

# Feeling good about food

Food nourishes and sustains us. Every day, more than 2 billion people consume foods processed with Bühler equipment. Our innovations play a vital role in helping our customers produce safe, high-quality foods with minimal waste and optimal efficiency. Safe food supplies support global health, national economies and trade, contribute to nutrition security, and underpin sustainable development. And let's not forget: They also make us feel good.

## Transforming lives and livelihoods with safe food

Contaminated food is a cause of over 200 diseases, and it leads to around one in 10 people falling ill each year, according to the World Health Organization. A common source of contamination of staple foods is naturally occurring mycotoxins produced by mold on grain. The mold thrives in warm, humid conditions – a problem that will only get worse with the effects of climate change.


One of the most highly carcinogenic is aflatoxin. Around 500 million people – mainly in the world's poorest regions – are at risk of chronic exposure to aflatoxins, which can affect the immune system, stunt children's growth, and cause liver cancer.

A team of dedicated engineers at Bühler has taken a big step toward solving this challenge with LumoVision, an optical sorting application able to identify and sort corn contaminated with aflatoxin faster and more accurately than has ever been possible. The team designed a hyperspectral camera and powerful LED-based UV lighting system to cut contamination rates by 90%. With these, each kernel is analyzed as it passes the machine's sensors. Contaminated grains that glow brightly under the UV light are blown out of the product stream by air nozzles that deploy within milliseconds of detection.

By connecting LumoVision to the cloud via the Bühler Insights platform, which was developed together with Microsoft, it is possible to make a real-time risk assessment of the grains as they are processed. The data collected is securely transmitted to the platform, where it is compared to other data such as the weather conditions under which the corn grew. This data is combined to calculate the risk of contamination for each grain. By comparing the data collected by LumoVision to the data stored in the cloud, it is even possible to assess the risk of aflatoxin occurring in each batch from a certain provider and optimize sorting accordingly. This predictive technology will bring food safety to new levels.

LumoVision processes up to 15 tons of product an hour. It also reduces yield loss to less than 5%. So it's no surprise that in 2018, Forbes called it a "remarkable new technology."





*Sorting to  
save lives*



*Closing the protein gaps*



## Textured thinking for tasty meat alternatives

By midway through this century, it is estimated that the world's population will require an extra 265 million tons of protein. Developing sustainable alternative sources is vital to closing this gap. Meanwhile, around two-thirds of all vegetable proteins produced are fed to livestock such as cattle, pigs, and poultry. The transformation of plant protein into animal protein is a far from efficient process.

Bühler is at the forefront of the search for alternative protein sources and is actively developing the potential of textured vegetable products. They are protein-rich meat alternatives that are obtained from vegetable raw materials via the cooking extrusion process, with many now virtually indistinguishable from meat (like the vegetarian "burger" in the photo on the left) in terms of texture, taste, and color.

Today, most textured vegetable proteins are soy-based, but Bühler is working closely with customers and key partners such as ETH Zurich (the Swiss Federal Institute of Technology) to develop products from materials such as bean isolate, wheat gluten, sunflower seeds, and pulses. Worldwide production rates for pulses remain far lower than for corn, rice, or wheat, though they are protein-rich and need less water to cultivate. Bühler has developed innovative solutions to streamline every part of the production process for pulses, including cleaning, hulling, splitting, and sorting.

The time is ripe to work together to invest in alternative proteins, not only to close the impending gap, but also because of consumer preferences. The ever-growing popularity of both vegetarian and vegan dishes among health- and environmentally-conscious flexitarian consumers is growing. Let's give consumers alternatives they will enjoy with every bite.

Textured vegetarian burger



## Improving diets and tackling malnutrition

That well over 800 million people worldwide should still suffer from malnutrition this far into the 21st century is a stark statistic, but equally shocking is the issue of hidden hunger caused by deficiencies in vitamins and minerals.

While this may not produce many of the physical symptoms we associate with malnutrition, it is a serious and disturbingly widespread problem and can be particularly damaging to the health and cognitive development of young children, which then only worsens the cycle of poverty.

One key reason for the hidden hunger epidemic is that daily diets based on a single starchy food such as rice, wheat flour, or corn may provide sufficient calories but not nearly enough vital vitamins and minerals.

Bühler is striving to tackle these challenges with innovative food fortification solutions, such as NutriRice, which adds an extra level of quality to this staple food by mixing broken kernels for rice flour production with vitamins and minerals, then adding them to natural whole rice kernels at a set ratio. The company has also been supplying thousands of microfeeders to mills and food factories in Pakistan to help reduce the region's high levels of child stunting and malnutrition.

As a key partner in the Food Fortification Initiative, alongside UNICEF and the CDC Foundation, Bühler is working to bring simple, affordable grain fortification processes to mills around the world.



J2  
UNION-KIDS STYLE  
1998-2008



A young child with dark skin and short hair, wearing a bright yellow t-shirt, is the central focus. The child is looking upwards and to the right with a curious expression. The child is being held or supported by several hands of other people, whose faces are partially visible in the background. One person in the background wears a black and white striped shirt, and another wears a vibrant red patterned garment. The lighting is warm and natural, creating a sense of community and care.

*Fortify to  
flourish*

*Reduce,  
reuse,  
renew*







## Reducing energy and water use is vital to food security

A third of all food is wasted between the field and the table. A sad truth, but this doesn't have to be the end of the story. Technology can contribute to the reduction of food waste, energy use, and water consumption. Bühler is committed to developing technologies that reduce waste and energy consumption by 30% by 2020, as well as methods to reduce water use in food processing.

An example is a new process for making Nixtamal corn flour used for tortillas – a product that outsells white bread in the US. Bühler's Prime Masa Nixtamal uses 90% less water than traditional methods through technology that steams the corn instead of cooking it in water for hours. The process uses almost 40% less steam and 30% less energy than previous methods and eliminates the need for the 1,500 liters of water that would normally be wasted during production of 1 ton of corn.

Bühler has also been addressing the issue of the up to 10% of bread left unused after baking as a result of errors, rejection, or overproduction. This unused, wasted bread is given a second life by being put back into the process, becoming a valuable ingredient that has proven to have a positive effect on the end product. It also increases dough yields by up to 10%.

It's not just new products where Bühler is helping to save resources. Its 2018 launched ReNew Internet platform enables customers to find new homes for their old Bühler machines. The company acts as a hub, overhauling these oldies but goodies and selling them to new owners with full warranties. This means machines remain economically viable and don't end up as scrap metal.



## Working to develop sustainable value chains

One of the key ways of ensuring sustainable food supply chains across emerging economies is by sharing valuable expertise. This enables countries to produce their own high-quality food, rather than importing goods while exporting their own raw materials. Bühler is committed to helping customers improve their productivity by training local operators.

A case in point is Ivory Coast – although two-thirds of the world's cocoa beans are grown in West Africa, most chocolate processing still takes place in Europe. Many major chocolate producers – several of them Bühler customers – have plants in the region. Bühler's new chocolate training hub in the capital, Abidjan, is set to open in the first half of 2019. Trainees will learn everything they need to know about operating and maintaining Bühler machinery, helping them to create high-quality products, increase yield, and meet Ivory Coast's target of increasing the local processing of raw cocoa to 50% by 2020.

Bühler's ongoing involvement in Partners in Food Solutions is also helping to bring technical and business expertise to millers and food processors in developing countries, while its African Milling School in Nairobi, Kenya – the first facility of its kind on the continent – has been providing trainees with the skills to significantly improve quality, safety, and output since 2015.







*Sustainable  
value*