

African Farming

and Food Processing

Poultry

Avian flu ongoing but sector gets a boost

Nutrition & Feeding

Substitutes to deal with feed availability issues

Conservation Farming

A hopeful path from subsistence to self-sufficiency



VIV MEA preview. p12

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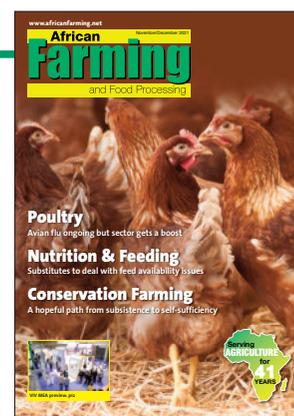


Image Credit: Adobe Stock



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African Farming

and Food Processing

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Farming Calendar 2021

NOVEMBER

22-24	agrofood Kenya www.agrofood-kenya.com/	NAIROBI
22-24	African Agri Investment Indaba www.agri-indaba.com/	LONDON
22-25	DJAZAGRO https://en.djazagro.com/	ALGERIA
23-26	AGRO PACK IRAQ ERBIL www.iraq-agrofood.com/	ERBIL
23-25	VIV MEA www.vivmea.nl/	Abu Dhabi

DECEMBER

3-5	TANZ FOOD www.tanzfood.com/	ARUSHA
11-14	Aquaculture Africa 2021 www.was.org/meeting	EGYPT
12-14	pacprocess Middle East Africa www.pacprocess-mea.com/	EGYPT

JANUARY 2022

26-27	Africa Agribusiness Summit 2022 www.eventbrite.co.uk/e/africa-agribusiness-summit-2022-tickets-139696161981	VIRTUAL
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MARCH 2022

15-17	Africa Agri Tech (AAT) https://africa-agri.co.za/	PRETORIA
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Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.

Agrofood & plastprintpack held in Lagos, fairtrade and APO join forces

THE SIXTH EDITION of agrofood & plastprintpack Nigeria was held in Lagos from 26-28 October. fairtrade Messe and the Africa Packaging Organisation have joined forces for the event.

The event was officially opened by representatives of Nigerian agrofood and plastprintpack institutions, the German, Italian and Swiss consul general in Lagos, representatives of the event's institutional partners and managers of fairtrade, the organiser.

HE Dr Bernd von Münchow-Pohl, consul general – Consulate General of the Federal Republic of Germany Lagos said, "The food industry and everything that caters to it continues to hold great potential in Nigeria, whether we think of developing the domestic market or exports of agricultural products and processing foods. That is why you are all here, and that was the right decision. Africa's biggest economy with a very sizeable middle class and, pardon the pun, a growing appetite for high quality products offers good business opportunities that cannot be ignored."

Some of the items on the event's agenda include: sustainable packaging in Nigeria – growth drivers, trends and business opportunities; driving plastic recycling towards a circular economy; cold chain as a catalyst for economic development of Africa; creating an enabling environment for cold chain businesses in Nigeria; integrating cold chain into the Nigerian economy by protocol and more.



The 6th edition of agrofood & plastprintpack Nigeria was held in October.

Image Credit: fairtrade Messe

Kingspan Group introduces innovative solution for post-harvest food loss

KINGSPAN GROUP, AN Ireland-based company, has introduced an innovative solution with an aim to solve the issue of post-harvest food loss that the world is facing.

According to the United States Environmental Protection Agency (EPA), about one-third of the food produced globally is either lost or wasted along the food supply chain. This amounts to more than billion tonnes of food and US\$940bn in economic losses annually, while one in nine people remain undernourished. Although in principle, the food produced around the world is enough to feed the global population, recent statistics by FAO show that the number of people in the world affected by hunger has reached 811 million.

Kingspan, set up with the mission to 'green the industry,' provides a solution to the issue of post-harvest food loss with cold store systems. Kingspan MEATCA president, Dr Suat Kiroğlu said, "With ColdBox, we both contribute to reducing food losses, and prevent products from losing value for the producers. We are delighted to have found a modular, easy, and guaranteed method of preventing post-harvest depreciation of crops."

Dr Kiroğlu explained, "The QuadCore technology behind the product's design increases energy efficiency with its thermal performance. The cutting-edge cold storage systems also provide 3.5 times more storage than any typical modular cold room storage available in the market.

"All components fit into a single container which can be shipped to any destination, globally just with the click of a finger. The



The QuadCore technology behind the product's design increases energy efficiency with its thermal performance.

components can be easily installed on the spot with little need for on-site adjustments and each component is covered with a warranty."

Dr Kiroğlu added that a variety of goods can be stored using ColdBox, including vegetables, fruits, meat, and sea products, for a lower electricity cost due to its energy-efficient design compared to traditional cold room solutions.

Image Credit: Kingspan Group

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FAO launches new guide to financially empower women in agriculture

THE FOOD AND Agriculture Organization (FAO) of the United Nations Regional Office for Africa has launched a new brief that supports seizing the opportunities of the African Continental Free Trade Area (AfCFTA), for the economic empowerment of women in agriculture.

AfCFTA holds the potential to contribute notably to eliminating poverty, creating jobs, and improving food security. However, the new publication 'Seizing the opportunities of the African Continental Free Trade Area', warns that AfCFTA could worsen existing gender disparities and deteriorate the condition of women engaged in trade and agriculture, their inclusion is not prioritised.

The AfCFTA will change existing trading practices and formalise markets which could preclude women's access and further relegate them

to informal and less lucrative value chains.

"It is of crucial importance that we create ecosystems of support that enable women to access opportunities created through the AfCFTA and reinvigorate our efforts to address existing gender inequalities in access to and control over land, services, technology, markets and knowledge," said FAO senior gender officer Clara Park.

The publication makes recommendations relevant to stakeholders across the trade sector, including strategic partnerships to develop innovative solutions and policy recommendations. This will ensure that the implementation of the AfCFTA agreement will provide opportunities that benefit women, build the capacity of women and their organisations so that they are involved in Africa's trade environment.

AUGA Group introduces environment-friendly tractor

AUGA GROUP HAS launched the world's first hybrid biomethane and electric tractor for professional farm use – the AUGA M1.

Until now, sustainable fuel tractors available on the market have not been suitable for large-scale farm work. This is the company's first step in offering technological solutions that will help eliminate climate pollution throughout the supply chain and foster sustainable agriculture.

According to a study, food systems are responsible for a third of global greenhouse gas emissions, and a large portion of these are due to the use of fossil fuels in agricultural machinery. According to K stutis Juš ius, CEO of AUGA Group, the new technology on which AUGA M1 is based will help create a new food production model on a global scale and reduce the environmental impact of agriculture. "Three years ago, when we first calculated our emissions, 30% of them came from the use of fossil fuels on farms. There were simply no solutions to change it. That is why we have taken the lead in developing technologies that will allow us to drastically reduce pollution throughout the food value chain," Juš ius added.

Powered by biofuel

Methane collected from livestock waste and converted to biomethane offsets more emissions per unit of energy in its production and use cycle than it emits.

"Our invention makes it possible to create a wide range of tractor applications and make it accessible to all farmers who want to work sustainably. We are not developing technology just to solve our own emissions and deliver on the promise of becoming a CO₂-neutral company by 2030. We will strive for this tractor, and other technologies that are still being developed, to help solve the global problem of pollution in the agricultural sector," Juš ius added.



The new technology on which AUGA M1 is based will reduce the environmental impact of agriculture.

Image Credit: Vytautė Stankevičienė

Tackling long-standing innovation barriers

The hybrid AUGA M1 tractor solves two main obstacles that have hindered the prevalence of biomethane-powered tractors – the inefficient refuelling process and underdeveloped refuelling station infrastructure.

"Currently, biomethane-powered tractors are able to operate for only two to four hours because the gas cylinders do not physically fit into the tractor structure. However, farmers need machinery that can work for 12 hours or more," the CEO explained.

Building eco-aware community with sustainable technology

Following the global strategy of agricultural technologies (AgTech), Juš ius added that more solutions which will help ensure the sustainability of the entire food chain, will be presented in the near future. Currently, the company's experts are developing 'green' technology that will eliminate carbon emissions from the soil.

Tractor of the year announced at EIMA International, shortlisted from 14 finalist models

THE INAUGURAL DAY of EIMA International, an exhibition of agricultural machinery, saw the announcement of the 'Tractor of the Year', voted by an international jury of journalists as the best performing from the shortlist of 14 finalist models.

EIMA International, the world exhibition of agricultural machinery, held in Bologna from 19 to 23 October, showcased the best technologies for every type of machine and every type of work. The award went to John Deere's 7R 350 AutoPowr model, which won the prize in particular for its on-board technology. The 'Best of Specialised' category, reserved for specialised crop tractors, was given to Reform model H75 PRO, for its comfort and safety features, while the 'Best Utility' award went to another John Deere, the

6120M AutoPowr, praised for its versatility. The 'Sustainable TOTY' award, for models with particular qualities in terms of environmental compatibility, went to New Holland's T6.180 Methane Power tractor, for its low environmental impact fuel supply.

In addition to the awards ceremony, this year's Tractor of the Year had a new showcase in the form of an open-air arena in which all 14 finalist models were paraded. A large grandstand allowed visitors to watch the finalist machines pass by, described by a speaker and also shown through reminiscent films transmitted on a panoramic screen. This was done to appreciate the technological level of these machines, capable of increasing agricultural yields and at the same time reducing environmental impact as much as possible.

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‘Invest in Tanzania’s aquaculture industry’

TANZANIA’S MINISTER FOR Livestock and Fisheries Mashimba Ndaki has urged people to consider putting money into the aquaculture sector in order to increase raw materials for the country’s fish processing industries. During a visit to the Tanlapia aquaculture facility in Bagamoyo district, he said, currently there are small scale industries, and some of them are producing below standards, owing to a lack of raw materials.

“However, projects like these will help the industry in having sufficient raw materials, particularly in the Indian Ocean,” Ndaki added. He said the government’s aim is to encourage large fish producers to invest more productively in the country, ensuring food security and employment.

US\$34.8mn agriculture investment initiative launched by Zanaco and Team Europe

SMALLHOLDER FARMERS AND rural cooperatives across Zambia will benefit from a new US\$34.8mn initiative to accelerate agricultural investment, launched in Lusaka and Luxembourg. The new initiative will improve agricultural productivity, upgrade agricultural processing, and support a sector severely impacted by COVID-19 and is supported by a best-practice assistance programme. The financing scheme will be managed by Zanaco and is backed by the European Union and European Investment Bank, as part of the broader Team Europe support for sustainable commercialisation of Zambian smallholder farmers. This represents the first targeted support for agriculture in Zambia by the European Investment Bank, the world’s largest international public bank.

Global summit boosts clean cold refrigeration drive to support Africa’s farmers

SUSTAINABLE COOLING EXPERTS from around the globe took part in a key virtual summit on ‘Accelerating Sustainable Cold Chain in Africa’ with an aim to give Africa’s policymakers and business leaders the tools to help keep farmers’ produce fresh.

The summit took place on 19 October 2021 and held programmes that focused on getting farmers’ produce to market quickly and efficiently – reducing food waste, boosting profits and creating jobs.

The event supported preparations to open the African Centre of Excellence for Sustainable Cooling and Cold Chain (ACES). Along with helping farmers reach new market opportunities, ACES will also improve cold-chains for vaccines and health – bringing together multi-disciplinary UK and African expertise with commercial partners.

Hosted by the British High Commission and Rwanda’s Ministry of Environment, the event was supported by the UN Environment Programme’s United for Efficiency (U4E), the Centre of Sustainable Cooling, the University of Rwanda (UR), the University of Birmingham, and a number of UK universities.

The summit informed audiences of the latest developments at ACES headquarters in



University of Rwanda facilities earmarked for ACES.

Kigali and affiliated Living Laboratories anticipated throughout the continent to scale up the adoption of sustainable cold chain solutions. There are ongoing close discussions with Defra regarding further funding to build on early investment and activities.

High Commissioner Omar Daair said, “Climate change is the greatest challenge facing the world today, and agriculture is vital to the livelihoods of so many Rwandans and to economic development across Africa. I’m looking forward to see how this partnership of world’s leading experts from the UK, Rwanda and beyond will find solutions to the challenge of sustainable cooling.”

Professor Toby Peters added, “Farmers need robust and sustainable means of getting perishable produce to urban markets. This high-profile summit moves us closer to achieving this goal in Rwanda and the wider continent without using fossil fuels.”

He further added, “ACES will develop and demonstrate ways of delivering affordable lowest carbon emissions cooling and cold-chain systems while meeting Africa’s social and economic cooling needs. Without a robust and sustainable cold chain, the continent will struggle to feed its millions of citizens effectively or meet its export targets to drive growth.”

Image Credit: University of Birmingham

Electrohydraulic and smart driver assist systems open up autonomy for mobile machines

SYSTEMS & COMPONENTS is all set to take place from 27 February to 5 March 2022, alongside the Agritechnica trade fair in Hanover, Germany. The show will be offering insights into the digitalisation, automation and networking of mobile work machines. The innovative power of the off-highway industry is focused on the electrification of drives and hydraulic systems, which form the basis for the advanced assistance systems, reducing the driver’s workload. Solutions on display on the trade fair grounds not only offer vehicle handling and greater efficiency but are also designed to take the machines in the field or on the construction site to the next level of autonomy.

The trends at SYSTEMS & COMPONENTS 2022 will include not only the automation of mobile machinery but also the steadily growing number of intelligent assistance systems. Functions such as crosswind compensation, lane departure warning or hands-on-wheel

detection intervene directly in the steering to support the driver and relieve him/her of routine tasks. Major players in the off-highway industries are said to be in focus, showcasing smart and connected technologies that make working in challenging environments not only more productive but also safer. At the Hanover exhibition grounds, this development is reflected in the extensive portfolio of components for the electrification of mobile machinery – an aspect that is also becoming increasingly relevant with regard to the emission and consumption values of heavy commercial vehicles.

The range of exhibitors enables OEMs to create versatile and powerful machine architectures and extends from engines and inverters to hydraulic components that operate as compact units with their own electrohydraulic pressure supply and oil circuit, independent of the combustion engine.

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JOSKIN launches e-configurator for machines

JOSKIN HAS ANNOUNCED the launch of an online configuration tool for its range, in a move to attain digital development.

The configurator is accessible on a smartphone, tablet or computer.

The company deals in agricultural automobiles and equipment and with this, its aims to use digital solutions to stay close to farmers.

In the livestock category, the rotary pasture toppers, choppers, water bowsers and slurry mixers now have their own configuration tool. In the transport range, the configurator of the silage trailers, multipurpose trailers, hook-lift systems, construction tipping trailers, bale trailers and low loaders. The slurry tanker, spreading implements, monocoque tipping trailers and muck spreaders will be added in October.

NGO to teach modern agri skills to female farmers

TO ENHANCE FOOD production in Kaduna state, the Women Initiative for Sustainable Environment (WISE), an NGO, inaugurated Climate Smart Agriculture (CSA) for women smallholders.

Women will be trained on backyard farming, water management and irrigation. Founder and programme director of WISE, Olanike Olugboji, during an interview with the News Agency of Nigeria in Kaduna, said that the CSA, supported by Global Fund for Women, will empower women with modern agricultural techniques and provide access to agricultural services.

"The effects of climate change demanded new approaches to agriculture and put focus on the need for women to be empowered with climate smart agricultural practices," she added.

Arrigoni showcases agrotextiles to grow berries in non-native climates

ARRIGONI, A DESIGN and agrotextiles production group, held a workshop during the Italian Berry Day, titled 'Cultivating berries in non-native environments – protective screens for every environmental need'.

Arrigoni presented its agrotextiles tested in different places in the world to ensure the possibility of growing berries.

Giuseppe Netti, agronomist and technical sales support of Arrigoni, held the conference at Macfrut, an international fruit and vegetable exhibition that took place at Rimini Fiera from 7-9 September.

Berry fruits are witnessing a phase of huge success at an international level. However, not all climates are suitable for the cultivation

of small fruits. For these reasons, Arrigoni presented its agrotextiles tested in different places in the world to ensure the possibility of growing berries. This is done by creating the environment of the crop's origin, in terms of light and temperature, protecting the plants from new insects and extreme atmospheric agents, while reducing the use of plant protection products.

Two of the most relevant factors have been the use of white thermo reflective screens to reduce temperatures, which in fact can be up to 8/9°C lower than outside. It has been shown how protection from the sun and the diffusion of light can be well balanced for raspberry plants, through Arrigoni's white thermo-reflective screens. One of their products, Prisma, made of polyethylene tape with LD additive, allows a more uniform development of plants and reduces the temperature in the protected area, thus creating the microclimate suitable for different crops.

Robuxta is a thermo-reflective screen made of tape and monofilament, resistant to abrasion. It is the ideal screen for the cultivation of berry fruits. Hail is also a factor for the cultivation of small fruits, which farmers can avoid by using Fructus and Iride monofilament mesh systems. These, in addition to protecting from hail, modify the microclimate by increasing relative humidity and shading, and protecting plants from birds and some insects.

Protecta is the single-layer multifunction screen made entirely of high-density polyethylene with high mechanical resistance and long life, which protects against the negative effects of rain on plants by reducing its passage by 90%, maintaining good conditions of permeability to air and protecting from late frost, wind, insects and sun.

Image Credit: Arrigoni



Arrigoni presented its agrotextiles tested in different places in the world to ensure the possibility of growing berries.

WEDA launches hygienic PVC walls and modules in wooden look

RESPONDING TO SPECIFIC requirements of pig keepers, WEDA Dammann & Westerkamp have come up with hygienic pen walls and modules in a natural wooden look.

Farms in the organic and conventional sectors give a lot of importance to individual and hygienic housing conditions. In pig farming, therefore, there is an increasing demand for housing concepts that focus on the health and performance of the animals. This is especially true in times of new types of infectious diseases spreading worldwide.

Until now, pens in the conventional sector have been equipped with the usual blue or grey hard PVC boards. In organic farming, on the other hand, operators have often used wood. "Real wood, however, has the downside of dirt and bacteria settling on the fabric. With our new plastic boards in wooden look, the hygiene standards

under ecological husbandry conditions can be achieved quite easily because nothing sticks after cleaning," said WEDA development manager Ralf Meyer.

The new wooden look boards are very easy to assemble. "Moreover, their surface is UV-resistant. This makes the material ideal for open stables with outdoor runs," Meyer added. The additional costs are also low. These pen walls made of PVC were developed especially for WEDA and are available in individual, adaptable sizes.

WEDA's first project was to equip the organic farm, Arche Wilhelminenhof, from Bakum in Lower Saxony with the innovative wooden look pens in a very short time. "The new material as well as the look fit perfectly into our existing concept," said operator Angelika Balz.



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VIV MEA is ready to welcome the feed-to-food, livestock and animal production industry players for yet another three-day exhibition and conference programme at a safely-equipped ADNEC venue in Abu Dhabi, UAE.

VIV MEA returns to Abu Dhabi



VIV MEA, THE international feed-to-food trade show for the Middle East and Africa, is returning from 23-25 November, 2021 in Abu Dhabi, UAE for its third edition.

VIV MEA is ready to welcome the feed-to-food, livestock and animal production industry players for yet another three-day exhibition and conference programme at a safely-equipped ADNEC venue in Abu Dhabi, UAE.

Despite the global situation, about 500 exhibitors will be present at the event which will be held on a 17,500 sq m gross space. As many as 8,000 visitors are expected to be attending the event. These are the figures making a mark for the upcoming show.

Feed and animal health are the vital factors driving the animal protein chain and one of the many reasons for anyone to be at VIV MEA is that it will bring together not only these two important factors, but also the rest of the supply chain, including farm production, breeding & hatching, processing and more.

About 500 exhibitors will be exhibiting from more than 40 countries. Some of the exhibitors include Al Dahra, Andritz, Biomin, Big Dutchman, Buhler, Cobb, Elanco, Jamesway Incubator, Moba, and Salmat. Brands related to all species will be under one roof, including dairy, fish, poultry, eggs, cattle, calves, goat and camels.

A lot of new products will be showcased, many of them for the first time since the pandemic. VIV MEA will be holding more than 20 conferences and technical seminars.

Industry support

Many industry leaders have extended signif-

A lot of new products will be showcased, many of them for the first time since the pandemic. VIV MEA will be holding more than 20 conferences and technical seminars.



Top-notch speakers from global and regional associations, partners as well as producers bring key insights for business development in this specific region.

icant support to the show with their experience and innovations. Global and regional partners include Abu Dhabi Agriculture and Food Safety Authority (ADAFSA), Ministry of Climate Change & Environment, DPC, NABC, GDF, EVA, Hub Orange, and FAVA, to name just a few. VIV MEA, firmly focused on the animal husbandry supply chain, will be a part of the first Abu Dhabi Agriculture & Food Security Week by the ADAFSA.

A promising third edition

VIV MEA 2016 had exceeded expectations and the show has been growing ever since, occupying three ADNEC halls in 2016 and an additional fourth in 2018 to meet the higher demand for stand space. A post-show survey found a satisfaction score of 7.3 out of 10 from exhibitors and an even higher rating of 8.3 from visitors.

Enriched conference programme

After a second edition that already surpassed expectations, this international event has returned with an enriched conference programme covering the latest trends in dairy, fish, poultry, eggs, cattle, calves,

goat, and camels. Top-notch speakers from global and regional associations, partners as well as producers bring key insights for business development in this specific region. Strongly driven by business, VIV MEA will offer more products and trade opportunities to professionals from the Middle East and North Africa (MENA) region.

As Abu Dhabi has eased travel restrictions since a couple of months now, all vaccinated travellers can visit the city and attend the show while following all the protocols properly. Situated in the heart of the Middle Eastern Countries, Abu Dhabi serves as the gateway to the wider Middle East and African region. With its well-developed infrastructure, political and social stability, and consistent openness to foreign investment, it has been a magnet for overseas companies looking for a strategic location to set up or expand business.

VIV MEA is ready to welcome the Feed to Food industry for an inspiring three-day exhibition and conference. Pre-registration is recommended as it ensures participation of the conference and seminar programme. To register, visit www.vivmea.nl. 

Image Credit: Jaarbeurs



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First Quantum's conservation farming programme is providing a hopeful path from subsistence to self-sufficiency and has become a model for sustainable agriculture for farmers in Zambia and beyond. Nawa Mutumweno reports.

Conservation farming: A story of hope, pride and success

FROM ITS HUMBLE beginnings in 2010, the First Quantum Minerals' (FQM) conservation farming (CF) programme in Kansanshi, North-Western Zambia, is today a resounding success which resonates across the continent, with the African Union (AU) citing the initiative as an example the region can follow.

Today, it boasts of 25 field officers, 7 lecturers and an institution that trains over 6,000 people a year in CF, cultivating hope and pride in the community.

The CF model is based on the principles of Christianity and addresses the heart of the farmer, modelled on the hugely successful 'Foundations for Farming' started by Brian Oldrieve, the 'father of CF' in Harare, Zimbabwe.

Programme coordinator Guy Hammond explained, "To describe the methodology of CF, it is 'minimum tillage'. It abolishes the use of the plough which inverts soil profiles and kills off aerobic and anaerobic bacteria and pulverises soil structure. Just dig a small hole, place the compost and seed till the bottom and cover it, and then maintain weeding, preserving the natural mulch which helps with water infiltration, weed suppression and reduces evaporation."

"The rotation of crops using a 4-year cycle is paramount to the success of CF for breaking the life cycle of pest and diseases, as well as utilising different rooting depths in the soil profile and leaving crop residues to rot down and be incorporated by nature's insect activities to regenerate the soil profile," he added.

The CF model is built upon 4 principles:

- **On time:** It is vital for the farmer to plant on time. For every day after 26 November, a maize crop is planted, 2% of potential yield is lost. Many farmers only plant well into December when the soil temperature is low due to rainfall, fertiliser has been leached and weeds have smothered the field.
- **To standards:** God demands incredibly high standards and when Noah was instructed to build the Ark, he was given precise measurements for it. Ezekiel walked with a measuring stick and was



Guy Hammond with a beneficiary of the programme, a former 'jerabo'. Jerabos are copper thieves.

fastidious in his measurements of the temple being built. This attention to detail translates to correct row spacing, plant population, fertiliser placement and methodical weeding.

- **Without wastage:** Africa is riddled with wasted resources, which include wasting sunshine hours, rainfall (by planting late), labour hours, theft and post-harvest losses. 33% of global food production is lost post-harvest.
- **With joy:** Nehemiah said, "Our joy is our strength." CF brings hope even to the poorest and they begin to see hope and a future. When household food security is guaranteed, and a farmer takes pride in his work in the field, he shirks the yoke of poverty and dependency.

The CF model has been embraced by over 40,000 local farmers who FQM has trained, and they directly support 7,000 farmers with inputs and technical advice, with teams of field officers on motorbikes servicing their areas.

An additional component to the CF scheme, the 'nutrition' aspect (CFN), encourages farmers to grow more diversified crops and vegetable gardens. 42% of children in North-Western Province are stunted, an irreversible condition emanating from malnutrition within the first 1,000 days after conception.

There are three major milling companies in Solwezi, the provincial capital, with the

town being a net exporter of maize. A food processing plant has also been established that buys the CF farmer products (maize, soya beans, groundnuts, sorghum and bananas) and turns it into a clinically formulated pre-cooked porridge for use in the school children feeding programme, the vulnerable villages relief programme and also for feeding the mine workers a supplementary meal during their shift work. Thus, a circle of life and value addition for the farmers and the communities, have been created. Now in its 11th year, the project has been fully adopted.

The NGO factor

NGOs are key players in CF. While many NGOs see the merits of the CF methods, their success rate is very limited for several reasons, including the fact that their funding span is never more than three to four years, whereas it needs to run for a minimum of 5 years, for its complete adoption. As a result, farmers only pay lip service to access inputs and they revert the minute the scheme closes. FQM are permanent residents and have stayed the course for 11 years now.

Josephat Kafwimbi, a beneficiary of the programme said, "With hard work, I can achieve a bumper harvest that will bring me even greater success. I am grateful in my heart to the conservation farming programme for giving me this opportunity to change my life for good." 

Catalysis offers four veterinarian products, which when combined together, provide a complete therapeutic result and more benefits for farm animals.

Solutions to boost animal health

WITH DISEASES AFFECTING livestock frequently, it's important for farmers to take proper care of their animals and ensure boosting their health. To cater to this need, Catalysis offers four veterinarian products, which when combined together, provide a complete therapeutic result and more benefits for farm animals.

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Renalof Vet contains natural plants extract that dilutes kidney



Image Credit: Catalysis

Asbrip Vet is used in the respiratory and the digestive system problems.

stones and prevent renal cholic derivate from hyperprotein diets. The product is an exclusively for farm animals. It reduces the pain syndrome and improves health conditions, feed intake and feed conversion ratio. **B**

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African Farming takes a look at some measures and tools helping the poultry industry keep diseases away.

Building on biosecurity to keep poultry healthy

DEVASTATING DISEASES, INCLUDING Newcastle disease and the Highly Pathogenic Avian Influenza (HPAI) are causing substantial losses in the commercial poultry industry. Experts agree that maintaining high biosecurity standards is the path to success when it comes to elimination and control of diseases.

Back to basics

Biosecurity is critical to the future of the poultry industry. While there are vaccines and antibiotics to assist, it will be necessary to prevent and eliminate disease agents if the poultry industry is to prosper. Biosecurity is, no doubt, directly linked to the health and well-being of chickens.

The new Management Guide by broiler breeder company Cobb, emphasises that biosecurity must encompass all the operations performed by the breeding stock caretaker. Procedures to prevent the introduction and spread of disease or contamination must be implemented at the hatchery, feed mill, farm operations, general maintenance and by personnel. An issue in any area will endanger the whole biosecurity programme and the general wellbeing and productivity of the flock. Cobb's industry-leading resource covers biosecurity essentials, including animal and bird contact, farm team hygiene, visitors, disease prevention, flock housing and litter management.

Researchers at Georgia Tech Research Institute are developing a robot that can navigate intelligently in breeder and aviary houses and pick up floor eggs and dead birds.

"The new broiler guide includes critical information to support more yield, better feed conversion, and healthy flocks for customers," explained Robin Jarquin, Cobb's director of world tech services.



Image Credit: Adobe Stock

Procedures to prevent the introduction and spread of disease or contamination must be implemented at the hatchery, feed mill, farm operations, general maintenance and by personnel.

New technologies

Breakthrough innovations and research are enhancing the power of the poultry industry to effectively keep diseases at bay.

From 3D cameras to machine vision to autonomous robots – a number of resources are set to transform the poultry operations of tomorrow.

Farm Health Guardian is a new disease spread mitigation technology from Canada that helps improve on-farm biosecurity and shorten response times.

Researchers at Georgia Tech Research Institute are developing a robot that can navigate intelligently in breeder and aviary houses and pick up floor eggs and dead birds, helping improve animal welfare. This robot is an intelligent system equipped with a suite of sensors, including environmental sensors, 2D and 3D cameras and a small robotic arm.

The laser bird deterrent system has been used worldwide in a variety of applications and is useful as a biosecurity measure to prevent Avian Influenza viruses from spreading from wild birds to domestic animals. The system spooks birds away by projecting a green laser beam across areas where birds aggregate. The birds see the green laser beam as a solid object and instinctively perceive it as a physical threat, causing them to flee the area immediately.

In Africa — recent measures

Animal farming, especially poultry, is expanding in Africa, with meat production increasing in response to a rising demand for protein by the growing population. Biosecurity plays a pivotal role in determining the success or failure of the industry in the region.

Government support and consumer behaviour accompanied by reopening of export markets have influenced analysts to predict positive recovery of South Africa's poultry industry in 2022.

As part of the government's efforts to support the industry, South African minister of Agriculture, Land Reform and Rural Development, Thoko Didiza appointed a ministerial task team on animal biosecurity, in August 2021. This team is focusing on issues related to Foot and Mouth Disease, African Swine Fever and Highly Pathogenic Avian Influenza.

The Food and Agriculture Organisation (FAO) of the United Nations, through its Emergency Centre for Transboundary Animal Diseases, swiftly responded to increasing poultry mortality – as well as the risk of human infections resulting from HPAI – with a comprehensive and dynamic HPAI control programme in West and Central Africa.

The support provided includes the provision of relevant personal protective

equipment (PPE) for the implementation of biosecurity and biosafety measures in farms and live birds markets and surveillance at hotspots. Additionally, the provided PPE is used during investigations as part of the updating of risk maps, which are needed to increase the understanding of the epidemiological links to the source of this infection.

The UN's FAO, through its Virtual Learning Centre for Southern Africa, recently launched an online course to strengthen the capacity of farmer field school (FFS) facilitators and master trainers in Zambia and Zimbabwe to prepare and run quality poultry-focused FFS.

Areas covered in the training include principles and characteristics of family poultry production and poultry FFS, signifi-

The FAO, through its Virtual Learning Centre for Southern Africa, recently launched an online course to strengthen the capacity of farmer field school facilitators and master trainers in Zambia and Zimbabwe.



Biosecurity plays a pivotal role in determining the success or failure of the industry in Africa.

Image Credit: Adobe Stock

cant technical information on poultry production and health such as good practices in animal husbandry, biosecurity and those promoting food safety. In addition, the course emphasises the importance of antimicrobial resistance (AMR), its potential impacts on farm productivity and the welfare of people and their animals.

"Poultry FFS master trainers and facilitators can enable sustainable changes in practices and behaviours that lead to safer and higher-quality animal-source foods,

higher profits, and ultimately limit the emergence and spread of AMR in family poultry systems," said Keith Sumption, FAO chief veterinary officer and leader of animal health programme.

In conclusion

Although technology advancements are enabling changes in the poultry industry, getting the basics right and encouraging more public-private partnerships to implement measures are vital to maintaining the biosecurity protocol. **B**

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The availability of feed for poultry nutrition is becoming more competitive, thereby threatening food security. Hence, efforts are being made to come up with alternatives to the traditional feed.

Substitutes mitigate feed availability issues

GLOBAL CONSUMPTION OF poultry products, such as meat or eggs, is increasing predominantly in developing countries. Consequently, the global demand for poultry feed has increased. The availability of feed for poultry nutrition nowadays is becoming more competitive. Thus, food security, especially in developing countries, is being threatened. Currently, efforts are on hand to come up with alternatives to the traditional feed.

Researchers have found a sustainable poultry feed ingredient made entirely of brewery waste, that increased the weight of broilers without the use of antibiotics in a field trial.

“The study demonstrated that this formulation, which is created entirely from renewable ingredients, could be just as successful in increasing the weight of broilers, while also increasing the animal’s viability, without the use of antibiotics,” Dr. Suresh Menon, CEO, Menon Renewable Products, said while speaking to WATTPoultry.com.



Caption: Adobe Stock

Over half of the greenhouse gas emissions produced in monogastric animal protein production are linked to feed formulation.

“The goal is to replace antibiotics and unsustainable ingredients, like fish meal, in livestock and poultry,” he added.

Values such as sustainability have become important factors in purchasing decisions for consumers. As a result, retailers have put mounting pressure on the supply chain to innovate more sustainable approaches.

Over half of the greenhouse gas emissions produced in monogastric animal protein production are linked to feed formulation, so finding ways to make feed production more sustainable is an easy way for poultry producers to reduce their environmental impact.

Adeleke Adegoke Ogunlade from Nigeria has come up with a new technique for processing wet cassava peels into high-quality feed within eight hours.

During the field trial, which took place at the Poultry Research and Training Center of the Zamora University in Honduras, Cobb MV x Cobb 500 FX mixed broilers were fed the ingredient made of brewery waste from birth to 35 days of age. The results revealed that the sustainable feed ingredient was safe, with no effect on the viability of the broilers. It also improved the birds’ immune system, reducing the incidence of disease compared to the control group.

In another example of discovering sustainable feed, an agribusiness entrepreneur Adeleke Adegoke Ogunlade from Nigeria came up with a technique for processing wet cassava peels into high-quality livestock feed within eight hours.

He invested in a cassava processing plant, and started producing the staple West African food garri – flour made from the tuberous roots of the cassava plant. The process produces a kind of ‘cassava peel cake’, which is then grated again, forming particles

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In mixed farming systems throughout Africa, farmers use agricultural by-products to feed their animals.

of the same size, which dry out within a few hours. The final product – called High Quality Cassava Peels or HQCP – has just 10-12% moisture content and can be kept for six months.

The high-fibre coarser particles can be separated out for pig and ruminant feed, while the higher-protein finer particles can be given to poultry. A series of trials conducted by International Livestock Research Institute and other Nigerian researchers found that HQCP could be used to replace significant quantities of maize in the diet of weaned and growing pigs without any impact on their health or weight gain.

With minimal effort from farmers, OFA utilises basic data on an animal, including its body weight, weight gain and stage of pregnancy, to calculate its baseline nutrient requirements.

Data-based feeding for better nutrition

Since most animals feed on concentrates specifically designed to maximise yield, they may lack some essential minerals and vitamins. Numerous studies by animal health experts have found a direct correlation between nutrition and reproductive performance in animals. Feeding patterns, the quality and quantity of rations, and more importantly, the nutritional value of feeds, profoundly affect an animal's reproductive health.

The International Livestock Research Institute (ILRI) in 2020 had launched the On-farm Feed Advisor (OFA), a mobile-based application designed to help farmers and extension workers balance nutrients in the diets of farm animals.

After undergoing successful pilot testing in India, now in 2021, the OFA is being scaled up in various countries across the developing world where it has the potential to increase the yields of animals and strengthen farmer livelihoods.

In mixed farming systems throughout Africa and Asia, where livestock productivity remains far below the global benchmark, farmers use agricultural by-products, such as straws, stovers and haulms, to feed their animals. These feeds are often supplemented with home-grown or purchased concentrates, but most farmers lack an understanding of how the nutrient composition of daily feeds affect the nutrient requirements of their animals.

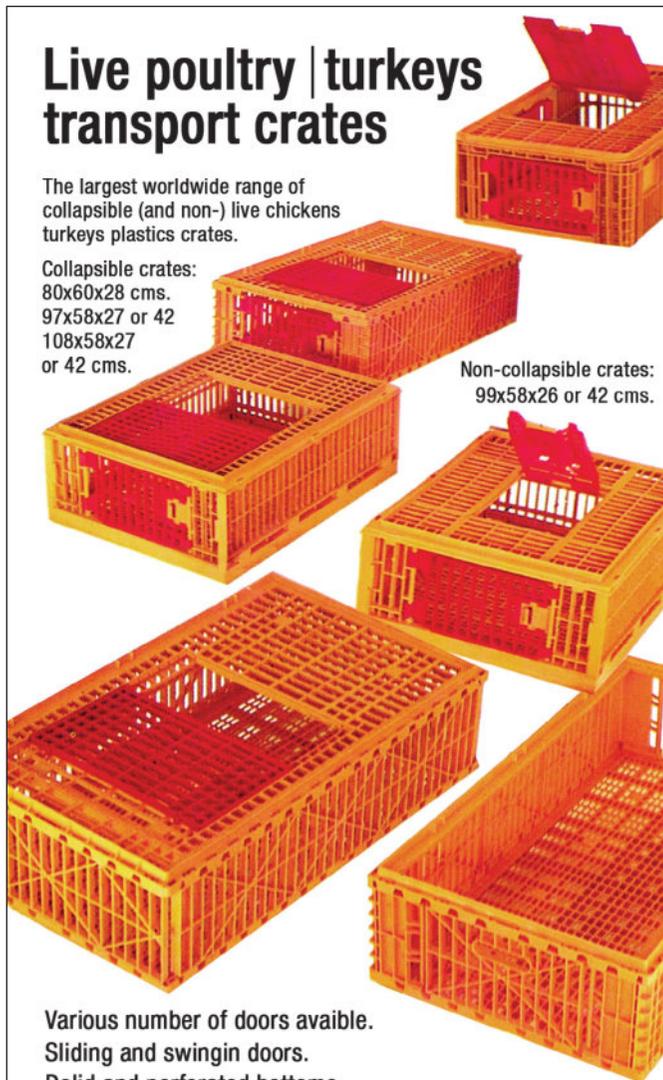
OFA is based on 'precision feeding' principles to fulfill animal nutrient requirements to the nutrient supply in its diet. With minimal effort from farmers, OFA utilises basic data on an animal, including its body weight, weight gain and stage of pregnancy (if applicable), to calculate its baseline nutrient requirements. 

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The poultry sector has received a boost while it is still recuperating from the losses incurred due to the virus

Poultry sector gets a boost, on the road to recovery from Avian flu blow



Image Credit: Adobe Stock

Reports show South Africa's laying flock and egg production is declining slightly, but recovery is indicated in rising numbers of day-old and point-of-lay pullets.

THE POULTRY SECTOR in Africa has been growing rapidly, thanks to rapid urbanisation and the growing need for animal protein. This has driven people towards investing and innovating more in the poultry sector. Recently, the Turkish Cooperation and Coordination Agency (TIKA) built a modern poultry farm in Mogadishu, the capital of Somalia, to provide food and employment opportunities and to create new sectors in the country.

The project is a part of the 'Project for Developing Layer Poultry Farming in Somalia'. It has been implemented in cooperation with the Ministry of Agriculture and Forestry of the Republic of Turkey, IHH Humanitarian Relief Foundation, and Zamzam University. As part of the project, a poultry farm with a total floor space of 198 sqm was built. As many as 1,200 ATA-S layer chicks, equipment, vaccines and feed units were provided.

Assoc. prof. Serdar Kamanlı from the Directorate of Poultry Research Institute in Ankara trained Somali academics and

specialists at Zamzam University in order to share Turkey's knowledge of poultry. After the training, the farm was put into service with the participation of Turkish and Somali officials.

A new broiler management guide launched by Cobb will help customers optimise flock performance through its expanded, updated and newly-added technical expertise.

Sekajja Agro Farms Limited (SAF), a Ugandan based poultry firm, has received US\$1.8mn blended equity and long-term debt from Pearl Capital Partners' managed fund, the Yield Uganda Investment. SAF's main operations entail rearing of day-old-chicks until maturity and the distribution of the mature birds as live birds and dressed chicken in the informal and formal markets, respectively.

The business also operates a feed mill, an abattoir, a cold chain and branded retail outlets. Yield Fund's investment will facilitate SAF's expansion plans which include scaling up its poultry production facilities and constructing a new feed mill. The investment will also finance the expansion of SAF's dressed chicken segment, covering the installation of a larger modern automated abattoir, cold chain facilities and spreading the footprint of SAF's branded distribution outlets.

Focus on boosting quality

A new broiler management guide launched by Cobb will help customers optimise flock performance through its expanded, updated and newly-added technical expertise. The new information includes recommendations on how to reuse litter and water management.

It covers topics such as water management, ventilation, equipment, and several other best practices in broiler management. Robin Jarquin, director of world tech services, said, "The new broiler guide

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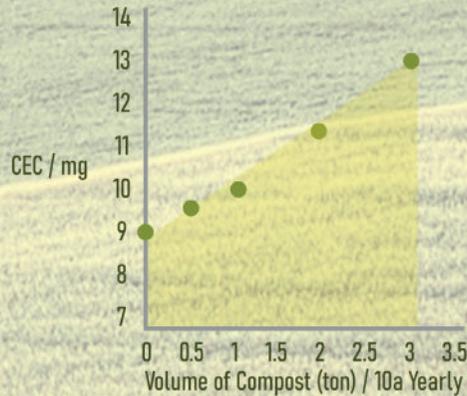
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includes critical information to support more yield, better feed conversion, and healthy flocks for customers."

The new information includes recommendations on how to reuse litter, water management – including a reference table to help evaluate water quality, management techniques and diagrams for naturally ventilated houses, and guidance for record keeping and data collecting along with sample sheets to record information.

"The guide is an industry-leading resource that helps customers raise the bar and achieve the full potential of broilers. It is one of the many ways Cobb supports customers and makes quality protein accessible, healthy, and affordable worldwide," said Jarquin.

All management guides and supplements are housed on Cobb's website. Additional guides cover hatchery, vaccination, brooding fundamentals, grandparent management, and processing procedures.

Recently, Cobb Africa collaborated with Irvine's for the first Irvine's Technical School. More than 160 industry professionals from across Africa joined the virtual event to gain knowledge that will help keep them get to the forefront of the industry. "This first Irvine's Technical School, in collaboration with Cobb Africa, is a project to bring customers the latest information and to refresh them on aspects they may have forgotten over time," said Stuart Burrell, planning director for Cobb Europe, Middle East, and Africa, while speaking to poultryproducer.com.

The event featured presentations from Cobb's industry-leading experts on a range of key topics. It featured informational sessions and panels on a range of important topics, including female management for optimum egg production, male management for optimum fertility, optimum chick quality, optimum cleanout, and brooding. The event was such a hit that Cobb Africa and Irvine's has decided to host it annually.

De Villeneuve, founder of South Africa Poultry Association's Egg (SAPA), while speaking to How We Made It in Africa said, "Poultry is a large market and in the context of Africa, chicken is at the top of the list." SAPA is an investment vehicle that supports the entry of European agribusiness groups into eastern and southern African markets.

De Villeneuve added that to be successful in poultry, producers must be



Turkish Cooperation and Coordination Agency (TIKA) built a modern poultry farm in Mogadishu to provide food and employment opportunities and to create new sectors in the country.

Image Credit: Turkish Cooperation and Coordination Agency

included and control the value chain, starting with the feed. "The cost of the feed often accounts for about 70% of the price of the chicken. Secondly, chicken for local consumption should not be produced close to the sea, because one could be impacted by imports from Brazil or elsewhere. Instead, produce chicken away from the coast as high inland transport costs create a barrier to entry for competitors," he said.

Meanwhile, Zimbabwe's poultry production this year is expected to rebound from a decline in 2020 due to a successful crop season. The production is estimated to increase to 156,078 tonnes this year, according to Finance Minister Mthuli Ncube, representing a 5% increase. Official data showed a 2.5% reduction in day-old chicks production from 73.4 million to 71.4 million, which consequently led to a 2.45% drop in meat production.

Limping back to normalcy after Avian flu

Reports show South Africa's laying flock and egg production is declining slightly after growth in the previous two years, but recovery is indicated in rising numbers of day-old and point-of-lay pullets. SAPA's Egg Industry Report for May 2021 estimated a laying flock of 26.5 million hens. This is a month-on-month decrease of 1.05 million hens (-5.3%) and a year-on-year decrease of 2.85 million hens (-9.7%).

While the demand for poultry and egg products has consistently increased in Africa, drought, avian flu and cheap imports have affected the local industry. Imports have targeted the low-priced brown meat bone-in products that are the mainstay of the local industry. These factors have led the industry to show growth in the recent years while experiencing local

production capacity decline, consolidation and vertical integration.

Avian flu has had a major impact on the African market in the past few months. Earlier in the year when the Avian flu hit the continent, Mozambique's government announced a ban on live bird imports and imports of meat, eggs and feathers from South Africa after an outbreak of highly pathogenic bird flu was reported.

In the Republic of Botswana in southern Africa, the H5N1 Highly Pathogenic Avian Influenza (HPAI) was detected for the first time, the agriculture ministry of the Republic of Benin informed in August that HPAI virus has been detected in two communities in the city of Abomey-Calavi. The Togolese Republic (Togo) which recorded its first cases of HPAI linked to the H5N1 HPAI virus variant in June. Almost 900 of the 1,880 laying hens died at a farm in Baguida town.

The recent mass deaths of seabirds off the coast of Western Cape have raised suspicions of a new wave of Highly Pathogenic Avian Influenza (HPAI) outbreaks in South Africa's farmed poultry and ostriches. In West Africa, a previous outbreak series in Ivory Coast has ended, and there have been no new cases in Togo. Flock owners in Ghana who lost birds to the disease, have been promised financial compensation.

Authorities in South Africa's Western Cape report that there is a plan to deal with the latest suspected avian flu outbreak in wild birds.

During the second week of October, The South African reported that more than 1,500 dead and dying seabirds have been found in the West Coast region. To tackle the issue, veterinarians collected the birds over the weekend in the districts of Bergvliet and Overberg. On-going tests will confirm whether the cause is avian flu.

With the clean-up continuing, a local official in Western Cape said that the number of dead birds collected has dropped from thousands to around 100. **E**

Mozambique's government announced a ban on live bird imports and imports of meat, and eggs from South Africa after an outbreak of highly pathogenic bird flu was reported.

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Community-based breeding programmes focus on training and building local capacity, leading to sustained genetic improvement of indigenous breeds. In Ethiopia more than 7,000 households have benefitted from it.

Breeding initiative offers solution for flock productivity issues

ETHIOPIA HAS A large population of small ruminants, which contribute substantially to the income and livelihood of the rural poor and the country at large. However, the productivity per animal and flock offake are both very low due to the absence of appropriate breeding programmes, lack of technical capacity, inadequate and poor-quality feeds and lack of infrastructure and information.

Community-based breeding programmes seem to be the solution for genetic improvement of sheep and goat in low input systems. It helped in the development of livestock by means of increasing the productivity and sustainability of production. These programmes mainly focus on training and building local capacity, leading to sustained genetic improvement of indigenous breeds.

Farmers have created more than 50 formal breeders' cooperatives to be able to build capital from investments, including the buying of rams and bucks.

ICARDA, CRP Livestock, and other partners have developed a community-based breeding programme (CBBP) focused on indigenous breeds suited to smallholder conditions. The CBBP focuses on indigenous breeds and is suited to smallholder conditions, making it a sustainable alternative to conventional methods. Modern livestock breeding methods are often unsuitable for poor households with small flocks of sheep and goats. Whereas, community-based breeding increases the productivity and profitability of indigenous breeds without undermining their resilience and genetic integrity with no expensive interventions. It is implemented directly by farmers.

Key elements of the approach are:

- Farmers are trained to improve selection methods such as retaining fast-growing ram/buck lambs/kids for breeding, rather than selling them.



The breeding programme focuses on indigenous breeds and is suited to smallholder conditions, making it a sustainable alternative to conventional methods.

Image Credit: Adobe Stock

- Community flocks are pooled to enlarge the gene pool for breeding sire selection.
- Interactions between farmers and scientists enable the evaluation of different breeding options and informed decisions on flock management.
- A recording system monitors the performance of individual animals, leading to the estimation of breeding values for selection decisions and continuous genetic improvement.

In Ethiopia, where ICARDA has partnered with International Livestock Research Institute (ILRI), the University of Natural Resources and Life Sciences (BOKU), and the Ethiopian National Agricultural Research System, more than 7,000 households have benefitted from CBBP. As per sources, the programme is generating a 20% average increase in farmer incomes and has helped the community triple consumption of animal source food.

Farmers have created more than 50 formal breeders' cooperatives to be able to build capital from investments, including the buying of rams and bucks. Successes of ICARDA's approach to community-based breeding have now been integrated into the country's national livestock plan. Through World Bank loans, the Ethiopian government and regional authorities are investing in the upscale of CBBP in the country. The programme has drawn the interest of local and international investors and governments. CBBP is now being implemented in Sudan, Tanzania, Iran, Uganda, Malawi,

Liberia, South Africa, and Burkina Faso.

ICARDA, ILRI, and the National Animal Genetics Improvement Institute (NAGII) organised a two-day event from 11-12 October 2021, in Bonga and Jimma to celebrate the success of community-based sheep and goat breeding programmes with farmers and partners. They also discussed and planned the way forward for technological packages that have been tested in the last decade.

The event included a panel discussion with farmers' representatives, a market place, an animal show and award and a one-day workshop to discuss on sheep and goat intervention packages.

CBBP resulted in sustained genetic gains in small ruminants which are economically rewarding to participating communities in Ethiopia. The programme ensured the genuine participation of livestock keepers in the design and implementation of sheep and goat breeding, as well as control over the sales and products generated.

CBBP has been tested in more than 5,000 households and 30,000 people in over 50 villages of Ethiopia. Despite a growing global demand for meat, milk and other livestock products, smallholder farmers in Ethiopia have struggled to increase the production of their animals.

"Taking a community-based approach to livestock breeding has not only improved thousands of lives in Ethiopia, but also given farmers the knowledge, skills and support they need to continue making

improvements long into the future,” says Aynalem Haile, a scientist specialising in small ruminant breeding with the International Center for Agricultural Research in the Dry Areas (ICARDA).

In 2009, this approach was brought to Ethiopia by ICARDA in partnership with the International Livestock Research Institute (ILRI), Austria’s University of Natural Resources and Life Sciences (BOKU), and the Ethiopian National Agricultural Research System. Haile and a team of scientists, students and national extension agents started by working with 500 households in four communities. First, they studied how farmers were managing breeding, how many male animals the communities had and how they were used communally. They identified a major problem – there were hardly any male animals and the main reason for that was financial problems. Farmers were selling their fastest growing animals and the useless ones would be the ones left for breeding.

In order to tackle this issue, the scientists helped the communities to formalise their traditional communal arrangement into a cooperative structure, and provided revolving funds for communal use. Once a



The programme ensured the genuine participation of livestock keepers in the design and implementation of sheep and goat breeding.

Image Credit: Adobe Stock

healthy breeding stock was established, they helped the communities define their breeding objectives. Then researchers helped the community develop a breeding structure – addressing how males and female livestock should be managed, how to use rams communally and the process for selecting animals for breeding. This data was then used by the scientists to estimate ‘breeding values’, that is, which animals should mate in order to best achieve the breeding objectives set by the community. Ten years on, the programme has reached 3,200 households in 40 villages at a fraction of the cost of introducing exotic animals or

nucleus schemes. The programme has also supported farmers to establish 35 formal breeders’ cooperatives.

Community-based breeding sites have been visited by one of Ethiopia’s former prime ministers as well as a number of high-ranking ministers. It has become the Ethiopian Government’s strategy of choice for sheep and goats. It’s been incorporated into the country’s livestock master plan, and has received a US\$560,000 investment from the World Bank and investment from regional government authorities to upscale the approach across the country. www.ilri.org 

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The Guinea rice value chain project aims to promote smallholder farming among women and youth across the country.

Historically, there has always been domestic production of rice in Guinea but imported products are generally much cheaper, and therefore more popular, according to the US International Trade Administration.

Project underway to achieve self-sustainability in Rice

ACCORDING TO A commercial country guide released by the US Department of Commerce, rice is the largest imported food item in Guinea, making up almost 40% of all food imports and accounting for 690,000 tn in 2020 and over US\$200mn annually.

According to the Food and Agricultural Organization (FAO) of the United Nations, Guinea's 2020 aggregate cereal production is estimated at 4.7 million tonne — about 20% above the five year average. This includes 2.9 million tn of paddy rice, which soared over 26% above the average. However, FAO's Global Information and Early Warning System on Guinea states that on average, cereal imports cover about one fifth of the nation's consumption needs, mostly rice and wheat. In the year 2020/21, cereal import requirements, were estimated at 830,000 tonnes for Guinea. The matter of food security is further strengthened by FAO, which said that the numbers indicate the serious impact on food security for the vulnerable people in the country. The number of insecure population has risen with the impact of the pandemic as the primary data was formulated in March 2020, before the full effects of the lockdowns and their impacts on the regional economy and the supply chain for agriculture.

A programme has been officially launched to reduce the dependency on rice imports in Guinea, with the support of the Lives and Livelihoods Fund (LLF), a multilateral development initiative created by the Islamic Development Bank (IsDB) and development cooperation partners.

The bank and the Ministry of Agriculture and Livestock in Guinea marked the nation becoming yet another member country of the IsDB in West Africa to kick off the Regional Rice Value Chain Project (RRVCP) with a working summit that brought together key stakeholders to set out the roadmap for the project in Guinea.

Rice is the main food staple in Guinea and is mostly produced by smallholder farmers in rural areas where nearly 80% of the country's population lives.

Guinea is among the first group of LLF supported West African countries to benefit from the Regional Rice Value Chain Development Program (RRVCP). The Guinea rice value chain project — funded to the tune of US\$28.3mn in concessional financing by the LLF, resources of the Islamic Solidarity Fund for Development and the Arab Bank for Economic Development in Africa — aims to reduce the high level of rice imports in Guinea by 10% and to strengthen economic growth by improving production and productivity, processing, marketing, and enhancing private sector participation.

The LLF uses a financing model that combines the lending capital of IsDB to offer concessional loans that are added to the grants of the regional and international donors: Abu Dhabi Fund for Development, Bill and Melinda Gates Foundation, UK

Foreign, Commonwealth & Development Office, Islamic Solidarity Fund for Development, King Salman Humanitarian Aid and Relief Centre and the Qatar Fund for Development. The loans do not merely address immediate needs but also set in motion fundamental livelihood changes that can create opportunities for millions of underprivileged people, particularly in rural areas. The fund currently supports 31 projects across the Arab World, Sub-Saharan Africa, and Asia.

The Regional Rice Value Chain Programme covers member countries of IsDB in West Africa that currently have low to intermediate rice self-sufficiency, ranging between 12% in Niger to 69% in Guinea. The gap is filled through imports that cost a combined US\$1.2bn annually.

Rice is the main food staple in Guinea and is mostly produced by smallholder farmers in rural areas where nearly 80% of the population lives. The volumes have not been able to sustain the country's needs largely because of the low productivity, with yields under smallholder farming typically being under 2 tonnes per ha. Consequently, the country imports around 600,000 tonnes of rice per year. This can be turned around quickly though, given the enormous potential of the country. For instance, Guinea's irrigation potential is estimated at 364,000 ha, of which only 30,200 ha is currently developed.

The Guinea project is said to have helped 60,000 rural households involved in the rice value chain in Guinea, equivalent to about 300,000 people. **E**

Every plant and crop needs its share of nutrients and minerals and it is important to provide these for high production rate in plants.

Fertiliser can affect your production

CROPS CAN OBTAIN mineral and nutrients from the soil. However, nutrients from the soil are released too slow to meet the crop requirements during its growth. The most common way to supply nutrients to the plants is by using fertiliser.

There are many types of organic and inorganic fertilisers, and each has its own characteristics. Inorganic fertiliser or chemical fertiliser has a high nutrient value but too much application can cause damage to the soil and to the plants. While organic fertiliser has a lower nutrient value compared to chemical fertiliser, but it can increase the cation exchange capacity (CEC) or the soil's ability to hold onto essential nutrients. Plants absorb the nutrients slowly during their growth and it is important that there is always an available nutrient whenever the plants need it. Soil with low CEC does not have

enough capacity to hold the nutrients that the plants need during its growth this could lead to poor growth and low production rate. Soil with high CEC has a higher holding capacity enough to supply nutrients for the plants through its entire growth.

Long term application of organic fertiliser is essential not only to raise the CEC of the soil but also improve the soil quality as it contains good microorganisms.

However, before using organic fertiliser, it is important to know if it is well composted as unprocessed fertiliser. For instance, raw animal waste can cause fly outbreak, transmission of disease to the plants and release of bad odour etc.

Kohshin Engineering: Identifying a good fertiliser

To identify if the fertiliser is well composted,

it is important to know how the material has been processed. Raw materials especially animal manure contains disease causing pathogens, therefore, it is important to achieve a high temperature (60 to 75 degrees celsius) during the process, and to obtain this temperature, correct moisture adjustment and sufficient supply of air is a must.

Japan-based Kohshin Engineering composters are designed to supply a huge amount of air that is necessary for an efficient aerobic composting process, with this technology it became possible to obtain a high temperature which is enough to kill disease-causing pathogens to produce high quality composted organic fertiliser that is sanitised and safe-to-use. 

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 **BALDAN**

Dr Terry Mabbett speaks about the role of sulphur nutrient in the growth and production of good quality tea leaves and how it helps in the making of high quality tea liquor.

Sulphur brightens the brew for tea



Image Credit: Omex

Sulphur is one of the major nutrients for maintaining the healthy, dark-green colour of tea foliage.

THE TEA CROP'S requirement for sulphur is very high at 16 to 26 kg/ha per annum, but it is not surprising since tea grows naturally on the volcanic soils created by the same geological processes that generate elemental sulphur.

Sulphur content of fresh green tea leaves should be maintained at 0.08% to 0.20% of total dry matter to achieve maximum yields for processing into high quality, finished tea products. 1.0 tonne of finished tea product requires 5 tonnes of freshly picked leaves which will have extracted no less than 10 kg of sulphur from the soil. By its very nature, tea harvesting – which requires the regular plucking of the youngest and most nutrient-rich foliage –

will deplete soil nutrients including sulphur, unless the shortfall is made up by fertiliser application.

When averaged out over the entire tea bush, sulphur content of leaves at 0.08% to 0.20%, is way down in the list of nutrients. However, when nutrient analysis is targeted

Consequences of shortfalls in sulphur for yield and quality are severe, especially for the new shoots comprising bud and two to three leaves, selected to manufacture the finest grade teas.

on the third-youngest unfurled leaf, then sulphur at 0.50% shoots up to rank equal third with phosphorus. This figure is clearly important given that tea pickers are selecting the new shoots comprising terminal buds (golden tips) and young leaves for processing into the finest grade teas. Plucking the terminal bud plus three leaves gives the highest yield of quality shoots and about 25% more than the terminal bud plus two leaves. Shoots which include the third leaf process into premium teas have high concentrations of two important tea chemicals — polyphenols (tannins) and theine (tea caffeine).

Up to 40% of sulphur absorbed by tea roots is recycled into the soil as fallen leaves and pruning waste, but there remains a

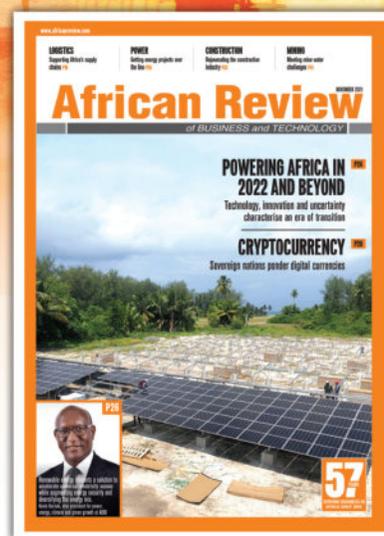
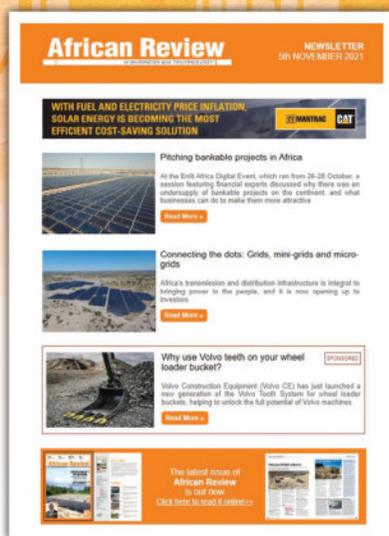
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considerable shortfall in the soil. Tea harvests that weigh in at 3,000 kg of fresh leaf will have removed some 6 to 9 kg of sulphur per ha in a year from the soil, say researchers at the internationally famous Tocklai Experimental Station at Jorhat in India, which is home to the internationally famed Assam teas. Field trials carried out in this world-famous tea-growing area of North Eastern India show how soils become seriously depleted of sulphur through continuous picking, unless appropriate fertiliser application is carried out.

Sulphur deficiency

Sulphur shortfalls on tea estates are nothing new. Sulphur deficiency symptoms in tea bushes, and commonly called 'sulphur yellows' or 'yellow disease', are recognised in tea growing areas around the world. Sulphur is central to plant nutrition. The nutrient is necessary for the synthesis of sulphur-containing essential amino acids like cysteine and methionine and for the synthesis of chlorophyll pigments. When sulphur is in short supply, chloroplasts break down and with them goes the normal, deep-green colour of healthy tea foliage.

Young leaves are hardest hit by shortfalls in sulphur. These newly-emerged leaves assume an insipid and unhealthy-looking pale yellow colour with general yellowing of inter-veinal areas. New shoots are smaller and internodes (distance between leaves) are also shorter due to a slowdown in growth, which may be followed by general shoot necrosis if the sulphur deficiency persists.

Consequences of shortfalls in sulphur for tea yield and quality are severe, especially for the new shoots comprising bud and two to three leaves, which are selected to manufacture the finest grade teas. To make matters worse, leaf-yellowing symptoms are exacerbated by lower temperatures. These are the very conditions experienced at night on the hillsides where tea is typically grown. Sulphur is known to enhance the frost resistance of tea bushes.



Sulphur is a key component of the chemicals in tea, responsible for 'brightness of the brew'.



Tea processing ends with the leaching out of chemicals into hot water (the infusion) for assessment by expert tasters.

'Sulphur yellows' have proved to be an ongoing problem in a number of key African tea growing countries, to a degree which demands dedicated applications of sulphur fertiliser. Sulphur was traditionally provided incidentally via nitrogen and potassium fertilisers such as ammonium

Problems may occur when ammonium sulphate and single super phosphate are replaced by urea and rock phosphate respectively, neither of which have sulphur in the molecule.

sulphate and potassium sulphate, which have a sulphur component in the molecule.

However, with the requirement for sulphur recognised, the fertiliser industry responded with the design and development of dedicated sulphur fertilisers based on pure elemental sulphur and formulated as pastilles and prills. Sulphur is degraded in the soil by Thiobacillus bacteria to form soluble sulphate, which is absorbed by the root system of the tea bush.

However, the selective use of traditional fertiliser with a sulfur component may still be important. Researchers at the Tocklai Experimental Station reported how increased problems with sulphur deficiency could arise. Problems may occur when ammonium sulphate (a sulphur-containing nitrogen fertiliser) and single super phosphate (a sulphur-containing phosphate fertiliser) are replaced by urea and rock phosphate respectively, neither of which have sulphur in the molecule.

Extra benefits from sulphur fertiliser arise from its additional role as a soil amendment product to increase soil acidity during tea estate rehabilitation. The tea bush requires an acid soil with a pH between 4.5 and 5.5 and will underperform in soils that are too compact or alkaline.

Sulphur and tea quality

Everyone knows that correctly dosed and balanced fertiliser improves crop yield and quality. The benefits are generally difficult to pin-down, but tea is different. The fresh green leaves are put through a series of exhaustive processes, including withering, rolling, fermentation and firing. This generates and consolidates a group of all-important chemicals that combine to determine tea quality through flavour and

'Sulphur yellows' has proved to be an ongoing problem in a number of key African tea growing countries, to a degree which demands dedicated applications of sulphur fertiliser.

aroma, body, strength, colour and brightness of the tea liquor. Tea processing ends with the leaching out of chemicals into hot water (the infusion) for assessment by expert tasters. Results from this ultimate test can be used to 'pin-point' the effect of growing conditions including soil nutrient status.

This is exactly what has been done at Tocklai, where tea agronomists, food scientists and tasters have identified the significance and exact role of sulphur in tea quality. Field trials over a six-year period using a variety of sulphur sources, including gypsum (calcium sulphate), ammonium sulphate and micronised elemental sulphur, gave positive responses but only up to a certain level. Sulphur up to 40 kg per ha in a year increased tea yield and when applied at 20 kg per ha in a year, was the most cost-effective treatment.

Colour, brightness, strength, body, taste and flavour of the tea liquor are adversely affected by sulphur-deficiency in tea leaves, but the Tocklai trials went further and related changes in these parameters to levels of specific chemicals in the leaves. The tea was produced by CTC (crushing, tearing and curling), the most commonly used method of 'rolling' in the Indian tea industry.

Key tea chemicals were measured using biochemical analysis and HPLC (High Performance Liquid Chromatography) of black tea liquors. Tasters from J. Thomas & Co Limited in Calcutta were used to assess organoleptic quality. Tasters' scores at 74.0 for tea produced with 20 kg sulphur/ha were by far the highest, 13.7 higher than no sulphur and a full 10.0 higher than 40 kg sulphur/ha.

Other objective quality factors showed the same trend with brightness and total colour, both of which responded positively to the application of sulphur fertiliser. Two groups of chemicals called theaflavins and thearubigins, and responsible for body, strength, taste, odour and the bright amber/red colour of quality liquor, were identified as keys to the quality status of tea. They were found at higher concentrations in tea following sulphur application and with 20kg sulfur/ha giving the best overall result. There were marginal increases in the flavonol glycosides such as rutin and

quercetin and thought to contribute to a brighter colour and enhanced flavour of the infusion. The contribution of sulphur to the bright, amber-red colour of quality black tea liquor is particularly interesting. Sulphur, in its common solid state, is a yellow powder. On heating, it melts to give bright, amber liquid, which crystallises on cooling to produce amber crystals with a colour and 'shine' which is not unlike the colour of quality black tea liquor.

These findings can be related to original concentrations of polyphenols in fresh tea leaves, because theaflavins and thearubigins are produced by enzyme-controlled

oxidative reactions on polyphenols during fermentation. Polyphenols are heavily concentrated in the youngest growth – terminal bud (28%), smallest (first) leaf (28%), second leaf (21%) and third leaf (18%).

In summary, sulphur deficiency is most acute in young growth (terminal buds and first three unfurled leaves), which is selectively plucked for processing into the finest grade teas. Top-flight teas possess high concentrations of polyphenols, which are converted during fermentation by polyphenol oxidase enzymes into the all-important tea chemicals responsible for tea liquor quality. **B**



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Reports show that the African agricultural tractor market is expected to grow at a CAGR of 9.6% during 2021-2026.

Changing the face of agriculture through mechanisation

AFRICA HOLDS A great market potential for agricultural tractors. Tractors sales went up by 27% during the first six months of 2021, in comparison to the same period last year, according to sales statistics released by the South African Agricultural Machinery Association (SAAMA). Paul Makube, senior agricultural economist at FNB Agriculture, while speaking to African weekly said, "The availability of relatively cheaper credit and the record-high grain and oilseed prices that boosted farmers' revenues, supported the increase in total machinery sales."

Findings by Mordor Intelligence – a market research firm – show that the African agricultural tractor market is expected to grow at a CAGR of 9.6% during 2021-2026. The constant support by the governments of African countries to develop the agricultural sector is expected to drive this sector. For instance, the government of Ghana provides tractors at subsidised rates to entrepreneurs who run 89 centres that rent out and service tractors.

Agriculture plays a crucial role in the economic development of Africa. However, the sector is performing below its potential. According to the Food and Agriculture Organization of the United Nations (FAO), agricultural mechanisation in Africa is still in its initial stages. Studies conducted by FAO also reveal that the level of mechanisation in the country is slowly moving from hand-driven technology to power sources.

As Africa has the highest area of uncultivated arable land in the world, its productivity lags far behind other developing regions. Mordor Intelligence reports pointed out that crop yields are only reaching 56% of the international average. "Thus, there is an urgent need to increase crop yields in the coming decades to keep pace with food demand driven by the population growth and rapid urbanisation in Africa. Mechanisation through tractors can directly and indirectly bridge the yield gap," the report added.

Some companies like Case IH have been transforming agricultural machinery in Africa. Their Magnum AFS Connect



Image Credit: VMC Automotive

Implement Automation allows towed machinery to communicate with the tractor, with a baler automatically stopping the tractor when it's time to wrap and unload.

tractor's wireless connectivity allows instant communication and two-way data transfer between the machine and its manager. It has performed successfully under local conditions in a series of field trials. The AFS Connect technology focuses on remote display viewing of the tractor's AFS Pro 1200 operating screen by farm owners, managers and, with permission, the dealer supporting their equipment, thereby providing exactly the same screen view the operator is seeing in the cab. The machine was tested at a large maize, soybeans, dry beans and wheat operation.

One of the important features of AFS Connect Farm is the ability for it to be linked with other cloud based farm management information systems (FMIS) such as Trimble and FarmersEdge FarmCommand platforms. The purpose of the current FMIS is to meet the increased demands to reduce production costs,

Studies conducted by the Food and Agriculture Organization revealed that the level of mechanisation in the country is slowly moving from hand-driven technology to power sources.

comply with agricultural standards, and maintain high product quality and safety.

Changing the status quo

Owning a tractor is a distant dream for many African farmers, but that could all be changing due to a new approach which allows farmers to use a tractor as and when they need it. Hello Tractor, an Internet of Things-based app, connects tractor owners with farmers who need their services. Farmers are charged a fee based on the type of work the tractor is doing and the time it is needed for.

According to World Economic Forum, the scheme is expected to bring nine million hectares of land into production and create two million new jobs. Until now, the cost of mechanising agriculture has been a barrier to making small rural farms more efficient and able to produce more food. However, this app helps farmers just like a car-sharing app that provides local transportation options to people, who don't own cars or only want them for short-term use.

Automated tractors

Today, tractors have been programmed to steer themselves, freeing up farmers to focus on the higher-value tasks, such as ensuring seeds are planted accurately. A driverless tractor is any autonomous farm vehicle that can manage its own speed,



There is an urgent need to increase crop yields in the coming decades to keep pace with food demand driven by the population growth and rapid urbanisation in Africa.

Image Credit: VMC Automotive

steering, braking, and navigation. This is done with the help of several additional systems such as GPS, lasers, cameras, and more. It is considered driverless because it can operate independently, without the need of a farmer or driver to run it.

Tom Blackie, founder and CEO, VNC Automotive said that automation in the agricultural sector is nothing new. "GPS-enabled automated steering systems, such as John Deere's AutoTrac, have been guiding tractors and self-propelled farm machinery for almost 20 years. Their ability to follow the same optimised paths through a crop time after time, all season long, reduces plant damage, increases crop yields, and reduces pesticide use," he added.

"These systems have come a long way since their inception two decades ago, and now offer accuracy down to just a couple of centimetres. Their widespread adoption across the globe shows they've earned the trust of farmers," he said.

Systems such as Implement Automation allow towed machinery to communicate with the tractor, with a baler automatically stopping the tractor when it's time to wrap and unload.

Recent innovations in machine learning and vision systems have led to technologies

such as See & Spray – a pioneering approach that uses computer vision and machine learning to precisely spray herbicides only where weeds are present. This approach generates vast amounts of data, much of it stored in the cloud. It can be used to support a growing wave of new functionality, from mapping crop yields and soil conditions within a field, to performing crop simulations to select the best planting strategies.

"We're already having these conversations with our clients and recent acquisitions by some of the biggest players in the industry point to this happening sooner rather than later. Hundreds of thousands of connected machines out there, collecting data for more than 20 years means there's a tremendous amount of learning that's already been done. Now

The ability of GPS-enabled automated steering systems to follow the same optimised paths through a crop time after time, all season long, reduces plant damage and increases crop yields

it's time to capitalise on that investment," Blackie added.

Affordable solutions

Another organisation, Tractors for Africa (TFA), is making agricultural technology more accessible for West African farmers. By providing affordable and reliable mechanisation services, coupled with facilitating the transition to more sustainable agricultural practices, the organisation helps farmers increase their productivity.

In 2021, they empowered Ghanaian smallholder farmers through their shared services model and have served nearly 700 farms so far. More than 3,500 individuals in rural communities have benefitted from this. This includes 150 women farmers that have gained access to timely mechanisation services and much needed fertiliser.

While speaking about their strategies to make tractors more accessible for African farmers, Jaco Beyers, managing director for John Deere told *How we made it in Africa*, "It's amazing when communities buy into these investments together. It reduces the cost for individual farmers, and usually also reduces the likelihood of default. Also, we work with the public and private sectors to find the right financing so that African farmers can access the equipment and technology they need."

Negative impacts

While tractors have been helping farmers for a long time now, it all comes with a price. Mechanisation can undermine long-term soil fertility, in particular when the disc plough is used. Heavy tractors can lead to soil erosion and compaction. Cultivating more land can also result in losing trees on a large scale, leading to deforestation. Even clearing trees from fields so that tractors can operate there, reduces biodiversity and makes the soil more susceptible to rain and wind erosion. **E**

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Satellite data providers ConstellR and ScanWorld have announced a partnership to combine their earth observation expertise that will enable a wide range of sustainable agricultural applications.

IoT and smart farming becoming the new normal in agriculture

Smart farming incorporates information and communication technologies into machinery, equipment and sensors used in agricultural production systems.

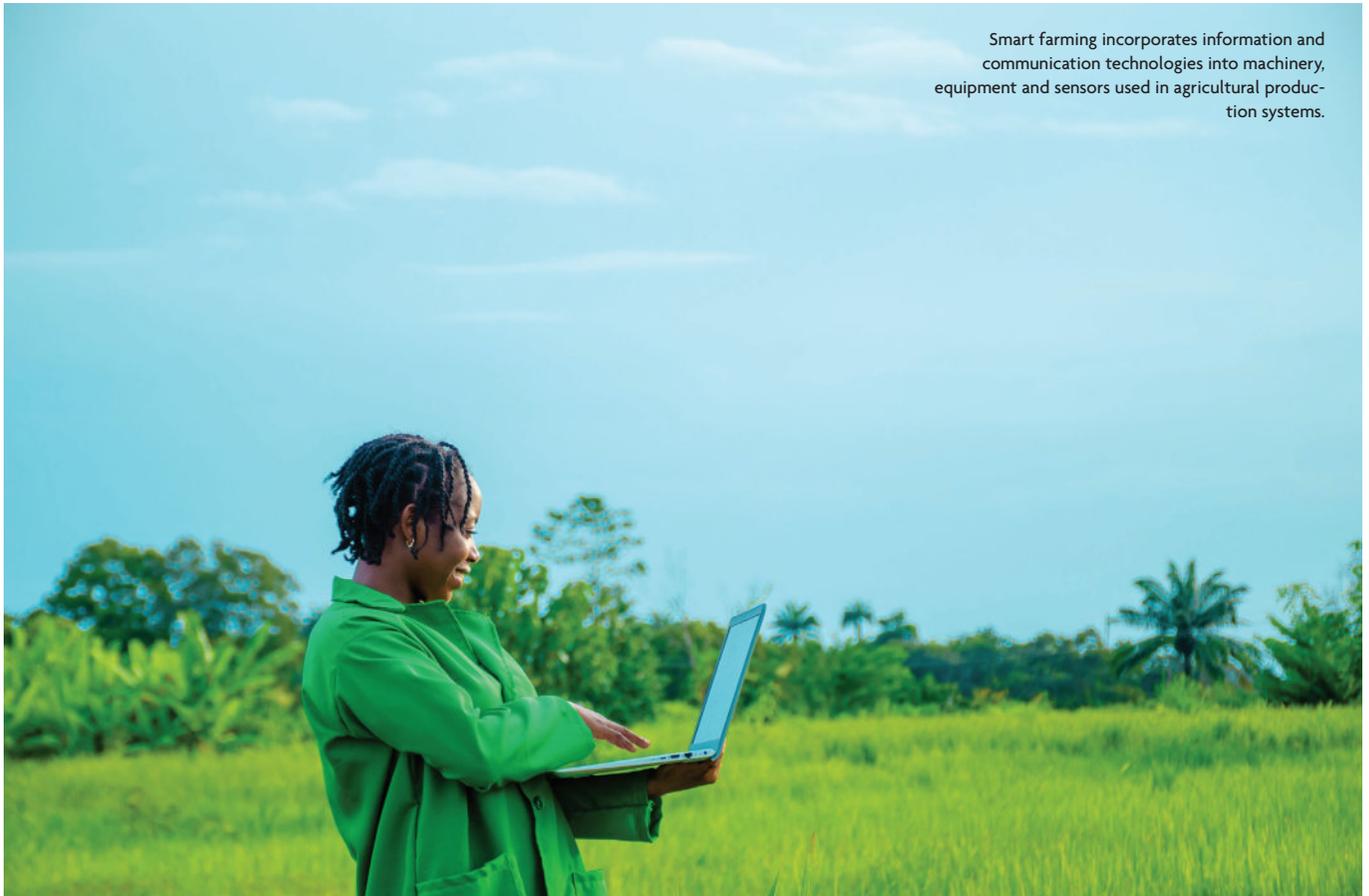


Image Credit: Adobe Stock

IN THE NEXT few decades, the agricultural industry is set to become more important than ever before as it will need to meet the demands of a growing population. That's why farmers and agribusinesses are turning to the Internet of Things (IoT) and smart farming technologies for improved analytics and greater production capabilities.

Satellite data improves yields

Emerging satellite data providers ConstellR and ScanWorld have announced a partnership to combine their earth observation expertise that will enable a wide range of sustainable agricultural applications.

ScanWorld leverages hyperspectral imaging to collect data from

Using surface temperature as data, ConstellR uses evapotranspiration as a fundamental measure of crop water need for irrigation and yield monitoring.

across the electromagnetic spectrum to detect small changes in plant physiology. This allows for the measuring of proteins and identification of diseases to support agriculture and forestry management.

ConstellR is a pioneer of thermal infrared imagery for agriculture, crop health monitoring and sustainable resource management.

Using surface temperature as data, the company uses evapotranspiration as a fundamental measure of crop water need for irrigation and yield monitoring.

The MoU between the two companies will include the harmonisation and interoperability of data products, the development of joint data products and services, as well as the potential for entering into joint commercial products.

"We both benefit from a world-class techno-scientific background," said Gueric de Crombrughe, general manager at ScanWorld. "This drives us towards high-quality products, which is a key requirement when it comes to delivering operational services. This is crucial in agriculture – the harvest depends on it – but in other sectors too. Combined with affordability, this is a real game-changer."

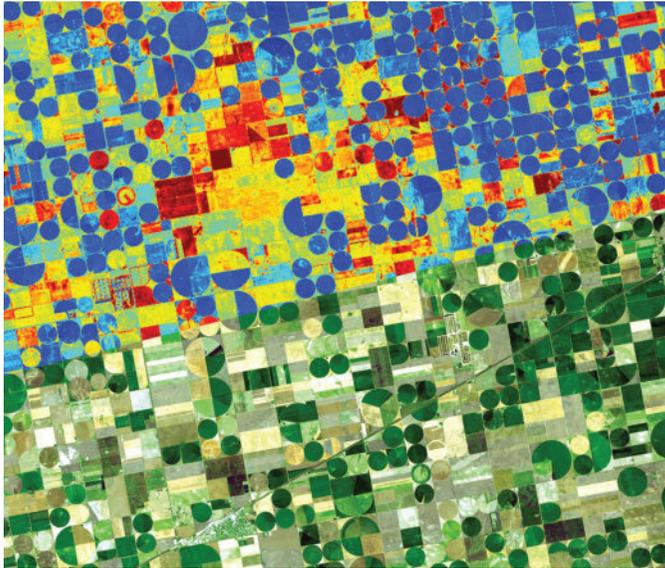


Image Credit: ConstellR

ConstellR is a pioneer of thermal infrared imagery for agriculture, crop health monitoring and sustainable resource management.

Max Gulde, CEO of ConstellR, commented, "I believe that what we are building here will be a game changer for all ESG related monitoring activities and enable a global quantification of key metrics with unprecedented accuracy, precision, and timeliness."

Smart solutions need of the hour

Farming 'smarter' is no longer an 'advanced' tactic for savvy farmers; it's becoming an increasingly necessary way to optimise and preserve human and natural resources.

Farm labour is becoming increasingly scarce due to urban migration and ageing populations. Intensifying climate change is altering growing conditions in less predictable ways.

Earth's resources and biodiversity are diminishing. Smart farming tools can help reduce these impacts, minimise environmental constraints and reduce production costs in farming activities. Smart farming tools introduce a new level of technology into agriculture, including mapping, robotics, geomatics, automation, decision making and statistical processes

Also known as Farming 4.0 or digital farming, smart farming is the application of information and data technologies to optimise complex farming systems. It involves individual machines and all farm operations.

With more control (even remotely), farmers can reduce risks and plan better. For example, if they know exactly how large their yield is going to be, they can ensure that they find enough buyers and their product won't lie around unsold.

Smart farming incorporates information and communication technologies into machinery, equipment and sensors used in agricultural production systems. Technologies such as the IoT and cloud computing are advancing this development even further by introducing more robots and artificial intelligence into farming.

For example, farmers can use smartphones and tablets to access real-time data about the condition of almost anything involved in their day-to-day operations.

The use of smart farming tools is possible due to the use of sensors connected to a network.

A sensor is an electrotechnical device. It measures physical

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quantities from the environment, converts these measurements into a signal, which is read and interpreted by an instrument.

Farming solutions at Smarter Technologies, are designed around the daily realities faced by farmers in the security of their premises, assets, and livestock – and in achieving competitive advantage through smart digital solutions. Simple, cost-effective, powerful smart technologies are unlocking a new age of precision farming. Smarter Technologies' smart agriculture security and herd management solutions give customers a unique, granular, whole-farm view.

A system of tags, sensors, pressure pads, gateways and cutting-edge herd management tools combine to create a digital ecosystem which can be remotely monitored in real-time. This empowers immediate response to security breaches, asset and equipment tampering, livestock status and location, and crop management.

Many advantages

A comprehensive guide put together by Smarter Technologies enlists the pros of smart farming.

- **No human error:** Using smart sensors reduces manual work, and thus human error. For example, a person taking a cow's temperature could take or record an inaccurate reading; whereas a temperature bolus inserted into the rumen of the cow sends accurate temperature data straight to a management dashboard.
- **Data collection and analysis:** Data collected by smart agriculture sensors can be used to track the state of the business as well as security, staff performance, equipment efficiency and so much more.
- **More control over internal processes:** With more control (even remotely), farmers can reduce risks and plan better. For example, if they know exactly how large their yield is going to be, they can ensure that they find enough buyers and their product won't lie around unsold.
- **Enhanced product quality and yield:** Automation allows farmers to achieve better control over the production process and maintain higher standards of crop quality and higher yields.
- **Improved efficiency:** Increase agricultural efficiency through process automation. Smart devices can help farmers automate operations such as irrigation, fertilising and pest control.
- **Reduced human resources:** Because smart technology automates manual processes, this reduces reliance on human resources. For example, instead of heading out into the fields to

Farmers can use sensors to measure the pH levels of soil as well as soil nutrient levels. This allows farmers to plant the right crops in the right soil and ultimately produce higher quality produce.

locate cattle, a cattle collar connected to the IoT can report back on an animal's location data in real time.

- **Saving on insurance premiums:** Farmers in the UK were able to save an average of 10% on insurance premiums by mitigating the risk of loss and damage from thieves and vandals, livestock and crop disease, trespassers and unleashed dogs.
- **Early disease detection and prevention:** Lower mortality rates and ensure a healthier herd with technologies like a livestock bolus, which reports on an animal's internal temperature in real time.
- **Beef up security:** Smart sensors can detect unwanted activities happening on the farm, such as gates opening, assets being tampered with, livestock crossing geofenced locations and more. IoT technologies can help protect the storage of crops, fertiliser and fuel, secure farm perimeters and buildings and safeguard workers.

Telecom companies play a big role

The World Bank and African Development Bank reported that there are 650mn mobile users in Africa, surpassing the number in the US and Europe. This proves that many African countries have extremely high cellphone penetration – an important factor in driving digital inclusion and helping benefit from real-time data. This can boost crop yields, soil quality analysis, resource management, tracking of livestock, farm security management, sustainable pest control and reduction of post-harvest wastage.

Although the cost of data can still be high, some African countries have more access to a mobile phone than to clean water, a bank account or electricity.

According to DispatchLIVE, to leverage the power of the IoT, MTN, present in 19 African countries, has partnered with Aotoso Technology in a proof-of-concept process to provide connected collars for cattle in the Sudanese cattle market. Using SIM cards on the collar, farmers can, using their cellphones, get vital information about the cattle, which they can use to inform feeding and breeding strategies as well as prevention of cattle theft, even in rural areas.

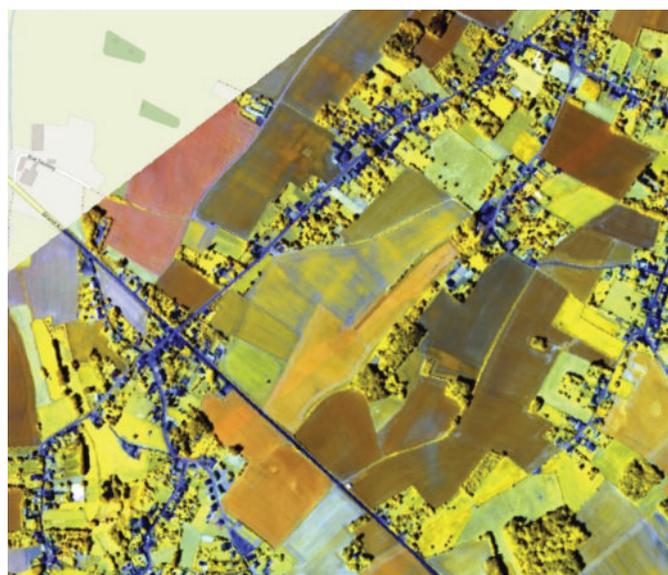
Orange, present in 16 countries in Africa, has co-developed Wazihub, an IoT innovation project that helps mainly informal sector farmers with supervising their livestock and crops for better disease detection and irrigation strategies.

Vodacom's MyFarmWeb collects data from multiple IoT sensors across the farm; the data is then assembled centrally on an app and can be used to make crucial decisions. Rooted 77 Farms use MyFarmWeb and its precision farming technology to gather data in farming corn, soybeans, and sugar beans. This is done by placing sensors across the farming lands measuring soil quality, weather forecasts and yield data.

These solutions have been rolled out more than 3,600 farming operations in Africa. Similarly in Kenya, the founders of AgriTech innovator UjuziKilimo, have combined the IoT to enhance their farming operations by using fast, informed and data-driven decisions.

Farmers can use sensors to measure the pH levels of soil as well as soil nutrient levels. This allows farmers to plant the right crops in the right soil and ultimately produce higher quality produce. The ability to use technology to improve decision-making for small-scale farmers was critical. 

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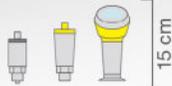


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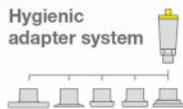
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- Process malfunction

Compact design



Hygienic adapter system



IO-Link

Adjustment via
smartphone



Netafim is working with the International Financial Corporation to bring drip irrigation systems and training programmes to women farmers, and other irrigation initiatives are underway.

New-age irrigation systems drive Africa's agri sector ahead

IRRIGATION IN AFRICA is witnessing a transformation as companies are coming up with alternatives to traditional irrigational systems. While InfraCo Africa and Bonergie Irrigation have signed new agreements to continue scaling up access to solar-powered irrigation solutions in Senegal, Aptech Africa is working on a solar-powered system at Njala University, which includes a drip-irrigation system too.

Following a successful pilot project, InfraCo Africa and Bonergie Irrigation will roll out over 500 drip irrigation systems, which are designed to optimise the efficiency of irrigation while protecting groundwater sources from over-abstraction. "InfraCo Africa's experience will help us in supplying a minimum of 2,000 pumps and 500 drip irrigation systems to rural farmers in a sustainable way," Gabriele Schwarz, CEO of Bonergie Irrigation SAS told *ESI Africa*.

The irrigation system set up by Aptech Africa uses solar power to pump water from a borehole to a reservoir tank and outlet water filter. The system uses gravity-fed drip irrigation. The system is fitted in a 100m x 50m greenhouse, as well as 1ha of farm land that is divided into 10 plots, each with a set of terminal driplines. The University has a School of Agriculture which is focused on teaching best agriculture techniques such as solar water pumping for irrigation.

In Niger, drip irrigation has helped female farmers in more ways than one. Netafim has trained tens of thousands of farmers, including women, to use its products effectively, enabling farmers to reduce waste and increase their incomes. The company is working with the International Financial Corporation, to bring microcredit and drip irrigation systems and training programmes to these farmers. Another example of an innovation in the irrigation industry is Responsive Drip Irrigation Growstream. When crops and



Image Credit: Adobe Stock

Trends predict that the African agricultural irrigation machinery market will see growth in the next few years.

plants need water and nutrients, they emit root exudates that allow them to consume what they need from the surrounding soil. The RDI system responds and interacts with these root exudates, allowing water and nutrients to be released out of the billions of 'smart micropores' in the tubing. The system provides a slow-release delivery of water flow that matches the roots' absorption capacity. When the plant is satisfied, it stops producing root exudates and GrowStream stops releasing water.

Meanwhile, Ouagadougou, the capital of Burkina Faso, has launched a vast programme to promote micro-irrigation, with some 2,000ha already developed with this cultivation technique. This method aims to bring water to the foot of the plant, which is usually drip-fed, through a surface or underground distribution network, avoiding evaporation as much as possible. Netafim is deploying this technology in Niger. The US non-governmental organisation IDE, which has supported initiatives in Burkina Faso, has more recently conducted trials in Gambia and South Africa.

The Food and Agriculture Organisation (FAO) of the United Nations has provided US\$350,000 in technical support for irrigation farming in Nigeria. The project, which will be implemented until December 2022, concerns Niger State in particular. Minister of Water Resources, Suleiman Adamu told reporters, "The project will identify and replace flood irrigation systems with water and electricity efficient drip irrigation systems."

Trends predict that the African Agricultural Irrigation Machinery Market is about to see a fair share of growth in the next few years. Mordor Intelligence reports suggest that it is estimated to grow at a CAGR of 7.45% during 2020-2025.

Drip irrigation is the most efficient water delivery system for crops and is particularly useful in sub-Saharan Africa, where water deficit is the most important factor limiting yields in agriculture. It delivers water and nutrients directly to the plant's roots zone, in the right amounts and at the right time. Thanks to drip irrigation, farmers can produce higher yields while saving on water as well as fertilisers, energy and even crop protection products. However, it also leads to minor issues like clogging. If not maintained, the drip line holes can prevent the flow of water. Some other problems are the need for installation and routine check of the drip lines. **E**

Ouagadougou, the capital of Burkina Faso, has launched a vast programme to promote micro-irrigation, with some 2,000ha already developed with this cultivation technique.

FLYING TO NEW BOUNDARIES



Through an OpenAg™ purpose we are building a network that redefines the way an entire industry thinks and works – open to fresh ideas, innovative ways and solutions to create a sustainable way forward for all.

Evonik has spent decades conducting science-based research in the field of animal health and nutrition where the company ended up with a comprehensive gut health concept for different animal species, broiler, layer, and swine.

Image Credit: Adobe Stock

Evonik has created a holistic approach to tackle gut health related challenges based on a unique set of solutions, like low crude protein concept, amino acids portfolio, probiotics, and AMINO services programme.

Evonik Gut Health concept: A new solution to tackle gut challenges

UNDER THE CURRENT conditions of the animal production industry, there are many challenges compromising profitability. These include fluctuating prices and qualities of raw material, the availability of feed ingredients, cost pressure, the need to reduce or eliminate the use of antibiotic growth promoters, along with consumers' desires for higher standards of animal protein.

To ensure the industry's economic success, we need a different understanding of the health status of the animals where gut health plays a major role. That is simply because the gut serves as a barrier preventing bacteria from passing through gut lumen, and responsible for proper immune function and nutrient digestibility.

In fact, a bird is very responsive towards its farming environment, feed, and digestive system. Any interaction between the external environment surrounding the birds and the feed consumed, will affect its gut microbiota, leading to a change in its gut morphology and in turn impair the nutrients' digestibility and absorption.

With this, Evonik has spent decades conducting science-based research in the field of animal health and nutrition where the company ended up with a comprehensive gut health concept for different animal species, broiler, layer and swine.

Comprehensive gut health concept

In the broiler concept, it clearly identified the main challenges like heat stress, high crude protein diets, diets with AGPs or antinutritional factors, coccidiosis, and pathogenic bacteria. All these issues have a direct impact on the GIT, especially when one, or many of them, leads to an imbalance in the system. This can result in poor animal performance, lower flock uniformity, higher mortality and poor litter and air quality. If not treated and solved, they can create a vicious circle.

As a solution for this, Evonik has created a holistic approach to tackle these challenges based on a unique set of solutions, like low crude protein concept, amino acids portfolio, probiotics, and AMINO services programme.

Implementing Evonik's concept by combining good farming management with Evonik products, services, and nutritional solutions, will balance the intestinal eco-system and ensure animal health, end-product quality and saving costs.

This concept also creates a positive environmental impact by reducing green-house gas emission and nitrogen exertion while ensuring economic success and social well-being and safety.

Implementing Evonik's concept by combining good farming management with Evonik's nutritional solutions, will balance the intestinal eco-system and ensure animal health.

For Middle East & Africa

For partners in the Middle East and Africa, Evonik experts are ready to work on their specific challenges, analysing the situation and implementing the company's concepts, to prevent any negative effect on birds' health and performance. Finally yet importantly, the company is confident that applying such concepts to their business will make a difference, especially because all of the improvements gained are proven by scientific feeding trials. 

For more details about the concept, please contact Evonik local expertise in your market.



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CARFED International offers nestable and stackable trays for all foodstuffs

CARFED INTERNATIONAL LTD, a worldwide leader for live bird plastic crates, offers a 60x40x30 cm code 643 FF tray, which is nestable and stackable. It is suitable for freezing at -40°C and for contact with food, and comes in red, with perforated sides and bottom. This tray is suitable for all foodstuffs, such as processed meat, grapes, olives, cheese, vegetables, etc.

This is just one in a full range of plastic crates offered by the company in different sizes, with various options available such as perforated sides and bottom, perforated sides and solid bottom, and solid sides and bottom.

Proper storing and transport of fresh produce from the farm to

market will help reduce the potential for microbial contamination or damage to fruits and vegetables. It is the responsibility of everyone in the transportation chain to maintain the quality and safety of the produce. CARFED offers top quality equipment for this purpose at affordable rates.

The company exports to more than 98 countries by means of high technology production facilities, efficient and modern tools, professional knowledge, strong organisation and a wide distributors network.

All of its trays are made of high density polyethylene, are UV-ray resistant and can be used in a range of temperatures from -40°C to +120°C. All trays are suitable for food.

The company also offers trays and crates for poultry and pig transportation, equipment for poultry farms and processing plants, and collapsible poultry / turkey baskets and frames.



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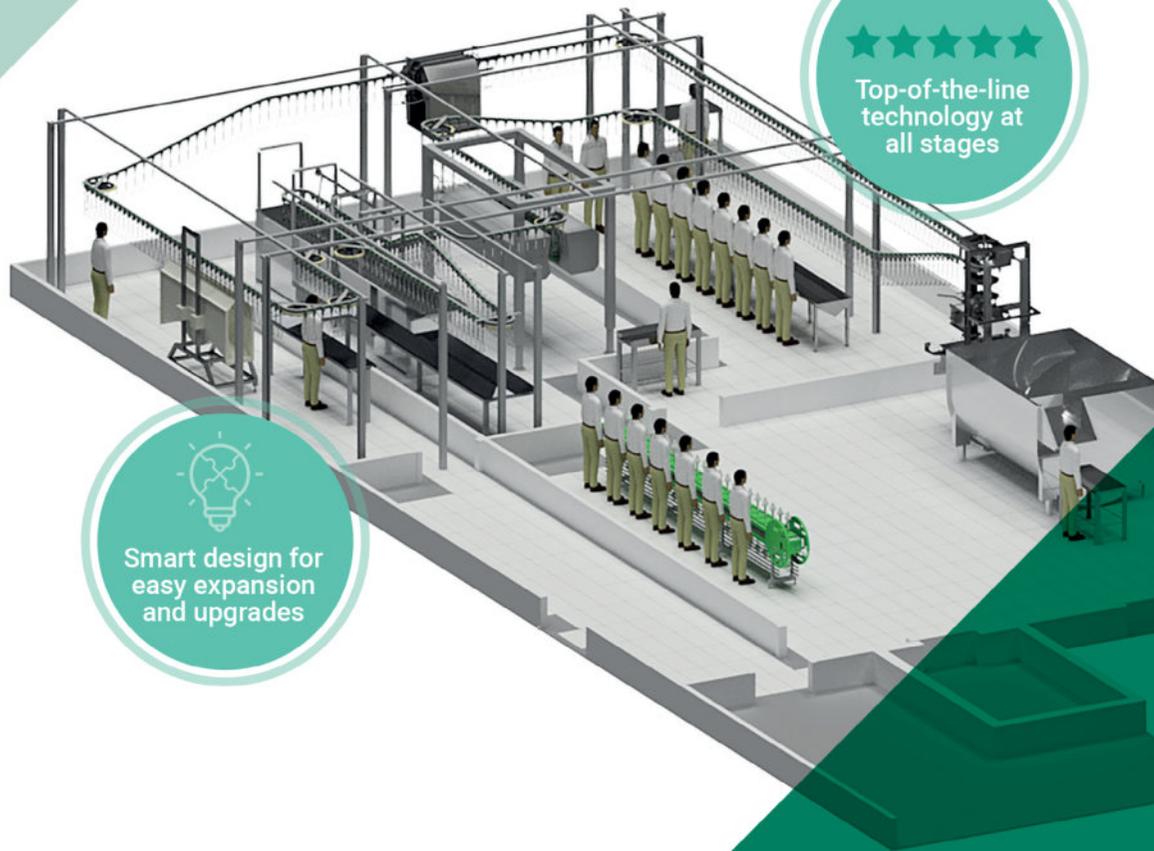
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