

difference

THE KÄRCHER MAGAZINE

01 | 2019

CULINARY PLEASURE

Food and drink

QUEEN OF THE WINE CELLAR

Winegrowing in
Tuscany

A SWABIAN SPECIALITY

Hygiene in the
food industry

CLEAN WATER IS THE BASIS OF LIFE

Microplastics: what we
can learn from animals





01 | 2019

Dear readers,

The world of business can be very similar to that of agriculture: we put measures in place that will pay off years down the line. I grew up on a farm myself and still cultivate a small vineyard today. Whenever I'm standing among the vines, I look forward to the moment when nature awakens in spring and they start to bloom. Years later, when I pour myself a glass of wine, I know that all that work was worth it. It must be similar for the young oenologist we visited at the traditional La Braccasca winery in Tuscany.

In this issue, we also examine how maintaining cleanliness and hygiene enables us as consumers to enjoy our food without a second thought. And we speak to Leandra Hamann, winner of the Alfred Kärcher Förderpreis 2017, about microplastics pollution in water. Last but not least, our report on Thank Your Cleaner Day focuses on those people who ensure that our living and working environment is clean and safe every day.

Happy reading!

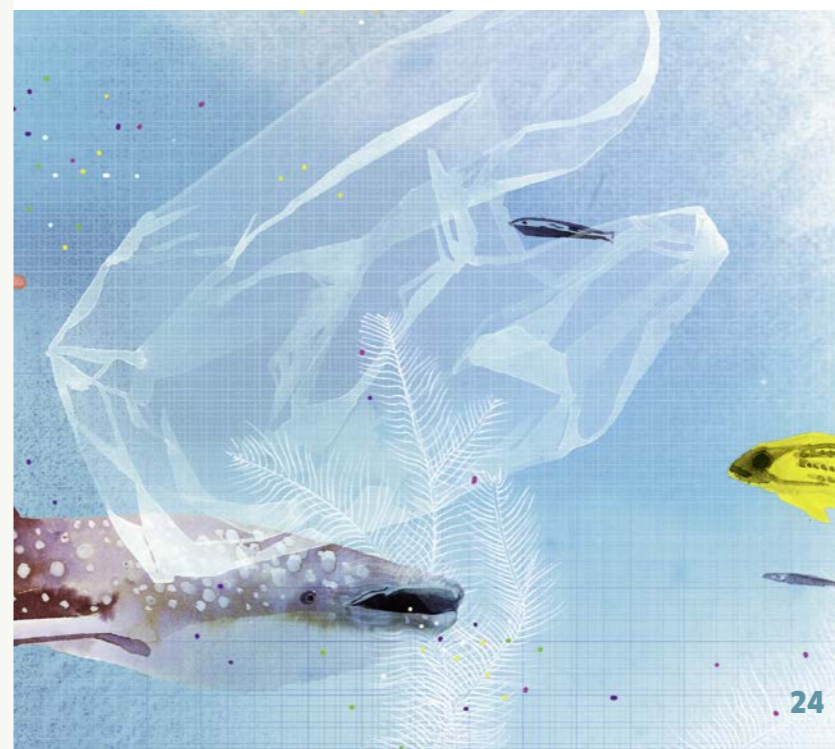
Hartmut Jenner
Chairman of the Board of Management
Alfred Kärcher SE & Co. KG



06



12



24

04

FOOD AND DRINK
Facts and figures

06

QUEEN OF THE WINE CELLAR
Winegrowing in Tuscany

12

A SWABIAN SPECIALITY
Hygiene in the food industry

18

NEW PRODUCTS
Current highlights from the Kärcher range

23

ON THE BALL
Kärcher and the AFC Champions League

24

CLEAN WATER IS THE BASIS OF LIFE
Microplastics: what we can learn from animals

28

CLEAN KITCHEN, FANTASTIC FOOD
Regional delicacies and tips for a clean kitchen

34

A WELL-DESERVED THANK YOU
Thank Your Cleaner Day

35

IMPRINT

02
03

difference 01 | 2019

ALL ABOUT FOOD

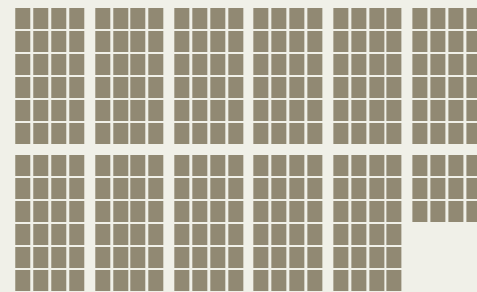
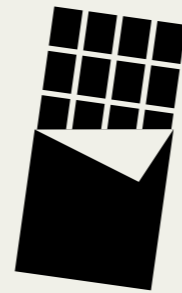


800 MEALS

Modular field kitchen systems from Kärcher Futuretech are ready to use in less than 30 minutes and can provide simple meals for up to 800 people in the event of a disaster.

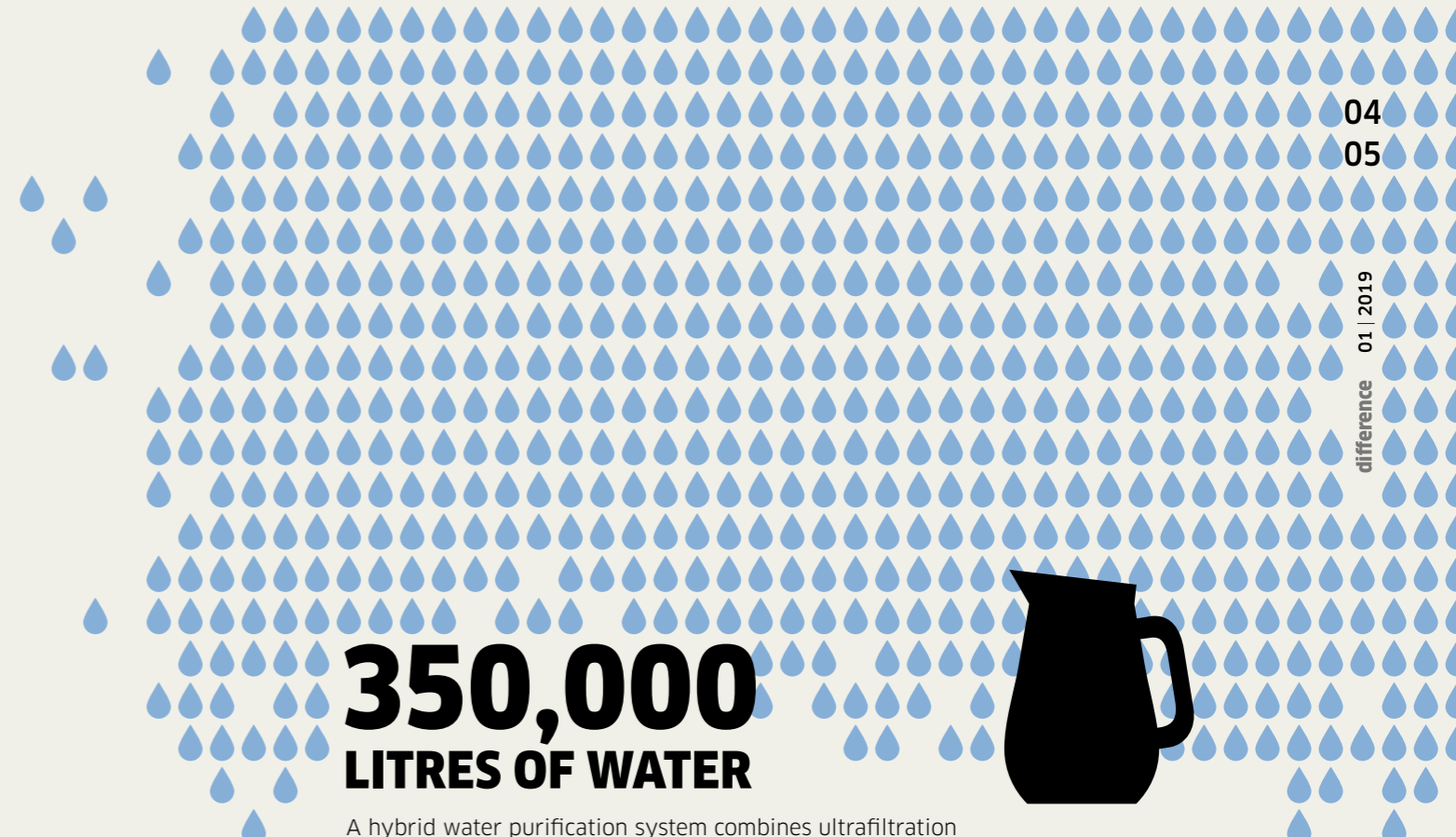
11.5 KG OF CHOCOLATE

On average, every German enjoys 11.5 kg of chocolate per year – a world record! It is often used to calm nerves in stressful office situations. But if some of it lands on your shirt, you need to react quickly. A drop of washing-up liquid and warm water will do the trick.



54.26 LITRES OF WINE

According to statistics, each inhabitant of the Vatican drinks 54.26 litres of wine per year. There are numerous household remedies for that red wine stain on your carpet. Baking powder, salt, etc. may be useful in the first instance, but you should use a spray extraction cleaner to remove the stain completely.



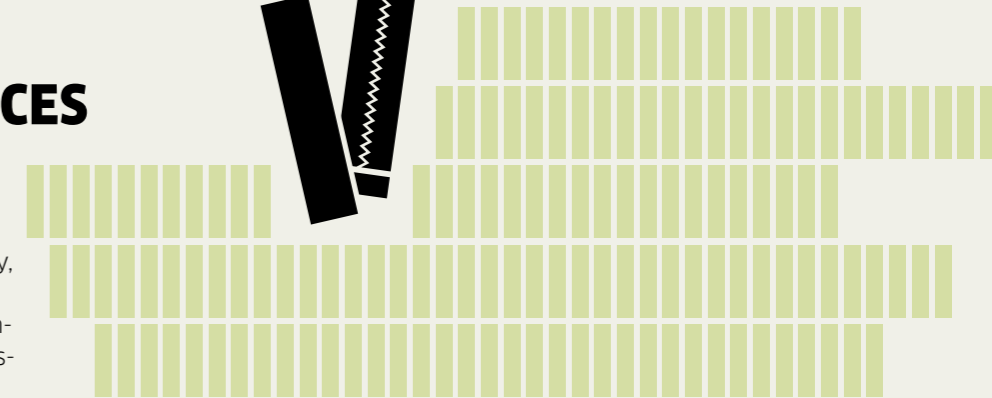
350,000 LITRES OF WATER

A hybrid water purification system combines ultrafiltration and reverse osmosis technology. In this way, Futuretech machines for mobile use can produce up to 350,000 litres of particle-free, microbially and virally safe drinking water from almost any raw water source in one day.



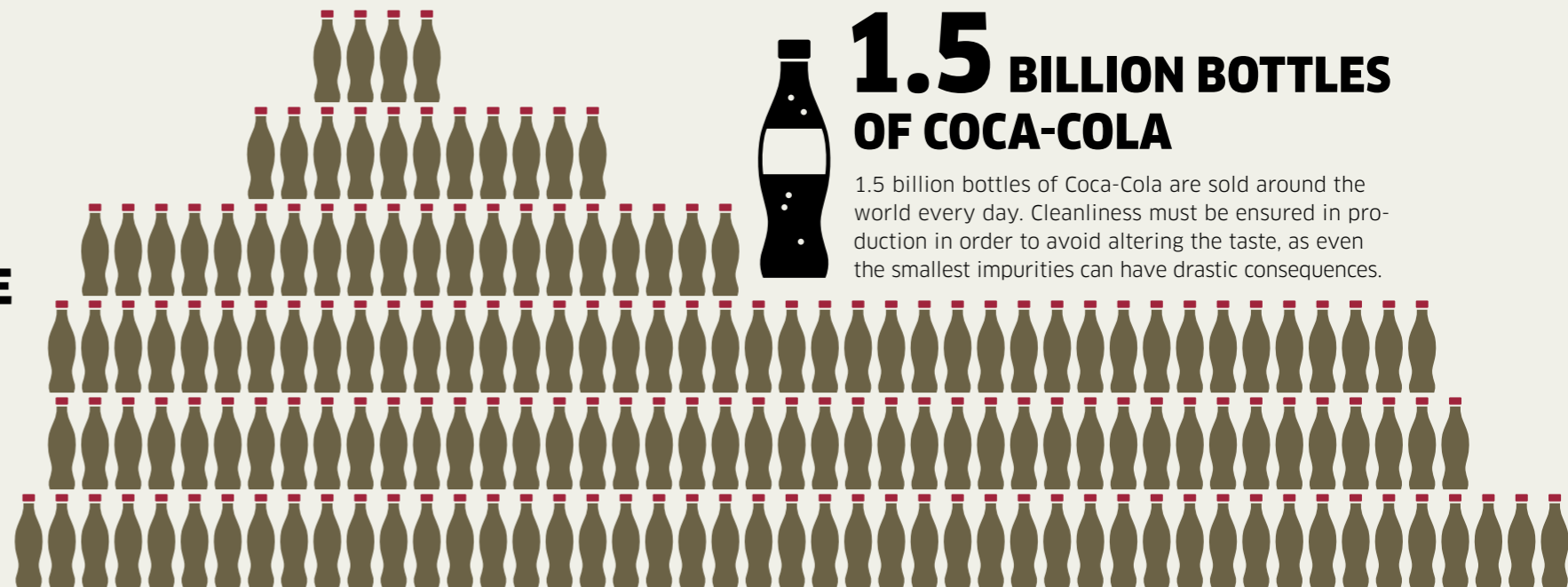
15,000 PIECES OF CHEWING GUM

15,000 pieces of chewing gum end up on the streets and squares of Rome every day, meaning the city's cleaners have their hands full. The gum can be removed without leaving any residues using a high-pressure cleaner or mobile steam machine.



1.5 BILLION BOTTLES OF COCA-COLA

1.5 billion bottles of Coca-Cola are sold around the world every day. Cleanliness must be ensured in production in order to avoid altering the taste, as even the smallest impurities can have drastic consequences.





La Braccasca vineyard in Tuscany

QUEEN OF THE WINE CELLAR

Since the Middle Ages, vines for premium red wines have been ripening on the slopes of the La Braccasca vineyard under the blazing Italian sun, which was in ample supply last summer. Today, the grapes mature under the watchful eye of oenologist Fiamma Cecchieri, who always has plenty to do at the winery.



» After the harvest, it feels like you have got to the top of a mountain. «

Fiamma Cecchieri, La Braccasca



difference 01 | 2019



..... Fiamma's job begins as soon as the grapes are harvested and continues until the wine is bottled.

It's an extraordinarily beautiful morning. The mellow light is slowly spreading over the vineyard and the mist lies like a delicate veil over the slopes. The sun is shining discreetly in the background – unlike during the summer just gone, referred to as the “summer of the century”, when the exceptionally hot weather helped the grapes to mature.

Fiamma Cecchieri is contemplating this idyllic autumn scene. For her, this is the best time of the year. For the first time since the grape harvest, things have settled down again at La Braccasca. The picturesque vineyard is located in the south of Tuscany in one of the best wine regions of Italy, half an hour away from the medieval towns of Montepulciano and Cortona.

Fiamma is an oenologist and is the cellar master for the long-standing, traditional

estate, which cultivates vines for exquisite red wines on its historic slopes. “After the harvest, it feels like you have got to the top of a mountain and you can stop and enjoy the magnificent view,” says the 29-year-old as she opens the door to the winery.

508
 HECTARES
 BELONG TO THE
 LA BRACCESCA ESTATE.

Most of Fiamma's time is spent in the cellars with the large stainless steel tanks or in the “barriccaia”, the barrique

cellar where the fine wines mature in oak barrels. First thing in the morning, she checks the condition of the youngest wines in filled tanks.

Fiamma tastes each sample, evaluates her analyses and decides how to proceed. The expert has quickly gained respect in the male-dominated winegrowing world. In fact, her colleagues Matteo and Leonardo – who are currently decanting a tank – jokingly call her the queen of the cellar.

One vineyard, two first-class regions of provenance

In Italy, strict rules apply to winemaking. Only premium products from certain areas of cultivation with permissible grape varieties can obtain a DOC or the even more prestigious DOCG label. La Braccasca is unique in this respect as the estate produces premium wines in two

designated regions of provenance which, despite being so close together, are completely different.

Wine has been cultivated here since the Middle Ages. The former core area of the estate stretches over more than a hundred hectares to Montepulciano. The Tuscan slopes produce *Vino Nobile di Montepulciano* from the traditional Sangiovese grape variety. This wine has the coveted DOCG classification and is probably so named because an erstwhile pope is said to have reserved the “noble wine” for himself.

In the area around Cortona, the vineyard cultivates Syrah, an aromatic variety that is not native to this area. By planting international vines on Italian hills, La Braccasca is able to produce a premium wine with a unique quality.



5 TUSCAN FACTS

- The region in central Italy is considered an important historical and cultural landscape.
- Tuscany is famous for its traditional vineyards and bold red wines.
- In addition to viticulture, the region's economy is supported by olive oil production and tourism.
- Florence is the capital of Tuscany and is considered the birthplace of the Renaissance.
- Tuscan cuisine is very varied and should be accompanied by high-quality olive oil and fine wines.



.....
Each barrel is cleaned before the aging period. Scrubber driers are used to clean floors on the estate, like here in the hospitality area.



» The interior of the wooden barrels must be meticulously clean to reach the best quality of our wines. «

Fiamma Cecchieri, La Braccasca



CLEANING AT LA BRACCESCA

Cleaning plays an important role in wine production. All transport containers and tanks that come into contact with the grapes or the wine must be absolutely free of particles and residues. At La Braccasca, this is ensured by using hot- and cold-water high-pressure cleaners with special accessories, such as the barrel cleaner. The vineyard's hospitality area is used for welcoming customers and hosting wine tastings. The staff use a Kärcher scrubber drier to ensure a neat and clean appearance.

In the winery, Fiamma refines and shapes the characteristics of the fruit with great care. "This is the only way that I can apply my passion for wine and make a difference," says the native Florentine. She studied viticulture for five years at universities in Florence and Asti. But degusting, the act of tasting and "feeling" wine, is not a skill that can be acquired at university. Fiamma laughs. You can only learn that through tireless tasting.

Knowledge, experience and diligence
After her studies, she sharpened her senses in New Zealand and on estates in Italy, for example in the area of origin of Chianti Classico. Passion, however, has to be in your blood. Her grandfather made wine in the Montepulciano region. As a young girl, she was fascinated by the labels on the bottles, which she copied with great care. Nowadays she does

CrossFit or goes skiing in her spare time – if she is not busy visiting other vineyards, like last week in Lombardy.

When fresh grapes are unloaded, things get hectic. The first few hours are extremely important and influence all subsequent processes. Special oak barrels, the barriques and the big oaks, play a fundamental role. La Braccasca, which has belonged to the Antinori family – one of the oldest winegrowing families in the world – for almost 30 years, uses French oak barrels for Syrah and Hungarian oak for Sangiovese.

In addition to the origin, the size and age of the barrels also affect the style and taste of the wines. Above all, however, the oak must be carefully cleaned to prevent harmful microorganisms from disrupting the sensitive maturation process of the wines.

Clean thoroughly before filling

Each barrel is cleaned before the aging period. The inside of the barrels must be prepared as quickly as possible. The barrel cleaner, a special high-pressure cleaner accessory, is inserted into the bung hole of the barrel. A rotating spray

cleaner. "The organic material must be meticulously clean to reach the best quality of our wines," explains Fiamma.

It is cool inside the spacious barricaia cellar and the humidity is regulated automatically. The *Vino Nobile* spends the longest amount of time in the wooden barrels. It is only decanted into bottles after a year, after which it ages for another twelve months in the cellar. The longer aged variant, labelled with the suffix "Riserva", is left to age for at least 24 months.

The choice of oak is very important to maintain the Tuscan character of the wines: "it should speak for itself." Fiamma says. "Ruby red and balanced, the premium wines from the last harvest will only retain a faint note of oak when they are enjoyed in about two or three years' time, once they have

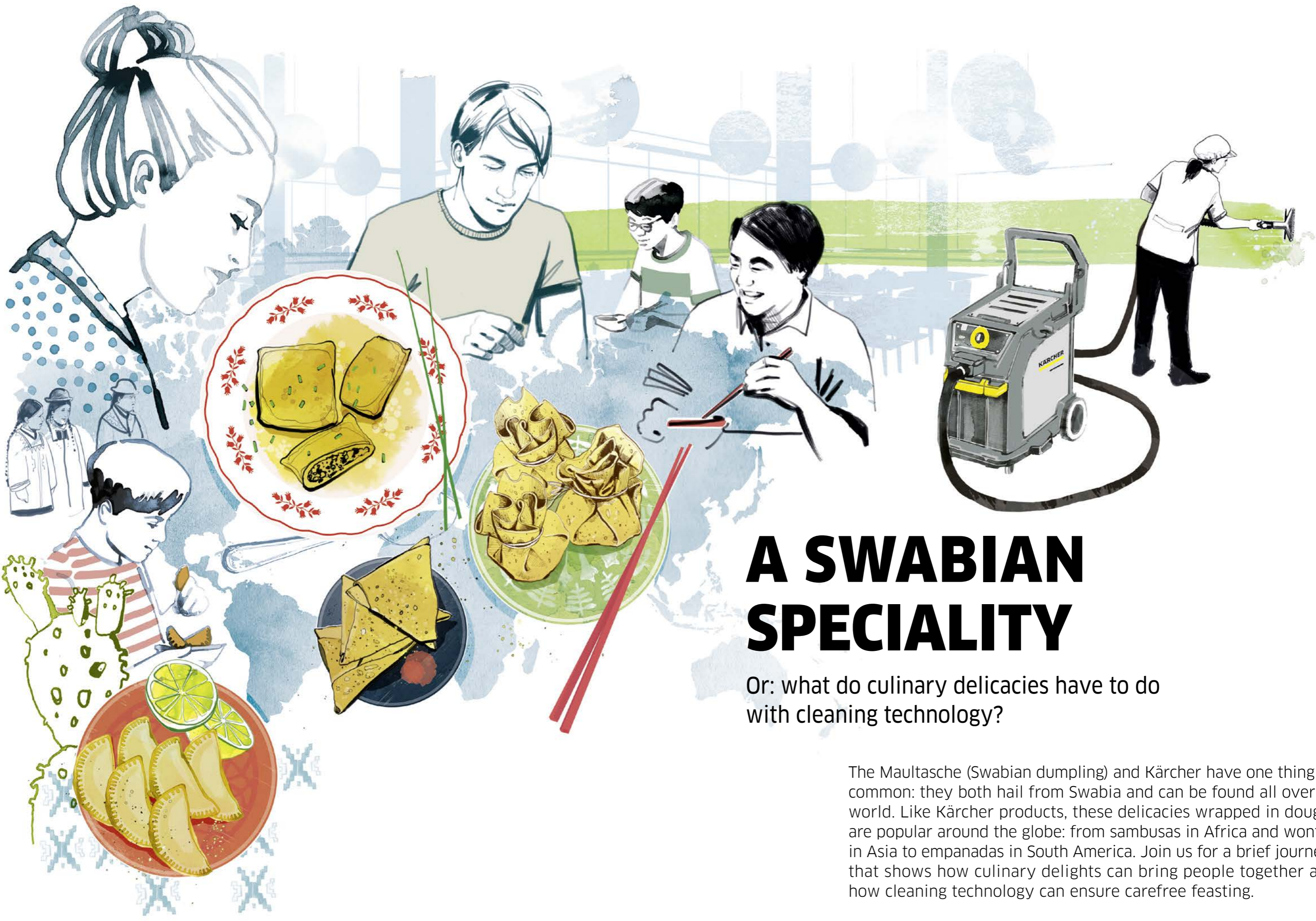
.....
12
MONTHS:
THE AMOUNT OF TIME THAT THE VINO NOBILE AGES IN OAK BARRELS
.....

head cleans the inside of the barrel evenly and thoroughly. The water is then extracted from the barrel by the barrel

matured in the tranquillity of the cellar." Fiamma, meanwhile, is also enjoying a moment of tranquillity as the Tuscan evening sun sets and she makes her way home. ■



Video of Fiamma at La Braccasca
www.kaercher.com/difference



A SWABIAN SPECIALITY

Or: what do culinary delicacies have to do with cleaning technology?

The Maultasche (Swabian dumpling) and Kärcher have one thing in common: they both hail from Swabia and can be found all over the world. Like Kärcher products, these delicacies wrapped in dough are popular around the globe: from sambusas in Africa and wontons in Asia to empanadas in South America. Join us for a brief journey that shows how culinary delights can bring people together and how cleaning technology can ensure carefree feasting.

In the beginning, there was agriculture:

THE INGREDIENTS

➤ Nowadays, food is about much more than satisfying our basic needs – all around the world, consumers want to be able to eat without thinking twice about whether the food is safe. From growing grain and breeding livestock to processing, production processes must be safe and meet strict hygiene requirements (see Standards and Regulations box). But what exactly does this mean?

Taking the example of the Swabian Maultasche, it is clear that even a basic, traditional dish poses great challenges for all those involved. According to the classic recipe, the dumpling consists of meat, bread, spinach and spices and thus incorporates various different areas of agriculture.

In the case of grain, warehouses in particular have to be very clean. The reason is that flour for bakeries and the food industry is produced only a few days before use because it can only be kept for a short time in the quality required for large-scale production. The grain must therefore be stored carefully. As dryness is a particularly important factor, water is avoided when

cleaning the warehouse halls. This means that most of the cleaning is done with vacuum cleaners and sweepers.

In livestock farming, the effort invested in terms of hygiene varies according to the type of animal. Whereas cows are comparatively uncomplicated and robust, calves require buildings, feeding facilities and water pipes to be meticulously cleaned and disinfected with hot-water high-pressure cleaners before the animals are allowed in. Both the pens and transport vehicles for pigs are also subject to very high cleaning requirements, including regular disinfection.

Spinach is transported rapidly from the field to the processing facility. It has to go from harvesting to freezing within a few hours, while maintaining high hygiene standards at all times, to ensure that it is still full of vitamins when it reaches the consumer. ■



Minced meat:

GERMS DON'T STAND A CHANCE

➤ Finely minced meat and sausage meat are used to make the filling for the Swabian Maultasche. In the field of meat processing, germs and bacteria must be eliminated effectively and residues of cleaning agents must then be completely removed. The production facilities and rooms therefore undergo comprehensive cleaning and disinfection at the end of every workday.

First, the production machines are switched off and removable parts are dismantled so that all the contaminated areas can be reached and the machines can be thoroughly cleaned. During the subsequent preliminary cleaning, visible meat residues are removed with clear hot water using a high-pressure cleaner. The facilities and machines are then thoroughly cleaned with special hygienic high-pressure cleaners. They are made of stainless steel and have high-pressure hoses that are resistant to animal fat. Water and a suitable cleaning agent are mixed to form a foam which is applied to production machines, walls, floors and shafts. In contrast to liquid cleaners, the foam adheres much more easily to vertical surfaces and stays on them for longer. After a specified application time, the foam is rinsed off with hot water. The last step is disinfection and subsequent rinsing with clear tap water.

In order to be able to carry out this complex cleaning process efficiently, many slaughterhouses rely on a stationary high-pressure unit with several points of use. Depending on requirements, hot water and chemical dispensing can be used. Steam cleaners with certified disinfection and HACCP approval ensure that areas which are difficult to access, such as joints between tiles, conveyor belts or other parts that come into contact with the product, are cleaned as required. Hot steam can be used to remove stubborn contaminants such as fats, oils or limescale, which are breeding grounds for germs and bacteria, without the need for chemicals. ■

STANDARDS AND REGULATIONS: A BRIEF OVERVIEW

There are numerous regulations and standards in the food industry. The main ones include the HACCP (Hazard Analysis and Critical Control Points) quality management system, the IFS (International Featured Standards) food, product and service standards and the international ISO 22000 standard for food safety. The provisions of the European Cleaning Document, published by the Deutscher Verband für Tankinnenreinigung e.V. (DVTI, German Association for Tank Cleaning) and its umbrella organisation, the European Federation of Tank Cleaning Organisations (EFTCO), apply to mobile tanks, containers and silos. There are also various regulations for animal husbandry, such as the Council Directive 2008/120/EC of 18 December 2008 which lays down minimum standards for the protection of pigs.



Explosive dough:

FLOUR DUST HYGIENE

➤ According to legend, the Swabians hid the Maultasche meat in dough so they could keep eating meat during Lent – hence the humorous German name “Herrgottsbscheißerle”.* The dough is therefore an important component of the Swabian speciality. The main challenge during its production comes from the fine flour dust which is an explosion hazard and settles on machine components, reducing their service life.

Stationary, ATEX-compliant extraction systems draw in the flour dust immediately during dough production. The ATEX Directive 2014/34/EU (Atmosphères Explosives – potentially explosive atmospheres) defines which machines can be used in areas where there is a risk of explosion. In addition, there are mobile vacuum cleaners with hoses that are resistant to heat up to 200°C, which are used for the intermediate cleaning of ovens.

* The German nickname literally means “small God-cheaters” and alludes to pulling the wool over God’s eyes with the green colour of the meaty filling and by hiding it in dough.

Dry ice is used for basic cleaning in order to remove dried dough residues from conveyor belts and production machines. The big advantage is that the machine does not have to be dismantled, as it is possible to clean it directly during the production process.

For this purpose, pellets of frozen carbon dioxide at a temperature of -79°C are accelerated by compressed air. When the pellets hit the surface to be cleaned, the surface is cooled significantly, causing the dirt film to tear open. It can then be easily removed.

Water is only used at the end of the day to clean the production facilities and ensure thorough cleanliness. Either stationary high-pressure units with several points of use are installed or individual mobile machines are used for this purpose. ■

The finished product:

IT’S ALL COMING TOGETHER

➤ At the end of the process, the dough and filling must be combined to produce the finished Maultaschen ready for the supermarket shelf. When ingredients with different properties are combined, the risk of cross-contamination increases. Wet and dry vacuum cleaners with stainless steel containers remove dirt from conveyor belts, production facilities and floors. Hygienic high-pressure cleaners made

of stainless steel are also used. They are resistant to hot water up to 85°C and have two detergent tanks with clear rinsing function. Large areas can be cleaned effectively and economically with vacuum sweepers and scrubber driers. Using the appropriate cleaning technology ensures that the final steps for producing the perfect Maultasche meet the required hygiene standards. ■



DUMPLINGS FROM AROUND THE WORLD: A FEAST FOR THE TASTE BUDS

One of the largest producers of **Maultaschen** in Germany exports the Swabian speciality to a total of 21 countries, including Japan, France and the USA. They are traditionally prepared in a vegetable broth, but are also delicious baked with cheese and tomato sauce.

Looking towards Asia, the Chinese **wonton** can be compared to the Maultasche. The wheat noodle dough is filled with minced meat, seafood and vegetables.

You could also head over to South America for some **empanadas**, which are very popular in Spain as well. The recipes vary quite a lot, but the dough is usually made from wheat or corn flour. Depending on the region, the filling consists of beef, chicken or pork, sometimes mixed with rice, or alternatively they can be filled with ham and cheese or tuna.

In Africa, **sambusas (also known as samosas)** are a popular staple. The spring-roll dough is filled with minced beef with onions, leek and garlic as well as spices such as cumin and cardamom.

Delicious dumplings from our Kärcher canteens around the globe: www.kaercher.com/difference

Current highlights
from the Kärcher range

NEW PRODUCTS

Light vibrations to remove dirt from smooth surfaces or a working pressure of 1,000 bar to remove stubborn residues from heavy equipment. The right solution for every cleaning problem. Kärcher technology sets standards for private users and professionals.

Professional

NT 30/1 Ap L

Versatile wet and dry vacuum cleaner



Home & Garden

WV 6 PLUS

Window Vac with long, flexible suction blade



Home & Garden

K 2 BATTERY

Powerful cordless high-pressure cleaner



Professional

HD 9/100-4 CAGE ADV

No chance for stubborn dirt with this ultra high-pressure cleaner



Home & Garden



STREAK-FREE WINDOWS FROM EVERY ANGLE: WV 6 PLUS



- Even large and floor-to-ceiling windows can be vacuumed in one go.
- Easy to clean edges thanks to the flexible suction blade.
- Slightly curved surfaces such as windscreens are easy to clean thanks to the flexible suction blade.
- The only Window Vac which displays the remaining battery life to the minute.
- At around 100 minutes, it has the longest battery life on the market.
- Approximately 300 square metres of surface can be cleaned with one battery charge.

kaercher.com/home-garden

Professional



COPE WITH ANY TYPE OF DIRT: NT 30/1 Ap L



- Improved semi-automatic filter cleaning system.
- Suitable for use by various target groups.
- Sophisticated storage concept for accessories.
- The removable filter casing allows the filter to be removed without releasing dust.
- The flat unit head has holders for accessories and power tools.

kaercher.com/professional

Home & Garden

WD 3 BATTERY PREMIUM

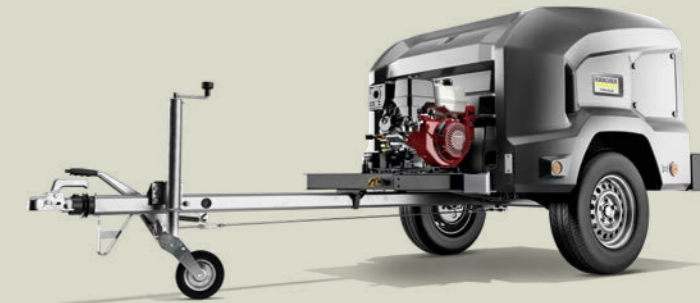
Battery-operated multi-purpose vacuum cleaner



Professional

HD 9/23 Ge/De Tr1

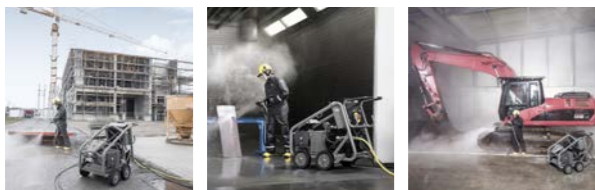
Trailer-based cold-water high-pressure cleaner for use as a self-contained solution



Professional



IMPRESSIVE CLEANING PERFORMANCE: HD 9/100-4 CAGE ADV



- Removes even stubborn soiling such as concrete residues or corrosion with a working pressure of 1,000 bar.
- Powerful pump from ultra high-pressure specialist WOMA.
- Carbide plungers and other wear parts can be exchanged quickly.
- An automatic pressure relief valve reduces the pressure in the hose when the trigger gun is closed.
- Very compact design and easy to transport thanks to four large wheels and the crane hook.

kaercher.com/professional

Home & Garden



ALWAYS CLOSE AT HAND: K 2 BATTERY



- Comparable performance to a corded high-pressure cleaner.
- Work flexibly and independently of any mains with the 36-volt battery.
- The battery shows the remaining running time in minutes.
- Battery and charger are included with the set.
- Easy to store, all accessories are attached to the machine.
- With optional suction hose which can be used independently of a fixed water connection.

kaercher.com/home-garden

Professional

HD 8/18-4 M CAGE

Middle-class high-pressure cleaner with cage design



Home & Garden

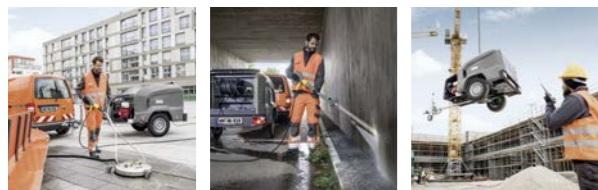
KV 4

The vibrating cordless wiper for smooth surfaces is an ideal complement to the Window Vac





**CAN BE USED ANYWHERE:
HD 9/23 Ge/De Tr1**



- Fitted with a petrol or diesel engine and 1,000-litre water tank for use as a self-contained solution.
- The large tank ensures at least an hour's cleaning time at full power.
- Numerous configuration options for different customer requirements.
- Optional hose reel for up to 50 metres of high-pressure hose.
- The trailer-based high-pressure cleaner is easy to transport and can be used anywhere and at any time.

kaercher.com/professional



**HIGH POWER, HIGH FLEXIBILITY:
WD 3 BATTERY PREMIUM**



- Powerful suction for excellent cleaning results.
- Very versatile: for wet and dry vacuuming without having to change the filter.
- Maximum freedom of movement: no restrictions due to cables or a lack of sockets.
- With a 36-volt exchangeable battery which displays the remaining running time.
- Battery and charger are included with the set.
- Accessories are stowed directly on the device to keep them close at hand at all times.
- Practical blower function for areas where vacuuming is not possible.

kaercher.com/home-garden



CLEAR ADVANTAGE FOR SMOOTH SURFACES: KV 4

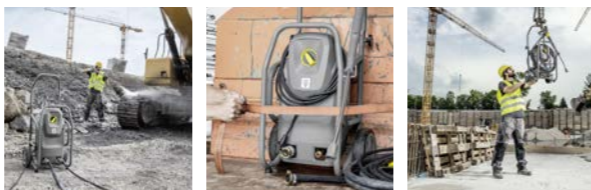


- Removes dirt and wipes surfaces in a single step, without any spray mist.
- The two buttons for controlling the vibrations and the automatic water supply are easy and intuitive to use.
- Thanks to the vibrations, dirt is removed particularly thoroughly and effortlessly.
- Cleans smooth surfaces such as windows, mirrors, hobs and tiles.

kaercher.com/home-garden



**FOR CHALLENGING APPLICATIONS:
HD 8/18-4 M CAGE**



- Particularly robust cold-water high-pressure cleaner with stable tubular steel frame.
- The machine is quickly and securely fixed to the frame for transport.
- If the machine falls over, the flexible tubular steel frame cushions the impact.
- A large filter on the water supply and the automatic pressure relief system protect the pump components.
- The pump is easy to access for simple maintenance without having to open the cover.

kaercher.com/professional



ON THE BALL

From Jordan in the west to Australia in the south-east: football is booming throughout the entire Asia-Pacific region. Rising spectator numbers and growing enthusiasm for the AFC Champions League are proof of this.

Typical stadium snacks vary from country to country, from sausages and pretzels in Germany to meat pies in England and Australia or sunflower seeds in Bahrain. But everyone shares a love for this sport and everyone enjoys a good game. A potentially record-breaking 100,000 spectators watched as the Japanese Kashima

Antlers defended their two-goal lead from the first leg and were crowned the Asian club football champions in Tehran, Iran. This photo depicts a moment from the round-of-sixteen match between the Kashima Antlers and Shanghai SIPG. In 2018, Kärcher became an official sponsor of the AFC Champions League and the AFC Cup. ■

CLEAN WATER IS THE BASIS OF LIFE

Microplastics: learning from animals could be the key for the future.

Nowadays, the responsible use of resources is an important issue across society – from local municipalities and companies to private households. One of the most valuable raw materials is water. The aim here is to reduce consumption, treat and recycle waste water as much as possible and avoid contamination. One of the major challenges, both now and for the future, is microplastics. **difference** spoke to Leandra Hamann (Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT) about the opportunities of bionics and what washing machines can learn from caddis-fly larvae.

Where does your interest in water and microplastics come from?

For me it was a classic case of really enjoying biology at school. My father also makes nature documentaries, which leads to lots of interesting discussions at home. Water has also always been my element – I started diving and surfing at a young age and I love to swim. Studying biology in Cologne was therefore the logical consequence of my experiences up to then. But during my studies, I felt that I was missing the practical benefits of the subject. It is interesting to identify species, to know how they are related and how they function, and to do basic research. But I was really interested in the question of how we – and society – could build on that. So I switched to the subject of bionics where we also study animals, but with the intention of finding out what we can learn from them. When it came to looking for a topic for my master's thesis, I stumbled across the issue of microplastics. It wasn't as hot a topic in 2014 as it is today, but the Fraunhofer Institute offered me the opportunity to work on filtration solutions. I was particularly fascinated by the combination of bionics and this environmental problem.

What is the approach that you are pursuing?

Suspension feeders filter floating particles such as algae and krill out of liquids for food, and can also ingest microplastics. So much would be gained if we could learn from them how to create filter mechanisms that prevent microplastics from getting into the water.

For my master's thesis, I first researched which animals could be used as inspiration. Suitable candidates included mussels, sponges, whales, sea cucumbers and also flamingos. I then classified



Leandra Hamann from Fraunhofer UMSICHT won the Alfred Kärcher Förderpreis (advancement award) in 2017.

these species, chose 24 and sorted them according to biological and technical parameters. How does the respective filter mechanism work, which techniques are used, and what could we use? The whale shark, for example, has flow-optimising structures in its mouth, the flamingo uses fine hairs, while the sea fan coral works with mesh size and flow resistance.

And how did you put this idea into practice?

In the next step, I thought about where the filter should be used and looked more closely at the washing machine. With an estimated quantity of 5,200 tonnes per year in Germany, synthetic textile fibres have a considerable impact on microplastics emissions. The key questions now were: how do the current filter mechanisms work, how should a microplastics filter be designed and how much space is available? In a case study, I chose the caddis-fly larva, which stretches nets made of a silky material between stones and sticks in running water. The nets catch food particles which it can then eat. Initial calculations have shown that the material and structure would trap the fibres and withstand the flow conditions in the washing machine. But the process of implementing a caddis-fly filter is currently still too complicated. Other biological models are easier to apply, and this is what the Fraunhofer experts are currently working on.

» There are still many unanswered questions about microplastics and it is not yet possible to carry out a risk assessment. However, the fact remains that we must reduce the amount of plastic in the environment. «

Leandra Hamann, Fraunhofer UMSICHT

SOCIAL RESPONSIBILITY AT KÄRCHER: DEALING WITH PLASTIC

Sustainability already plays a key role at Kärcher, as cleaning serves to preserve the value and thus the durability of machines and buildings. But it doesn't stop there: the company is committed to ensuring sustainability in all of its activities. The use of recycled plastics and bioplastics is to be quadrupled by 2020. This means, for example, using granulate from our in-house plastic processing system and regranulate from the recycling of car-battery housings or airbags. We also use bio-based plastic for our cleaning-agent bottles. The Kärcher standard of "environmentally friendly products" ensures that problematic substances such as plasticisers and flame retardants are no longer used or are used to a lesser extent.

The machines themselves are designed to be recycled and achieve a reusability rate of more than 90 per cent, as confirmed by means of external test dismantling. Another important step is to reduce plastic packaging for products.

This example shows that it is worth studying biological filtration mechanisms in more detail and working on their implementation in technology. That is why, starting this year, I will be working on my doctorate in bionic filtration concepts at the University of Cologne in cooperation with Fraunhofer UMSICHT. This research could be beneficial for sewage treatment plants, industrial filters and cleaning systems in oceans. I am also still actively involved in microplastics research. I took part in the Runden Tisch Meeresmüll (round table on marine waste) and was invited to participate in discussion panels. It is very clear that there is an urgent need to get the situation under control.

In your opinion, how good are our chances of mastering the problem? Besides your own, do you know of any other approaches that seem promising?

It's not an easy situation to judge. There are still many unanswered questions about microplastics and it is not yet possible to carry out a risk assessment. However, the fact remains that we must reduce the amount of plastic in the environment. It is an extremely complex problem – plastic is available all over the world and many parties are

involved – so we must work together to get the situation under control. Consumers must understand that plastic is a recyclable material and act accordingly. Authorities must establish legal requirements that limit the use of certain materials and additives. Businesses must be proactive and use high-quality, durable and above all abrasion-resistant materials. And the scientific

world must focus on researching topics such as bioplastics, recycling possibilities and filtration mechanisms. This brings us right back to bionics. In my opinion, we can learn a lot from nature – and not just about filters. ■



Further information on this topic:
www.kaercher.com/difference

FOCUSING ON PLASTIC: THE MICROPLASTICS STUDY BY FRAUNHOFER UMSICHT

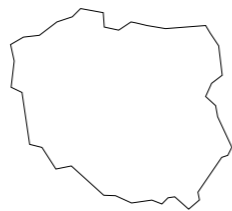
Commissioned by partners from the plastics industry, the water and waste management industries and research institutions, Fraunhofer UMSICHT has gathered together the latest information about microplastics and macroplastics in a study which was published in 2018. Essential findings include:

- Type A primary microplastics are industrially produced plastic particles that are either deliberately or carelessly left to pollute the environment (such as microbeads in cosmetics or plastic pellets). Type B primary microplastics are only created through use, i.e. abrasion or weathering of car tyres, shoe soles, textiles or paints. Plastic waste that is left to break down in nature comes under secondary microplastics.
- In total, 51 sources of microplastics have been identified: tyre abrasion, release during waste disposal, abrasion of bitumen in asphalt, pellet loss and drifting of sports field or playground surfaces are all at the top of the list. The release of microplastics from cosmetics is in 17th place.
- 78 per cent of waste water in Germany is treated by sewage treatment plants while 22 per cent – mostly rainwater – flushes macroplastics and microplastics into the ecosystems with every rainfall. Depending on the technical equipment, sewage treatment plants retain up to 95 per cent of inflowing microplastics. However, the small particles accumulate in the sewage sludge. Checks must be carried out on a case-by-case basis to determine whether it is preferable to incinerate the sewage sludge instead of using it for agricultural purposes.

CLEAN KITCHENS, FANTASTIC FOOD

Dumplings are found all around the globe in many delicious varieties. Here, **difference** spends some time with amateur and professional chefs as they prepare the regional delicacies and provides tips for keeping a clean kitchen.

PIEROGI FROM POLAND: probably the best-known Polish dish is called pierogi. The yeast, puff or noodle dough can be filled with numerous sweet or savoury fillings, including minced meat, quark and cheese or various fruits. If you feel like trying them, visit Krakow in August where they celebrate the Pierogi Festival every year. Smacznego!



1

2

3

1

SINKS must be cleaned after each use, otherwise they provide ideal conditions for bacteria. Clean stainless steel sinks with washing-up liquid and a dishcloth. Even tricky areas near the plughole can be reached with a steam cleaner and power nozzle.

2

GRANITE WORKTOPS must not be cleaned with alkaline, acidic or solvent-based cleaning agents. It is better to use a special cleaning agent for natural stone from specialist retailers. Use a soft, damp cloth to wipe the worktops and then wipe them dry to prevent stains from forming.

3

KITCHEN WINDOWS often become dirty during cooking. Splashes of water, fat or drinks are all very visible on a pane of glass. The best solution is to spray a small amount of detergent onto the pane and vacuum it off with the Window Vac. Use the KV 4 vibrating cordless wiper to remove particularly stubborn dirt beforehand.



2

1

1 HEAVILY SCRATCHED CUTTING BOARDS provide a perfect breeding ground for bacteria, as they can easily settle in the grooves. It is therefore not enough just to rinse the cutting boards with warm water. It is more effective to clean them in the dishwasher or with plenty of washing-up liquid and a sponge.

2 STAINLESS STEEL SURFACES FROM THE COOKER HOOD are best cleaned with a steam cleaner and a velour nozzle cover. If you cook a lot, we recommend cleaning the grease filter every six to twelve weeks. Metal filters can easily be cleaned in the dishwasher or with soapy water.

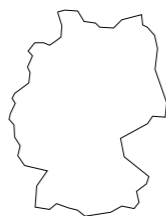


EMPANADAS FROM ARGENTINA: they are one of the most popular dishes in Spain as well as in Central and South America. In Argentina, the crescent-shaped dumplings are usually baked in the oven. The edge of the dough is artfully designed, providing information about the filling. This varies depending on the province, but often consists of beef or ham and cheese. ¡Buen provecho!





MAULTASCHEN AT KÄRCHER: for the chefs in a Swabian family business, Maultaschen are part of the standard kitchen repertoire. They are prepared as soup in a broth, with sautéed onions or sliced with egg. The name is derived from the Maulbronn monastery. Legend has it that the Maultasche originated there when resourceful monks tried to get around the rules of Lent and “hid” the meat in spinach and dough. Guten Appetit!



1

LIGHT-COLOURED TILES AND STAINLESS STEEL are characteristic features of commercial kitchens. They are cleaned with high-pressure cleaners in combination with foam jets or cup foam lances. Using suitable foam cleaning agents (alkaline/neutral/acidic) and air, which is added at the nozzle, the high-pressure cleaners generate foam via the high-pressure jet.

2

MANY MACHINES AND KITCHEN UTENSILS in professional environments are also cleaned with steam cleaners. Industrial steam cleaners make it possible to use chemicals for pre-treatment in the case of heavy soiling and to suck up the loosened dirt.

3

THE FLOOR of a commercial kitchen presents a particular challenge. It must provide a very secure foothold to prevent occupational accidents. Surface cleaners with a rotating nozzle bar or scrubber driers with a roller design remove even stubborn grease stains and food residues.

.....
Even a small "thank you"
shows appreciation for
cleaners.



A WELL-DESERVED THANK YOU

A day to say thank you: "Thank Your Cleaner Day" is a special day dedicated to all cleaners.

Day after day, cleaners tirelessly ensure that our living and working environment is hygienic and safe. The cleaning sector is one of the most important industries worldwide, but is often underestimated. Cleanliness is taken for granted, while dirty workplaces, slippery floors and overflowing bins, on the other hand, are noticed immediately. When hygiene regulations are violated in the food or medical sector, it immediately becomes clear that a clean and tidy environment not only contributes to a good working atmosphere and a sense of well-being, but is also essential for ensuring occupational health and safety.

In order to meet the often demanding requirements of their customers, building service providers work in a highly professional manner and are an important part of modern industrial society. But until now, this professional group has not been shown the appreciation it deserves. That is why, together with Kärcher, the trade association Building Service Contractors of New

Zealand launched the Thank Your Cleaner Day in 2015. Every year, this day honours and highlights the work of cleaning staff. The idea quickly caught on and, thanks to the support of Kärcher, word spread around the world. 18 countries took part in the celebration in 2018. On Thank Your Cleaner Day, companies that employ professional cleaners organise events and activities such as communal breakfasts, barbecues or coffee and cake to recognise and honour their work. And even just a friendly note left on your desk or workbench is a sign that you appreciate and value the cleaning staff.

At a time when services are often taken for granted, this form of appreciation is something completely new, especially for the valued cleaners who enjoy an unexpected moment of special attention. ■

IMPRINT

Publisher

Alfred Kärcher SE & Co. KG
Bernd Rützler, Executive Vice President
Corporate Marketing & Brand Management
Alfred-Kärcher-Straße 28-40
71364 Winnenden, Germany
T +49 7195 14-0
F +49 7195 14-2212
www.kaercher.com

Concept, editing, creative direction

Vera Umbrecht, David Wickel-Bajak
Alexander Becker

Art direction

Britta Raab/Studio Somo

Authors

Alexandra Lachner
Silvia Kling
Kay-Uwe Müller

Photos

Alfred Kärcher SE & Co. KG
Frank Schultze
Lagardère Sports
Mateusz Torbus
Francisco Cao Zen
Martin Baitinger
Martin Stollberg

Illustrations

Julian Rentzsch
Claudia Meitert
Tina Berning/2agenten

Sources

www.statista.de
<https://readersdigest.de/de/gesundheit/diaet-ernaehrung/item/schokolade-ist-nervennahrung>
https://www.focus.de/reisen/service/italien-rom-erklaert-den-kaugummis-den-krieg_aid_693949.html
<https://de.globometer.com/getraenke-coca-cola.php>

KÄRCHER is the world's leading supplier of technology for cleaning transport equipment, buildings and surfaces as well as cleaning and pumping liquids. The company's portfolio comprises more than 3,000 products and ranges from devices for private households to cleaning systems for commercial, industrial and municipal users. With 40,000 trade partners and 50,000 service centres, the family company is represented all over the globe. The portfolio: high and ultra high-pressure cleaners, vacuum cleaners and steam cleaners, pumps for the home and garden, watering systems, sweepers and scrubber driers, vehicle wash systems, cleaning agents, dry ice blasters, drinking water and waste water treatment systems, and water dispensers. Kärcher provides everything from a single source: machines, accessories and cleaning agents, consulting, customer service and digital services. The company's main growth driver is its innovative capacity: at the end of 2018, 632 of its patents were active. In the 2018 business year, the cleaning specialist generated the highest turnover in its history at EUR 2.525 billion.



www.kaercher.com