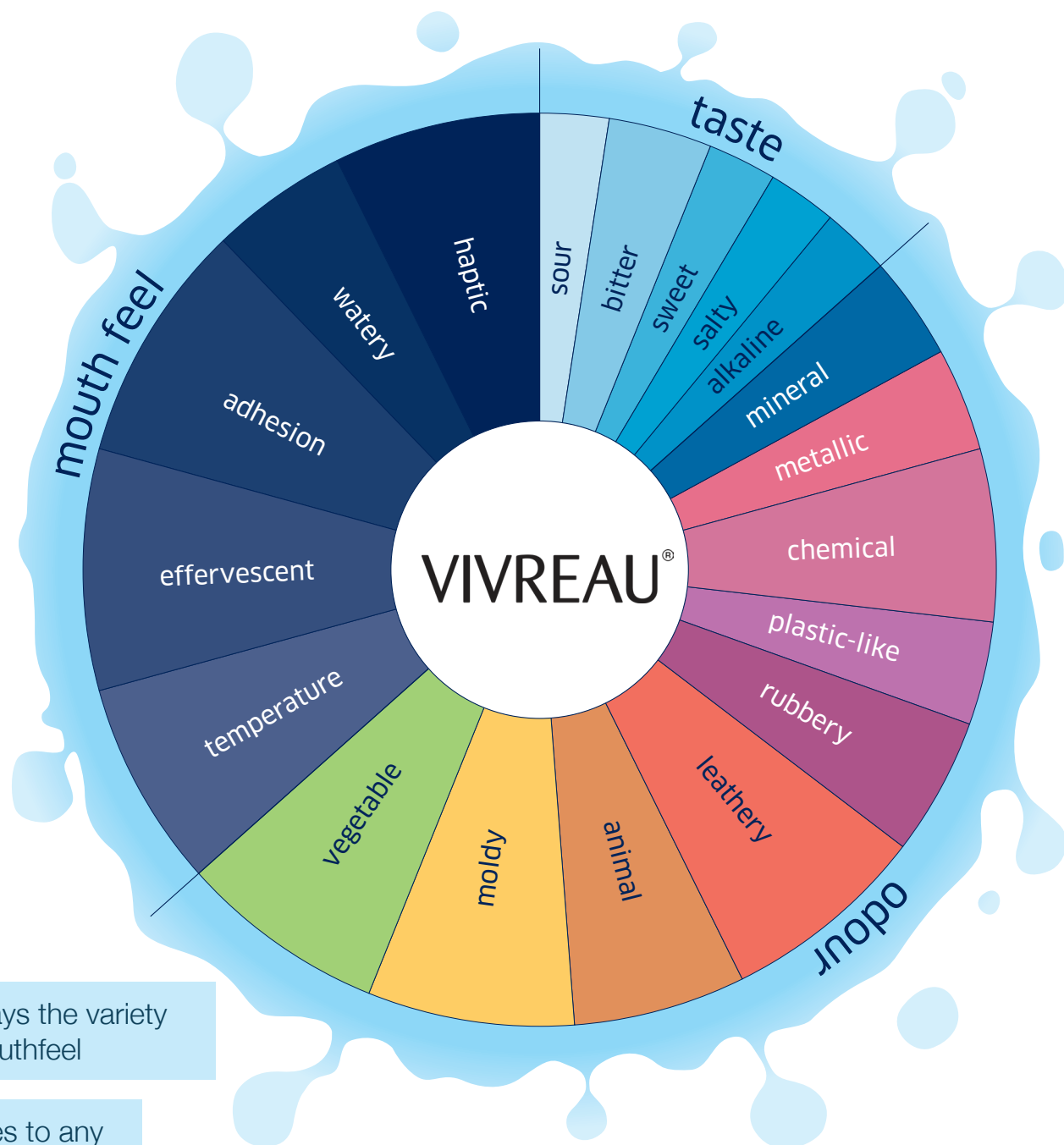


Great tasting water is an art and a science



Displays the variety of mouthfeel

Applies to any kind of water

Real reference substances that can occur in water

How does water taste like?

As water evaporates, it leaves minerals or contaminants behind. However, once it condenses in the atmosphere, it begins to acquire new solutes and new attributes. Rainwater dissolves carbon dioxide, as it falls to the ground and becomes slightly acidic.

It then percolates through soil, gathering organic matter and biological residues and leaching minerals. Consequently, water can contain diverse blends of substances, that imbue it with an unexpectedly broad and nuanced range of tastes and properties.

Water that is in the mains has been treated and tested. As drinking water is one of the most highly controlled food in the western world, there are strict limits on what it can contain – but some minerals, substances used for disinfection and particles from piping, may remain. ^{(1) (2)}

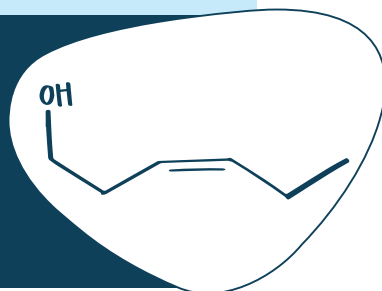
Water is an excellent solvent for a wide variety of substances. As a result, it can contain diverse minerals, organic compounds or substances from water treatment that influences the sensory of water.

How to use the waterwheel

A sensory wheel is used to describe foods and beverages and to train sensory panels. Therefore, the VIVREAU Water Wheel is divided into the three main sensory dimensions: taste, odour and mouthfeel.

The inner circle of a sensory wheel helps to differentiate the attributes of each sensory dimension. The second circle is used to detail the quality of each attributes. The outer circle is used for panel trainings. It contains so called reference substances. These substances are known to cause the corresponding sensory effect. For example: Cis-3-hexen-1-ol smells like fresh cut grass that is why it is the reference substance for a grass-like smell.

Cis-3-hexen-1-ol is used by flowers and plants for killing bacteria and fungus due to damage by insects or a lawn mower. ⁽³⁾



Birgit Kohler

Head of Organoleptic Department at VIVREAU and certified Wassersommeliere

Adequate hydration is the basis of all metabolic processes in our body and thus the basis for our health. Drinking water can be very easy, if the water tastes good. This is why VIVREAU has a special department which is dedicated to taste.



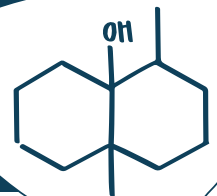
A certain kind of feeling

Whenever people are asked to describe water samples, they often use wordings like “soft”, “flat” or “drying”. Water sensory is not only about taste and odour, it is also about the feeling that water causes during and also after drinking. There are some waters which cause a drying mouthfeel and people feel even more thirsty than before. Actually, in terms of preference, mouthfeel is the most relevant sensory dimension!

Organic substances

include plasticizers, residues of plant protection agents and solvents, but also natural substances like algae metabolites. Organic matter in drinking water is highly controlled. Many of these substances such as pesticides have very strict limit values. Some of these substances are perceptible in taste even in tiny quantities. One example is geosmin – a natural algae metabolite – tiny amounts of which can produce an earthy-musty taste reminiscent of beetroot. ⁽⁴⁾

Fruit flies flee if they recognize geosmin, because it can be the smell of moldy food, too. ⁽⁵⁾



Examples of odour impairing substances in water ⁽⁴⁾ ⁽⁶⁾

Substance	Quality	Odour threshold	Origin
Cis-3-hexen-1-ol	freshly mown grass	70 µg/l	Algae
β-Ionone	violet-like, floral	7 ng/l	Green algae, cyanobacteria
Benzothiazole	rubber-like	80 ng/l	Polyethylene/HDPE pipes
2-Chlorophenol	medical	0,36µg/l	Chlorination of phenols
2,4,6-Trichloroanisole	cork-like, musty	0,03 ng/l	Methylation of 2,4,6-trichlorophenols by biofilms

Vanessa Reinhardt

Sensory Specialist and Panelmanager

The taste of water is significantly influenced by the quantity, relation and kind of dissolved minerals. Cations are responsible for tasting qualities like sour, bitter or sweet. Anions affect taste intensity and mouthfeel. For example, water that is rich in calcium, potassium, chloride or magnesium may seem bitter. Sodium can make it sweet or salty. Hydrogen carbonate could result in flat-tasting and even “dry” water, whereas sulphate can create a chalky taste. And these properties will, in turn, have an impact on the flavour profile of coffees, teas and more.

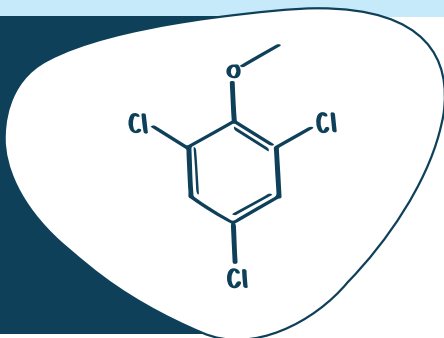


Do you know the smell of chlorine?

Certain substances are deliberately added to treat water for example to eliminate turbidity or chlorine for disinfection. A small quantity of chlorine is added to disinfect tap water. However, depending on the binding partner, chlorine has different odour qualities and threshold values. That is why you can find different kinds of chlorine in the VIVREAU Water Wheel. Even in the segment "mouldy": If specific chlorinated organic compounds are metabolized by microorganisms 2,4,6-trichloroanisole may arise. This substance smells "corky" even though its cause is the chlorination of water. ^{(1) (4)}

2,4,6-Trichloroanisole

is also a typical off-flavour in winery. It can occur, if winery equipment is not rinsed properly after disinfection.



Drinking water can be very easy, if the

Water tastes good.



For more information please contact:

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Sources

1. VIVREAU. Water Basics. 2017.
2. Advancing the Science of Water: WRF and Research on Taste and Odor in Drinking Water. <http://www.waterrf.org/resources/StateOfTheScienceReports/TasteandOdor-Research.pdf> : Water Research Foundation, Updated 2014.
3. Biologie Lexikon. [Online] [Cited: 09 19, 2019.] <https://www.biologie-seite.de/Biologie/Cis-3-Hexenol>.
4. M. Antonopoulou, E. Evgenidou, D. Lambropoulou, I. Konstantinou. A review on advanced oxidation processes for the removal of taste and odor compounds from aqueous media. *water research* . 2014, Vol. 53, pp. 215 - 234.
5. nik/dpa/dapd. www.spiegel.de/wissenschaft. [Online] 12 07, 2012. [Cited: 09 10, 2019.] <https://www.spiegel.de/wissenschaft/natur/fruchtfliegen-geruch-verdorbenere-spisen-loest-fluchreflex-aus-a-871541.html>.
6. World Health Organization, WHO. Guidelines for drinking-water quality. 4th ed. 2011