accessible to his left and to his right. This makes the milking process much more comfortable for the milker. Teat and udder are disinfected; when the milking is complete the milking machine is removed automatically, the milking stall opens automatically and the cow walks back to the pen barn by itself.

Müller has known about energetic preparations since 1992 and was one of the first Penergetic users in Switzerland. He vitalises the drinking water for the animals with the AquaKat, the slurry is treated with Penergetic-g and he also uses Penergetic-t and –k.

Georg Müller's example shows that acting consistently and with a long-term vision leads to success in an agricultural-biological sense. Many people might start using certain agents such as Penergetic and then discard them again even when they have started to work. So they think: "Well, everything is fine, everything works, why should I use any additional substances?" When the old state of affairs inevitably returns, many might not remember what helped in the first place. Thankfully there are the "Müllers" of this world who shake things up and lead by example by taking the right steps into the future.

Slurry and Compost trial with 600 cows

Edgar Smith and his two brothers work a 300 ha farm in Comox on Vancouver Island (B.C.), Canada. It is very important to him that all work is carried out in an environmentally friendly way. For the extensive trial outlined here, the aim was to find out if Penergetic-g is able to bring about an odour reduction in the barn and if changes in nitrogen and ammonia levels would be noticeable. Another aim was to see if the slurry conversion would be accelerated.
The trial was divided into two parts: slurry was to be examined on the one hand and solid manure on the other. This was gathered before the trial. The trial period was set at 16 weeks. For the slurry, Penergetic-g was added into the lagoon that had been filled to two thirds of its capacity with spring water beforehand (1'120 m³). This was mixed (to a depth of approximately 75 cm) with the existing slurry sediment. The initial amount of Penergetic-g used was 16.8 kg and subsequently 2 kg (400 LSU* times 5g / LSU) was added per week. Penergetic-k was mixed with a little bit of soil and scattered daily over the solid manure at a rate of 40 g / m³ as soon as it came out of the separator. The slurry samples were taken every Wednesday at 1pm; the slurry in the lagoon was stirred for one hour beforehand. The analysis was carried out by Nordisland Laboratories.

The following observations were made:

1. The slurry in the lagoon was distinctly homogenous. There was no evidence of solid substances on the bottom of the pond. The slurry was runny and flowed without any blockages. Furthermore, the floating layer no longer formed on the surface of the pond.

* = livestock unit

Left: The untreated anaerobic mass stinks in the lagoon.
Right: The lagoon was mostly cleared after the treatment period of 4 months.

2. The grey water from the lagoon that was used for cleaning the barn floors was more liquid and had less of a smell. It did not leave any residue on the barn floor and the floors were cleaner.
3. A certain micro-activity was noted for the second pond. Small bubbling circles formed on the surface.
4. The smell was constant for the entire duration of the trial, which is equivalent to an improvement since usually the smell gets worse while the cattle are inside.
5. After the two two compost piles were turned over, a clear difference was evident. The pile that had been treated with Penergetic-k had decomposed evenly and was odourless. The untreated pile was only partially rotted. The rotting was uneven and the pile smelled strongly of ammonia.

Trial results

The analysis of the two solid manure piles showed significant differences: the pile that was treated with Penergetic-k had a higher nitrogen content and a lower pH-value. The carbon-nitrogen ratio was ideally balanced.

Initially, a reduction in ammonia was observed. However, as the old load of slurry was then converted, the ammonia levels remained approximately the same. This conversion took about 4 months after which time ammonia levels went down in favour of ammonium, which now was available as a stored nutrient. As expected, the volume of dry matter was also reduced during the trial.

In conclusion, it has to be noted that the Penergetic products improved the quality of the liquid and solid manure effectively. The result of this trial was distinctly satisfactory for the Beaver Meadow Farm and they will continue to use Penergetic.

Significant reduction of odour

The Stoller family brings a "fresh breeze" into pig farming

Pig fattening farms close to residential areas always get complaints about their "fragrant" business from residents who scrunch up their noses. Indeed, there is usually a significant ammonia concentration in the air around them and these unpleasant smells will travel farthest with adverse wind conditions.
Kurt Stoller and his family from Aach near Romanshorn in Switzerland work a so-called PAL farm, which stands for "particularly animal-friendly livestock housing".
On a PAL-farm the animals have more space than on a conventional farm and are housed on littered floors. In spite of large groups of piglets (mostly more than 80 animals in the individual pens) there are hardly any fights among the animals. They are mainly fed concentrated liquid pig feed, but they also receive 20 tons of hay per annum.

Penergetic-g is regularly added from autumn until spring into the two slurry tanks with a capacity of 400 m³ each. Kurt Stoller explains that before he used Penergetic-g, his two stirrers (flat blade stirrer and turbine stirrer) had been hardly able to move the slurry in spite of daily use because of the floating layers. Since he has been using Penergetic-g these problems have dissapeared. His slurry is constantly homogenous and runny. An additional very positive effect is that the Stoller family farm now operates practically "odour-neutrally". Passers-by no longer even realise that this is a pig fattening farm.

Homogenous Manure

Results:
Remarkable change in the slurry pit:
After a few months less need for mechanical agitation. Watery consitency, almost without any unpleasant smell.
The previously neccessary addition of water became obsolete.

After a visit to Austrian colleagues, Slovenian pig breeder Mr.Valenko Ptuj decided to start using Penergetic products on his farm. He had problems with the smell (in the stable as with spreading the slurry onto the fields). Another major issue was the difficulty to keep the slurry homogenous.
End of June 2003 he started to use Penergetic-g for the first time.
3 kg Penergetic-g for pigs were mixed with water and sprayed over the lattice floor into the cesspit below. The slurry was additionally stirred for a few minutes with the mixer. Every week further 5 g / LSU were mixed with water and sprayed over the floor.

It was noticed, that when he stopped using Penergetic-g for longer than 2 weeks, the piglets started to cough. With regular application in spring the pigs didn't have any pneumonia at all!

In January 2004 Penergetic-t was introduced with the feed (50g/t). Subsequently Penergetic-g could be reduced to 3g/LSU weekly.

Bioenergetic principles of orgone-based systems

Prof. Dr.
Bernd Senf

The principles of the numerous and impressive areas of use of energy systems for the vitalisation of living organisms and systems, that remain enigmatic to many people, become easier to understand against the background of groundbreaking research carried out by Wilhelm Reich (1897-1957). The following article by Prof. Dr. Bernd Senf, one of the foremost international Reich experts, gives a brief insight into parts of this research and its connection this kind of energy-systems.

The question of the moving force behind human emotions led the physician, psychoanalyst, Freud-scholar, scientist and founder of body psychotherapy to the discovery of life energy in 1938 that could not be described in common physical terms. Reich named it "orgone" or "orgone energy". He identified the free flow of this energy in the human organism as the essential base of physical and mental health and self-regulation. He considered the blockage and/or fragmentation of the energy flow to be the underlying reason for functional disruptions that can also develop into organic illnesses (even cancer). In this context he coined terms such as biopathy (i.e. bio-energetic illness) and developed methods for their dispersal with the aim of regaining trapped vitality and self-regulation. Many diseases were interpreted by him as an expression and consequence of weakness of bio-energetic charges of the organism and the blood; some caused bio-energetic overstimulation (for example from radioactivity or electrosmog).

With all the differences between the human organism and other lifeforms, including unicellular ones, he discovered a common functional principle in the spontaneous flow and pulsating of the cell plasma and the underlying life energy. The essence of the living organism is therefore not only based in the substantial-material structure of the cells or the body, but in the unity of the material substance and the life energy that moves it and flows in it and around it.

In relation to the exploration of biogenesis (the creation of life), Reich discovered in Oslo, in 1938, minute, blue, blister-like transitional forms

on the border between non-living and living substances that he called "bions". The radiation of blue light was interpreted as a visible form of the orgone life energy that he considered to be the basis of natural self regulation - the creative force in nature.
In order to shield the radiation emitted by the bions from surrounding electromagnetic fields, Reich put a test tube with bions into a metal box (which functioned as a Faraday cage) and observed the phenomena inside the metal box. In spite of the test room being almost totally in darkness, light phenomena were noticeable in and around the test tube. Similar slightly glowing clouds, at first interpreted by Reich as an expression of bion radiation, even occurred within empty metal boxes but not within wooden boxes.
With this test, Reich practically stumbled upon a revolutionary discovery: he laid the foundations for the "orgone accumulator" which could be used to compress "atmospheric" or "cosmic orgone energy" which is also found in the atmosphere and thereby make it easier to observe and more easily available for any potential use.
The decisive factors in the effectiveness of the orgone accumulator are alternating layers of metal and (electrical) isolators. The compression of the orgone energy is, under identical conditions, all the stronger the higher the number of alternating layers.
With this simple order of materials and method of construction, a very effective compression of an energy can be achieved that was overlooked or kept out of the world picture by the orthodox sciences of physics, biology and medicine. This happened even though in centuries and millennia past there were always clear indications, experiences and research with regard to its existence and its functional laws (e.g. acupuncture, homeopathy, chakra teachings and many more). This means that Reich "only" rediscovered something in his own way and in a scientific way that had been known in previous ages, even in our part of the world, but went underground in our culture for various, sometimes dramatic reasons (e.g. witch hunts).
The sciences, mostly mechanically orientated, did not do anything either to resurrect this buried knowledge. On the contrary - as soon as scientists had taken up the scent of life energy, they were (and often still are) excluded from the scientific community. This also happened to Reich whose books were banned and officially burned in 1950s America. Reich himself did not survive a two-year prison sentence. Even today one can find unobjective, distorted, confusing and sneering reports and comments about his research (in particular orgone research) and his person. The wildest rumours about his alleged madness do the rounds.

These can only be responded to with objective information, as I have been trying to do for 35 years.

His old publications have now been accessible again for quite some time and their detailed review and their literally putting them to the test by scientists has shown that his orgone research, which was at first ignored and later often ridiculed, is to be taken absolutely seriously. In spite of occasional internet and media articles to the contrary, his bion experiments (which also formed the basis of his bio-energetic cancer research) could be successfully reproduced. Likewise, the physical properties as well as biological and medical effects of orgone energy in connection with the bio-energetic charge of organisms could be confirmed.
Beyond Reich, the connection between orgone energy and accupuncture could also be proven and a treatment of acupuncture points with radiation of highly concentrated orgone energy (without needles or physical contact) became possible (orgone acupuncture).
Not least the successful applications of Penergetic technology show that living processes can be influenced positively on a purely living-energy level (literally) - a connection that cannot be understood by a science that is obsessed with active ingredients.
The Penergetic method shows that an active substance such as oxygen obviously is not effective because of its material structure but because of the energy structure that goes with it. When highly concentrated energy is radiated through an oxygen layer then the oxygen information is modulated onto the energy current and carried on by it. It can also be transferred onto a carrier subtance (e.g. quartz powder) and stored on it; similar to the light beam of a slide-projector that projects the information of the slide onto the screen or similar also to a data disk that stores information that in turn can be copied from it.

In a similar fashion, the carrier substance radiates the information that has been modulated on to it into its environment and sends, so to say, any number of copies without losing the information itself. If the energy is brought into lifeless water it can play a part in charging the water with life energy and to continually supply it with oxygen information, i.e. with an "effective energy" or an "effective information" that works as if the water was oxygenated. Other information that is beneficial for healing processes in the water, the organism or the living system through stimulation of bio-energetic self-regulation and self-healing can be modulated on according to the same principle. On this basis, many areas of application in agriculture have already emerged with plenty of proven success. One can mention for exam-

ple treatment of slurry, soil, water, plants and animals with methods of life energy.
Even extreme desert areas have by now been transformed into oases through the combined use of bio-energetic methods for the vitalisation of soil, water, plants and atmosphere. In a project to turn a stretch of desert in the northern part of the Sahara green, Penergetic products play an important role, as do other methods and devices that go back to Reich and Schauberger. Even though the project is still in the early stages, fruit and vegetables are already being harvested there in abundance and clouds form that bring the necessary rainfall and shade to an area where only sand and stones existed before - and an unbearable heat. What appears to be a miracle was made possible on the basis of using life-energy - also in the field of "integrated healing of the environment". However impressive these effects are, against the background of life-energy research by Reich and others, they become very plausible.

Additional reading:

- Bernd Senf: Die Wiederentdeckung des Lebendigen, Omega-Verlag
- www.berndsenf.de (topics "Wilhelm Reich", "Bernd Senf in emotion", "Lebensenergie-Forschung" and "Energetische Wetterarbeit nach Reich")
- www.desert-greening.com

Project *El Haouita*

Desert-greening in Algeria

Civil Engineer Madjid Abdellaziz, Vortex-Energy expert

In 2003 Algeria experienced a continuous drought of enormous proportions. One of the causes of global warming is the expansion of deserts, in particular the Sahara. This expansion, which goes widely unnoticed, threatens many countries of the Sahel region in Africa as well as China, India, Arabia, Pakistan, Iran in Asia and Peru and Argentina in South-America. It affects Algeria worst because two thirds of the country is desert. As a consequence of the general water shortage, the government even considered importing drinking water by ship. The reservoirs of the country were in danger of drying up. Information on these conditions can still be found in the archives of the national press. In Algeria, water has always been a rare commodity. Over the last decades an expansion of the desert to the north has been observed. This expansion has also sped up dramatically over the last years. Quick action was required. Civil Engineer Madjid Abdellaziz writes: "At that point in time I had the required technology and the know-how to work against the drought. As a native Algerian I also felt I had to help my country with whatever means I had at my disposal."
This happened with a specialised process (cloud-buster). Since then, there has been rainfall again in

This really does not look like a desert anymore. The Penergetic products help the plants to survive in these harsh conditions. Moreover, a rich harvest has now grown.

all of central Algeria. Nature, soil, water and plants have visibly recovered. Abdellaziz accompanied his desert greening project with the Penergetic-p and -k products. The preparations were used in the usual manner: several grams were dissolved in water and sprayed or poured directly onto the plants. On his website www.desert-greening.com one on can, for example, adopt a fruit tree.

The photographs above show some of those trees that were planted in 2007. Further photographs from 2008 show distinctly strong growth of vegetables and fruit. Civil Engineer Madjid Abdellaziz deems the Penergetic products to be excellent - the plants are becoming more resistant and are already carrying plenty of fruit.

The Penergetic mission

Who are the people behind Penergetic?
It is a team of three who share years of experience with energetisation and its related technologies.

Robert Wilhelm, Penergetic management

Robert Wilhelm worked for several years with Nestlé, the world's biggest food company. There, and in an international trading company he gained the neccessary experience. In 1993 he was given the opportunity to start his own business with his wife Birgit and to look after the new Penergetic range of products. In this role his highest priorities have been the production of these products to the highest standards and on time, an extremely fair pricing policy and the continuous development of an international distribution network with highly motivated agents. No effort is too big to meet the needs and requirements of potential and existing customers and their agents with understanding and sensitivity. When visiting Penergetic's offices and production facility one can literally feel it: everybody here goes about their work constructively, with enjoyment and commitment. Everybody contributes to new opportunities and ideas and people help each other out.

Birgit Wilhelm, Penergetic management, research

Birgit Wilhelm, who came into contact with visionary and alternative ideas through her family, the Plochers, from an early age, became a doctor's assistant after school. It was a further milestone and a very special achievement in her life to pass her diploma as a naturopath. In this way she gained a better understanding of the processes that take place in humans and in nature, and that knowledge in turn became the foundation for the further development of new Penergetic product lines.

Daniel Plocher, Penergetic Germany

As young as eight years old Daniel Plocher came into contact with the area of knowledge of information transfer in the family home. Since 1994 he has worked in the field of ethereal-energetic information transfer in his father's company where he was head of research and development. In 2001, he was involved in the foundation of Penergetic. Today he mainly looks after the German market and the AquaKat range of products.

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