

## Don't turn sour

Pretty much every consumer has heard or read something about pH, and quite a few will know or suspect that the letter H here stands for hydrogen. What p stands for is perhaps not known to so many. It means *potentia*, i. e. strength, ability, power, influence, ... The value in question therefore indicates the efficiency of hydrogen, corresponding to the proportion of hydrogen ions in a liquid, for example. These ions are positively charged and create an acidic state in certain compounds with other elements - in the chemical sense. HCl, for example, stands for hydrochloric acid, H<sub>2</sub>SO<sub>4</sub> for sulphuric acid. This is probably also known to most people, as is the following concerning the bases.

The counterpart of hydrogen as an acid generator is the OH group as part of a larger compound and as a base generator, i. e. this special type of compound of oxygen with hydrogen. Well-known examples of this are NaOH, the sodium hydroxide solution, and KOH, the potassium hydroxide solution. The OH group is negatively charged. Ions are electrically charged atoms or groups of atoms.

With this, our memories of school lessons in chemistry are already sufficient in this context. We now know that the pH value indicates whether a substance is more acidic or more basic. The scale of these values ranges from 1 to 14, so that a liquid with a pH value of 7 indicates neither an acidic nor an alkaline, i. e. a neutral range.

For the human body, there is a very specific functional value on this scale, namely the value 7.4. This means that we are slightly alkaline and deviations from this value are accompanied by functional disorders, especially in the case of hyperacidity. Such an acidic condition, called acidosis in medicine, is life-threatening and ends fatally if it is not remedied in the short term. In order to survive, we are equipped with an extremely effective correction system

by which our pH value remains within the normal range. This system is called the "buffer system".

Our acid buffer system is a complex of several individual buffer systems. Our skeleton holds a large supply of minerals such as calcium that can be called upon to combat hyperacidity. For now, however, the lungs and kidneys intervene to ensure normal levels. The lungs remove hydrogen ions by combining them into carbonic acid ( $H_2CO_3$ ). Normal breathing air contains about 0.04% of this compound, exhaled air about a hundred times more, i. e. about 4%. So if you want to do something good for your houseplants, breathe on them for a while every day or get very close to them and tell them a nice story.

When I was young, I worked with an airbrush for a long time. Although the material sprayed was not really harmful to my health, I put a protective filter in front of my nose and mouth. An irritating cough developed and I consulted a specialist about the matter. He advised me: "Leave the filter off!" A residue of air enriched with  $CO_2$  remains in the cavity of the filter. When you breathe in, the air under the filter mixes with the air you breathe through it, which reduces the amount of  $CO_2$  in the air you breathe in, but brings it down to that of normal breathing air by far. I would estimate the  $CO_2$  content of the air breathed in this way to be ten to twenty times higher than the 0.04% in normal breathing air. The oxygen content is correspondingly reduced. This is very bad air that is breathed in, and this considerably inhibits an important deacidification process.

If you measure your urine pH and it is 6 or even lower in the acid range, you know that your kidneys are busy deacidifying. So it makes sense to drink plenty of still liquids with minerals, and herbal infusions are particularly appropriate. Long-steeped black tea is also possible. Drinking three litres of beneficial fluid daily would be a good thing. It is wise to avoid using the mineral stores of the bones as much as possible.

Other bodies that regulate pH in humans are the blood pigment, certain cellular proteins and the blood proteins. Acids and bases formed in the sto-

mach are also involved in this regulation. Furthermore, the liver is also said to be involved and, to a lesser extent, sweat. So we see: this regulatory system is very complex; and we can conclude that it is very important.

It should also be mentioned here that the body also stores fat to protect itself against over-acidification. Body fat fends off damage from toxins and from too much acid. A one-sided acid-forming diet and the intake of toxic substances therefore promote obesity.

It is undoubtedly a reasonable conclusion that our mind should also be included in this regulatory system. In this way, we can take action against an imminent overload of our organs and their interaction. So let's pay attention to what we eat and how we behave!

The danger of alkalosis is less than that of acidosis, especially since the usual diet, at least in industrialised countries, is predominantly acid-forming. An alkaline surplus can occur during rapid and deep breathing, because it reduces the CO<sub>2</sub> content in the blood. This condition is called respiratory alkalosis. It disappears by itself and does not need to be treated.

Metabolic alkalosis, as the name suggests, has to do with metabolism. Severe cases of this type are accompanied by headaches, increased excitability of the muscles (tetany, cramps) and lethargy (impaired consciousness, drowsiness). This is often caused by a considerable calcium deficiency.

Acidosis already occurs when the pH value of the blood drops below 7.35. Here, too, a distinction is made between respiratory and metabolic acidosis. Respiratory acidosis is caused by mechanical obstruction of breathing, metabolic acidosis by certain irregularities of the metabolism.

Acidosis of the blood, especially acute acidosis, indicates that the buffer system is no longer capable of producing the normal, slightly alkaline property of the blood and nerve fluid (liquor cerebrospinalis). This leads to a drop in blood pressure, a decrease in cardiac output, cardiac arrhythmias and other symptoms — altogether a life-threatening condition.

Individuals do not know how far or how close to exhaustion their buffer system is, but they know their dietary and lifestyle habits best. For most people it will be true that an analysis and reorientation in this regard is highly advisable. An appropriate blood test can show whether there is a deviation from the normal value or not, but how far the skeleton has already been deprived of minerals, especially calcium, through the activity of the buffer system, cannot be determined in this way. A deficiency of calcium in the skeleton may therefore be interpreted as a warning sign.

It is never too early to ask yourself if you have been exercising enough and eating enough alkaline-forming food. Both are vital for the acid/alkaline balance of the human body. The psychological condition, the basic mood of the person and his or her emotional reactions also influence the physiological processes concerned. Those who overload themselves organically with acid are also quickly acidic psychologically, which in turn leads to reactions that drive hyperacidity even further. Distress and frustration thus enter into a ping-pong game with acid-forming nutrition and lack of exercise until the ball lands on the ground.

On the psychological side, states of mind and their opposite are to be considered. For this, it is best to imagine pairs of terms such as: Envy — contentment, greed — willingness to donate, victimisation — ardour — composure; distress — constructiveness, jealousy — trust ... Psychological moods contribute to becoming acidic, and not only in a figurative sense. Acidity also affects the other way round and can show itself in a sour facial expression through which the mood is revealed.

It follows from all this that we should start at three points in order to support our organism sensibly: in our diet, in our exercise and in our attitude.

Prior to this, it is necessary to acquire some basic knowledge, especially in the field of nutrition. some basic knowledge, especially in the field of nutrition. You can start by becoming aware of which which foods are very acid-forming and which are very alkaline-forming. have an alkaline effect. There are tables for this with the corresponding degree of acidity. For the a lot can

be gained from knowing the extremes, because then you can avoid the most acidic foods or at least reduce them considerably and include the most alkaline foods in the diet.

According to the table of a Swiss food chain, the most acid-forming foods include: rabbit meat, shrimps, pork, beef and veal liver, crabs, mussels, oil sardines, canned corned beef, goose meat, unpeeled rice, salami. The most alkaline foods, on the other hand, are: Sultanas, dried figs, spinach, parsley, fennel, kale, rocket, basil, blackcurrants, celery. But beware! According to the PRAL (Potential Renal Acid Load) scale, the total value in the acid range is +146.9; in the alkaline range, however, it is only -107.3. In order to achieve a balance, more base-forming than acid-forming food would have to be ingested, if the individual quantities and their specific values are not taken into account; for example, 2 oz of sultanas could neutralise 3,5 oz of salami or unpeeled rice, and 4 oz of dried figs easily outweigh 4 oz of mussels.

So we have to look a little more closely and cannot be content with simply dividing foods into acidic and alkaline. However, every person has his or her own preferences when it comes to eating and drinking. Therefore, he does not necessarily need to know the values of the whole range of foods. It is therefore helpful to draw up your own table by assigning the values in question to your preferred foods.

For some, it may not be easy in terms of their preferences to relieve their organism in its fight against hyperacidity. But it should be possible for everyone to design an acceptable dietary plan based on the PRAL values. It is worthwhile. Not only does one lay an optimal foundation for one's health, but one also shapes one's personality through self-discipline if one then successfully puts this plan into practice.

As a transition to optimised nutritional habits, a one or two-week alkaline cure can be useful, even if there is no evidence of hyperacidity yet. You can also get advice at a pharmacy on how to measure acid excretion. It is advisable to do this in any case. It is easy to get it wrong with an estimate. If you know a doctor you trust, you should bring up the subject with him or her. It is

not a mistake to have certain blood values taken at the beginning of a dietary change. Something may need to be compensated for.

The two starting points of exercise and psychological condition should not be forgotten. They should be dealt with just as carefully. Mind and soul are not only influenced by the body. It is also the other way round, in that they cause processes to it and in this context want to be perceived as entities of their own.

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