

*The variety of mineral and spring waters out there is mind boggling! Each mineral or spring water has its own geological origin and therefore its own unique mineralization.*

*This series, compiled in cooperation with Doemens Academy, aims to give the interested reader from the beverage trade, catering industry or source company an overview of the diverse nutritional effects, tastes and nutritional value of mineral and spring water as a companion to food and drinks.*



## Sodium-rich mineral and spring waters

### Geology

Sodium is usually linked to chloride. Rock salt (NaCl) was deposited in shallow sea basins about 260 million years ago. These deposits are now widely found in many areas, forming salt deposits up to a layer thickness of 1,000 meters. However, sodium can also come from the mineral feldspar. Feldspar is not directly water soluble, yet in certain regions it can be dissolved in water via the introduction of volcanic CO<sub>2</sub>, imbuing these waters with raised concentrations of NaHCO<sub>3</sub> (Sodium bicarbonate). Several classic mineral waters belong to this type.

### Nutritional importance

According to the European Mineral Water Directive 2009/54/EC, mineral water from 200 mg/l may be advertised as “sodium-containing.” Sodium plays a crucial role in maintaining osmotic pressure of extracellular fluid as well as in the regulation of a healthy acid-base balance. In addition, sodium is a mineral component of bone and is involved in the activation of many enzymes. Finally, this mineral is also important for transmitting stimuli in nerve pathways and the activation of muscles.

High blood pressure patients and overweight people are often prescribed a low-salt diet. In the case of mineral water, however, a strict distinction must be made between pure sodium and table salt (sodium chloride content). In many mineral and spring waters with high sodium content, this mineral is present as sodium bicarbonate. Since these waters contain virtually no chloride, it cannot be compared to table salt. Actual table salt content of a mineral water with a higher sodium than chloride content is determined according to a simple chemical equivalence calculation: chloride content in milligrams x 1.66 = table salt content in mineral water.

It should also be noted that by far the largest intake of sodium is not via mineral waters, but through solid

foods that have considerable concentrations in relation to 100 g, such as sausages (e.g. salami approx. 2,000 mg Na per 100 g), cheeses (e.g. Parmesan approx. 700 mg Na per 100 g) or bread (circa 500 mg Na per 100 g). In contrast to mineral or spring waters, sodium is always present in the foods mentioned above in the form of sodium chloride (i.e. table salt).

For adults, a daily dose of at least 550 mg to about 2,300 mg sodium is recommended, which is usually achieved by eating a mixed diet – and often even exceeded. In certain situations, however, the body requires vastly higher quantities of sodium. This is always the case when a lot of fluid is lost due to perspiration or digestive tract illness.

Those who practice sustained and frequent exercise may need up to 10 g of sodium per day, even more for competitive athletes. A maximum concentration of 200 mg/l sodium is allowed in tapwater. For endurance sports in particular, a highly mineralized mineral water is recommended, for the pure sodium but also for the other minerals present.

### Market overview Europe (without guarantee and without claiming to be exhaustive)

Mineral waters with high sodium content	Na <sup>+</sup> [mg/l]	Country
Vincentka	2,500	Czech Republic
Rogaska Donat Mg	1,700	Slovenia
Borjomi	1,200–1,700	Georgia
Roisdorfer Original	1,240	Germany
Sicheldorfer	1,175	Austria
Vichy Celestins	1,172	France
Vichy Catalan	1,100	Spain
Jamnika	821	Croatia
Pedras Salgadas	622	Portugal

# BREWING AND BEVERAGE INDUSTRY INTERNATIONAL

Founder  
Werner Sachon (1920 – 2005)

Editor-in-Chief  
Dipl.-Volksw. Wolfgang Burkart

Editor  
Christoph Seifried -317  
B. Eng. Brau- und  
Getränketechnologie

Schloss Mindelburg  
D-87719 Mindelheim  
Telephone +49 (0) 82 61/999-0  
Fax +49 (0) 82 61/999-391  
(Advertising dept)  
Fax +49 (0) 82 61/999-395  
(Editorial office)

www.sachon.de  
info@sachon.de

The magazine and all individual contributions and figures included are copyrighted material. On receipt of the manuscript, the publishing house reserves the right to publication as well as the rights to translation, placing of copyrights, electronic storage in databases, production of off-prints, photocopies and microcopies. Any utilisation that violates the copyright law is inadmissible without the publishers' prior approval. Any contributions and information sent to the publishing house without request implicate the anytime revocable agreement to publish the contributions and information in databases maintained by the publishing house or any third party cooperating with the publishing house. Publishing house and editorship do not assume any responsibility for the contributions marked with name or signature.



Publication and Production  
VERLAG W. SACHON GMBH + Co. KG  
Schloss Mindelburg  
D-87719 Mindelheim

Ownership according to Bavarian Press Law

Publisher  
© Ernestine Sachon  
HRA 16639 München  
HRB 85685 München

Managing Director  
Dipl.-Volksw. Wolfgang Burkart  
Telephone -310

Advertising Services  
Sabine Reggel  
Telephone -338  
reggel@sachon.de

Advertising Administration, Coordination  
Sandra Wulkan  
Telephone -335  
wulkan@sachon.de

Distribution Manager  
Yvonne Musch

Print  
Holzmann Druck GmbH & Co. KG  
Gewerbestraße 2, D-86825 Bad Wörishofen  
Subscription Rate  
EUR 45,- per year + postage + VAT  
(where applicable)

ISSN-No. 0949-8877

Note according to § 26 (1) of the Federal German Data Protection Laws  
Addresses of recipients of the periodical are recorded in a computer address file.  
The publishing company's competent court is optionally either Mindelheim or Munich.

## Sensory Assessment

In sensory training of the basic tastes “sweet,” “acid,” “salty,” “bitter” and “umami,” sodium chloride (NaCl) is used as the standard substance for a salty taste. In fact, only NaCl conveys a purely salty note, while other mineral “salts” generally produce different flavors (see also the sensory descriptions of calcium- and magnesium-rich waters previously published under this heading).

Sodium is therefore an essential ingredient in mineral or spring waters! Sodium is sensorily detectable in water from a concentration of about 120 mg/l. It lends the water a pleasant, full-bodied taste up to a concentration of about 300 mg/l. At higher concentrations, distinctive spicy-salty notes dominate.

## Recommendations

Sodium-rich mineral or spring waters are particularly suitable as a companion for savory dishes that include roasts from pork, beef, fried fish or poultry (duck or goose). Since these foods are often quite high in fats, pairing with a carbonated water is particularly suitable here, because the fats become better emulsifiable and therefore more digestible.

Tip: Prepare some Indian Lassi or Turkish Ayran (approximately 50 % sodium-rich mineral water and 50 % whole milk yoghurt; the usual addition of table salt can be dispensed with; spices and flavorings can be added at will) with a sodium-rich mineral water (> 1,000 mg/l Na). The drink tastes excellent as a morning beverage and has the great advantage that, in contrast to conventional Lassi or Ayran (made with pure table salt: NaCl) it supplies the body with further vital minerals.

Combined with vegetable juice, a sodium-rich water enhances the spicy note, be it beetroot, carrot or tomato juice. And the addition of sodium chloride can easily be avoided here. Vegetables (broccoli, carrots, etc.) can also be steamed with sodium-rich mineral water (every chef knows the world-famous Vichy carrots, named after the French mineral water Vichy Célestins). The minerals in the water preserve the original color and allow the vegetable to develop a fuller flavor. □

## Dr. Peter Schropp

Managing Director, Water Sommelier Union,  
(www.watersommelier-union.com) and Initiator/Manager  
of Doemens Water Sommelier training programs  
(www.doemens.org)

