FOOD SECURITY FOR A GROWING WORLD POPULATION

INTERVIEW WITH PROF. PEDRO SANCHEZ
“We need the private sector as the engine of development”

INNOVATION
Game-changing in drying

SOUTH AMERICAN CUSTOMER
Family enterprise on a global stage
FOCUS: GROWING WORLD POPULATION
“WE NEED THE PRIVATE SECTOR AS THE ENGINE OF DEVELOPMENT”

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Dear Readers

Ensuring that people around the world have access to basic necessities is extremely difficult. Around 800 million people still suffer from hunger. The challenge does not get any easier when we consider the rapid growth of the global population – the main topic of this edition of our magazine diagram. According to UN reports, the world population is expected to grow from around seven billion people today to over nine billion by 2050. A “keep-it-up” attitude and linear progression will not help to match the rising demand. Recent studies, for example, have revealed that we will not be able to meet the growing demand for rice by simply increasing the available land for cultivation. Innovation for better yield, reduced waste and losses, better education and a change of behavior is required to master the challenge.

One thing that gets lost among the crisis reports that we see and hear every day is this: Significant progress has been made in the fight against hunger. In our interview (pages 4 to 7), Professor Pedro Sanchez, Director of the Earth Institute’s Tropical Agriculture and Rural Environment Program at the renowned Columbia University in New York, argues that Africa will become a food exporter over the long term.

We are using our resources to help make that a reality. Through our involvement in volunteer programs such as Partners in Food Solutions, Bühler is helping to transfer important knowledge to Africa in order to allow the people there to support their own independent food industry (see pages 11 to 12). There are also new technological solutions available to help make food production more environmentally friendly and reduce waste.

These advancements have already shown a positive impact today: Since 1990, the number of hunger-related deaths of children under five and the numbers of children under five who are underweight have been reduced by 40 percent worldwide.

Calvin Grieder, CEO
Professor Sanchez: “I work in Africa because that is where the most difficult issues are.”
“We need the private sector as the engine of development”

THE QUESTION WHETHER THE WORLD CAN FEED ITSELF WILL BE ANSWERED IN AFRICA. AGAINST ALL ODDS THERE ARE CHANGES THANKS TO MARKET OPPORTUNITIES FOR THE INTERNATIONAL AND NATIONAL PRIVATE SECTOR.

INTERVIEW BY MARTIN SUTER, PHOTOS BY KAI NEDDEN

diagram: Professor Sanchez, what changes have Africa’s soils undergone since 1976, when you first wrote your seminal book “Properties and Management of Soils in the Tropics”?

Pedro Sanchez: In Africa there have been mainly negative changes. The best soils are now suffering from urban sprawl. Where we used to grow coffee in Nairobi we now grow houses. But the main problem is that many intensive agricultural systems are abusing the soil. We extract too many of the basic nutrients that the soil provides: nitrogen, which gives us muscles; phosphorus, which builds the bones; and potassium for the electrolytes running around in our body.

What is being done in Africa?
There are processes happening now under the general banner of the African Green Revolution, which former United Nations Secretary Kofi Annan launched ten years ago. Some countries have resorted to fertilizer subsidies. Malawi did that and also offered hybrid seeds at a 70 percent discount to small farmers. That transformed Malawi from a food importer and very hungry country to a largely food-secure country.

Is capital not so much of a problem in Africa now?
At the moment there is enormous liquidity in African banks, partly because of better governance. Foreign direct investment is going up. Partly it is remittances in countries like Ghana, Kenya, Nigeria, which have huge populations here, and in Europe. But mainly it is because economic growth in Africa is very high now. It is 6 to 9 percent in many countries – the same rate as in China, three times the rate as in the United States.

Does the capital flow to the farmers?
The problem is that the bankers don’t lend to people who don’t own collateral. And the vast majority of the smallholder farmers in Africa – which is about 300 million plus family members – don’t have any loan security. So the economist Akinwumi Adesina, who is now agricultural minister in Nigeria, proposed that the collateral be given by the government. It worked out well: By now, the Central Bank of Nigeria has provided over USD 3 billion in guarantees.

MILLENIUM VILLAGES PROJECT
At Columbia’s Earth Institute, the Agriculture and Food Security Center was deeply involved in the Millennium Villages Project. Professor Sanchez initiated this assistance program for African villages when he was co-chair of the Millennium Development Goals Task Force on Hunger.

The Millennium Villages are proving that by fighting poverty at the village level through community-led development, rural Africa can achieve the Millennium Development Goals proclaimed by the United Nations in 2000. The aim is to reduce extreme poverty and hunger by half and to improve education, health, gender equality and environmental sustainability.

Based on advances in science and technology, project personnel work with eighty villages of about 5,000 people each. They create and facilitate sustainable, community-led action plans that are tailored to the villages’ specific needs. Simple solutions like providing high-yield seeds, fertilizers, medicines, drinking wells and materials to build school rooms and clinics are nourishing communities into a new age of health and opportunity. Improved science and technology such as agroforestry, insecticide-treated bed nets and antiretroviral drugs, the internet, remote sensing and geographic information systems enrich this progress.

“The main problem is that many intensive agricultural systems are abusing the soil.”

There are about 7.1 billion people on earth now. How many of us will there be in the future?
We will be nine to ten billion in 2050. I work in Africa because that is where the most difficult issues are. The population grows particularly fast and will continue to do so. At the current rate of growth, Africa will have two billion people in 2050. So the question whether the world can feed itself relies on whether Africa can feed itself. Latin America, Southeast Asia, India, China and the rest of the developing world are all doing well.
I sense optimism when I hear you talk, despite what you said about soil deple-
tion earlier. Am I right?

Very much so. Since 2005, cereal crop
yields have increased by 50 percent in
Sub-Saharan Africa. That sounds nice,
but in fact it is very small because we are
talking about increasing from 1 to 1.5 tons
per hectare. Europe and the United States
are at 10 tons per hectare, China at 5.

And how do we get the additional 8.5 tons
in Africa?

It’s a curve that is beginning to move up –
even though GMOs are not allowed in
most African countries – because of
increased use of fertilizer and increased
use of hybrid seeds.

What could go wrong in Africa?

Climate change is number one. It is
already with us, it is not a hypothesis
any more. There will be more droughts
in southern and western Africa, and
more floods in eastern Africa. And over-
all increasing night temperatures,
which are going to decrease yields. The
reason is that during the day plants
grow and take carbon out of the air with
the help of photosynthesis and sunlight
as the energy source. At night the plant
respires just like you and I. It takes oxy-
genin and exhales CO₂. It loses some of
the carbon it took in during the day.
Unfortunately, plants respire harder the
hotter it gets, like panting dogs. The
answer to this problem is breeding,
finding cultivars, exceptions or wild
relatives that are more tolerant of higher
night temperatures.

What about the floods?

The floods are terrible. For rice there are
some genes being developed for total
flooding. That could be helpful for other
plants. But the floods cause a tremendous
disruption in infrastructure. So climate
change is my number one concern.

And the second one?

Political upheaval of any kind. For instance
nations that are governed well can fall
into dictatorship. Take Zimbabwe, which
was one of the most stable countries in
Africa. Now it is a disaster, simply
because of poor governance. They don’t
allow good agriculture, because they
only care to put money in their pockets.

What is the trend here?

About twenty-three of the forty-nine
countries in Sub-Saharan Africa are
democracies. There used to be only three
of them in the 1990s. So things are getting
more democratic. That is good. Also,
there seems to be a convergence now
between the African governments, scien-
tists, non-governmental organizations
and the private sector. The international
and national private sector has jumped in.
They see a market opportunity and help
organize a better market. We need the
private sector as the engine of develop-
ment. This development that we are doing
is not going to be done by governments.

What role can manufacturers of
equipment play?

They can play a major role. What is needed
in Africa are machines that are a bit more
rugged and have fewer bells and whistles.
And they need to have a setup of mechan-
iccs and spare parts. I’ve seen a lot of dead
tractors under trees, rotting away. A good
system, not only of tractors but also of
milling equipment – that is what is needed.

“Since 2005, cereal
crop yields have
increased by 50%
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Africa.”

Bühler is establishing an African Milling
School in Nairobi, Kenya. The company
wants to replicate the Swiss apprentice-
ship model for Africa and train people to
become expert millers and to be able to
repair the machinery themselves. What
do you think of that?
I think it is marvelous. And I wish the rest of the world would do that. If you find nobody who can do the job you should train them. That is a win-win solution. Half of Africa’s population is under twenty-five years old right now. That is half a billion young kids. There need to be better schools, especially for the girls. They need to go to high school, because very often they are married off at a young age and have five to seven children, of which half die.

The increased food production in Africa needs to be both ecologically and economically sustainable. Should Africa eventually export more food?

Yes, Africa will become a major exporter. There is a lot of land available in Africa that is not under a forest or in any other ecologically sensitive situation. The best approach is sustainable intensification. There is no physical limitation to that. Africa is not a dark continent, Africa is a very sunny continent. And that means there is a lot of solar energy there for photosynthesis. And lastly I would like to say: Africa is a continent of mainly happy people.

That is what everyone says who has been there.

Yes, and this is and will be a real asset. No matter whether you’re rich or poor, Africans are basically happy. I wish I could say that of other continents.

Martin Suter has been reporting from New York City about politics, technology and business news for more than twenty years. He writes for major European publications.

Pulses Are the Meat of the Future

Pulses have the potential to become the preferred source for center-of-the-plate foods that are rich in high value protein and at the same time leave a minimal environmental footprint. Yellow peas, lentils, chickpeas, dry beans and other dry legume seeds are part of the big variety of pulses that come in different shapes, sizes and colors. What they all have in common is the relatively high protein content, which typically is double compared to cereals, along with other nutritional benefits like low fat, carbohydrates with a good blood glucose response, high dietary fiber, and high content in minerals and vitamins. However, despite the interesting composition, the advantageous environmental footprint, and the appeal of plant protein as an alternative to animal-based foods, pulses are still underexploited. Harvesting the full potential of pulses as a top source of healthy plant protein starts with understanding local taste, culture and lifestyle. For all those who like cooking and consuming dishes based on cooked pulses as whole or split seeds, as is typical in traditional pulse-consuming regions like India and the Middle East, the trend goes towards adding convenience in home cooking, for instance by imparting quick cooking properties to pulses.

In contrast, in cultures with limited pulse consumption, the promotion of this valuable food crop requires the delivery of the desired consumption mode and eating experience from taste and texture to digestibility. Pulses may be added in milled form into known products like pasta, noodles, baked goods or snacks. This is likely to be an appealing form of pulse consumption. A big plus of this solution is that the combination of pulses with cereals leads to a significant improvement of the nutritional value, since the combination of both protein sources is complementary in terms of essential amino acids.

Finally, new foods in their own right can be designed with protein-rich formulations. Based on pulses and other plant proteins they deliver new food experiences with regard to cooking, texture and taste. These protein structuring and shaping processes are based on extrusion as technology, and offer the possibility to increase the choice of healthy and sustainable foods rich in plant proteins as attractive alternatives to meat.

Pulses Are the Meat of the Future

Dr. Beatrice Conde-Petit, Bühler’s expert for Food Safety and Security.

Pulses are rich in protein and need less fertilizers.
Solutions For a Growing World Population

Nine billion people in 2050: The growth of the world population creates immense challenges and at the same time new opportunities to fight hunger and misery. A brief series of articles show how countries could develop, food loss and waste be reduced and mobility ensured with less emissions.
NIGERIA
The country became Africa’s leading economy; our customer Fine Chemicals Nigeria is part of this success story.

EDUCATION
How the voluntary organization Partners in Food Solutions supports food producers in Africa.

FOOD SECURITY AND SAFETY
Solutions to minimize losses and waste in the food production value chain.

PULSES
The green favorite to ensure nutrition of a growing world population.

INFOGRAPHIC
Global Loss in the Cereal Production Chain.

MOBILITY IN CHINA
How lightweight constructions enable less CO₂ emissions.
Fine Chemicals Nigeria is the largest producer of inks and colorants in the rapidly growing African powerhouse, which recently overtook South Africa as the continent’s heavyweight economy with a GDP of USD 509.9 billion. “We are working with such a wide array of products; our product portfolio spans printing inks, textile colorants, printing cylinders, cast polypropylene, metalizing and lamination adhesives,” explains dynamic director Rajeev Samant about the complex operation which employs some 300 Nigerian staff.

“Customers wanted to increase quality and reduce losses.”

The company has been operating in Nigeria for nearly three decades. Mr. Samant, who has been based in the country for twenty-two years, has presided over its considerable expansion. Manufacturing is based at facilities in Ota, just north of Nigeria’s teeming capital Lagos – where the company has its corporate headquarters –, and the company recently moved to upgrade its equipment and factory layout as demand surges.

The company currently produces some 300 tons of ink per month and provides solutions for some of the world’s most recognizable brands. As quality and efficiency demands mount amid a rising middle class customer base, Fine Chemicals Nigeria has made modernization its priority. Mr. Samant says: “With our aging machinery customers also wanted improved quality and we were keen to reduce volatile losses. So we turned to the best company we know in this sector.” Fine Chemicals Nigeria has chosen a complete Bühler solution from powder and liquid handling, mixing and grinding to the letdown station, which is expected to go into operation in 2015.

With costs for raw material and power increasing, and quality requirements in the food industry getting tougher amid a more discerning market, efficiency – making best use of available human resources and keeping production costs stable – was vital.
Mr. Samant said: “Bühler has been painstaking in delivering integration of the process in a very sophisticated way, in a limited area – having twice visited our facilities. We have a limited footprint and a complex client portfolio, so automation across all the different products is not easy but they have more than delivered.”

What’s driving that expansion? Nigeria, which has Africa’s largest population, is leading a burgeoning growth in middle-class households on the continent with an estimated 7.6 million to be added in the next sixteen years. Nigeria’s middle class grew by a staggering 600 percent between 2000 and 2014 giving the country 4.1 million middle-class households.

The New Middle Class
The new middle class now represents 11 percent of the country’s surging population and represents a growing consumer base, with GDP also anticipated by the IMF to climb 7 percent this year alone. Alongside that consumer base comes a corresponding uptick in the need for packaging of consumer goods.

With ratings agencies pointing to its robust growth, stable and low public and external debt ratios compared with peers on a net and gross basis, general government debt of just 12.5 percent of GDP and gross external debt of 9.7 percent of GDP at end-2013, it is likely that investment is set to keep coming and with it, that consumer demand.

Fine Chemicals Nigeria is ready to meet that strong market demand and moreover is also reaching further into neighboring Ghana, Togo and Cameroon. For Mr. Samant, who is comfortably settled in Nigeria with his wife, the improved storage capacity and production is set to rise by 50 percent, and a market that is only set to grow means the future for Fine Chemicals Nigeria looks as bright as the colors he makes.

AFRICA: SUPPORT OF FOOD PRODUCERS

Help Against Hunger

The humanitarian organization Partners in Food Solutions supports small and growing food producers and millers in Africa in order to help increase food safety and the shelf life of their products, as well as to make their production processes more efficient. The necessary expertise for these projects is provided by employee volunteers from companies in the food industry, including a number of specialists from Bühler.

Nearly every fourth person in Sub-Saharan Africa is food-insecure – a higher percentage of the population than on any other continent. Jeff Dykstra, CEO of the non-profit organization Partners in Food Solutions (PFS), which is headquartered in Minneapolis, is convinced that “one reason for this is the lack of technical know-how coupled with inefficiency throughout the entire food value chain.” For example, a substantial portion of the crops harvested every year spoils because they are not properly stored and processed. As a result, some countries in Africa end up importing more food than they produce.

A Functioning Industry Stimulates Demand
Partners in Food Solutions wants to correct this discrepancy. Whereas other humanitarian organizations work with small-scale farmers, PFS focuses on local processors and producers. “If we can make these companies more efficient, we can create more demand for raw materials such as soy or corn. A functioning industry must be in place in order to create incentives for farmers to plant these crops,” Dykstra explains. The goal is a functioning economic cycle for the safe processing of locally grown products.

In order to achieve this goal, PFS relies on sustainable knowledge transfer to producers on the local level. Employee volunteers from leading companies in the food and commodities industries provide this know-how to regional businesses. General Mills, Cargill, Royal DSM and Bühler are currently partners of the organization. Employee volunteers do not even have to leave their desks in order to be involved; they communicate with their partners in Africa via Skype or e-mail, as well as over the phone. This model makes it possible for an engi-
neer from Bühler to work on a PFS project in Africa for a few hours every week.

Projects With Wide-Reaching Results
Over the last six years, PFS has worked together with hundreds of small companies, mainly in Kenya, Zambia, Tanzania, Malawi and Ethiopia, and has already completed nearly 300 projects. More than 700 employees from the four partner companies have been involved with the program.

Partners in Food Solutions projects often have wide-reaching implications, as this example makes clear: The UN’s World Food Programme uses a special corn soy blend (CSB) in its programs against hunger. In one case, local producers were not cooking the blend correctly, resulting in poor quality, consistency and poor taste. Around ten PFS volunteers were able to provide support to the producers in Malawi to help them adjust their recipe and optimize their production process. The product continues to be produced locally providing healthy meals to more than a million kids a day and providing markets for thousands of small-scale farmers with long-term income.

Bühler Employees Are Also Involved as Volunteers
At Bühler, the partnership with PFS was met with great enthusiasm. Over the past eighteen months, around sixty employees with qualifications in a wide range of fields have signed up to volunteer. About twelve of them have already worked on a project with PFS, such as Rolf Kamps, who is a Senior Project Manager at Bühler. He helped rice producers in Senegal to implement a technically simple but efficient process for drying rice, allowing them to significantly increase the shelf life of this basic staple, which is only harvested twice a year. Trevor Somerville, who originally comes from Australia, coordinates the partnership with PFS at Bühler. He sees Bühler employees’ volunteer work as beneficial in two ways: “On the one hand, our specialists can use their know-how to effect change that improves the situation in Africa. On the other hand, their volunteer work provides them with more insight into the requirements of the local food industry.”

“WE WANT TO STIMULATE THE PROCESSING SECTOR”

According to CEO Jeff Dykstra, Partners in Food Solutions wants to increase the efficiency of the food processing industry in Africa.

Diagram: How did you get the idea to bring together businesses from Africa and Western companies?
Jeff Dykstra: I began my career in the food industry and later worked in a humanitarian organization. Working closely with General Mills we realized that a functioning food industry cannot develop in a number of African countries because the local processors and manufacturers are missing basic knowledge. That’s where the idea came from to provide small businesses in Africa with the kind of comprehensive know-how that Western companies already have.

How does the knowledge transfer work exactly?
We have a central, cloud-based platform that allows us to profile, track and engage volunteers from our partner companies based on their expertise. Volunteers are contacted when a project requires their specific expertise. This way, employees don’t have to travel in order to be a part of the project, but instead they can support businesses in Africa by providing them with help and information from their desks for a few hours each week. That is why people are so eager to get involved.

Why should employees volunteer?
A lot of people want to make a difference. Just donating money often isn’t enough. We provide people with the opportunity to work on specific projects. Volunteering makes people happy and motivates them in their own daily work.
Asia: A jute bag full of wet rice is turned in the sun – improperly and unevenly dried, the precious crop will probably rot. Western Europe: Broken wheat kernels tumble into storage – Trojan horses for fungi, they are likely to contaminate the effort of a long growing season.

There have been many attempts over the years to reduce post-harvest losses in both developing and developed countries. Despite all efforts, losses are generally considered to remain high, although – there are significant measurement difficulties. One problem is that while engineers have been successful in developing innovations in cleaning, drying and storage, these improvements are often not adopted by developing countries or small scale operations. Plant operators may not be convinced of the benefits of using the technology or costs may outweigh the perceived benefits, and even if the benefits are significant the investment required from them may present them with a risk they are not prepared to take.

Approximately 805 million people go hungry every year, according to recently updated Food and Agriculture Organization (FAO) figures. Tragically, despite this, an estimated one-third of food produced for human consumption is wasted globally; nearly 1.3 billion tons per year. Even in developing markets where the vast majority of those suffering from hunger live, the UN estimates that food waste per capita is as high as 170 kilograms per year. The lion’s share of those losses occurs at the post-harvest (PHL) and processing levels.

Bühler offers storage solutions, machinery and components throughout the entire food value-added chain – from an agricultural product’s reception through to the final stages of processing. Continuously improving products and solutions, Bühler sees to it that post-harvest losses are further reduced and that fewer commodities go to waste, Head of Grain Storage, Tobias Daniel, notes.

Post-harvest losses cannot be stopped with one measure only. It is well known, that good cleaning, gentle conveying, appropriate drying like storage aeration and cooling reduce post-harvest losses considerably. Mr. Daniel said: “To start with cleaning, already the mechanical separation of dust and broken grains before storage will, for instance, reduce the multiplication of fungi and mycotoxins significantly. However, Bühler has also developed a cleaning line for reducing aflatoxin in corn, which includes separator, aspirator, concentrator and optical sorters. This line can be tailored to the individual requirements taking into account the condition of the material being processed and the acceptable levels in the final product.

Depending on the commodity and region of production, drying is among the most important elements for
ensuring losses are minimized prior to storage. “Wet paddy rice in Asia but also corn harvested at 35 percent moisture content in parts of Europe lasts just a few days before rotting unless properly dried,” Bühler’s Head of Research and Development in Grain Processing, Dr. Eliana Zamprogna Rosenfeld states, describing most waste as the result of primitive storage methods and facilities, especially open air facilities with high exposure and poor ventilation – along with the jute sacks described above.

But also for other cereals, it is only when excess moisture has been removed that the product is suitable for storage. Failure to dry crops adequately can lead to much higher levels of loss than poor-quality drying, and may result in the entire harvest becoming inedible. However, Bühler’s drying solutions include techniques that displace the moisten grains in the middle of the product flow to the outside, cutting the thermal load on the product in half and using precious energy more efficiently for gentle and uniform drying.

Such techniques are vital: Poorly conceived ventilation of grain storage can result in further problems. If humid air is blown into dry grain in storage, for example, moisture will develop, building up significantly when the air temperature is higher than the grain temperature. Therefore, a well moderated air flow is important to extend storage time and hence market flexibility.

Hygienic storage, as the top examples highlighted, is vital. But it doesn’t have to cost the earth. As Dr. Rosenfeld puts it: “In many producing nations educated labor is scarce in the agricultural sector and hence the value also of optimized processes that don’t rely on a skilled operator. We have to bring our skills to these markets to make sure such losses are minimized.”

And so much more can be done. Speaking to the Committee on World Food Security, FAO General Director José Graziano da Silva noted that close to 500 million family farms represent 90 percent of global agricultural production: “Family farmers need to be protagonists of innovation. Only this way can they take ownership of the process and ensure that the solutions offered respond to their needs.”

PULSES

Think of United Nations resolutions and you may think of peacekeeping operations or high diplomacy. Shortly before last Christmas the General Assembly adopted an unusual and startling resolution: to dedicate a year to a humble food group.

Declaring 2016 the International Year of Pulses, the UN pointed to the crop as a critical component of food security, highlighting the nitrogen-fixing and health-giving properties of pulses, which make them an environmentally sustainable food choice.

With agriculture a significant driver of global warming – causing 15 percent of all emissions – and the pressures placed on the planet by the huge amounts of grain and water needed to raise livestock the – primary agricultural emitter – pulses have emerged as something of a green favorite.

Unique in their symbiotic relationship with nitrogen-fixing soil bacteria that live inside their root systems, pulses reduce the need for hydrocarbon-based nitrogen fertilizers. With a considerable 40 percent of the world’s dietary protein needs currently supplied by nitrogen fertilizers, the reduced impact of growing pulses as a crop is clear. A further benefit exists: When soil is fertilized with nitrogen, soil microorganisms convert some to nitrous oxide which has 298 times the global warming potential of carbon dioxide. Pulses prevent this process.

Consumer power is also vital to their emergence. Pulses are relied on by many in the developing world to obtain at least 10 percent of their daily energy intake; but demand continues to increase in developed markets too. Pulses – prized for their nutrient content and rich in protein, carbohydrate, vitamins and minerals – are recommended by health organizations around the world as part of a healthy diet to address obesity, as well as preventing and managing chronic diseases such as diabetes, coronary conditions and cancer.

Along with their uniqueness come unique processing challenges however: Contrary to cereals such as rice and

A Global Partnership for Pulses

Bühler has joined forces with Pulse Canada, the industry association that represents growers, processors and traders of pulse crops in Canada – the world’s largest pulse producer – alongside several multinational branded food manufacturers to set up the global Pulse Partnership Task Force, which it also chairs.

With the pulse industry poised for growth as demand rises for sustainably grown, economical plant proteins, the Task Force brings together representatives of the global food value chain with pulse industry members to discuss market opportunities and strategic direction.

Dr. Julianne Curran, Pulse Canada’s Director of Nutrition, Scientific and Regulatory Affairs, said: “The Task Force has, for example, provided input regarding a pulse milling project that is a collaborative research initiative with the Canadian International Grains Institute. The focus of the project is to improve the understanding of the impact of pulse milling technologies on the functionality of pulse flours and ability to incorporate pulse flour ingredients into various food product categories.”

She added: “We have also gotten feedback from the Task Force regarding research the pulse industry is doing on pulse protein quality, as well as initiatives related to achieving nutrient content claims and health claims for pulses. The Task Force has also identified a project on pulse flavor as a potential collaborative effort.”
wheat, with pulses, both the seed coat covering the grain and the underlying endosperm are firmly attached by a naturally occurring gum layer. The strength of this attachment varies with the differing types and the origins of the pulses. In order to remove this seed coat and split the nutritious product into halves, pulses are milled – a process that improves the digestibility, texture, cooking quality and palatability of pulses.

Any equipment dedicated to the complex processing of pulses must overcome the various adhesive forces within the grain, with minimum loss of the endosperm. Ultimately of course, the criteria dictating the processing of any pulse is yield. High impurity levels and difficult processing parameters can lower yield, unless the pulse is processed with dexterity and care.

Modern technologies can ensure careful processing in combination with proper conditioning of the grain. Perfected over the years by experienced suppliers such as Bühler, such technologies can bring dramatic increases in yield; as population pressures grow, a capability that will become ever more vital.

The automation and sophistication they bring to the pulse production process help reduce damage, provide far more efficient separation of impurities and far better recovery of valuable products such as lighter grains, which would otherwise be rejected into the waste stream. It is a result that ensures that rare and gratifying outcome: profitability and sustainability hand-in-hand.

Pulses are rich in protein and need less fertilizers.

THE PULSE PARTNERSHIP TASK FORCE MANDATE:

– To provide strategic direction to the pulse industry on marketing, regulatory, research and processing initiatives to drive commercialization of pulse utilization in food and beverage applications.

– To provide an open forum for information exchange on pulse-related initiatives in areas of interest to Task Force participants.

– To increase the overall nutrition of people, i.e. improve quality of life, while maintaining a consumer focus on all initiatives.
Global Loss in the Cereal Production Chain

Loss and waste during the cereal production chain is still an immense challenge. Only two-thirds of the grains grown and harvested on the world’s arable land every year are actually used to feed the human population. The rest, almost one-third, is lost, first during the harvest, then during transportation, processing and distribution, and finally during the consumption process, whether through improper handling or because it is thrown away.

It hardly comes as a surprise that consumption losses are highest in the world’s developed regions where huge amounts of food end up in waste bins in households and restaurants. In regions where many people go hungry, however, this loss drops to almost zero. The opposite is true for harvest and production losses, which are low in highly developed regions but almost cynically high in starving regions, where there is a lack of...
modern technology, good logistics and qualified personnel. With its industrial solutions – ranging from consulting, education and engineering to machinery, plant and services – Bühler contributes to efforts to optimize the cereal production chain in order to alleviate world hunger.
Merely thirty years ago, Chinese conurbations used to be known for the myriads of bicycles crowding the streets. Today, traffic jams and air pollution dominate the picture. Riding a bike is hardly an option any more. “Naturally, everybody wants the freedom of individual traffic,” says Siegfried Wu, one of China’s leading urban planners. “On the other hand, the danger is that it renders cities unlivable.”

Cars are among the main air polluters in China. In 2013, growing middle class demand for cars made China the first country in which more than twenty million vehicles were sold in a single year. Already in 2009, China overtook the USA as the world’s largest car market. In spite of this, the rate of car ownership in China is still only half of the global average. If the country had the same number of cars per capita as the U.S., there would be a billion cars in China. Meanwhile, sales continue to grow.

Naturally, China’s citizens and their government are aware of the problem. “We declare war on pollution,” said Prime Minister Li Keqiang earlier this year. One approach the government is taking is to promote electric vehicles (EV). The authorities have ambitious plans. In 2012, the government targeted ownership of five million battery-electric vehicles and plug-in hybrid-electric cars by 2020. The government backed up this plan with various subsidies and tax breaks.

According to the news service Bloomberg, China is currently considering providing as much as USD 16 billion in government funding to build electric-
GROWING POPULATION / Focus

Vehicle charging facilities and spur demand for clean cars. Additionally, the country will exempt new-energy vehicles from a purchase tax starting next month, and has ordered government departments to buy such vehicles for their official fleets. Supporting a strategic and emerging industry like new-energy vehicles is a “win-win” for industrial development and environmental protection, the central government said according to Bloomberg. Developing new-energy autos is important for spurring innovation, promoting energy savings and reductions in emissions, and will help to drive domestic demand and nurture new avenues of growth, according to the notice. These initiatives are a strong tailwind not only for carmakers but also for suppliers like battery manufacturers – and with this also for Bühler, providing game changing electrode material processing solutions for lithium batteries.

Lightweight constructions
Another key approach to achieve higher fuel efficiency and less emissions is to reduce the weight of vehicles and their components – mainly by substituting steel with lighter materials such as aluminium and light alloys. This requires new processes for die casting, as weight reduction has other implications too. Components need to be more thin-walled, more complex and more functional in order to achieve the desired effect. As a technology leader, Bühler provides the know-how and the machines that get the job done.

This is significant, because the shift to lighter materials is a major trend in the automotive industry worldwide. Seventy-one percent of car-components were made of steel in 2010, while light materials made up only 29 percent. It is expected that this ratio will switch by 2030, with 67 percent made of lightweight materials such as aluminum. Since the global production of vehicles is estimated to reach 120 million in the same year, this will represent a significant improvement.

But making cars lighter and hence more fuel-efficient is no silver bullet. While it does make a real contribution to slowing down the increase in carbon emissions, other measures are called for as well. A more varied mix with regards to transport is an essential part of this. High-speed trains between new subway networks in large Chinese cities are increasingly playing a role, and the good old bicycle could also become useful again, according to Siegfried Wu, the urban planner.

“I am convinced that the bike will make a comeback in China within the next ten years,” he says. The car, however, will remain the prime means of transport in China. In order to make this more viable, cars will have to become better – and this means, among other things, that they need to become lighter. Bühler technology makes a contribution to getting this done.

BMW’s electro vehicle i3 is already now a success story.
Game-Changer in Drying

BUHLER’S NEW CERES DRYER FOR COATED READY-TO-EAT CEREALS FEATURES GROUNDBREAKING DESIGN FOR IMPROVED SANITATION, HIGHER PLANT UPTIME AND MORE OUTPUT. WHILE FLEXIBLE PRODUCERS WITH A VARIED CEREAL PORTFOLIO WILL ESPECIALLY APPRECIATE THE SHORTER CLEANING TIME, PRODUCTIVITY INCREASE AND LONGER UPTIME ARE SET TO BENEFIT FOOD PROCESSORS OF ALL SIZES.

BY JEAN-COSME DELALOYE

THE SECRET TO DRYING YOUR FAVORITE BREAKFAST TREAT
Ever wondered how sugarcoated cereals are dried? The new Ceres cereal dryer developed by Bühler Aeroglide is the answer (picture). After the cereals enter the dryer, they are exposed to a continuous flow of heated air while being transported on a conveyor belt. Cereal clumps are broken up as the product is transferred from one belt to another in the transfer section, before entering the cooling zone of the dryer where it is cooled with ambient air.
The supermarket’s cereal aisle is where kids linger to choose their favorite sugarcoated breakfast treat. But parents are most probably unaware that one of the quality-defining steps in the production of the cereals they will be choosing involves a cereal dryer. And that this key machine in the cereal processing line has the potential to improve the overall product characteristics, including food safety – while saving energy at the same time.

This is where the new Ceres cereal dryer – aptly named after the Roman goddess of agriculture, grain crops and fertility –, developed by Bühler Aeroglide, comes in. Officially launched in June 2014 at the Interpack trade show in Düsseldorf in Germany, its first prototype was installed in South America in October, with a second one scheduled for installation in North America in early 2015.

**A Collaborative Effort**

Bühler spent eighteen months developing the Ceres cereal dryer from scratch in North Carolina. The goal was to create a “game-changer” in the coated cereal drying technology. At the beginning of this process there was a roundtable meeting with customers, the “Safe Food Engineering Roundtable,” recalls Nick Manley, the Marketing Communications Manager of Bühler in Cary, North Carolina.

“Our food safety group worked with cereal processors from around the world. And one of their biggest concerns was the time it took them to clean their dryers when changing products,” he explains. This is especially important for cereal processors who create different products on the same line and frequently change recipes.

But the issue of sanitation is crucial to all processors, whether small or large, with a varied product portfolio or a single recipe line: When sugarcoated cereals enter the dryer, the coating spreads all over the dryer’s interior, which in turn becomes sticky and may constitute a health hazard.

“In order to prevent contamination and bacterial growth, it can take a cereal processor between eight and fourteen hours to clean a dryer for sugarcoated cereals,” Mr. Manley says.

Andy Sharpe, the Vice President for business development at Bühler Aeroglide, agrees: “Our main focus in the design of the Ceres was to improve the cleaning process significantly. To achieve this, we rethought every facet of the dryer, from how the product is conveyed, improving access...
FROM CORN TO CEREAL

Annual sales of breakfast cereals exceed USD 30 billion, and this figure is on the rise. Bühler supports manufacturers with innovative solutions for all their production processes.

Breakfast cereals in their different compositions and forms are nutritious, low-fat and above all quick to prepare. They are part of the morning ritual for an ever-growing number of people. Around 5 million tons of breakfast cereals are manufactured globally every year. And every year the production volume grows by around 3 percent.

The undisputed market leader is Kellogg’s, the company founded by Will Keith Kellogg, the legendary inventor of cornflakes. Kellogg’s has a market share of 36 percent, followed by General Mills and Cereal Partners Worldwide, a joint venture of General Mills and Nestlé. Together, these three providers account for around 60 percent of the total market.

What is striking is the geographic concentration on relatively few countries: Almost 60 percent of breakfast cereals are consumed in North and South America, 30 percent in Europe and 10 percent in Australia. While the market in North America is more or less saturated, the countries of Europe are still seeing growth. Emerging markets such as India and China also still have much potential. Although most Indians and Chinese continue to eat a traditional hot breakfast, increasing numbers are discovering that breakfast cereals make a practical alternative.

There are basically two methods of manufacturing cereals. Traditionally, ingredients such as corn, rice or grains are ground and cooked before being rolled out, cut into flakes and roasted. The early 1980s saw the introduction of the extrusion process where the cooked mass is pressed through a shaped opening under high pressure. This is not only more efficient, but also gives manufacturers more freedom to design the shape of their flakes.

Bühler Aeroglide, a subsidiary of Bühler, has almost seventy-five years’ experience in the development of production facilities for breakfast cereals. It is a leader in the market and provides all the big manufacturers with innovative solutions for all their processes, from preparation of the raw materials to the extrusion, cooking, flaking and toasting processes required for the final product. Customers also benefit from Bühler’s full-scale engineering expertise, regardless of whether they need to build a complete production line or develop new products such as multigrain flakes.

to the dryer, and even down to removing nuts and bolts from areas above the food stream.”

The strategy paid out: “We evaluate the typical cleaning time for the Ceres at two hours – that is a reduction of at least 75 percent,” he says. Another side effect of the new design is that the uptime between cleaning intervals has become longer. “With a standard dryer, you might have to clean it every eight hours. With the Ceres, it could be every twenty hours.”
Achieve up to four times the airflow of a typical cereal dryer. So in the Ceres, the heat goes into the product faster, accelerating the drying process. The air is also recirculated. The variation of temperature between the air entering and leaving the product flow (Delta T) is between 5 and 10° C. With lower velocity, the difference of temperature can go up to 30° C. The smaller variation in the Ceres’ Delta T allows it to maintain excellent moisture uniformity throughout the product.

According to Nick Manley, the management of increased airflow provides the opportunity to more efficiently, uniformly and consistently produce sugarcoated cereals to specification, resulting in higher yields and better product quality. "In addition, new direct drive fans eliminate the traditional belt and pulley arrangement, increasing the hygienic standard and energy efficiency," Mr. Manley says. "The new fan features a patent-pending load adapter that helps dissipate damaging heat, increasing motor and fan life."

Energy-Efficient Drying
Bühler also addressed another major challenge for cereal dryers: energy efficiency. "This is one of the main concerns of food processors," Professor Onkos says. "If energy is not managed correctly, drying can be pretty inefficient and can represent a major cost for cereal producers." To deal with that issue, Bühler worked on new air management technologies and a more efficient airflow design. And an advanced control system was introduced in the Ceres to allow food processors to manage the drying process with precision and to reduce their energy consumption – thus lowering operational costs.

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Better Hygiene, Faster Startup

CONDITIONING ALLOWS FEED MILLERS TO IMPROVE THE PHYSICAL CHARACTERISTICS OF THEIR FEED AND MAKE IT MORE NUTRITIONAL FOR ANIMALS, BUT IT MUST BE DONE AT THE RIGHT TEMPERATURE. THE NEW UPGRADE OPTION HYMIX PLUS HELPS TO RELIABLY REACH THE RIGHT TEMPERATURE – WHILE REDUCING STARTUP TIME UP TO 50 PERCENT.

More and more feed millers are looking to improve their production processes so that 100 percent of their feed mash is heated to the target temperature before it is fed into the pellet mill. As they do so, companies are discovering that they can reduce startup times, avoid recycling or dumping due to insufficient temperature treatment – and they can use the process as a selling point to win new customers.

With a conventional conditioner, it takes several minutes after a cold start or a recipe change before the target temperature is reached. The product discharged from the conditioner during this period of time is not treated at the right temperature. This is one reason why Agravis Raiffeisen AG, a feed miller in Münster, Germany, recently implemented the new HYMIX Plus retrofit from Bühler on an existing conditioner.

With the upgrade, Agravis can guarantee full compliance with temperature requirements for all batches, which improves the feed quality, and – Agravis hopes – will attract new customers.

Stepping Up to HYMIX Plus

The new HYMIX Plus is an option for new machines or a simple retrofit based on existing DCHA-400 or DCHA-700 conditioners. The main changes in the HYMIX Plus are the position of the steam connection, the sensors and the process intelligence, integrated in a smart terminal box.

Specifically, the shaft has new, specially shaped paddles in the inlet section, two surface temperature sensors – one in the inlet section and one in the outlet section – and new software that controls the starting process. The specially shaped wedge-like paddles allow the product to be only mixed or only conveyed to the outlet, depending on the direction of rotation. A patent is pending for the HYMIX Plus option.

Tangible Benefits

“We can now guarantee that only products that have reached the right temperature are fed to the pellet mill. In addition, HYMIX Plus gives us smoother and more careful production,” says Philipp Rowoldt, Production Manager, Agravis Münster. In addition, Agravis now has “no-loss” conditioning because it no longer has to put feed through twice, waste or recycle it.

At the same time, HYMIX Plus saves on energy and increases productivity with shorter startup times.

Stefan Hoh, Product Manager Feed, says, “HYMIX Plus has enabled Agravis to reduce the startup time of the pelleting line from about eight minutes to four minutes after recipe changes. Depending on the production planning and processes, this can result in a significant productivity increase and translate into additional profits.”

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A HYMIX Plus speeds up production time.
When Willa Mehl wants to show documentation of its maintenance to customers, Susanne Milcher, the quality manager at the flour miller near Munich, Germany, simply clicks a few buttons on her screen and generates a report.

Willa Mehl, a supplier to McDonald’s and others, recently implemented Bühler’s ProPlant Service Management System – previously sold under the name WinCos Care – to gain a better overview of the maintenance status of its production equipment. The company produces 240 tons of flour a day in twenty-four-hour production, using more than 750 machines. It must ensure that all machines are running properly and spare parts are available to avoid costly production downtimes.

If a production downtime occurs and a miller is unprepared, it could take several hours to perform maintenance. In the worst case, a miller may need to order a spare part, and a repair could keep a machine standing still for several days. This adds up when production downtime can cost hundreds of euros an hour.

Smart Maintenance Keeps Mills Running

BÜHLER’S PROPLANT SERVICE MANAGEMENT SYSTEM HELPS COMPANIES TO PROACTIVELY MANAGE THEIR MAINTENANCE PROCESSES. THE RESULT IS IMPROVED UPTIME, AUTOMATED CERTIFICATION OF MAINTENANCE AND TRANSPARENT MAINTENANCE MANAGEMENT. BENEFITS, WHICH NOT ONLY HELP MILLERS SAVE MONEY, BUT ALSO BUILD TRUST WITH THEIR CUSTOMERS.
Easy Audits
ProPlant Service Management is a software program that merges the documents and information that users need to manage maintenance and repairs. Before implementing the system, Willa Mehl scheduled and tracked maintenance with pen and paper. Now, for instance, the company can generate electronically the individual job cards it needs for its maintenance work, which clearly list the instructions for what has to be done. And when McDonald’s conducts its regular quality checks, it’s now easier for Willa Mehl to go through the audit process.

“Everything is pulled together from all machines across the factory. I can find out which blowers I have, where they are and what the maintenance status is,” says Milcher. “This is extremely helpful when you have new employees or want to make sure that maintenance was not overlooked.”

Willa Mehl was convinced about adopting the system in its old and new plants after seeing it at a Bühler customer event, and viewing it in action at Meyerhans Mühlen in Switzerland. Once the decision was made, it did not take long for Willa Mehl to get up and running with ProPlant, since Bühler pulls together all necessary information in the existing systems into ProPlant. And once all that data is collected and placed on a mini server, it is backed up on a daily basis on the cloud so that users do not have to worry about losing their data.

Transparent Management
The ProPlant Service Management System includes four elements: installation data management, jobs to do, stock management, and a document management system. Among the benefits is the automated certification of the maintenance status. “Our maintenance records are now much more detailed than before,” Milcher says. “We can quickly pull up a record of maintenance for a particular machine or time period.” A further feature of the ProPlant Service Management System includes an alert tracker – e.g. alerts that go off when the warehouse is low on a certain spare part.

Blerim Lataj, Customer Care Project Manager at Bühler, says ProPlant helps plant managers reduce errors of oversight. “ProPlant tells you what to do, when to do it and where to do maintenance so that your machines keep running.”

Given all the benefits with ProPlant, millers will have less unscheduled downtime and can concentrate even more on their production.

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Timing the Timeouts

Production downtimes result in loss of efficiency, energy and productivity. With a dedicated software tool that performs in-depth analyses of shutdown causes, machine operators can now streamline their production processes and raise efficiency.
When machines experience an unexpected shutdown, the first priority is to get them running again. If it happens too often, the operator needs to find out what is causing the disruption and how to optimize the production process in order to get the maximum usage from the machine in question.

For Bühler die casting machines and cells a new analytical software tool is now available that evaluates information gathered from sensors to pinpoint the causes of interruptions and helps reduce shutdown periods. This, in turn, enhances operational safety and reliability, resulting in higher output and a reduction of operational costs, higher productivity, and more stable output in the long term.

Long-Term Observation
Using the Bühler Event Analyzer, operators can establish the source of a shutdown and determine whether it is due to machine failure, human error or a faulty peripheral device such as robotic arms, sprayers or removal/extractor units. But beyond immediate troubleshooting, the Event Analyzer collects and computes long-term data on downtimes and other disruptions to the production process.

Time series data is visualized to show the spread of timeouts by source, and indicates whether remedies are taking effect over time. Customers can choose for each die casting machine whether Bühler is to provide them merely with weekly evaluations or whether an additional expert comment with suggested productivity-increasing measures is to be attached to these evaluations. This service is supplemented with quarterly long-term evaluations.

Efficiency Boost
“We offer this service to help customers raise their overall equipment efficiency,” says Carsten-Dirk Ludwig, Team Leader Product Management CS and Retrofit at Bühler Die Casting. “Optimized processes require less energy consumption. These cost savings are compounded by the customer’s ability to plan maintenance work according to a tailored timetable, and by the overall benefit of reducing production timeouts. With precise analysis and elimination of disruptions, the efficiency of the overall installation can be brought up to more than 70 percent.”

The software tool for die casting cells is already available and has met with positive initial responses from customers in the automobile industry, says Ludwig. And it underscores Bühler’s innovative competence in streamlining production and boosting the performance of machines and customers alike.

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Stop Auto Mode

Report Bühler Event Analyzer
- div. peripheral equipment 36.7%
- operator 27.2%
- extractor 12.7%
- machine 11.1%
- die temperature control system 5.0%
- no classification 2.9%
- die 2.4%
- dosing system 1.3%
- safety guards 0.5%
- sprayer 0.3%
- control system 0.0%
OPEN INNOVATION NETWORK

Among others, Bühler collaborates with the following universities and research institutes.

**STRONG FOCUS ON R&D**
Approximately half of Bühler’s sales revenues are generated by products that are less than five years old. For this reason, the company invests an average of 4 to 5 percent of all profits annually in basic research and applied development. More than 7,500 patents stand testament to Bühler’s innovative power. Interdisciplinary research teams comprised of well over 200 employees are constantly on the search for new innovative solutions. While the majority of these are self-generated, many are also the result of close collaboration with our clients as well as in cooperation with numerous colleges and research institutes. Collaboration in research and development guarantee our position at the forefront of knowledge. Bühler works globally in conjunction with other companies, colleges and renowned institutes with its ongoing developments as well as its improvements of existing products and solutions. Working closely together with research and development institutes is an important cornerstone for the company’s continuing advancement.
STATE VISIT

Uzwil Hosts U.S. Second Lady

SWITZERLAND IS FAMOUS FOR VOCATIONAL TRAINING, AND SO IS BÜHLER. THAT'S WHY THE COMPANY WAS CHOSEN TO PRESENT ITS MODEL TO THE SECOND LADY JILL BIDEN, WHO IS ENTHUSIASTIC ON THIS TOPIC.

On September 15, Bühler welcomed a special visitor to its Uzwil headquarters. Dr. Jill Biden, the wife of U.S. Vice President Joe Biden, visited Bühler after giving the keynote speech at the International Vocational Training Congress in Winterthur. Dr. Biden is an educationalist and, for a number of years, has been committed to helping the Obama administration enhance vocational training opportunities in the United States.

During her visit to Bühler, she was given the opportunity to see the company’s vocational training program in action, as well as to talk to individual apprentices. One of the apprentices, Sabrina Würsch, described her vocational training to Dr. Biden; together they then applied the branding to a machine, before Sabrina presented the Second Lady with a special gift from the company: the world’s smallest mill, which had been created by Bühler apprentices.

Speaking of Dr. Biden’s visit, Bühler’s Head of Vocational Training Andreas Bischof said that it had been an honor, adding: “It was a recognition of Swiss vocational training education.”

“The visit of Dr. Biden was an honor and a recognition of Swiss vocational training education.”

Dr. Biden in discussion with apprentices.
Sweet Success

The 2014 Innovation Challenge concluded on September 5, 2014, when four teams of finalists gathered in Uzwil to present their ideas to the competition jury. Joining Calvin Grieder, CEO, Stefan Scheiber, CEO Grains & Food, Samuel Schär, CEO Advanced Materials, Bruno Mendler, Chief Strategy Officer, and Ian Roberts, Chief Technology Officer, on the panel of judges was Professor Roland Siegwart, VP of Research and Professor of Autonomous Systems at the ETH in Zurich. A total of 220 ideas were submitted; the panel had the difficult task of choosing the winner from a shortlist of four – all of which embodied the innovative spirit of the challenge.

From a smartphone-based app for identifying spare parts, to smart feed milling, and establishing a food-safety service business – all of the ideas had potential. So much so, they all got the go-ahead for implementation. However, there could only be one winner: Choco-Botic, which uses robotics to update established molding techniques and produce innovative new product ranges. A member of the winning team said, “Competition was a driving force. We enjoyed the high energy displayed by the molding team to develop new production methods. We will keep up the pace!”

Award for ClassUnlimited

During a ceremony on October 13, in the German city of Bonn, Bühler CEO Calvin Grieder was presented with the Leonardo Corporate Learning Award in recognition of Bühler’s ClassUnlimited training concept.

Comprising three categories – Thought Leadership, Crossing Borders and Company Transformation – the Award honors corporate educational pioneers from across Europe. In selecting Bühler for the Company Transformation Award, the international jury cited the company’s success in linking the values of the dual education system and advanced technologies to create a classroom without borders. Peter Palme, the Leonardo Ambassador for Switzerland, said, “By awarding the groundbreaking approach of Calvin Grieder and Bühler with the Leonardo Award, we want to motivate other companies and institutions in Europe to take new and sustainable approaches in apprenticeships.”

ClassUnlimited is an alliance between Bühler and the Uzwil-Flavil vocational and further training center. Thanks to a virtual classroom, the project makes it possible for students to experience a four-month overseas placement in the final year of their apprenticeships without missing vocational school classes.
**A MAJOR HONOR**

**CCP Process Wins IFT**

During a ceremony at its Annual Meeting and Food Expo in New Orleans, on June 21, 2014, the Institute of Food Technologists (IFT) presented Bühler Barth with its 2014 Food Technology Industrial Achievement Award, in recognition of the company’s “Research into preserving the hygienic and sanitary quality of foods in order to maintain the highest food safety standards for the sake of the health of the consumer” and its development of the Controlled Condensation Pasteurization Process (CCP). Originally developed to maintain the natural quality of raw almonds, CCP is a steam pasteurization process for all types of nuts, oil seeds, spices and other dried food products. It enables quality standards in food safety to be comprehensively met. The IFT called CCP pasteurization technology “an impressive example of straightforward technological development in combination with engineering skills and sound physical principles.”

**HOST OF EUROPEAN PHD STUDENTS**

**Research Elite of Tomorrow Visits Uzwil**

How can we increase safety in food production processes in the future? How can micronutrients be administered effectively? And how can we find natural ways to increase the shelf life of products? Research plays a major role in finding the answers to these kinds of questions. In order to promote the exchange of ideas between representatives from the fields of science and industry, a competition for PhD students takes place every year, which is organized in part by Bühler. After eight years, the event will be held in Switzerland for the first time, on March 24 and 25, 2015. Selected PhD students from sixteen European countries will present their research projects at Bühler’s headquarters as part of the “9th European PhD Workshop on Food Engineering and Technology.” The best project will receive the Julius Maggi Research Award 2015, which is sponsored by Nestlé.

**COMPETITION FOR WINNING IDEAS**

**From Farm to Fork**

The online competition “From farm to fork” invited EPFL and ETH students, as well as other interested parties, to submit ideas on how to minimize the 30 percent food losses and waste between the farm and the end consumer. With around 250 people registering on Fusebox and more than ninety innovative ideas submitted, the Bühler challenge received lots of interest from the students. A jury comprising members of Bühler’s executive board had the difficult task of selecting the best entries. Five ideas and sixteen winners were chosen for an intensive two-day workshop at Bühler’s headquarters in Uzwil at the end of April 2014, during which participants were invited to defend the business cases for their respective ideas. Finalists came from all over Switzerland, with students from the ETH in Zurich and the EPF in Lausanne being particularly well represented. Their ideas included using food waste to feed insects, which, in turn, could be used as livestock feed; bio-engineered packaging, and an efficient and connected storage system that helps preserve crops and reduce intermediaries by creating a direct market.

Bühler CEO Calvin Grieder presented prizes ranging from CHF 1,000 to 2,500 for the five winning ideas.

For a better life: Food in focus.

For more information, visit https://fusebox.epfl.crowdicity.com/blog/post/S1147
Podium Place for Solar Energy Racers

The weekend of October 11 and 12, 2014, saw racing success for the Bühler-sponsored Solar Energy Racers, with the team achieving third place in the European Solar Challenge. Held at the Zolder Grand Prix circuit in Belgium, the two-day competition was made up of four parts: Short Trek, Long Run, Presentation and KO-Chicane. The Solar Energy Racers did especially well in the ten-hour Long Run segment, coming ahead of five other teams to take second place behind the winning University of Bochum team.

The Solar Energy Racers team will next compete in the Abu Dhabi Solar Challenge in January 2015. In the meantime, their solar-powered racing car will make two public appearances – as an exhibit at the Fakuma and SwissTech trade fairs.

More information at www.solarenergyracers.ch

Educate African Millers

Population growth and increasing urbanization across Africa have led to rapid acceleration in demand for staple food. Food companies – and cereal processors in particular – are investing heavily in new capacity; however, they are often held back by a shortage of skilled labor. In response, Bühler has founded the African Milling School (AMS), a new vocational school that will train millers throughout Africa. Based in Nairobi, Kenya, the new facility will welcome its first apprentice in spring 2015.

AMS combines theoretical training and a practical apprenticeship to provide young employees of African milling companies with the skills necessary for running a milling facility. The basic “Miller” diploma program takes two years and concludes with an examination. After gaining a year’s professional experience, graduates of the program have the option of returning to the AMS for a further year to qualify as “Head Miller.” Apprentices must be over twenty years old to study at the AMS. They also need to speak English, have at least a grade “C” secondary school leavers’ certificate, and already work in the milling industry.

AMS – AFRICAN MILLING SCHOOL

Bühler has founded the African Milling School.

BÜHLER SPONSORING

A Small Enterprise on a Global Stage

THE FAMILY FIRM ACEITERA GENERAL DEHEZA (AGD) HAS STRONG ROOTS IN THE SECTORS OF FOOD AND AGRICULTURE – AND IN THE HUMID PAMPAS OF ARGENTINA.

BY ANDREAS FINK (TEXT) AND ANDRÉS ALBERTO RUFFO (IMAGES)
Humility is one of the primary business principles at AGD. And it is the firm’s boss himself who likes to place the emphasis on understatement: “We’re a small enterprise,” says Adrián Urquía with no hint of irony, and backs up his remark using a comparison with his competitors: Globally active giants turn over twenty or even thirty times more than the USD 3.5 billion the company generates from the Argentinean province of Córdoba each year.

But a visit to the “small enterprise,” reached following a drive of some 600 kilometers of flat highway to the west of the capital Buenos Aires, immediately reveals gigantic silos, imposing oil tanks, and a highly branched complex of mills, including a direct link to the railroad line. There is no doubt that here in the linear settlement of General Deheza beats the heart of an agricultural giant with the ability to feed millions of people with its products – millions of people all over the world.

Firmly in Family Hands

“We’re a family firm,” says Adrián Urquía, introducing Aceitera (Spanish for “oil mill”) General Deheza, the management of which he shares with two younger siblings and a cousin. The role of CEO is rotated, and it is currently the turn of the eldest, a man passionate about his work, who appears much younger than his seventy years when speaking enthusiastically about his business, his country, and naturally above all about his company; about its beginnings, the over thirty years of constant growth and about new opportunities and new areas of business.

These lie exclusively within the agricultural sector. The family has consistently rejected all offers to enter into any other areas. “We are at home in the sectors of food, agriculture and seed-based biofuels,” says Urquía.

Around 3,000 people work in mills, silos and offices for AGD. The “small enterprise” has its
Extremely satisfied with their projects and performance.

AGD’s Business Areas
- Production and export of oil from soybeans, sunflower seeds, peanuts and high-protein flour
- Peanuts and peanut products, almost exclusively for the global market
- Manufacture of cooking oils and mayonnaise, primarily for the domestic market
- Cultivation of grain and oilseeds over approximately 200,000 hectares, partly under the ownership of the company and partly rented
- Refining of biofuels, ethanol for the domestic market, and biodiesel for export, the latest addition to the group

An Efficient Response to Unfavorable Conditions
“Argentina’s agricultural industry is by now probably the most efficient in the world,” says Adrián Urquía, explicitly also including other producers from the Humid Pampas in his statement. Argentina’s agriculturalists have to be more efficient than the competition, owing to a number of factors. The ports where soybeans, sunflower seeds, wheat, corn and peanuts are loaded are situated further away from sales markets in Europe and Asia than those of competitors. Freighters from Rosario have to cover some 3,000 more kilometers to reach Europe than those making their way from Brazil’s main port of Santos, for example.
The grinders have been at work for sixty-six years now, with Adrián Pascual Urquía, father and uncle, respectively, of the company’s current leaders, having set up his first linseed mill in 1948. In the mid-1950s, Urquía started marketing the oil himself and added sunflower seeds and peanuts to the firm’s product range.

**Pioneer in Soybean Cultivation**

Urquía was quick to identify the potential of soybeans, which are not native to South America. AGD built the country’s first soybean mill at the beginning of the 1970s, and has since succeeded in benefiting fully from the momentum that these super-pods brought to the Pampas. Acreage, exports and usually also earnings increased every year, with around USD 29 billion being generated by soybean exports from Argentina last year. This legume has long been the biggest foreign currency earner for the country.

AGD’s expansion was closely accompanied by its technology partner Bühler. “We’ve been working together since 1970,” recalls Adrián Urquía. “Together, we’ve completed many large projects on a solid basis of trust, with usually a word being enough, and both sides meeting all of their promises. Our business relationship to date has been nothing less than excellent. We’re extremely satisfied with all of the projects – and with their performance,” affirms Adrián Urquía.

After joining with other partners to commission a modern plant that produces bioethanol from corn, a biodiesel plant and a soybean mill over the past few years as well as expanding its own soybean mill at General Deheza, AGD recently decided to install Bühler technology in its prospering peanut section. The former storehouse, which is at least 200 meters long, now houses the AeroRoast dry roaster above a gleaming brand new floor. It is the first of its kind anywhere in Latin America.

Protective clothing is worn by all of the staff. Troughs are used to bring the peanuts, which still have their inner, red skin that is removed in the AeroRoast’s ovens and rollers. The powerful machine can blanch up to 12 tons of peanuts per hour, drying them with the “dual plenum” process using double hot-air circulation, while rollers with a raw surface scrub off the red skins that have been
CUSTOMER CASES / AGD

Peanuts from Córdoba
At the end of the entire process, the nuts, which have been dried to a humidity level of around 6 percent and are now white, are emptied from a filling nozzle into huge white plastic sacks that weigh just over a ton when full. Bearing the AGD brand logo “Natura” and the protected designation of origin “Córdoba Peanuts,” the XXXL packages are ready for a Europe-bound container. Two months later, the Pampas peanuts are roasted, salted, packaged, and sold by European firms.

AGD is market leader, with around one-quarter of all Argentine peanut and more than half of all peanut oil exports. “Thanks to the AeroRoast, we are able to produce 40 percent more blanched nuts,” says Javier Martinetto, head of the peanut section. And because the machine is so efficient, AGD has been able to free up a second factory for peanut roasting that was previously used for blanching, enabling AGD to roast twice as many peanuts as before. “The new technology has enabled us to increase capacity and cut costs,” enthuses section head Martinetto.

Peanut exports are symbolic of the transformation of the Argentine agricultural sector. At the end of the 1970s, companies started to export peanuts, which thrive in the province of Córdoba, unpeeled and unblanched. At the time, the newcomers from the deep south were well behind the main producers of the USA and China.

“We burn 140,000 tons of peanut skin each year, and use the heat to convert water into steam. This covers 70 percent of our energy.”

Today, the Pampas export 500,000 tons annually to more than 100 countries. More than 60 percent of all nuts are exported already blanched, which in turn increases the added value for the country. “By dried using warm air, before the fully automatic Bühler SORTEX system removes the badly blanched nuts and feeds them back into the peeling cycle.
making our process efficient, we can hold our own against our competitors,” says Javier Martinetto with more than just a little pride.

Innovative Power Production
A structure located on the edge of the industrial complex helps to illustrate the value of peanuts for the oil mill in General Deheza. In a glass-paneled control tower, technicians focus on their screens. Three of them schematically display the factory’s energy supply – and one transmits a collection of red flames that fill the screen. Here, it is the skin of the peanuts and sunflower seeds that is up in flames.

“If we had to throw them away, we’d have a serious waste problem,” smiles Adrián Urquía. “We burn 140,000 tons of peanut skin each year, and use the heat to convert water into steam, which in turn is used to drive an electricity generator. This enables us to cover 70 percent of our energy requirements here in General Deheza ourselves.” This provides the firm with security against power failures and fluctuations in fuel prices. AGD is now also experimenting with corn-cobs, which were previously chopped up by the stripping machines and left on the fields. A new machine leaves the woody core whole, reports the company boss. “We could perhaps use this for bio-fuel manufacture!”

The Urquías – a Dynasty of Entrepreneurs
All major decisions at Aceitera General Deheza are made in a family context, as the company is run by three siblings and a cousin. The eldest, Adrián Urquía, 70, is currently serving as CEO, the second-born Roberto Urquía, 66, is responsible for finances, and the sister Adriana, 53, runs the office based in the capital city of Buenos Aires. Cousin Alberto Vicente, 69, is in charge of logistics, which includes Argentina’s most important private port and the “Nuevo Central Argentino” railroad network, which connects the productive hinterland with the ports.

There will be no shortage of opportunities in the Pampas, as this breadbasket will be required to feed more and more people. For the first time, in 2014 more of the world’s inhabitants lived in towns and cities than in the countryside, and this trend is set to continue. Adrián Urquía says that “all of these people need to eat every day.” And is safe in the certainty that his small enterprise is ready for a big future.
Atta, or whole-wheat flour, has been a part of the Indian kitchen for time immemorial. It is creamy brown in colour and quite coarse compared to other types of flour. The high bran content in whole-wheat atta makes it a fibre-rich food. Before mechanisation, atta used to be made at home, with a circular manual stone grinder (known as a chakki) that would grind complete (semi-hard, durum) wheat grains. Atta produced this way was quite coarse.

Even today, many homes in rural India grind wheat manually. Modern day flour mills continue to use stone crushers in the milling process, and are known as chakki mills.

Indians are quite finicky about atta. Traditional industrial milling (hammer or roller milling) does not yield atta flour with the specific qualities of chakki flour. The high temperatures attained in a chakki – produced by friction between the
stones – give out a characteristic roasty smell and add to the sweetness of the atta. That’s why much of urban India takes their wheat to the neighborhood chakki mill. Even packaged and branded atta is produced in a chakki mill.

Bühler has now developed an innovative process for making high-grade atta, with a traditional taste and consistency, but at industrial capacity and using a hygienic grinding technology based on rollers rather than stone plates. Christened PESA™ (which means “grinding” in Sanskrit), this mill is able to accommodate local preferences by arriving at the right level of granulation, water absorption and damaged starch characteristics of atta. Due to its inherent advantages, PESA™ is fast catching the fancy of millers across India and in countries with a large Indian population base.

Market surveys indicate there exists a high potential for premium whole-wheat atta in India and in neighboring countries due to growing demand from the middle class, which is increasingly opting for atta over rice due to its high protein content and health benefits (such as in regulating blood sugar). The Indian middle class is also more quality conscious and prefers brands that meet high food safety standards. The traditional chakki mills are finding it hard to comply with food safety standards, especially when operating on a large scale.

PESA™ Mill addresses that gap. It offers a higher output capacity with less maintenance and better energy efficiency. It has been adapted to the particular characteristics of atta. The compression technology enables the mill to grind the whole kernel while maintaining a small footprint.

The first company to go in for the PESA™ Mill is Pune-based Parakh Agro Industries, a long-standing Bühler customer. The Parakh group is India’s leading atta manufacturer with a capacity of 900 tons per day with three plants. It has eight plants located in central and western India that manufacture wheat products. Parakh Agro purchased the mill in 2013 and started commercial production in February 2014.

“After we commenced production, we introduced the PESA™ Mill atta in the market as if it was not produced by a new technology. Once people accepted this atta, we informed them about the new technology used in production. The response was good,” says Prakash Parakh, owner of Parakh Agro Industries.

The Safer, Energy-Efficient Solution

The PESA™ Mill is the first of its kind and comes with several advantages. For one, the grinding process is flexible and millers can adjust the settings as per requirement. For instance, the PESA™ Mill can produce flour with specific levels of water absorption, starch damage and granulation, to cater to the preferences in different markets.

Moreover, the mill requires little maintenance. The PESA™ Mill is easy to clean and requires less maintenance than a chakki mill, whose stones must be redressed every two to three weeks. Since the core of the new process is stoneless and roller-based, the end product is homogenous, guaranteeing consistency in product quality to the end consumer.

The PESA™ Mill not only saves energy, but also saves space. The operations are automatic, so the miller can save on manpower. Moreover, the yield is a lot higher than chakki mills. “One PESA™ Mill replaces twenty chakki mills. Commercially, it makes sense to use PESA™ as compared to a chakki mill,” says Parakh. Overall, the cost of production of wheat from the PESA™ Mill is lower due to consistency in production, low maintenance, low power consumption, low manpower requirement and higher throughput. In fact, there is considerable interest in the PESA™ Mill from the Middle East as well. Bangladesh, Pakistan and Sri Lanka are also captive markets for the PESA™ Mill. As of today, the mill is being imported from Switzerland. But Bühler plans to manufacture the PESA™ Mill in India by the end of 2014. “This technology will definitely catch up, and I think after ten to fifteen years it would be difficult to find a chakki in the market,” says Prakash Parakh of Parakh Agro Industries.

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Indians are finicky about atta flour.
Increased productivity thanks to Cenomic™.
CUSTOMER CASES / SaarColor-LackTec

More Coatings in a Shorter Time

FOR SAARCOLOR-LACKTEC, HIGH QUALITY AND SPEED ARE KEY FACTORS WHEN PRODUCING HIGH-GRADE INDUSTRIAL COATINGS. THE MEDIUM-SIZED COMPANY HAS CONSIDERABLY BOOSTED PRODUCTIVITY BY USING BÜHLER’S INNOVATIVE CENOMIC™ 3 FULL-VOLUME AGITATED BEAD MILL.

Coatings provide effective protection against corrosion and rich colors for the surfaces of steel constructions and facades. SaarColor-LackTec has been producing high-grade industrial coatings in Kirkel-Limbach, near Homburg in Germany, for almost seventy years. In addition to various grades of anticorrosive coatings and topcoats, its product range also includes a variety of special-purpose products – such as highly heat-resistant coatings that can withstand temperatures of up to 1,000 degrees Celsius.

The second mainstay of this medium-sized company is its service business: “We also offer our customers complete surface treatment in the form of pretreatment and coating of everything from microcomponents to large-scale constructions,” explains Managing Director Michael Müller. This area has experienced strong growth in recent years and now accounts for around half of the company’s turnover. However, SaarColor-LackTec is not only increasing its added value by offering services related to the coatings it produces: “At the same time, this allows us to better understand customers’ requirements, which, in turn, helps us to develop new coating materials,” explains Müller.

The Aim Is to Achieve as Even a Mixture as Possible
Manufacturing colored coatings involves mixing liquid raw materials such as binders, extenders, pigments, additives and solvents. The challenge is to disperse the raw materials as evenly as possible, i.e. to wet, distribute and stabilize them within the respective binder. Agitated bead mills are particularly efficient for this wet grinding process. In these mills, pigments are ground down to an ever-finer level by the constant friction between a mass of small grinding beads until the required particle size is reached.

SaarColor-LackTec previously had a high-performance mill for this purpose. However, such systems are primarily optimized for the so-called recirculation mode and are therefore particularly suited to manufacturing very high-grade coatings, such as automotive coatings. As the mill required significant maintenance, Müller decided to consider machine technology that would better

ABOUT SAARCOLOR-LACKTEC
SaarColor-LackTec, based in Kirkel-Limbach, near Saarbrücken in Germany, was founded in 1947. Each year, the company produces up to 400 tons of industrial coatings such as topcoats and anticorrosive coatings, along with various grades of special-purpose coatings. In addition to this, SaarColor-LackTec acts as a service provider offering a full coating service. The company has strong local roots but also delivers some of its products overseas. The majority of its customers are businesses in fields such as mechanical engineering or construction. Under family ownership, the company currently employs a staff of around thirty people.
AN ECONOMICAL SOLUTION FOR SMALL AND MEDIUM-SIZED ENTERPRISES

Bühler’s Cenomic™ full-volume agitated bead mill offers innovative and highly economical technology for the wet grinding and dispersing of protective coatings, paints or printing inks. The key feature of the mill is its exceptionally high productivity yet very low specific energy consumption. The large diameter and special geometry of the agitator discs ensure the grinding beads are evenly distributed throughout the grinding chamber. A high level of efficiency can therefore be achieved in just a single pass. Another unique feature is the efficient separation of the grinding beads by the patented superior centrifugal separation (SCS) system. The larger-than-average surface of the screen, and the significantly reduced pressure loss as a result, allows a higher flow rate, which in turn significantly increases production capacity. The Cenomic™ is available in three versions, with a net grinding chamber volume of 21, 50 or 117 liters. Bühler is therefore also addressing the requirements of small and medium-sized enterprises in the paints and coatings industry for high-efficiency, economical grinding technology. Since its market launch in 2012, the Cenomic™ has already sold over 200 units.

suit his needs. Following intensive discussions with Peter Schick from Ingenieurbüro 3d, the local distribution partner for Bühler, the company decided to purchase a Cenomic™ 3 full-volume mill with a net grinding chamber volume of 21 liters.

Increased Productivity With the Cenomic™

The Cenomic™ 3 has been in use at Saarcolor-LackTec since January 2014, allowing the company to significantly boost its productivity. Above all, this increase is due to the optimised pass operation, as well as the mill’s particularly high throughput capacity. Even at low milling speeds, specially shaped pulverizer discs ensure even distribution of the grinding beads throughout the milling chamber. “With the previous model we had to process our coatings in multiple passes. Now, though, a single pass is usually sufficient to achieve the required particle sizes,” observes Müller. In addition, pass operation ensures highly consistent product quality that can be easily replicated. However, the increased productivity is also partly down to the higher throughput of the Cenomic™ in comparison to the previous model. For a single product, throughputs of up to 1,000 liters per hour are achieved. This is possible thanks to particularly efficient separation of the grinding beads and the exceptionally large screen surface.

The optimized pass operation and higher throughput capacity result in massive timesaving for Saarcolor-LackTec during production. “In addition to high quality, speed is key for our customers. With the new mill, we can now produce the coatings they order even faster,” says Müller.

“Proactive maintenance allows for reduced downtimes.”
**Proactive Maintenance Prevents Downtime**

The businessman from the Saarland region also values the other benefits of Bühler technology – such as the especially convenient and straightforward cleaning of the grinding chamber and screen: “This allows us to produce multiple batches of different-colored coatings in quick succession.” Furthermore, he sees the system’s intuitive operation as a big plus point. And, thanks to the mill’s simple structure, a trained toolmaker can perform small-scale maintenance work independently. SaarColor-LackTec also relies on Bühler for servicing and, once a year, has the machine put through its paces by a specialist on the basis of a maintenance contract. “This proactive approach to maintenance allows us to plan forthcoming servicing work better and therefore to minimize downtime,” Müller explains.

For a medium-sized company such as SaarColor-LackTec, purchasing a full-volume mill is a significant investment. Müller therefore particularly appreciates that Bühler provided a mutual financing arrangement to help him make the technology switch. The managing director, who in future wants to refocus his attention on developing new coating systems, is also considering further modernization of his machinery: “The successful introduction of the Cenomic™ has led us to consider replacing another existing mill with Bühler’s efficient technology,” Müller tells us.
Revolution in 3D

3D PRINTING COULD LEAD TO PROFOUND CHANGES IN CREATING AND MANUFACTURING MANY THINGS. WE, AT BÜHLER, SEE A RADICAL IMPACT ON HOW WE DO BUSINESS IN THE FUTURE.

BY IAN ROBERTS, CTO

3D printing, or additive manufacturing, has come a long way from its roots in the production of simple plastic prototypes. Today, 3D printers can not only handle materials ranging from titanium to human cartilage but food items from pasta to chocolate spreads as well.

The advantages of 3D printing over other manufacturing technologies could lead to profound changes in the way many things are designed, developed, produced and supported. It is a process for creating objects directly, by adding material layer by layer in a variety of ways, depending on the technology used. Today’s advances have brought the technology to a tipping point – it appears ready to emerge as a viable alternative to conventional manufacturing processes in an increasing number of applications.

Should this happen, the technology would transform manufacturing flexibility – for example, by allowing companies to slash development time, eliminate tooling costs and simplify production runs – while making it possible to create complex shapes and structures that weren’t feasible before. Moreover, additive manufacturing would help companies improve the productivity of materials by eliminating the waste that accrues in traditional manufacturing.

Already we see a wave of Internet-based companies offering shared 3D printing services and/or 3D designs for sale. These new business models are unlocked by the relative ease of creating digital models, facilitated by free or commercially available design software and the speed of 3D printing to produce standard products. These are primarily based on polymer printing systems, and they have the potential to challenge the role of traditional stores that carry thousands of stock items. How will all these developments impact our industry? All over the world, food-processing companies right now are doing some incredible things with 3D printing; they’re actually using it to make real food. 3D printing of polymers is basically a fused depositing or extrusion process. This is a microversion of similar extrusion or forming processes currently used for food production. The application of 3D printing to create cakes, chocolate, sugar systems or spaghetti has been successfully demonstrated for example by organizations like the TNO in the Netherlands.

Will this open a new opportunity for personalized foods, starting with late differentiation in food production lines, such as names or designs all the way to in-home machines printing our meals based on continuous health state monitoring with wearable electronics?

We at Bühler believe that additive manufacturing will indeed radically impact how we do business and how we collaborate with our suppliers and customers. We are actively engaged in R&D and exploration covering the development, machine manufacturing and food and advanced material production. We are not alone in exploring these opportunities and are always open to discussions, collaborations and partnerships on these topics and welcome your involvement with us on this journey.
IN ADDITION TO THEIR DAY JOB, BÜHLER RESEARCHERS HAVE FOUND TIME TO CONTRIBUTE SCIENTIFIC PUBLICATIONS. HERE'S A SELECTION.

1  For Better Food Preservation
Nicolas Meneses co-authored a book chapter on food preservation technology, guiding the selection of suitable processing technology according to the characteristics of the food, the processing targets, relevant spoilage microorganisms and desired shelf life conditions. The work highlights a range of emerging technologies tailored to better preserve food involving minimal nutritional changes. An overview of thermal and nonthermal technologies, kinetics models, shelf life and validation is shown.

Reference:
Henry Jaeger, Dietrich Knorr, Nicolas Meneses, Kai Reineke and Oliver Schlüter.

Food Safety:
Web reference:
www.sciencedirect.com/science/article/pii/B9780444525123000504

2  Helping to Fortify Rice Kernels
With wheat and corn, rice is one of the three most important staple foods. In 2012, the WHO, together with the Global Alliance for Improved Nutrition (GAIN), organized a conference in order to review scientific, industrial, regulatory and public health aspects of rice fortification from different perspectives. Bühler, together with DSM, presented a review of current technologies, in particular the different types of extrusion, that enable the production of fortified rice kernels.

Reference:

3  A Prize-Winning Study
Also on the topic of rice we would like to congratulate Christoph Brunschwiler, a Bühler Master’s student from the Institute of Food, Nutrition and Health of ETH Zurich, who received the SGLWT prize for the best Master student for his work on direct measurement of rice bran lipase activity. This allows the assessment of rice bran stabilization directly after processing which is a first step towards predicting oxidative storage stability of rice products.

Reference:

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