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ISSUE 6 FEBRUARY / MARCH 2022

Poultry Bulletin

THE TECHNOLOGY ISSUE

OFFICIAL MAGAZINE OF THE SOUTH AFRICAN POULTRY ASSOCIATION

SEXING EGGS, BIRD FLU VAX AND OTHER POULTRY INNOVATIONS

FRAUD ALERT

BEWARE OF EASTER SCAMS!

Bogus birds and avian imposters

TIME FOR AN UPGRADE?

WHAT AN EGG-GRADING SYSTEM CAN DO FOR YOU

When America took on South African ostriches

...and failed

5 WAYS TECH HIT THE SPOT

How poultry was launched into the future

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The latest chicken intel dissected and organised

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If you've ever read up on the history of the chicken you'll know that it is only in the last 100 years or so that our favourite bird became the affordable, ever-present dinner staple that is the broiler of today. Technology has enabled commercial farming of chickens on a scale that was unimaginable before, and this march of progress is only going in one direction... ever forward. The pressure is on farmers to keep up or be left behind.

In this issue we unpack the five biggest technological developments that fundamentally changed the industry (p26), review some of the most exciting future tech in poultry (p37) and hear from farmers how technology is making their lives easier (p58). We look at how the technology behind egg-grading systems is ramping up in sophistication (p52) and quiz the experts on when to know when the time is right to invest in an expensive new technology (p60).

With Easter around the corner, broiler farmers everywhere are planning their production cycles so that they will be ready for the long weekend when everyone wants a juicy chicken for the pot. This leads to a chick shortage, and unfortunately, people fall prey to scams. Learn how to avoid being one of the unlucky ones (p12).

We are surrounded by technology wherever we turn in 2022. Here's to finding the best way it can serve you in your business.

Melinda
editor@poultrybulletin.co.za
@melshaw001

THE TECH ISSUE

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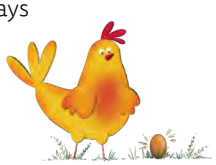

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Poultry Bulletin

The official magazine of the South African Poultry Association (SAPA).

Visit the website at **www.sapoultry.co.za**

Published by Poultry Bulletin Publications (Pty) Ltd, Wild Fig Business Park, Block C, 1494 Cranberry Street, Honeydew, Extension 19. Postal address PO Box 1202, Honeydew, 2040.

About the magazine

For private circulation only.

Content printed in this publication does not necessarily represent the views, policies or opinions of SAPA, the publisher, or editor, who accept no liability of any nature arising from or in connection with the contents of the magazine.

Editorial team

Editor: Melinda Shaw
editor@poultrybulletin.co.za

Editorial board: Gary Arnold, Izaak Breitenbach, Christopher Mason, Marthinus Stander, Vincent Sharp, Aziz Sulliman, Adel van der Merwe

Design and layout: Twisted Toast

Contributors: Michael Acott, Alyn Adams, Jason Bronkhorst, Ellen Heydenrych, Glenneis Kriel, Charmain Lines, Diane McCarthy, Anél Roets, Malapane K Thamaga

Advertising & production

Ad sales & production manager: Louisa Nel
Email: advertising@poultrybulletin.co.za
Tel: +27 11 795 9920
Fax: +27 86 627 5897

Printing and binding: Seriti Printing

Distribution: The Tree House

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A watershed moment

Dear members

As an industry we survived a number of tough challenges last year, and it was heartening to start 2022 knowing that one of our biggest ongoing worries has been definitively addressed.

I speak of the new provisional antidumping tariffs announced by the International Trade Administration Commission (ITAC). South Africa's chicken producers have suffered under the suppressing effect of predatory trade for years, which has kept an inherently healthy and globally efficient industry from expanding and developing.

Market share of our local producers was eroded by the leftovers of the Brazilian and EU industries, dumped here to elbow South African products off retailers' shelves.

The scope of the tariffs that were imposed indicate just how unfair the competition has been: they range between 67% and 265%, which mirrors the difference between the actual production cost of the product or its price back in the countries where it came from, and the much reduced price at which it was selling into South Africa.

Brazil, Ireland, Poland, Spain and Denmark will from now on be compelled to pay the difference in tariffs to the South African Revenue Service, to level the playing field for local producers and give them an even chance to build sustainable businesses, and thrive, in their home market.

More importantly, ITAC's decision confirms once and for all that dumping is real and has inflicted material harm on this crucial local industry which plays such a key role in job creation and food security. Moreover, it has found that there is an indisputable link between dumping and the damage.

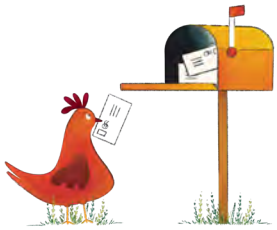
'ITAC's decision confirms once and for all that dumping is real and has inflicted material harm on the industry, and that there is an indisputable link between dumping and the damage suffered'

This decision signals a watershed moment for the poultry industry. The elimination of unfair trade will stimulate local production which in turn will create more jobs and bring transformation and economic growth to the benefit of South Africa as a whole.

We should note that the tariffs will not affect the many imported products that are traded fairly with our valuable international trade partners; but only curtail those that are noncompetitive and contravene global fair trade practices.

In the coming year we look forward to a revision of all trade measures and an increase in growth to catch up to the industry's real production capacity, and we are hopeful to bring avian flu under control. As the second biggest agriculture sector, poultry's growth will reverberate along a vast value chain that includes the grain industry, transport, pharmacology, packaging, retail and so much more.

Aziz Sulliman
Chairman, SAPA



LETTERS

Readers share their views and extend an invitation to a training series

Masterclasses for farmers

Poultry Bulletin readers and anyone who is interested in learning more about poultry farming are invited to book for AfriFarm Crowd's next round of the Chicken Farming Masterclass. We have offered this popular masterclass series since 2018.

The training we provide is aimed at giving people the tools they need to start and run their own farms, with the two-pronged result of creating employment and self-employment, and contributing towards food security in South Africa.

We have finalised 13 dates between February and May around the country to reach as many farmers as possible. Your R700 ticket includes a broiler and a layer business plan, and lunch. Dates are as follows: February 5: Midrand Gallagher Hotel, 6: Pretoria, 19: Polokwane, 26: Witbank; March 5: Durban, 12: Umthata, 13: East London; April 9: Mafikeng, 10: Kuruman, 29:Welkom; May 1: Bloemfontein, 7: Nelspruit, 17: Qeberha. Our book *Chicken Farming Master – how to make money from chicken farming* will be for sale for R200. For more info, email sammy@afrifarmcrowd.com or Whatsapp 067 003 0635

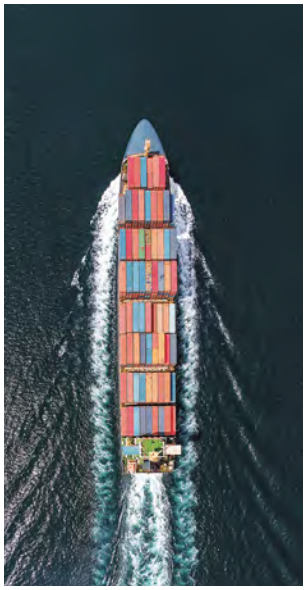
Sammy Sehoana
AfriFarm Crowd

Tips from farmer to farmer

I was so excited to be featured in *Poultry Bulletin* Dec/Jan issue, sharing my hack on how I saved on energy. My purpose-built wood-burning stove helped me save on electricity as I started rearing layers in winter. It is a great innovation to use if you have a source of wood. Thank you *Poultry Bulletin* for the opportunity!

Suzen Masingi via Twitter

We want to hear from you. Send your letters to editor@poultrybulletin.co.za



A view of localisation

Thank you for publishing my letter in the December/January issue.

SAPA's chairman suggests in his response that AMIE leaked confidential meeting documents to me. I clearly stated that there has been zero contact between AMIE management and myself for a considerable time. This is a fact.

AMIE has leaked nothing to me. The meeting minutes and documents that I have seen do not come from the importers' side of the table. Their contents are well known and I have not misunderstood or misrepresented anything.

I clearly said for months that dumping could very possibly be occurring but not to the extent that has been claimed. I also said that the application would succeed because it all forms part of the localisation strategy which makes up the spine of the poultry master plan.

I do not agree with importers on all issues (that's why we are at odds) and I have great respect for SAPA and its achievements. This also applies to the management teams of the local poultry companies. They are superb.

However I don't think that localisation will be an effective policy in this industry. It will benefit a few but hurt many more. Time will tell.

Thank you for giving me the space to express my views so openly. That says much about the integrity of your magazine and the industry you represent.

David Wolpert

NEWS IN BRIEF

A roundup of the industry's latest news, hot off the press

Compiled by **Charmain Lines**

Transformation is a growing reality

Chadé Groenewald welcomes the first 80 000 chicks in her expanded new facility

On Friday, 21 January, the placement of 80 000 day-old chicks at CUTT Agriculture marked a milestone on owner Chadé Groenewald's journey to become a large-scale chicken farmer. An expansion project funded by DALRRD and project-managed by SAPA has resulted in infrastructure that allows Groenewald to raise 135 000 broilers per cycle. She has concluded a supply agreement with Sovereign Foods.

Groenewald's story is but one example of the change that has taken place in the South African poultry industry over the past five years. The numbers speak for themselves.

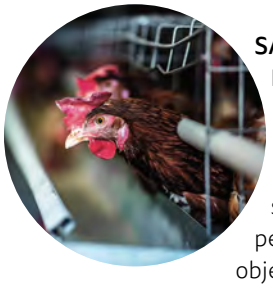
Among SAPA's members, black contract growers currently farm 12.6 million birds – a number set to reach 16 million birds over the course of the next 12 months. In 2020 and 2021 alone, black farmers have built 79 poultry houses to the value of R355 million, while the industry invested a further R1.14 billion to create markets for these additional chickens.

Beyond the material investment, SAPA has supported more than 40 independent producers with business plans, environmental impact analyses and water licences to enable them to farm. A further 40 farmers received assistance with various aspects of their operations. Almost 2 000 emerging farmers received training in different facets of their farming operations, while an additional 1 460 farmers are receiving remote assistance.

The transformation train is steaming along, and more happy tales such as that of Chadé Groenewald is sure to follow.

Photographs: Shutterstock, CUTT Agriculture

New layer breed standards



SAPA's latest Egg Industry Report mentions the introduction of new breed standards, or performance objectives, for layer hens and their impact on feed consumption.

Dr Shelley Johnston from Leading Edge Poultry Software explains that the international genetics companies publish new breed standards every few years. "Genetic improvements to the layer birds are brought about by advanced scientific poultry-breeding programmes," she says. "The aim is to benefit worldwide egg production and to help feed the global population. The implication for egg producers is increased profitability – provided their flock management makes it possible for the hens to achieve their genetic potential."

In recent decades, the focus has been on extending the laying cycle to between 90 and 100 weeks of age. In the 1980s flocks were generally culled when they were about 72 weeks old because of declining egg production and profitability. The Lohmann Brown Lite hen of today, for instance, has the potential to lay 414 eggs to 90 weeks of age while consuming an average of 107 grams of feed per day. The previous target was 407 eggs per hen to 90 weeks with feed consumption averaging 112 grams per day.

In addition to extended laying cycles, the geneticists try to produce a smaller, lighter chicken that will consume less feed and be more robust, thereby improving feed conversion and liveability.

CHICK OF THE MONTH

Dracula's chicken of choice?

They might not be the prettiest chickens in the coop, but Naked Necks sure are some of the most interesting. They are not a cross between a chicken and a turkey as some people believe (the two species can't breed), and their lack of feathers is not a sign of illness – that's just how they roll. Not only are their necks featherless, their bums are too, leaving them with about 50% less feathers than other chickens. This means they cannot fly at all – not enough feathers, you see – but are super easy to pluck. They also cleverly use the energy they don't need to grow feathers, to produce more and better meat. Combined with less plucking, this makes Naked Necks an excellent dinner-table breed. They are also consistent egg layers and, reportedly, have lovely personalities.

Naked Necks originate from Romania, more specifically Transylvania, as if Count Dracula himself bred them for easy neck access...

National layer flock recovers well

During the 2021 HPAI outbreak, around 2.2 million hens had to be culled, which was around 7% of the national flock. Estimated at around 27 million hens before the outbreak, the flock was deemed to be back up to 26.8 million hens by November 2021.

Based on pullets hatched, the number of laying hens is projected to reach 27.5 million in February 2022. "We are pleased and grateful that the national flock has recovered so well and so quickly," says Dr Abongile Balarane, general manager of SAPA's Egg Organisation. "To some extent the numbers hide the hardship suffered by those egg farmers who lost their entire flocks, but SAPA supports them as far as possible as they rebuild their businesses."

The current supply and demand of eggs in South Africa is well balanced, with no shortages and imports expected. Dr Balarane notes that egg exports to the SADC region were reduced to balance local supply and demand at the height of the HPAI outbreak.

Don't miss out on grants

Employers who qualify should ensure they apply for mandatory grant payments.

The AgriSETA raises funds for skills development through a skills levy paid by employers with an annual payroll greater than R500 000. In turn, employers can get 20% of that levy back to use for training, provided that:

- They are registered with SARS in terms of the SDL Act.
- Their levies are paid up.
- They have submitted their annual training report (ATR) and workplace skills planning (WSP) accurately and on time.

The closing date for the last financial year's ATR and the next financial year's WSP is Sunday 30 April 2022. Be sure to get your paperwork in on time. For any enquiries, send an email to mandatorygrants@agriseta.co.za

NOTICES

No AVI Africa this year

After careful consideration of the global situation with the Covid-19 pandemic, SAPA's board took the decision to cancel the AVI Africa 2022 conference. SAPA agrees with many of our regular exhibitors who expressed ongoing concern about large gatherings, and looks forward to a stabilised situation in 2023.

AI stops Spanish imports

An outbreak of avian influenza in Spain in January has led to the Directorate Animal Health of South Africa suspending all imports of live poultry, meat and eggs from the EU country into South Africa. Heat-processed poultry products are exempted from the ban.

Poultry needs investment in grain-sector technology

By **Malapane Thamaga**

The National Development Plan (NDP) recognises the poultry sector as an industry with significant growth potential. This sentiment is shared in the poultry master plan and the highly anticipated agriculture and agro-processing master plan (AAMP). However, this potential is unlikely to be realised if South Africa's level of technology adoption and development remains stagnant along the poultry value chain, especially in feed production which amounts to 60–70% of input costs for poultry farmers. This is significant and it's likely to increase with the rise in prices of fertiliser and fuel needed to produce grain for feed.

According to DALRRD, it is estimated that the average inclusion rates for grains in feed production is 47%, 13% and 5% for maize, soya-bean meal and sunflower seed and oilcake, respectively. Consequently, there is strong correlation between the success or otherwise of the poultry industry and the international trade dynamics in the grain sector, especially maize and soya-bean production. So it's not surprising that poultry farmers obsess about developments in the grain sector, especially around what could be done to manage grain-price fluctuations. One such possible solution is investment in innovation and technology in the grain sector. The areas that are worth exploring include climate-smart agriculture, weather-based index insurance and revolutionising small-scale poultry farming.

Grain farmers are faced with climate change, increasing labour costs and unpredictable fuel and fertiliser prices. It is important that innovative and technology-driven solutions are constantly sought and refined, including the production of seeds that are drought-tolerant, water-efficient and resistant to infestation by the fall armyworm. And just as important is to have these varieties accessible to the whole maize industry, including emerging farmers, which in turn would boost the poultry industry in feed production.

'SAPA may consider introducing a clustering strategy to enable small-scale farmers to work together, integrate vertically and horizontally and in the process enjoy the benefits of economies of scale'

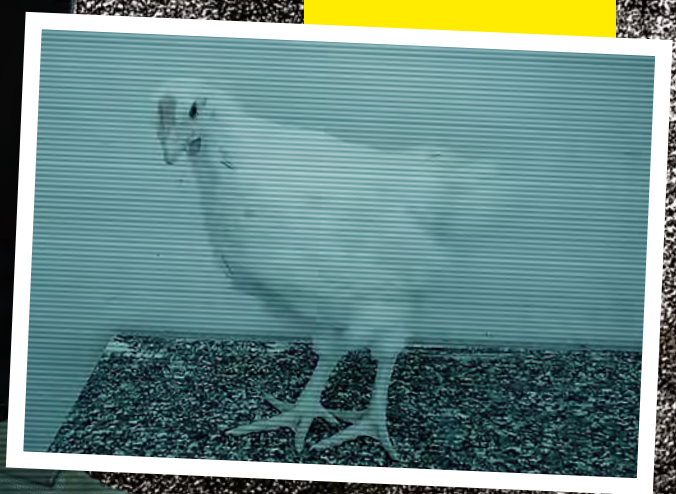
Secondly, we should explore adopting weather-based index insurance, administered through mobile phones and using weather indexes such as rainfall to determine pay-outs. This may be an incentive for farmers to plant more types of grains in less expensive ways to cater for bad seasons as it does away with the moral-hazard dilemma and high administration costs associated with traditional insurance. Unfortunately, SA lags behind our neighbours in Malawi, Zimbabwe, Zambia and Tanzania.

Lastly, there is a huge untapped potential in small-scale producers who're held back by the high costs that comes with producing at a smaller scale. SAPA may consider introducing a clustering strategy to enable small-scale farmers to work together and in the process enjoy the benefits of economies of scale. This strategy may encourage small-scale farmers to market their produce as a collective, purchase inputs together and enter agro-processing schemes as a collective. In this way, government and industry interventions geared towards technology adoption becomes easier and the industry may realise the vision and objectives as set-out in the NDP, AAMP and the poultry master plan.

Malapane Thamaga is an agricultural economist, former national manager of the African Farmers Association of South Africa (Afasa), and a ministerial representative on the Maize Trust. He hosts regular webinars under the auspices of The Agricultural Transformation Focus

FAKE CHICKS AND OTHER SCAMS

Stay away from unknown suppliers as you prep for a bumper Easter, or you might just burn your fingers. **Glenneis Kriel** reports



Layer cockerels have no value in the chicken-for-meat market.

Photographs: Supplied. Graphic: Shutterstock

FRAUD ALERT!

It happens every festive season, and this past December broiler producers Dikeledi Mashigo from Pretoria and Maphate Rakome from Nobody in Polokwane were the unlucky ones who joined the ranks of the scammed, learning a tough lesson that cost them time, money and goodwill.

Neither Mashigo nor Rakome thought this was something that would ever happen to them, yet they fell prey to two different scammers.

Their problems started when they sourced chicks via new avenues due to the shortage that usually occurs over the festive season. "I knew I had to be wary of scams, but thought the supplier was legit as she claimed to be endorsed by a well-known feed company," Mashigo says.

Rakoma, on the other hand, trusted the judgment of her supplier when he told her that he would have to source chicks via a new avenue, because he had supplied her with good-quality chicks for over a year.

Dikeledi Mashigo was misled by a fake endorsement

Maimela and Boikano Rakoma with the day-old chicks that later turned out to be layer cockerels instead of the broilers that were bought

The rip-off

Things went south soon after they received their chicks. Says Rakoma, "I suspected something was wrong when I did not see any vaccination stains on the chicks and noticed one with brown markings, but my supplier reassured me that all was fine."

She and Mashigo also both noted these chicks were livelier, noisier and jumpier than their past batches, something that became more obvious as time went by. In addition, the birds did not eat well, with feeders' contents hardly being halved at the end of each day.

They were soon to learn that they had both been scammed: what they thought were broiler chicks – birds specifically selected to grow fast for the meat market – were in fact layer cockerels.

Rakoma halted production after two days, when her scale showed that the chicks weighed even less than when they arrived on the farm. Mashigo kept going for two weeks and three days, before realising they were eating into her profits.

"I lost the R11 000 I paid for the thousand birds, along with the feeding, rental and electricity expenses to keep them. And of course, I lost all of the festive season income I had budgeted for," Mashigo says.

Rakoma estimates her losses at around R28 000, as her 2 000 chicks cost her R20 000 and feed and water amounted to R8 000.

No-one wanted the birds, so the farmers had to give them away, and so far, neither have been compensated for their losses.

Says Mashigo, "I tried to solve the situation amicably with the supplier, but only got empty promises. I now know it might have been better to go to the police straight away."

Rakoma, on the other hand, is

Dikeledi Mashigo realised there was something wrong when the chicks did not eat as much, or pick up weight at the rate that broilers would

sympathetic to her supplier, Edzisani Mulaudzi of Gizmmo Poultry, as the scammer had also defrauded him.

Mulaudzi says his problems developed because he'd received a number of "impromptu orders" late in the year from extra customers wanting to take advantage of the festive season demand.

"It takes 21 days to incubate eggs, so I need to know a month in advance how many chicks my clients want by when. For ease of planning, most bigger hatcheries actually require production plans for the whole year."

While some of Mulaudzi's clients supply him with an annual production calendar or notify him of their production plans a month in advance, many only give him a week's notice, making proper planning impossible.

"Under normal circumstances I can accommodate impromptu orders by sourcing chicks from other reputable hatcheries, but during times of shortages such as Easter and Christmas this is really difficult. In an attempt to accommodate everyone, I therefore took a chance on a new supplier," Mulaudzi says.

Nothing was wrong with the first few batches of day-old chicks (DOCs) he received, but, unknown to Mulaudzi, the ones delivered thereafter contained a mix of broilers and layer cockerels.

"Unfortunately, it takes about three weeks before one can see there is something wrong with the birds, so I only started getting complaints from about 10 December. At that stage there was not much I could do, and the guy I bought them from had vanished," Mulaudzi says.

Mulaudzi has reported the incident to the police, but has had no answers. He has since appointed a private investigator to help him catch the con man, and is working hard to replace at least half of the 15 000 chicks he sold to more than 70 of his clients.

"I have a small hatchery. This has been a severe blow to me," Mulaudzi says.

The scam was not limited to Mulaudzi, Rakome and Mashigo either. Other farmers came forward and told similar stories after Mashigo lamented her lot on social media.

'Con artists particularly prey on small operators during times of shortages, such as in the runup to Easter'

Easy prey

Unfortunately scams are on the rise across the agricultural sector, and with the proliferation of social media and digital platforms, fraudsters have new avenues to exploit. According to Christopher Mason, operations and sustainability manager at SAPA, they have seen a steep increase of similar dirty tricks over the past two years.

"Anybody can be scammed, but in our industry con artists particularly prey upon small operators during times of shortages, as in the runup to Easter or Christmas. Some people only raise chickens at these times of increased demand, and they can fall prey to fraudsters who get hold of discarded cockerels that have no value, and sell them as broilers."

Commercial farmers are less vulnerable as they generally have long-term relationships and contracts with suppliers that are structured around the ebb and flow of demand for chicken, Mason says.

The formal market basically sorts itself out, as commercial suppliers of broiler chicks wouldn't risk supplying incorrect product to clients. In the informal market, however, anything goes, especially when buyers are desperate for affordable deals or to get hold of chicks when there aren't any.

Livhuwani Mudau, a scientist at the Directorate of Animal Production, says that the Department of Agriculture Rural Development and Land Reform (DALRRD) also receives regular complaints about scams and confirms that it is mostly smallholder and emerging farmers who are affected.

"There are numerous reasons why these groups are more vulnerable, ranging from poor planning, ad hoc ordering and a lack of infrastructure, to the fact that they hop from one supplier to another. The situation is exacerbated by a lack of or poor market access, which makes it difficult for them to know when their stock will be depleted, and plan orders in advance," Mudau says.

Soon after posting a happy photo of her son and niece with her new day-old chicks, Maphate Rakoma was back on Twitter, sharing the shock news that she had been scammed and lost all the money she had invested

The scam

A con can take various forms, according to Mason. The farmer might buy equipment, layers or broilers online or via WhatsApp, after which the seller disappears without a trace; or the buyer might receive an inferior product, or the wrong thing altogether, as happened with Rakoma and Mashigo.

"Fraudsters might set up their digital platforms with fake details that

SCAM-PROOF YOURSELF

- **If it sounds too good to be true, it probably is.** Ten to one, something is wrong if someone is able to supply you with DOCs at a time when most suppliers have low supplies.
- **You get what you pay for.** You should see a red flag if prices are below market average.
- **Check the credentials of the supplier.** It is becoming easier to forge and steal identities, so do a solid background check. It is not enough to read reviews or look for information on the supplier's website. If the supplier claims to be a representative of a specific company, phone the company to verify this. Also ask for references and talk to other buyers or check social media to hear if others were happy with the service. Both SAPA and officials at DALRRD will be able to assist you.
- **Keep records.** Take photos, keep records and save your correspondence to create a trail of evidence in case things go wrong.
- **Only buy from reputable companies.** Once you have found a reputable supplier stick with them, as most will be quick to act if you experience any problems with their products. SAPA has a list of accredited suppliers.
- **Try to buy DOCs directly from reputable hatcheries** and get on their production calendar.

mimic those of legitimate, well-known companies, including misappropriated logos, websites, locations, or similar-sounding names," he says. These crooks tend to delete their details as soon as their fraud has been executed.

From its side, SAPA addresses the problem with farmer education and clear warnings on its website, but it is largely up to farmers to scam-proof themselves.

Mason says SAPA encourages farmers to only buy equipment and birds from suppliers accredited by the association. "For a monthly fee suppliers can become allied members of SAPA , and then share in membership benefits and agree to comply with our code of conduct. These are people we can trace and who are legitimate."

According to Mudau DALRRD also offers credential checks and farmer education in the form of information days where, for instance, a hatchery owner might be brought on board to give advice on how to identify good-quality chicks.

Going forward, Mashigo and Rakoma have vowed to never buy poultry from unknown sources again. Mashigo has gone back to her old supplier, while Rakoma has approached a commercial farmer to set her up with a reputable commercial supplier.

"Smallholder farmers really struggle to get a direct line to commercial suppliers, but once you have managed to get on such a supplier's books, you can supply them with your production calendar to ensure you have chicks when you need them, and also benefit from good production support," Rakoma says.

Easter is approaching, and with it another peak time of demand. Mudau cautions farmers to be sceptical when faced with social media offers of chicks when there is a shortage everywhere. "Rather do your homework for the next peak time, and save yourself the heartache."

THE COCKEREL SCAM

Broiler chicks are generally not sexed before they are supplied to broiler farmers, as both male and female birds are used for broiler production.

Layer chicks are however sexed, to enable the removal of cockerels, which are regarded as useless because they cannot lay eggs and do not grow as well as broilers. Layer hens are raised up until point of lay before they are sold to layer producers, whereas male layer chicks are generally culled. These are the chicks that are fraudulently sold on as broiler chicks in the typical scam.

YOU WERE SCAMMED – WHAT NOW?

- **Negotiate a solution.** If your supplier was also scammed as in the case of Rakome and Mulaudzi, try to come to an agreement – either money back or replacement of the product.
- **Report the fraud.** If you report it quickly enough, a bank transaction might still be reversed, and by laying a charge at the police you could help prosecute a fraudster, although this is not a high-priority crime for police. Another option would be to report the fraudster at HelloPeter.com. Also report to your agricultural advisor – while DALRRD doesn't compensate farmers for losses, sharing information might prevent other farmers from becoming victims.
- **Warn others.** Use your social platforms and networks to alert others to con men and their scams.

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MEMBERS' NOTICEBOARD

One of the benefits of being a South African Poultry Association member is the regular reports on all key issues for poultry producers, summarised here into a handy guide for easy reference

Compiled by **Michael Acott**

Producers earning less per chicken in real terms

Despite regular producer price increases, poultry producers in South Africa are actually earning less per chicken now in real terms – that is, after discounting for inflation – than in 2017.

The effect of inflation on producer incomes is highlighted in SAPA's latest key market signals for the broiler industry, covering the third quarter of 2021.

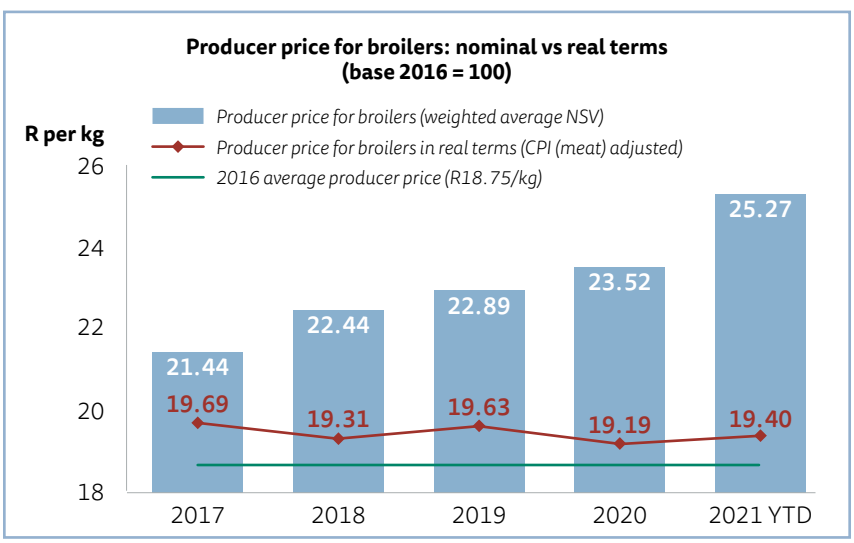
The nominal producer price for broilers has gone up from R21.44 per kg in 2017 to R25.27/kg in the year to September 2021. However, the real price, discounting for inflation, has gone down from R19.69 in 2017 to R19.40 over the same period. Producer prices in 2020 (R19.19/kg) increased by 2.8% from 2019; but in real terms decreased by 2.2%.

The SAPA report also details the significant mark-ups between producer and retail level. For instance, producers received an average of R29.60/kg for whole fresh chicken in the third quarter of last year, while consumers paid an average of R58.89/kg in retail shops.

Average third-quarter mark-ups from producer to retailer were 99% for whole fresh chicken, 124% for fresh chicken portions, 59.2% for individually quick-frozen (IQF) portions and 100% for frozen portions not IQF.

Comparing chicken to other meats such as pork and beef, the report shows that broiler meat and eggs remain the most affordable of all protein sources.

Broiler producer price in nominal and real terms: annual averages 2017 to 2021 YTD (base = December 2016)
Source: SAPA



Photograph: Shutterstock

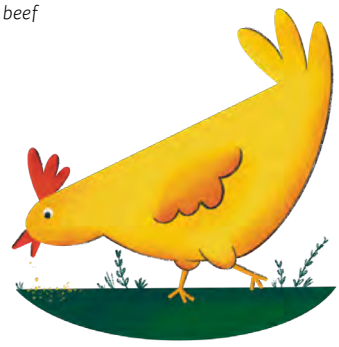
In September 2021, the broiler producer price was R26.72/kg, while pork fetched R25.80/kg, beef classes A2/A3 fetched R51.74/kg and class C2/C3 beef fetched R44.37/kg.

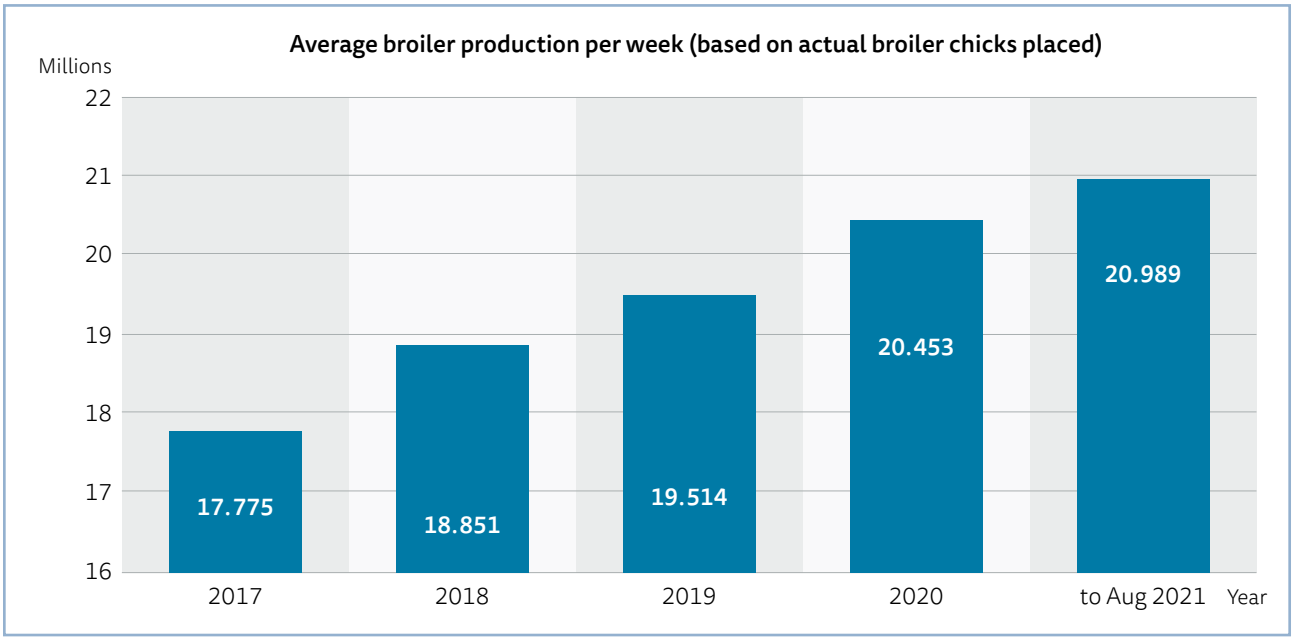
The egg producer price in September 2021 was R23.82/kg (R17.43/dozen).

Broiler feed prices have climbed steadily since mid-2018, so that prices for the nine months to September 2021 are 27% higher than in 2016. The average feed price indicator for the third quarter rose 14.6% on a yearly basis to R7 137 per ton, while the average breeder feed price indicator was up 19.8% over the same period to R5 940 per ton.

Average mark-ups from producer to retailer were 99% for whole fresh chicken, 124% for fresh chicken portions and 59% for individually quick-frozen (IQF) portions

Despite price increases chicken and eggs remain the most affordable of all protein sources, if you compare cost with other meats such as pork and beef





Average weekly production per annum
Source: SAPA

Chicken prices rising faster than production

Broiler production grew by 5.8% in the first half of 2021, but then turned negative, resulting in average growth of 2.9% to September 2021, the latest figures available.

This follows production increases of 6% in 2018, 3.5% in 2019 and 4.9% in 2020.

Year-on-year price changes remained positive for nine consecutive months to September 2021, and averaged a 10.6% increase.

In September 2021, the monthly broiler producer price increased by R0.46/kg (+ 1.8%). The broiler producer price was estimated at R26.72/kg, with increases in the producer prices of both fresh and frozen chicken. Compared with September 2020, the monthly broiler producer price has increased by 12.2% (+ R2.90). It should be noted that producer prices were still recovering in Q3 2020, after Covid-related lockdowns.

The average yearly price (per kg) for net sales realisation for the first nine months of 2021 is R25.63, an increase of 9.0% over 2020. Average prices increased by 2.7% in 2020 and 2.0% in 2019.

According to the participants in the monthly pricing survey, frozen meat contributed 86.8% of total sales during September 2021, while fresh meat contributed 13.2%.

Price increases for fresh product were slightly lower than for frozen. In September 2021, the producer price for frozen broilers increased to R25.64/kg. This is an increase of 1.5% (+ R0.38) over the previous month and 12.5% (+ R2.84) higher than September 2020.

In the same month, the producer price for fresh broilers increased by 1.1% to R33.85/kg in comparison with the previous month (+ R0.38) and increased by 8.6% (+ R2.69) on a yearly basis.

Are AI controls on the cull trade still needed?

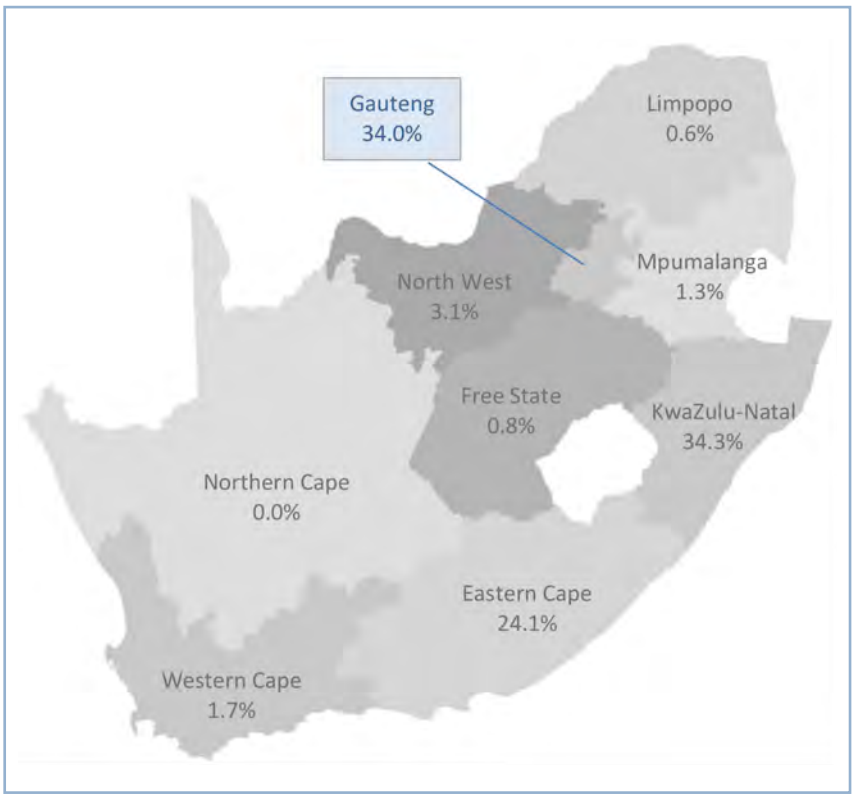
More than a million live chickens were bought and sold by cull traders in the fourth quarter of last year, after apparent decreases in the two previous quarters. However concerns remain that some producers and traders are not registering or reporting as required.

Based on information for Q4, a total of 1 098 335 live birds were purchased by cull traders and 1 228 632 birds were distributed into the market during that period.

These chickens are distributed in the informal economy in townships and rural areas and are part of the poultry value chain.

Because of outbreaks of highly pathogenic avian influenza (HPAI), the movement of live birds has been regulated since 2017 to manage the risks posed by their transportation. Cull buyers have to be registered, and both producers and cull buyers must report transactions, which are consolidated.

Permits are required to remove flocks from farms, and to move live birds across provincial and national boundaries. In its latest cull trade report, SAPA noted once again that reported sales from farms were far below the totals expected, "suggesting either that cull birds are being moved without the required permits, or that the permits are no longer being submitted to Silverpath Consulting". Silverpath has been contracted by the Poultry Diseases Management Agency (PDMA) to manage the system.

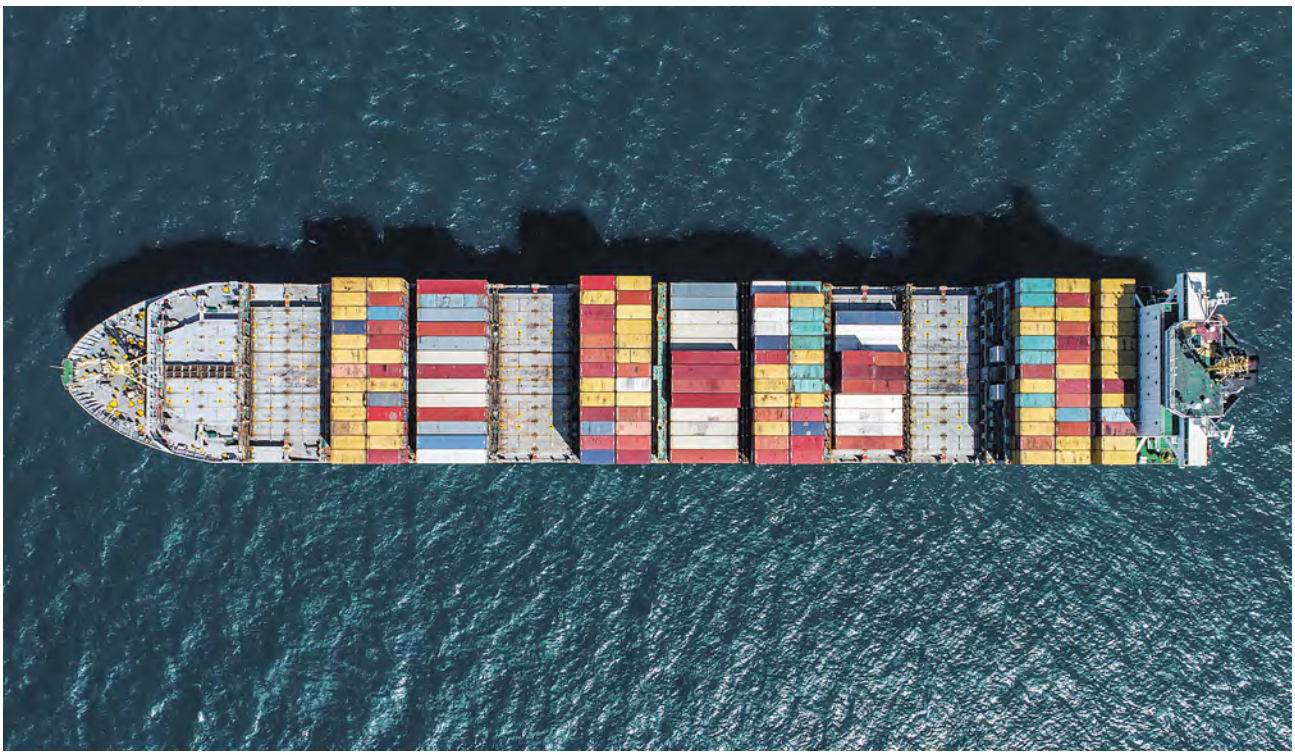


▲ *Provincial purchases of cull birds from farms in Q4 2021*
Source: SAPA

SAPA had previously urged all poultry producers and traders to comply with the "Protocol for the sale of live poultry" issued by the Directorate of Animal Health, including the requirement to obtain removal permits for live birds.

However, in view of the declining reporting levels, it says the Department of Agriculture, Land Reform and Rural Development needs to decide "whether the control of the movement of live birds is still of importance to the poultry industry, given that the threat of further outbreaks of HPAI appears to have diminished".

The threat of dumped chicken is not going away



Chicken imports might be dropping, but volumes remain high and billions of rand leave the country every year to sustain jobs at poultry producers in Brazil, the United States and Europe.

Watching the declining import totals, it would be easy to think that the threat of dumped chicken imports is over and that the South African poultry industry is no longer vulnerable and under pressure. But a closer look at the numbers and the reasons behind them shows that this is not so.

Import totals are indeed down – sharply down – since peaking in 2018. They have dropped steadily for the past three years, and every month official import statistics have shown a further decline.

There are several reasons for the lower totals. Higher tariffs are one factor, but so is the spread of avian influenza across Europe in recent years, leading South Africa to ban products from every European poultry producing country. More recently, the coronavirus pandemic has disrupted production and distribution, while lockdowns have resulted in lower demand, in South Africa and globally.

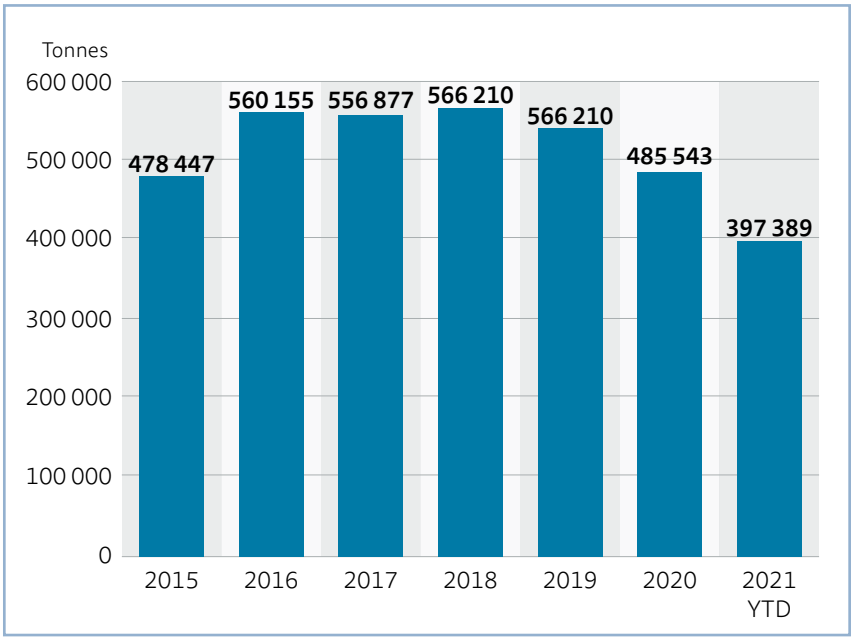
Lower import totals are certainly a relief for the local poultry industry, but there is no reason for long-term celebrations. Firstly, the import volumes and values remain substantial, and secondly the coronavirus disruption and European bird flu are temporary factors.

For the five years leading up to

2020, poultry imports totalled just under R30 billion. Even after two years of decline, broiler meat imports in 2020 were valued at R4.63 billion, of which bone-in portions comprised R2.23 billion.

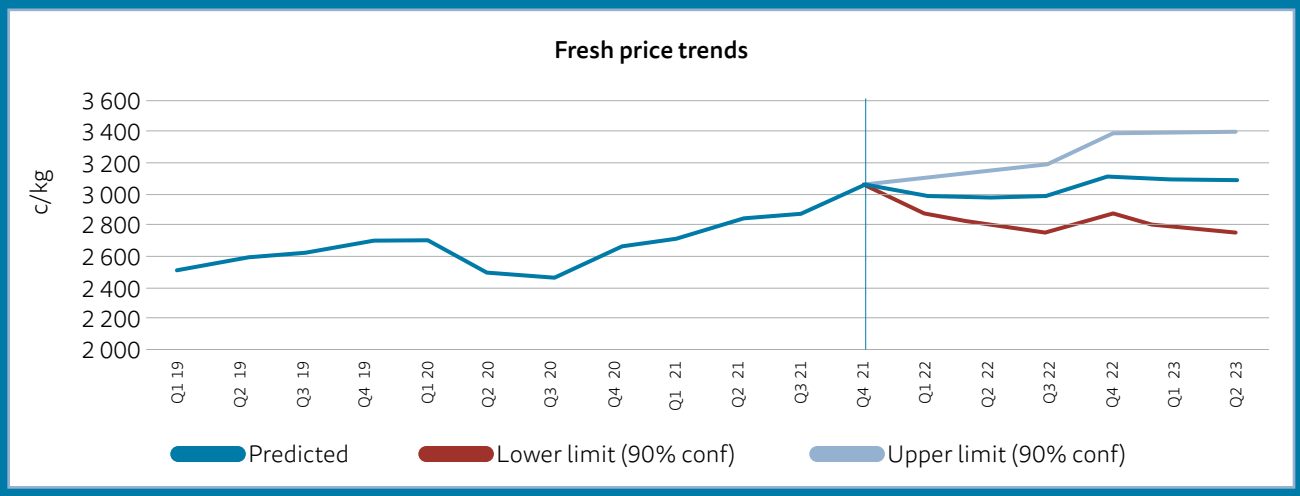
Poultry imports in 2021 are likely to exceed 400 000 tonnes, with a value of nearly R5 billion.

Those billions should rather be applied to create jobs in South Africa, and imports are likely to rise again. The poultry industry's fight against dumped, predatory and illegal chicken imports remains crucial.



Total poultry imports
Source: SAPA

Poultry prices may drop in early 2022



Fresh price trends
Source: AMT

Agricultural trend analyst company AMT says South African poultry prices may decline over the first quarter of 2022.

AMT's quarterly livestock report for January 2022 notes that the prices of fresh, frozen and IQF chicken have all risen over the past year. However, it says for all three categories, based on historic trends, "the price can trend downward over the coming quarter".

Predicted prices for 2022, again for all three categories, show prices increasing from the third quarter onwards.

The price of frozen chicken averaged R29.12/kg for the fourth quarter of 2021. This is 3.93% higher than the previous quarter and 12.31% up on the last quarter of 2020. Fresh chicken averaged R30.56/kg, 24% higher than the previous quarter and 15.34% higher than the same quarter a year ago. IQF chicken averaged R27.42/kg, up 4.42% on the previous quarter and 11.72% higher than the final quarter of 2020.

Reap the benefits of membership

Insider industry information analysed and presented to all members in clear reports on a regular basis is only one of the good reasons to belong to the South African Poultry Association (SAPA).

There is also the access to credible networks of veterinarian and nutritional experts, and trusted and accredited suppliers, to keep producers safe from the proliferation of scams that abound on digital platforms (also read "Fake chicks and other scams", p 12).

SAPA is the eyes and ears of the industry, and works tirelessly to represent the interests of both small-scale and large-scale producers of broilers and eggs in South Africa. We invest in scientific research to find solutions to challenges within the industry and to align our producers with global best practices. We address trade issues in close cooperation with

government and regulatory bodies, to protect our producers' markets from adverse legislation and other forms of systemic aggression such as dumping by global trade partners.

We provide guidance on issues of transformation and form public/private partnerships with government departments and other public bodies, and we ensure that our industry is represented on the relevant international forums so that we have a voice when global regulatory frameworks are developed.

Anyone who produces broilers or eggs in South Africa is eligible to apply for membership, for an annual fee of R405 excluding VAT, plus an additional fee based on slaughter volumes for broilers or a statutary levy for eggs. Members quality for a free subscription to *Poultry Bulletin*

We also offer allied membership to make the circle bigger and include the vast network of organisations that supply services, technology and products to the poultry industry – from feed manufacturers, financial service providers and suppliers of chemicals and specialist equipment to retailers that stock poultry products and cull traders. The monthly fee for allied membership is R2 000, excluding VAT.

How to sign up

1. Request the official application form by calling 011 795 9920 or mail reception@sapoultry.co.za. Complete and return the form as stipulated.
2. Your application will be evaluated by either the Broiler Board or Egg Board, and then be ratified by the SAPA Board. The board reserves the right to accept or reject any application at its discretion.
3. Once your application has been approved, you will be notified and your annual membership fee will be payable.

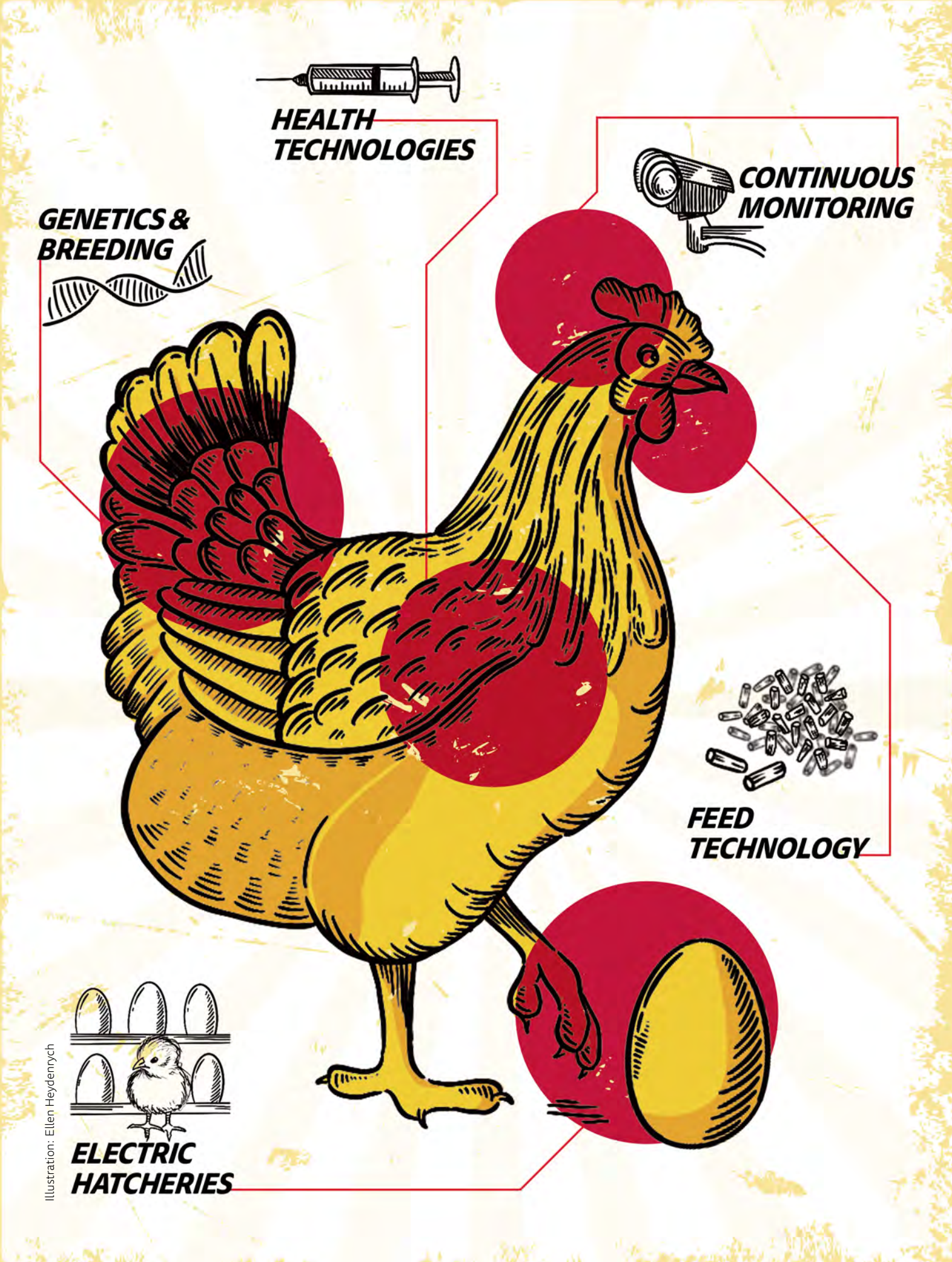


Illustration: Ellen Heydenrych

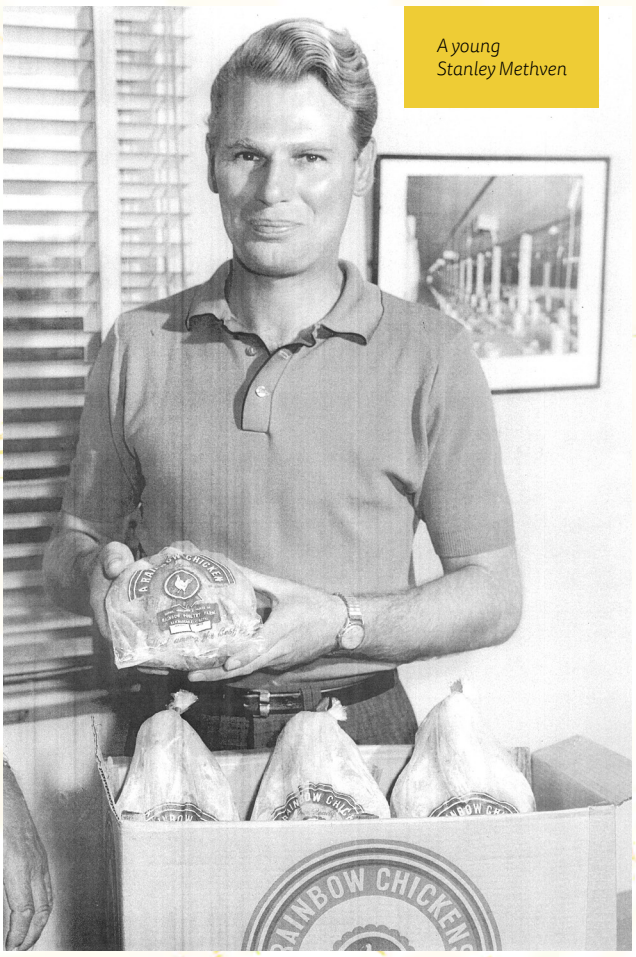
5 TECH INNOVATIONS THAT REVOLUTIONISED THE CHICKEN INDUSTRY

Not many lifetimes ago chickens were raised in backyards and prized more for their eggs than their meat. How did we get from there to the 100.9 million tons of chicken meat that will be produced globally in 2022? The answer lies in technology. **Charmain Lines** investigates

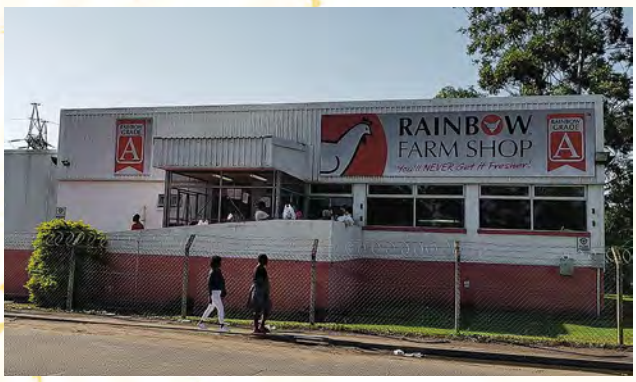
Poultry production in South Africa has come a long way in the last 100 years. When the SA Poultry Association was established in 1904, it was to represent an industry that revolved around fanciers. The association's main functions were to formulate the rules of poultry shows and competitions, and to regulate the appointment of judges.

"Commercial broiler production was not even considered," says Izaak Breitenbach, general manager of SAPA's Broiler Organisation. In fact, the very largest poultry operations consisted of units of between only two and four thousand birds.

This started changing in 1960 when a young visionary called Stanley Methven founded the Rainbow brand on his father's farm at Hammarsdale, outside Durban, with



A young Stanley Methven



From Rainbow's small beginnings in Hammarsdale (above and below) RCL has grown to the second largest producer in South Africa

an output of around 3 000 broilers per week. He first sold from a stall in central Durban, but demand grew quickly, leading to the commissioning of the first processing plant at Hammarsdale in 1963. Fuelled by the vision that chicken would become a staple protein source, Methven went abroad to study intensive mass-production methods.

By the end of the 1970s, Rainbow had increased production in KZN to around a million birds per week. Today, RCL is the second largest chicken producer in South Africa, a major player in an industry that produces 22 million chickens per week.

In the 50s it took 13 to 14 weeks to produce a 1.81kg broiler. Today it takes less than 5 weeks

According to the National Chicken Council in the US, in 1925 it took a broiler an average of 16 weeks (112 days) to reach a market weight of 2.5 pounds (1.13kg). SAPA's records show that in the 1950s it took 13 to 14 weeks to produce a 1.81kg broiler with a feed conversion rate (FCR) of 3.5:1. In 1979, the same live weight was attained in just over seven weeks at an FCR of 2:1. Today, slaughter weight is achieved in less than 34 days, with an FCR of around 1.45:1.

This quantum leap in production – here as elsewhere in the world – was the result of five groundbreaking technological innovations.

TECHNOLOGY TO THE RESCUE

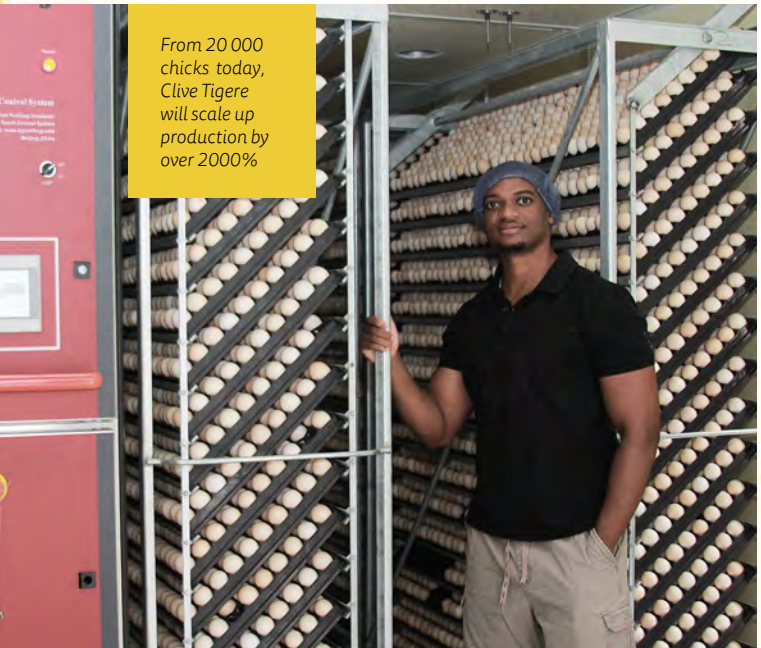
1 ELECTRIC HATCHERIES

Given that a broody hen takes around 21 days to hatch an egg, it is clear why industrial-scale incubation is a bedrock tech breakthrough in the commercial production of chickens and eggs.

The first electric incubator is attributed to the Bavarian inventor Georg Kesel in a November 1907 article in *American Scientific*, but it was Ira Petersime of Gettysburg, Ohio, who turned the dream of large-scale commercial hatcheries into reality. In 1922, he invented an electric egg incubator with capacity for 6 000 eggs.

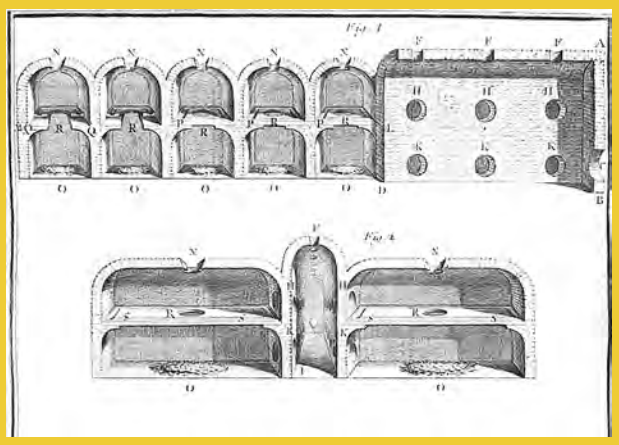
Based in Belgium since 1949, Petersime NV remains one of the leading manufacturers of hatchery equipment, and a leader in hatchery innovation. Says Rudy Verhelst from Petersime business development and product management: "As hatcheries become larger and more integrated, optimising the poultry value chain is crucial. Petersime's Eagle Trax™ is the first intelligent, cloud-based hatchery software that turns data into the best possible incubation results by, for instance, automatically providing the optimal incubation program for setters and hatchers."

Clive Tigere, co-owner of KC Hatcheries in Louis Trichardt in Limpopo, knows all about the latest in hatchery equipment. Construction recently started on the new NorthRoost hatchery that is a joint venture between KC, Bushvalley Poultry in Tzaneen and Country Bird Holdings (CBH), and will have a final incubation capacity of 450 000 eggs per week.



From 20 000 chicks today, Clive Tigere will scale up production by over 2000%

Ancient techniques in modern times



The ancient Egyptians were the first to master the technique of artificial incubation in around 750 BC, and they constructed vast incubation complexes made up of hundreds of ovens. According to *Smithsonian Magazine* each oven was a large chamber, which was connected to a series of corridors and vents that allowed attendants to regulate the heat from fires fuelled by straw and camel dung.

Hundreds of these traditional hatcheries are still in use today, with petrol lamps and electric heaters the only concession to modernity. An article published by *Poultry World* reveals that, instead of relying on thermometers or thermostats, a skilled hatchery worker judges temperature by holding an egg against his eyelid and letting his delicate eyeball feel the heat. If too high, heat is expelled through increasing the ventilation in the cell; if too low, oil lamps are lit.

Humidity is mostly controlled by spraying water or hanging wet cloths in the central corridor. To see if the eggs are developing, the workers simply hold the eggs up against a source of light such as a lamp. These skills have been handed down for generations within certain families, and the techniques of their profession are a closely guarded secret.

Images: Anél Roets; www.aviculture-europe.nl

TECHNOLOGY TO THE RESCUE

"At the moment, KC Hatcheries produces 20 000 day-old chicks a week," Tigere says. "The scale-up we are doing is massive, especially if you consider that when KC started in 2017, we did 2 000 chicks a week and it was a mostly manual operation." Tigere recalls spending up to three hours manually placing eggs in the hatch trays and filling a pan with water to achieve the right humidity in the incubator.

The NorthRoost facility will be fully automated, with the entire hatchery building temperature controlled to keep a stable environment on even the hottest Limpopo day.

But the future of hatchery equipment holds more than bigger and more finely tuned incubators. Current research, for example, focuses on ways to give water to the chicks as they hatch and only incubating fertile eggs.

"Our hatch rate is around 90%; it could go up to 99% if we could hatch only fertile eggs," says Tigere.

2 GENETICS AND BREEDING

The size and shape of today's commercially raised chickens are a direct result of a competition launched in the United States back in the 1940s. It all started, according to the US Institute for Agriculture and Trade Policy (IATP), when the poultry research director for the A&P Food Stores chain told a poultry meeting in 1944 that someone needed to develop a sumptuous chicken with a breast like a turkey's, if chicken was ever going to became an American staple.

His wish resulted in the Chicken of Tomorrow competition. The first iteration ran from 1945 to 1948 and was organised by the US Department of Agriculture, with the backing of A&P and the support of every major poultry and egg organisation in America.

At the time, farmers distrusted crosses, hence most competitors opted for refining the pure breeds they were already raising. In the final stage of the contest, only eight of the 40 contestants entered birds crossbred from the historic standard breeds.

The winner was Charles Vantress whose winning, red-feathered hybrid was a cross between a New Hampshire and a Cornish chicken. Three years later, another one of Vantress's crossbreeds won the second Chicken of Tomorrow competition.

In the purebred category, both competitions were won by Arbor Acres White Rock broilers, bred by Henry Saglio. The white-feathered Arbor Acres birds were preferred to the higher-performing dark-feathered Red Cornish crosses from the Vantress Hatchery. Eventually the two breeds were crossed to become the Arbor Acre breed that came to dominate broiler genetic stock worldwide.

Today Arbor Acres is one of three grandparent and parent stock brands, along with Ross and Indian River,

The cover of a 1940s brochure to promote the Chicken of Tomorrow competition in the US

A look back in poultry history

Scan the QR codes with your smartphone to watch an interesting video on poultry history from Arbor Acres (1) and *The Chicken of Tomorrow* documentary (2).

1

2

Scope for improvement

It is estimated that the global average of table eggs produced per laying hen over a laying lifetime of 52 weeks is 185. In South Africa, the figure is between 360 and 370 eggs over a laying cycle of 62 weeks. However, given that the performance of modern layers has advanced at a rate of almost three extra eggs per bird per year, genetics specialists believe that white-egg layers could ultimately produce 520 eggs as a hen-housed average and that the ceiling for brown-egg strains could be 480 eggs – both over 82 weeks of production.

owned by Aviagen broiler breeders.

The winners of the Chicken of Tomorrow competitions did more than create new birds. As *National Geographic* states, they recreated the chicken industry by concentrating breeding technology, expertise and genetic material in the hands of a few multinational companies.

Greg Celliers, global technical services veterinarian at Hy-Line International, a world leader in poultry layer genetics, says that genomics has been among the biggest advances in breeding stock technology over the past few years. "Genomic (DNA) data, combined with pedigree data and genotypes, enable precise selections. Rather than selecting a family of males based solely on the performance of their sisters, breeders directly identify elite individual males through genetic values and genotypes. This ensures genetically superior males are selected to sire the next generation of pure line birds."

Genomics not only increases the accuracy of breeding values but also makes it possible to select males at younger ages. This shortens the generation interval and allows more selections over a given period, which speeds up genetic progress. Hy-Line, for instance, now performs 20 selections, instead of the previous nine, in a 10-year period.

Looking towards the future, Celliers says the next frontier is technology that stops the euthanasia of day-old male chicks. "We'll see either in-ovo sexing or a change of heart towards genetic modification. We currently use genetic information for selection criteria only, not for gene editing, mainly because people are not comfortable with the idea that their food comes from a genetically modified organism. But soon we will be hatching only female layer chicks."

Ancestor: a red junglefowl hen

Genetic secrets revealed

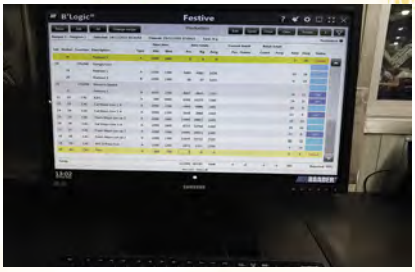
In 2004, a complete map of the chicken genome was produced, providing fascinating insights into how millennia of domestication can alter a species.

Comparing the red junglefowl and modern-day layers and broilers, Swedish researchers found significant mutations in a gene that regulates glucose metabolism. In the human genome, mutations in this gene have been associated with obesity – a positive trait in broilers destined for the dinner table.

Selective breeding also mutated the thyroid-stimulating hormone receptor gene that, in wild animals, coordinates reproduction with day length to confine breeding to specific seasons. The mutation disabled the gene, thus allowing chickens to breed – and lay eggs – all year long.

TECHNOLOGY TO THE RESCUE

3 CONTINUOUS MONITORING



At Astral's Festive plant every process in the facility is monitored live with an automated system, which allows for early intervention in case of any system problems

Modern poultry production is a numbers game, and the ability to know what is going on all along the production chain is essential for large-scale production. Enter monitoring technologies, which touches every link in the poultry meat and egg production chain of today.

Take a hi-tech plant such as Astral's Festive operation in Olifantsfontein, where a mammoth 24 000 birds are processed per hour. At such scale, it is impossible to manually monitor all systems, and even a temporary failure of a crucial system can have calamitous results.

The Festive plant's cutting-edge automated monitoring system ensures that all processes run smoothly, and early intervention is possible in the case of any system problems, to prevent significant losses.

"The industry has come a very long way since the days of paper and pen, and even Excel spreadsheets," says Dr Shelley Johnston, founding member of Leading Edge Poultry Software, which supplies cloud-based software to pullet rearers and commercial table egg producers. Leading Edge is also contracted to provide SAPA with reports that identify and track industry trends.

"The value of monitoring lies in how quickly and effectively the data can be gathered and interpreted to inform decision-making," Johnston says. "Access to data and information sharing are also vital, and in this regard the cloud has revolutionised the poultry industry."

Johnston cites the example of De Heus Animal Nutrition, a Leading Edge client that encourages its customers to also use the pullet and layer software. "With the farmers' permission, De Heus can access their non-sensitive farm data via the cloud, making it possible to identify problems in a flock and provide solutions," says Johnston. "This also gives De Heus valuable information on the performance of its feeds, helping the company to formulate a better product."

> ***'We have come a long way since the days of paper and pen, and Excel spreadsheets'***

Such collaboration has also been made possible by the monitoring and reporting systems implemented as part of the Festive plant's upgrade, says Wickus Kleynhans, COO of Astral's central region. "The quality monitoring we do in the plant is translated into reports for the broiler farms, both our own and our contract growers'. The reports pinpoint quality concerns so that corrections are easily done."

Some poultry veterinarians have also started to use large farms' cloud-based data to diagnose health issues in those farms' flocks quickly and accurately, resulting in more efficient flock care.

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4 FEED TECHNOLOGY

Fortified feed makes it possible to keep birds indoors, safe from predators and the weather, while they still get the vitamin D they would otherwise only get from sunlight

The way chickens access optimal nutrition has become enormously sophisticated with various breakthroughs in the technology around feed enabling increasingly efficient production. One of the first of these gamechangers, according to *Smithsonian Magazine*, was the fortification of feed with antibiotics and vitamins. Like most animals, chickens need sunlight to synthesise vitamin D on their own. The advent of fortified feed, however, made it possible to keep chickens indoors where they are sheltered from weather and predators, and can be fed a controlled diet.

In recent years, much work has been done to make feed more digestible so that chickens can derive the maximum nutritional benefit from what they eat. "Genetics are moving faster and faster, and the challenge is to provide the nutrition that supports these huge improvements," says Heiko Köster, an animal nutritionist and commercial director of Kaonne Investments.

Much has been done to make feed more digestible, so that birds get maximum nutrition from what they eat

The quest to improve digestibility involves the use of digestive enzymes that help break down the feed. These proteins speed up chemical reactions that turn nutrients into phytases which are easily absorbed in the birds' digestive tracts. This increases the availability of energy, proteins and minerals that are present in feed but in a form that the bird cannot digest.

In addition, close attention is paid to gut health, specifically in the lower gut, to increase digestion, feed conversion and the bird's overall health. "By adding the right micro ingredients to feed, you can kill off the bad gut microbes and promote the good ones," says Köster.

In terms of layers, additional research focuses specifically on calcium availability in feed to improve eggshell

quality and to extend a layer hen's productive period to up to 99 weeks, compared to the current average of between 58 and 62 weeks.

Feed technology is an ever-developing field, along with discipline like epigenetics that has tremendous potential to improve gut efficiency. Research into organic versus inorganic minerals is ongoing, as are studies into improving the genetic composition of microbes to improve the digestibility of feed. Scientists are also continuously improving probiotic strains to keep animals healthy in a natural way through feed supplements.

"It really is all about understanding the bird better," says Köster. "For instance, a better understanding of how chickens synthesise protein has resulted in the use of synthetic amino acids to increase the protein values of feeds, which has improved conversion rates and reduced the cost of feed."

Feed 'tech' in history

As far back as 800 BC Roman farmers had been developing ways to fatten chickens. Some used wheat bread soaked in wine, while others swore by a mixture of cumin seeds, barley and lizard fat, according to *Smithsonian Magazine*. Due to concerns that the Roman Republic was descending into decadence, a law was passed in 161 BC limiting chicken consumption to one bird per meal and only if the bird had not been overfed. However, the practical Roman cooks soon discovered that castrating roosters caused them to fatten on their own, and thus was born the creature we know as the capon.

5 HEALTH TECHNOLOGIES

Keeping birds diseasefree and healthy is top of any poultry farmer's list, and the tools available to today's farmers have come a long way since Stanley Methven took his first 3 000 broilers to market.

Intensive animal production, including that of poultry, became more achievable with the advent of antibiotics in the 1950s, says Dr Shahn Bisschop, a specialist poultry veterinarian and CEO of Avimun. These wonderdrugs reduced mortality, but over time excessive use led to reduced efficacy, increased resistance in bacterial populations and, in response to growing concern about the threats to human health, increasing usage restrictions.

Vaccination has been another industry gamechanger. Live and inactivated vaccines against viral infections, and inactivated vaccines against bacterial diseases have been developed steadily over the past 50 years. A breakthrough was the introduction of live *Salmonella* vaccines in the 1990s and, since the early 2000s, viral vector-based vaccines. "Some of the latest advances include insertions of genetic material from two viruses into a single vector – allowing for vaccination against three diseases through a single product," says Bisschop.

The rapid advances in vaccine technology brought about

TECHNOLOGY TO THE RESCUE

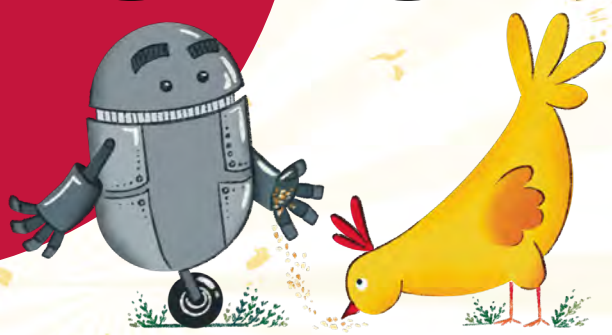
by the Covid-19 pandemic will also benefit the poultry industry. mRNA vaccines specifically could prove useful in the fight against infectious bronchitis of poultry, a disease caused by a coronavirus related to the one that leads to Covid. The avian coronavirus is known for its rapid rate of mutation which means that new vaccines are regularly needed to control it.

The move away from antibiotics combined with a growing understanding of gut health and the role it plays in overall health and wellbeing, has resulted in the development of products such as organic acids, prebiotics, probiotics, antimicrobial peptides, anticoccidials, epithelial support agents and immune modulators, all of which will play increasingly important roles in poultry health in the future.

Once novel, PCR tests are now routinely used for quick diagnosis

Disease diagnostics also continues to advance. PCR technology, novel in the 1990s, is now used routinely for disease monitoring and diagnosis within 24 hours of sampling. It has been augmented by genomic sequencing to allow the detailed description of pathogens to trace their spread. With deep sequencing, a recent development, the entire genome of viruses can be sequenced. This has been used to good effect during the recent HPAI outbreak to show that most HPAI cases in chickens were introduced into sheds directly by wild birds and not through chicken-farm to chicken-farm spread. This information was used to discourage extensive quarantine zones around infected farms and to encourage producers to step up biosecurity measures against wild birds.

TECH THAT WILL SHAPE THE FUTURE



Urban legend has it that in 1899 the commissioner of the US patent office, Charles H Duell, declared that "everything that can be invented has been invented", and that his office's job was therefore done. A look at poultry technology trends in 2022 shows just how wrong Duell would have been

The 2021 Poultry Tech Summit Webinar Series had "What's coming next?" as its theme and provided a fascinating overview of technologies, solutions and innovations poised to make an impact on the poultry industry in 2022. Here is *Poultry Bulletin*'s top four.

MRI technology to identify fertile eggs

German company Orbem is working on an AI-powered MRI system capable of "looking" inside eggs and predicting which will develop into healthy chicks, and which are infertile or contaminated.

The variables the camera system can scan for include fertility, inner quality, position, double yolks, yolk volume, white volume, air-cell volume, shell fractures, dirt, hairline cracks, wrinkles and ridges.

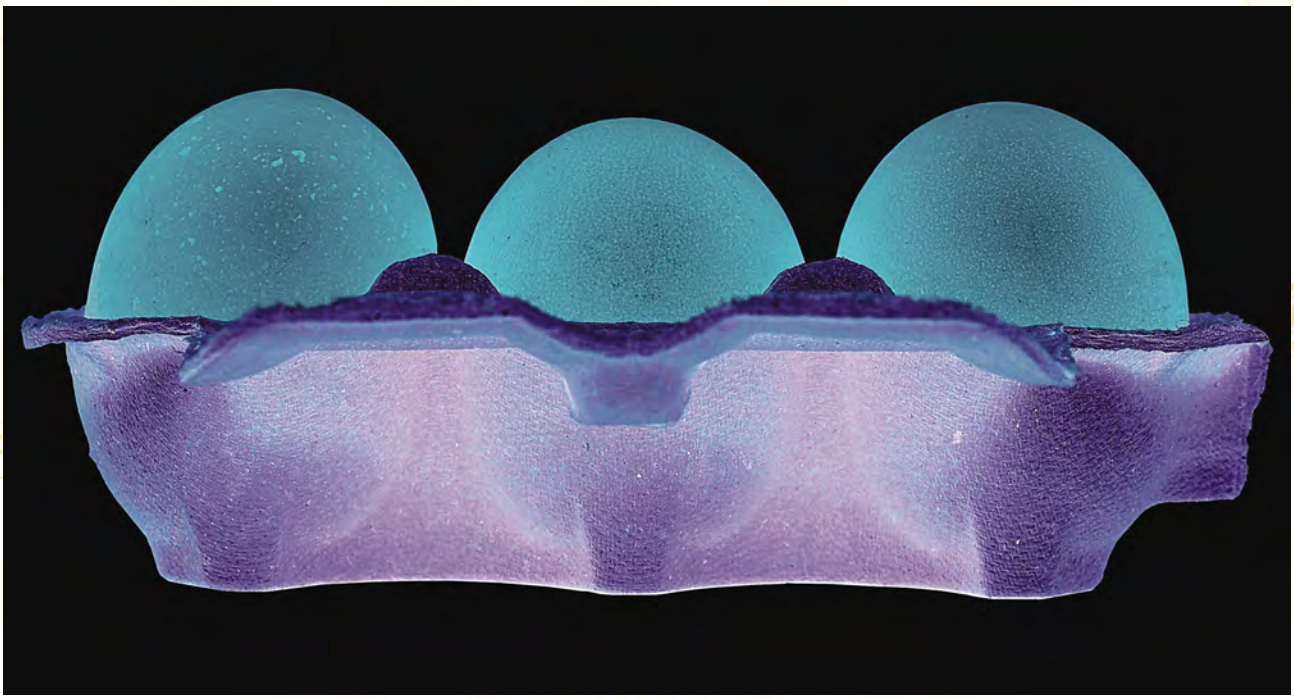
Orbem's existing prototype scanner cannot keep up with current industry line speeds, but the next prototype, planned to be ready in March 2022, should scan 9 000 eggs per hour.

Smart watches could make poultry workers happier

Workers that are not engaged is one of the largest drivers of staff turnover in the poultry industry, but a smartwatch being developed by Iterate Labs that gamify performance could be the answer.

The watches, or wearables, record performance data and upload it into the cloud from where it is easily

TECHNOLOGY TO THE RESCUE



accessible to managers. The information is also displayed in recognition dashboards to give workers real-time feedback on their performance.

In a test that involved 50 workers at a meat-processing facility, two workers were promoted based on their dashboard scores, turnover and safety incidents were down 65% and 75% respectively, and productivity improved by 5%. Managers reported that almost nobody was absent from work or resigned from the facility while the platform was being tested.

The AI smartwatch platform test was scaled up to four more facilities in the last 12 months.

Hyperspectral imaging for improved food safety

The human eye sees visible light in three bands (red, green, and blue); with spectral imaging it is possible to look into many more bands. Hyperspectral imaging collects and processes information from across the electromagnetic spectrum. A company called P&P Optica is developing a system that uses hyperspectral imaging in poultry processing to identify food-quality issues and detect foreign objects more accurately.

In extremely simple terms, the system uses light wavelengths to analyse the chemistry of meat. Drawing on the power of AI and machine learning, the system rejects anything that doesn't have the same chemistry makeup as raw meat. It can also determine what was identified (metal, rubber, plastic, bone, cartilage, and so on) so that the source can be traced.

Peptides look set to replace antibiotics

The concerns around the use of antibiotics may have a new solution, thanks to the efforts of Amphoraxe, a Canadian biotechnology R&D company that is researching the use of naturally occurring antimicrobial peptides (AMPs).

AMPs are proteins that all living organisms produce naturally as part of their immune systems. As such, they can kill many kinds of bacteria, including medically important antibiotic resistant strains, without harmful side effects. AMPs act fast and usually do not interact with the DNA of their target bacteria. As a result, the pathogens do not evolve into superbugs as fast as they would when treated with antibiotics.

Natural AMPs are encoded in the DNA of all species and can become active peptides when needed. To date, Amphoraxe has identified more than 1 000 unique AMPs, all now at various stages of validation.

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Arbor Acres celebrates excellence

Productivity comes out tops as broiler and breeder producers are rewarded for outstanding results

Every year Aviagen distributor Arbor Acres celebrates its top producers in South Africa with awards in two categories. Broiler producers qualify for the 400 Club when they achieve a 400 or more European performance efficiency factor (EPEF), the measure that standardises technical results, by taking into account feed conversion, mortality and daily gain.

Producers of broiler breeders, in turn, are recognised in the 140 Club, when they reach a production factor of 140 chicks per hen housed until 60 weeks of production. According to general manager Arno van der Nat many Arbor Acres clients outperform the base standard by considerable margins, with hens that not only produce as many as 161 chicks during the set period, but also lay productively for longer than 60 weeks.

"It has been enormously rewarding to see the excellent results Arbor Acres South Africa produced in the face of the serious challenges the industry faced in 2021," said Van der Nat. "We thank our loyal customers for their continued support and look forward to a year of keeping those smiles on our producers' faces, ably assisted by our dedicated and qualified technical support team."

The Arbor Acres 2021 Awards covered the period from November 2020 to October 2021, and all producers who supplied data during this time were automatically entered. Awards went to a total of 48 recipients from companies including Chubby Chick, Supreme, Caledon and VKB. In the 140 Club there were 26 award recipients, while the 400 Club delivered 22 recipients.

CHUBBY CHICK: ARBOR ACRES 140 CLUB BREEDER AWARDS

1. Cooper Emms: 159 chicks per hen housed (HH). **2.** Joe van Dyk: 157 chicks/HH **3.** Derick Burgers: top flock – 159 chicks/HH

CHUBBY CHICK: ARBOR ACRES 400 CLUB BROILER AWARDS

4. Gerrit Burgers: EPEF 420 **5.** Boeta Burgers: EPEF 405

6. Terrence Taylor: top flock – EPEF 425

CHUBBY CHICK

7. John Fourie Junior **8.** Deon, Jonathan and John Fourie: 140 Club Award for top flock – 159 chicks/HH, 400 Club Award for top flock – EPEF 425

An Aviagen Brand

SUPREME: ARBOR ACRES 140 CLUB BREEDER AWARDS

1. Hein van Wyk: 156 chicks/HH
2. Gustav Aspeling: 154 chicks/HH
3. Jonathan Watson: top flock – 156 chicks/HH

CALEDON: ARBOR ACRES 140 CLUB BREEDER AWARDS

1. Charles Matamba: 161 chicks/HH
2. Promise Machepi, Ndumiso Khumalo, Charles Matamba, Darlington Kamutanho: 161 chicks/HH

VKB: ARBOR ACRES 400 CLUB BROILER AWARDS

1. Mike Potgieter: EPEF 419
2. Jurie Jonker: EPEF 429
3. Arie van Wyk: EPEF 418
4. Hennie du Plessis: EPEF 428
5. Elna Oosthuizen: EPEF 434
6. André Koen: EPEF 410
7. Gary Mbundire: EPEF 407
8. Conrad Bruwer: EPEF 401
9. Theunis Oosthuizen: EPEF 406
10. Jan-Louis Marais: EPEF 418
11. Jonathan Hobden: EPEF 419
12. Stephanus Pretorius: EPEF 427

DID YOU KNOW?

The EPEF formula is: (average grams gained/ day X % survival rate) /feed conversion X 10

Arbor Acres

An Aviagen Brand

Bogus birds
and avian impostors

Words **Alyn Adams** Illustrations **Jason Bronkhorst**

What's in a name? When it comes to our feathered friends, not everything is what it seems. Time for a visit to the Museum of Questionable Ornithology

The Piet-My-Vrou, the Hornbill, the Scarlet Bee-Eater – these are no-nonsense bird names that make sense the moment you see or hear the feathery critter. Kingfisher is only slightly obscure, until you watch one of them dive for a fish.

Other bird names, however, have their origins lost in the mists of time and dead languages. And some are just outright lies. In the Museum of Questionable Ornithology these fake birds would fill a small wing, so let's take a cultural outing and see if we can spot the imposters...

Common Nighthawk

We'll leave aside the indignity of sounding like a demoted Marvel superhero; there are two other reasons the name is misleading. The nighthawk isn't really a night bird – it's active at dawn and dusk, when the insects it feeds on are plentiful. It's also not a hawk – it's a member of a group of birds called "goatsuckers" because they roost in barns. People once thought they were stealing milk, straight from the teat. Yes, people are weird.

Titmouse

Stop sniggering at the back! We've had quite enough jokes about rodent adult entertainment, thank you very much! The Old English word for "bird" was "māse", and "tit" meant "small", do you see? By the time Middle English happened, the name of this little brown job had morphed into "titmouse". It's never been changed because ornithologists like a bit of puerile fun as much as the next scientist, and "tufted titmouse" has them in stitches.

Turkey

This is a lovely case of mistaken identity that plays out on three continents. Back in the 1500s, when the turkey first made its way across the Atlantic, there was already an exotic bird from far away to be found on well-off European tables: the African guinea fowl. Because of the way trade routes were laid out, these came to Europe from Africa through one major market – Constantinople in Turkey. Guinea fowl were thus commonly called "turkey cocks".

When a new exotic fowl from the Americas arrived, a vague similarity in shape saw the name transferred to the new bird. But unlike the subtropical guinea fowl, turkeys could thrive in Europe's temperate climate, so domestic farming became an option. The guinea fowl market would eventually disappear completely, but Europe still had its "turkeys" – a name that British settlers would take back to North America with them.

Cornish Game Hens

A tasty addition to the menu, we have no doubt, and the perfect excuse to eat a whole chicken all by yourself. It's weird that we insist on calling them "Cornish game hens", though, because:

1. It's not a game bird, it's a domestic fowl, farmed like any other;
2. It grows large breasts out of proportion to the rest of its development, which is why it can be slaughtered so young, then cooked and served whole. But that means both males and females can be served at the table, so you have as much chance of eating a cockerel as a hen; and
3. It's not even 100% Cornish; the Cornish chicken was cross-bred with the White Plymouth Rock to produce "Cornish game hens". So, it's half-American.

Egyptian Goose

Taxonomy is a field of heated debate – and ornithologists can bicker with the best of them. So, there's no one-size-fits-all distinction between a swan, a duck, and a goose, but some consider the number of neck vertebrae a reliable guide. A swan has 24 or 25 neck bones, they maintain, a goose has 17 to 23, and a duck has 16 or fewer.

By that metric, the Egyptian Goose is a duck – or a shelduck; the name for a genus of ducks with several gooselike features, but still a duck. Obviously, a duck in denial...

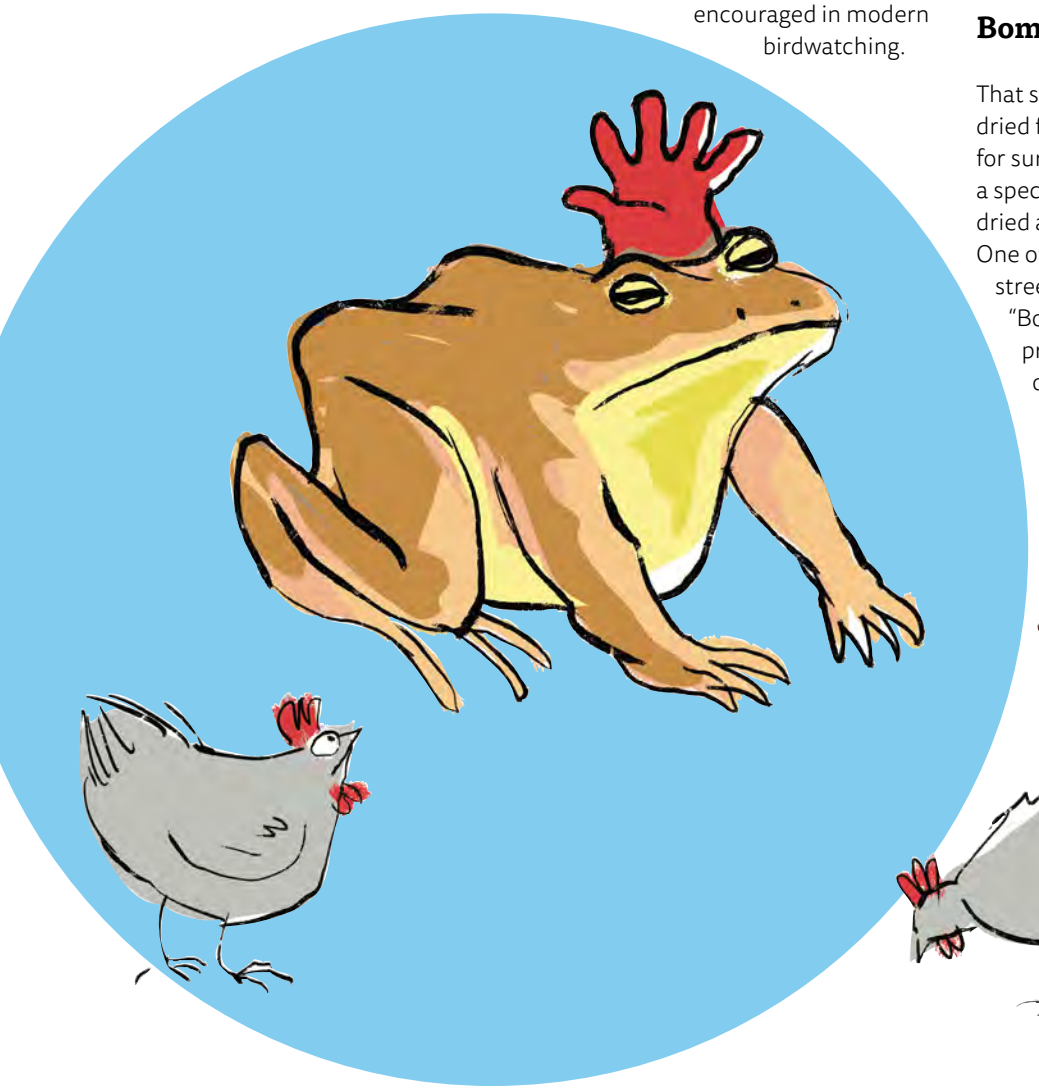
Mountain Chicken

The Mountain Chicken is found on only two Caribbean islands – Dominica and Montserrat. The loss of its restricted island habitat is one reason it's now a critically endangered species. Another is a nasty fungal disease that has caused rapid population decline. But a third reason it's now so scarce is human hunting – it's a tasty local delicacy. Which is fascinating, because its other name is the Giant Ditch Frog – it's the largest frog in the Caribbean, and one of the largest in the world. But the locals swear it tastes just like chicken...

Tennessee Warbler

The Tennessee Warbler is seldom found in Tennessee – they pass over the state when migrating between Canada and Mexico. Like the Connecticut, Nashville, Cape May, Magnolia and Prairie Warblers, they were all named by US ornithologist Alexander Wilson in the early 1800s, and none of their names reflect where the birds can generally be found.

Where they could generally be found, of course, was dead at Wilson's feet – he collected migrating specimens by shooting them on the wing. Not, happily, a practice still encouraged in modern birdwatching.



Bald Eagle

This majestic raptor isn't bald at all, but its hood of white feathers can make it look bald from a distance. Here in South Africa we use the much more accurate "fish eagle", but Americans are absolutely obsessed with ageing...

Bombay Duck

That sounds much better than "smelly dried fish", doesn't it? Nobody knows for sure how it got the name, but it's a species of Indian lizardfish, usually dried and then cooked in a curry. One of its local names is "Bomil", and street vendors tout it with cries of "Bomil tak!" ("Bomil here"). This is probably the most reliable origin of the name.

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A rooster at Clark Ostrich Farm

THE RISE AND FALL (AND RISE AGAIN?) OF THE TEXAS OSTRICH INDUSTRY

In the 1990s, Texans lost their minds – and their shirts – investing in ostriches and emus. But some think the industry could take flight again.

Words: **Asher Elbein** Photographs: **Matt Conant**

When the ostrich reached in to nip at his collar, Boyd Clark bopped it gently in the face with his cowboy hat. The bird drew back, seemingly affronted. The rest of Clark's flock of yearlings – each already over 2.5 metres tall – swirled around him like feather dusters. Then they pressed back in, looking for a meal.

"Sometimes I'll be out here working on something, repairing the fence, and they'll all be around, pecking at my ears or the back of my neck," said Clark, an easygoing, bearded man dressed in a sleeveless puffy jacket.

Americans don't generally consider ostriches to be promising livestock, but Clark has recognised that an ostrich can also be turned into all sorts of useful products: red meat, a tough hide, and luxurious feathers. Clark Ostrich Farm is a 40 hectare fenced property in Bend, a small Texan town on a bend of the Colorado River, where Clark and his family run a part-time business breeding and raising birds for their meat.

When we visited, about 700 ostriches of various ages wandered among the century-old pecan trees, larger Masai red-necks mingling with the smaller, slightly more docile South African black ostriches. In the barn, the last hatchlings of the season, as fat and fluffy as teddy bears, clustered beneath red heat lamps.

In the breeding pens, Clark pointed out the openings at the bottoms of the fences that allow him to speedily duck out of the enclosures when collecting eggs. "The ones we hatched ourselves are more comfortable with humans, so they're more aggressive when it comes to protecting their nests," he said. "Sometimes you have to move pretty fast."

With no eggs to protect, the 26 laying hens and their accompanying roosters kept a wary distance as we passed. The birds in the main paddock weren't as nervous. While a few held back when we climbed out of Clark's truck, uttering low grunts of alarm, a mob rapidly coalesced around us, heads bobbing, and the shakedown commenced. Within five minutes I had been comprehensively nibbled. As a dog sniffs or a child pokes, Clark said, ostriches peck, perhaps out of a touching optimism that this time, the buttons, phones, collars, hat brims, or masks might prove to be edible.

Clark weathered the storm: he kept his operation small, kept his day job, and kept his birds

The oldest birds in the paddock date back to the early 80s, when Clark was first starting out as an ostrich farmer. The birds and Clark are some of the few survivors of one of the most extraordinary bubbles in Texan and American agricultural history: a brief period in the early 90s when rural Texans went crazy for emus and ostriches. The notion that there was a vast untapped market for ostrich meat and ostrich leather drove countless Texans, from hobby ranchers to big-time investors, to buy and breed the large birds. Unwary doctors and lawyers put their savings into ostrich farms; trucks full of nervous birds trundled toward slaughterhouses, where inexperienced processors struggled to harvest valuable hides. By 1995 the industry was a smoking ruin. Many of its proponents had filed for bankruptcy, and the idea of the American ostrich was a punch line – one more speculative 90s bubble, like the dot-com boom.

Clark weathered the storm: he kept his operation small, kept his day job, and kept his birds. Today, he's one of just a few veteran ostrich breeders who believe the industry may still have a

Boyd Clark with his herd at Clark Ostrich Farm in Bend

Clark checking ostrich eggs in the incubator

future. The question is what kind – and whether it's really possible to get the US ostrich industry off the ground.

In 1985, when a 14-year-old Boyd Clark bought his first clutch of ostrich eggs for $15 apiece (R30 at that time) from a local exotics farmer in Bend, most ostriches in America lived either in zoos or as novelties on game farms. Clark, an outdoorsy kid with a fondness for birds, raised the ostriches as part of a Future Farmers of America project, then kept breeding them on his own for the fun of it.

A year later, the US Congress passed the Comprehensive Anti-Apartheid Act, which limited trade with South Africa – where the ostrich industry had been born, in the 1860s. The supply of ostrich products from SA was abruptly cut off during a period of high demand. As a result, ostriches in the US were suddenly fetching very high prices.

Though Clark was still too young to appreciate how his hobby had turned into a business, others were ready to take advantage. To Tom Mantzel, a Texan oilman and exotic-animal breeder, the sanctions gave American ranchers an opportunity to make a play for the global ostrich industry. Mantzel, then 41, dove into the ostrich import business in 1988, securing egg-collection permits from the Tanzanian government and paying kids from Maasai tribes for tips about wild ostrich nests. The eggs were hatched in a facility under the peaks of Kilimanjaro, and the chicks were shipped to Mantzel's ranch, where he bred the birds for meat and leather.

Ostrich products, Mantzel argued, were a sure thing: by breeding more birds, ranchers could increase demand and kick-start a profitable industry. In 1988 he founded the American Ostrich Association to promote ostrich

ranching. Many ranchers were easily enticed. The prior decade had seen a nationwide farming crisis, spurred in part by record agricultural production pushing prices down. By 1989, the association had 500 members, most of them Texan.

"I tell ranchers, 'Just set aside 1% of your land, a hectare or so, raise ostriches and make a profit,'" Manzel said in an interview that year.

With few ostriches available and demand skyrocketing, prices shot up. A breeding pair of birds now sold for anywhere from $30 000 to $80 000 (R75 000 to R202 000 at the time), while eggs Clark had once bought for $15 each now went for $3 000 (R7 590). The timing of the boom couldn't have been better for Clark, who was paying for his BA degree at Texas A&M University by selling yearlings, which were now fetching $10 000 (R25 300 at the time) each. His clients were large farms investing in breeding stock or brokers who planned to flip them to other sellers.

Before long he'd made around $300 000 (R759 000). "I just couldn't believe it was happening," Clark said. "Imagine someone calling you up to buy an ostrich for $5 000 (R12 650), and then, later that day, someone else calls and offers you $7 000 (R17 710), and then someone else buys it for $8 000 (R20 240). It was like a fever."

In 1993, a 21-year-old Clark – who'd joined the American Ostrich Association – was voted onto the board of directors, a position he still holds. It was a heady year. Thousands attended a convention in Fort Worth, Texas, where vendors hawked incubators, and farmers from South Africa gave tips on the finer points of ostrich raising.

If anyone had reason to be excited about the ostrich business, it was Clark. In a few short years, he'd made enough money to put himself through college and buy his 40 hectares in Bend. But for all the excitement of the time, Clark said, he began to feel that the whole thing was spinning out of control.

A red ostrich rooster at Clark Ostrich Farm

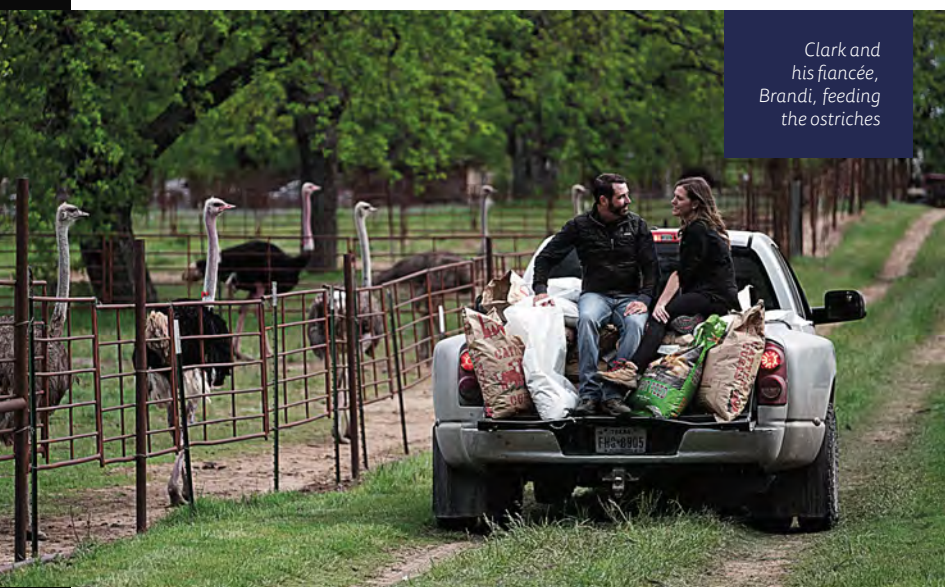
"Everyone thought there was no end in sight. But as the market went up, there were people getting in that really had no business being in ostriches – a lot of city people who saw supposedly easy money."

In a few short years he'd made enough to money to put himself through college and buy his land

The year 1993 proved to be the high-water mark for ostrich mania, with an estimated 50 000 birds roaming on 3 500 farms across the US. Speculators had also roped in the Australian emu: breeding pairs hit $40 000 (R136 000 at the time) at the peak of the bubble, and emu farms proliferated across the Texas countryside, eventually outnumbering ostrich operations.

With so much money changing hands, fraudsters rushed in. Scams where shares in nonexistent breeding operations were sold through cold calls, proliferated and $6.5 million (R22 million at the time) were harvested by scammers before regulators shut this down in 1995. Meanwhile, many new farmers had little to no experience in agriculture. Novices soon discovered that ostriches were finicky to breed. The hatchlings, as one farmer complained to the *New York Times* in 1997, went "looking for things to die of".

Husbandry was the least of an ostrich farmer's woes, however. Mantzel's goal had been to build up a supply of birds and then start processing them for meat and leather. But the few hundred processing plants able to handle ostriches were scattered throughout the country,



Clark and his fiancée, Brandi, feeding the ostriches

and large birds do not travel as well as cattle. Without widespread processing facilities, nobody could guarantee a consistent supply of meat. Soon, the few restaurants that had stocked ostrich dropped it from their menus.

Attempts to get American ostrich leather off the ground also ran into serious problems. Mantzel had begun acting as a broker between farmers, meat processors, and a tannery in Mexico. Many of the hides the tannery received were disasters, Mantzel said, with some of them arriving at the plant already rotten. Even the tannery's best work simply couldn't approach the quality of hides produced in South Africa.

"Nobody knew how to process or sell them," Mantzel said. "Skinning an ostrich is not like butchering a deer… If there's a scar, a cut, or a scratch, basically the boot company doesn't want anything to do with it."

With the repeal of American anti-apartheid legislation in 1993, South African farmers tried to cash in on the American boom, releasing a new wave of birds into the market.

By 1995, the global ostrich market was glutted, and ostriches, once valued for their comparative rarity, dropped in price. Brokers and new farmers found themselves stuck with expensive, hungry flocks**.** The bubble popped. Panicking ranchers fled as fast as they could and, in doing so, drove the prices down further still.

Mantzel got out in 1995 after concluding that trying to beat the South Africans at their own game had been a mistake.

Even the tannery's best work couldn't approach the quality of hides produced in South Africa

By 1997, a breeding pair went for around $500 (R2 210 at the time). The dizzying highs were gone, leaving unprofitable farms and thousands of excess birds. Most of the ostriches eventually ended up at slaughterhouses or were sold back to exotic game ranches.

The emu crash was even worse. According to Donald Feare, an Arlington, Texas, lawyer who runs a bird sanctuary, when the emu market imploded, meat processors simply weren't able to handle all the birds. Some farmers left their birds to starve. Some opened their gates and turned the confused emus loose.

For years, feral emus haunted the rural byways of Texas, frightening motorists and frustrating sheriff's departments before they eventually died out.

Clark, meanwhile, weathered the crash. He'd been lucky enough to get in on the ground floor and had sunk his money into his degree and the business itself: the land, the fencing, the barns. When the lean times came, he simply turned the adult ostriches out onto the property and left them to their own devices. But, privately, he wondered if someday the ostrich business could rise again.

Texas ostrich farming got another chance in 2011, when an outbreak of avian influenza in South Africa had hobbled the country's ostrich industry, and both demand and prices crept up. Many American ostrich ranchers who'd been burnt by the crash stayed away, but the few who'd kept their birds, such as Clark, cautiously began trying to sell them again.

This time they emphasised the value and health benefits of the lean meat, which has been a big driver of today's ostrich market.

Business eventually picked up enough for Clark to run the farm part-time as a specialty meat business, a side hustle to his day job as an attorney. He occasionally sells birds

to exotics ranchers or for special occasions, but most of his birds are processed and the meat shipped to wholesalers that supply restaurants that specialise in game.

Clark recently bought a further 56 hectare parcel of land in the hopes of expanding the operation, but he's still haunted by memories of the crash. The infrastructure problems that once plagued the ostrich industry have only escalated: in the 1990s, a few hundred plants processed ostrich; these days, only a dozen do.

"I'm a believer in growing slowly and, if everything's looking well, only then do you expand," said Clark. "There are some people whose business model is different to that, who try to get as big as they can as fast as they can. But it takes time to learn to raise ostriches properly."

There are speculators who believe that a commercial market is possible, such as Superior Ostrich, a breeding operation that has reportedly invested the equivalent of R180 million over the past few years and enlisted the expertise of South African investors. The company aims to grow the market and hopes to produce a steady 5 000 to 10 000 birds a year by 2025, selling to high-end restaurants and stores.

But whether Americans will bite is an open question. For all the rhetoric about ostrich as a healthier replacement for beef, the bird isn't likely to dethrone the heavily subsidised cattle industry anytime soon. Ostrich meat is still expensive in the US, costing at least three times more than beef.

Ostrich meat is still expensive in the United States, costing at least three times more than beef

And the shadow of the 1990s crash still looms. Smaller scale farms such as Clark's seems reasonably sustainable, but it remains to be seen whether the more industrial model – the type that Superior Ostrich is working toward – has solid footing.

Mantzel, once the great champion of Texas ostrich ranching, now dismisses it. Selling ostrich meat could potentially work, he concedes, but the South African ostrich industry has a hundred-year head start on infrastructure and distribution. "American ostrich is a pipe dream. They can talk about it around drinks every night, but when it comes to putting down cold, hard cash and connecting the dots to a viable product, no, it will not work."

Still, there's something about ostriches that keeps Americans coming back – the lure of expensive leather shoes, the dream of red meat with no fat, the romance of living dinosaurs. Leaning against Clark's truck, watching the flock grazing under the pecan trees, it's easy to see the appeal. The industry might not take wing the way that boosters once dreamed, Clark said. "But it's definitely got legs."

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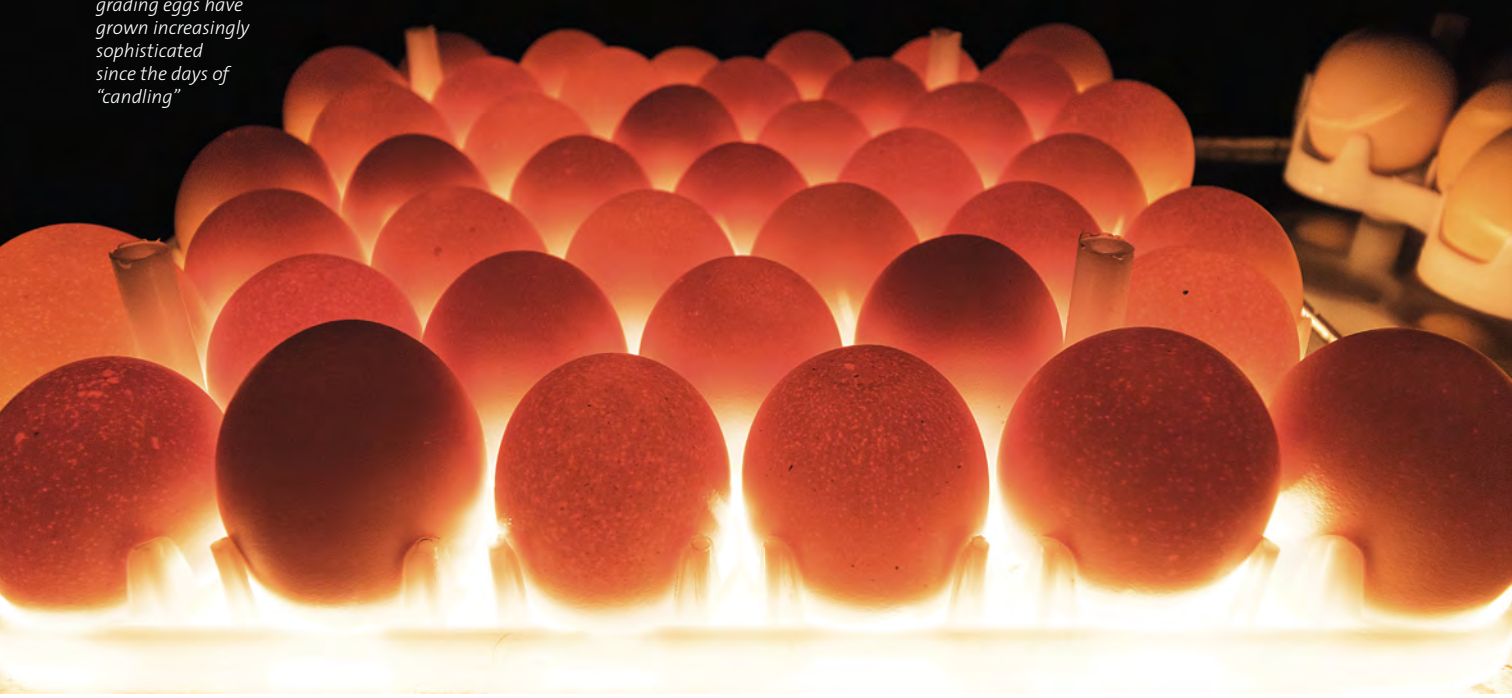
The flock from the air

Egg graders *in the* spotlight



Methodologies for grading eggs have grown increasingly sophisticated since the days of "candling"

Egg-grading machines take the guesswork out of egg sizes, and bigger eggs attract better prices. But there is more to grading, as *Poultry Bulletin* discovered after reader Ade Camngca from Ruffled Feathers Farm asked for guidance on this technology

Producers of eggs in South Africa have strict standards to adhere to, as specified in Regulation R345, which regulates the "grading, packaging and marking of eggs intended to be sold in the Republic of South Africa". In South Africa eggs are graded into seven size categories from superjumbo to small depending on their mass; and three numbered grades, with Grade 1 being the table eggs you'll find in the supermarket, to Grade 3 that might have minor cracks or other defects, and are turned into liquid eggs, which can be pasteurised and sold fresh or frozen.

And the bulk of these eggs, certainly the table eggs that end up in retail stores, are weighed and evaluated with a grading machine.

Today's graders are mostly automated, but in the past the process relied on people manually inspecting eggs in a process called "candling", whereby eggs are backlit on a conveyor belt in a darkened room, and visually inspected for cracks and blood spots. Cracked eggs can pose a health hazard if bacteria get in, hence the importance of close inspection and efficient grading.

Most eggs in South Africa end up taking a spin through a Moba grader, the most widely used brand, which spans operations of all sizes, from entry level plug-and-play graders that sort 1 600 eggs per hour and requires one person to operate it, to massive and highly computerised, customisable systems that can handle 180 000 eggs per hour. These technological wonders deliver details such as UV disinfection to reduce bacteria, sophisticated packing options with detailed labelling that allow for total traceability of each batch of eggs, and built-in self-check and diagnostic systems.

"Handling eggs with extreme care to avoid cracked shells and keeping them apart to prevent cross contamination with bacteria, are priorities when working with such vast numbers of eggs," says John Futter of Movosa, which has represented the Dutch Moba brand in South Africa for years. "The high-end graders are made of food-grade steel and all sensitive detection equipment are positioned above the egg flow so that potential leakage would never compromise the equipment, and a deep-clean with water is possible at the end of every working day, promoting hygiene and food safety."

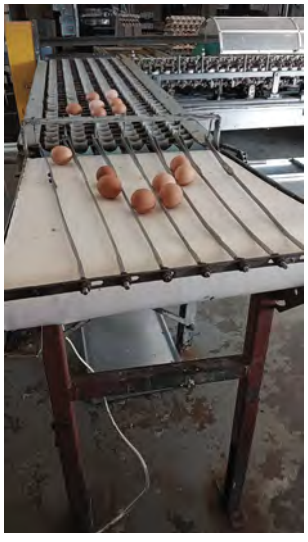
DID YOU KNOW?

South Africans eat an average of 159 eggs per person per year.

High-end graders can disinfect eggs using UV light, and offer sophisticated packing options

What automated graders have brought to the commercialised egg industry, above all, is the ability for a producer to accommodate the fact that hens can't be stopped and started for weekends and holidays. These systems allow for production processes to continue uninterrupted even when their human participants are unavailable.

Willie Bosoga from Aldabri Agricultural in Mogale City, Gauteng, produces 50 000 eggs per day, and supplies the bulk as ungraded mixed eggs on contract to a large producer. About 30% of Aldabri's production is graded for sale in their own shops, where cutting out the middle man gives them the best possible profit while also introducing their own brand to the market. Bosoga inherited an older-model Moba grading machine when he took over his farm in 2007, and this trusty workhorse has never let him down, grading 10 000 eggs per hour.



Aldabri Agricultural has operated with its older model grader for almost 15 years. The machine is semi-automated and grades 10 000 eggs per hour

Modern graders, such as these from Moba, come in a variety of sizes, speeds and price tags, from a hand-grading model to high-capacity machines such as the Moda Omnia range that can process 180 000 eggs per hour

To see the Moba entry-level machine in action, aim your smartphone at the QR code:

"Our machine is semi-automated, and requires people to pack the graded eggs into the right size cartons at the output side. Aside from cleaning and disinfection, it requires very little maintenance; we get someone to recalibrate it from time to time to ensure accuracy," he says.

"The benefit of grading is that you can get a better price for a bigger or higher graded egg, but aside from the initial capital investment, a smaller-scale farmer also has to weigh up the cost of running a grading machine, in terms of the electricity and labour it requires," cautions Bosoga. Although he values his grader, he would do without one if it had not come with his farm, he says.

Suppliers of day-old chicks also use grading machines, to ensure eggs that are set into incubators are big enough. According to Vincent Sharp of Hy-Line, they grade all the eggs that come from their younger flocks, where the layers are only 22 to 32 weeks, because young hens don't lay consistently big eggs.

"I don't set eggs that are lighter than 52 grams into incubators, because they're unviable or will hatch into underweight chicks, smaller than 32 grams. We want to send out uniform size chicks. The grading machine has the added benefit for us that it turns the egg the right side up. If you set an egg upside down, it won't hatch as the air bubble needs to be at the top. Setting eggs manually, by eye, you miss up to 5% that are wrong side up, and you lose all those eggs," says Sharp.

'The grader also turns the eggs the right side up, which ensures that they will hatch'

"We use a Staalkat grading machine, which we bought around four years ago, and we only use it for the younger flocks coming into production. It grades around 28 000 eggs per hour. Once the flock is mature, you know that the hens lay big enough eggs as a standard, so the size monitoring is not necessary any longer."

EGG SPECS UNPACKED

Size designation	Mass per egg
Super jumbo	More than 72g
Jumbo	More than 66g
Extra large	More than 59g
Large	More than 51g
Medium	More than 43g
Small	More than 33g
Mixed sizes	More than 33g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Compiled by **Charmain Lines**

How insects shrink eggs' carbon footprint

Morrisons, the UK's fourth largest supermarket chain, is set to introduce carbon-neutral eggs in 2022 – thanks to insects.

The installation of small-scale insect farms at 10 of its egg farms will allow Morrisons to replace soya with insect larvae in its chicken feed. At the same time, the insect farms will recycle the supermarket group's fruit and vegetable waste.

The insects in question are black soldier fly larvae. Each container of larvae can process three tons of food waste and help to feed 32 000 hens every week. Across the 10 egg farms, 320 000 hens will be fed while 30 tons of food waste is being recycled.

Hens cannot, however, live by insects alone. The supermarket chain will also feed its hens a supplementary diet of locally produced beans, peas and sunflower seeds.

According to Morrisons, soya currently accounts for 10-20% of UK hens' normal diet. Up to 70% of the emissions from the UK's egg supply chain is attributed to feed, of which soya is a major contributor.

Reducing soya, the company says, and feeding insects food waste on these 10 farms alone is expected to prevent the deforestation of 56 hectares of South American land every year, where half of the world's soya beans are currently farmed. It will also reduce CO_2 emissions by 5 737 tons and save 40 billion litres of water annually.

Heiko Köster, a South African animal nutritionist, says that, locally, insects as protein source in chicken feed is still a niche market. "Opportunities certainly exist, but a lot of research is still needed to bring the cost of producing a unit of insect protein in line with the cost of a unit of soya." Calling all bug researchers!

Ostrich antibodies unmask Covid infections

Photographs: Shutterstock

Japanese researchers at the Kyoto Prefectural University have developed masks that use ostrich antibodies to detect Covid-19. The innovation built on previous studies that showed ostriches have strong resistance to disease.

The scientists started by creating a mask filter coated with ostrich antibodies targeting the novel coronavirus. Participants wore the masks for eight hours, after which the filters were removed and sprayed with a chemical that glows under ultraviolet light if the virus is present. The filters worn by people infected with Covid-19 glowed around the nose and mouth areas.

The team hopes to further develop the masks so that they will glow automatically, without special lighting, should the virus be detected.

Should the masks prove commercially viable, they could make low-cost home testing possible.

Girls only, please

A solution might soon be on the cards for the layer industry's major animal welfare and economics headache: the culling of male chicks. An estimated six to seven billion male chicks are culled every year in the US alone, costing the industry more than $440 million in wasted eggs.

However, scientists at the Francis Crick Institute and the University of Kent in the UK recently announced the successful breeding of female-only and male-only mice litters, using CRISPR/Cas9 gene-editing technology.

"We have developed a method for 100% efficient sex selection of offspring sex in mice, and we believe this will be readily adaptable to other species including livestock, should public opinion and legislation allow for the use of this type of genetic technology in the food chain," Peter Ellis, co-author of the research paper and senior lecturer in molecular genetics and reproduction at University of Kent, told WATTPoultry.com.

Ellis pointed out that the mice research has taken six years. A similar timeframe would be required to prove the concept in chickens, given that the mechanics of sex chromosome expression and silencing are not the same in poultry and mammals, followed by a further scale-up period before it could be deployed widely.

It's a long time to wait, but the layer industry can take heart from this development.

Is AI vaccinations the answer?

With bird flu cases continuing to climb in Europe especially, and the disease appearing to lose its previous seasonality, culling can no longer be the prime solution. This is the opinion of Kees de Jong, chairman of the poultry department of the Dutch agricultural and horticultural organisation LTO Nederland. The time, De Jong says, has come for a vaccine.

De Jong's comments followed the release of research findings by the FLI, a government animal welfare research institute in Germany, that argue that Europe has never experienced an outbreak of bird flu as severe as seen in this current European winter.

In previous years, the virus appeared mainly in countries with plentiful bodies of water, such as the Netherlands, and often only during the migration season in the last months of the year. Now, the virus also appears in drier areas and is present all year. For example, the virus was discovered in nests with young birds last spring.

Since October, the European autumn, the virus has been detected 675 times in wild birds in Europe, and 534 outbreaks have been reported in domestic (backyard and commercial) animals. In addition, the virus has also been detected in mammals in several countries: in foxes in the Netherlands and Finland, in seals in Germany and Sweden, and in otters in Finland.

While large pharmaceutical companies are working on a bird-flu vaccine to fight the virus, many countries remain concerned about the safety of meat and eggs from vaccinated animals. But with the virus spreading as fast as it is, opinions will have to change according to the science. Trials with vaccines are expected in the near future in the Netherlands, Belgium and France, among others.

HACKS&TIPS

Farmers tell all about the technology that makes a difference in their operations

We asked

1. **What technology do you consider essential on your farm?**
2. **If money was no object, what equipment would you invest in?**

Pheona Phalane

Phalmosh Poultry Farm
Hlohlokwe village, Gasekororo,
Tzaneen, Limpopo

Follow Phalmosh Poultry Farm on Instagram:

@phalmosh_poultry_farm

1 Top of the list is my laptop for record-keeping, and for the mentoring that I do via Zoom or MS Teams; and the apps that I use for marketing and invoicing – those are the technologies I can't do without. I offer mentorship packages to aspirant poultry farmers that includes a broiler-production manual which I wrote, and market my services on Instagram. More details are on my website, www.phalmoshfarms.co.za.

2 I'd get a chicken plucker, a cooling system, and a camera installation for security, to monitor the farm when I am not available. I'd also invest in a hatchery system and abattoir equipment. It is a dream to have the full supply chain sorted and be able to supply big numbers. At the moment I raise 1 000 to 2 000 chickens during the year and double that during the festive season.

Photographs: Shutterstock

Do you have a shortcut or a clever plan that helps your business run better? Let us know: editor@poultrybulletin.co.za

Zondile Kamanga

Botsalo Farming and Poultry
Bapong, Brits, North West

Follow Kamanga on Twitter:

@BotsaloBtf

Kamanga's plucking machine is a great time saver

1 I started my business just before the first Covid-19 lockdown because my employer was retrenching people. We plant crops and raise poultry – 500 chicks per cycle – and some goats. Technology has made life much easier in terms of poultry farming, and I rely a lot on my chicken plucking machine. It is not a big-name brand; I bought it from a Chinese shop, but it has cut down on the hard labour.

We used to slaughter 50 a day for three days as my orders would be 150 per cycle. During this period we would work 14 to 16 hours a day. We would slaughter the birds by hand, pluck them, clean the innards, sleep for five hours and then do another batch. It was just my partner and I as we could not afford to employ another worker. We bought the plucking machine in November 2020 and since then I can do 50 chickens alone in eight hours. The machine takes three to five chickens depending on their weight, and will remove the feathers in a fast spin cycle.

The biggest work now is to clean the innards. Where previously I'd spend four hours just to remove feathers off 50 birds, it now takes 30 minutes, and I can get through all 500 birds in just five hours.

2 If money was not an issue, we would expand and work towards having a full, automated system, and eventually an abattoir which could also serve the farmers in the area. Many people around here started poultry farming after losing jobs due to Covid-19.

Do I buy that bright new tech?

When is the time right to invest in an expensive new technology? **Nico Groenewald** advises

***"Dear* Poultry Bulletin, *I am trying to decide whether I should buy automated equipment for my hatchery. It's a big investment, so how do I know if I should make that leap?"* – Bongani, via DM.**

Since the 60s when William Gaud from USAID coined the phrase "Green Revolution", the advancement in a number of agricultural technologies transformed the agri landscape. In most of what is written about "agritech" its advantages focus on increased productivity because of cost reduction and/or increased production. Added benefits include improved and consistent quality, and easier access to markets and information.

Indeed, technology changed agriculture, including the poultry industry, and contributes to big issues such as food security for a growing population.

On the downside, the implementation of technology can require high setup costs which likely will have to be financed – adding financial risk to a farming operation. Then there are aspects of compatibility challenges with existing technologies and processes, the potential of high complexity of new additions, and potentially the sole reliance on the technology which could pose a risk to production in the event of a tech failure.

The impact on the environment because of intensive farming practices on the back of technology could also come at a cost.

Ultimately you as the farmer are responsible for optimising your own financial performance and so, as with everything in life, a balanced approach towards technology too could help you avoid making the wrong decision. Remember the basics when investing in technology. In the versatile textbook *Finance and Farm Management* Standard Bank dedicates a full chapter to the investment decision.

The timing of an investment and its anticipated benefits could complicate decision-making because of uncertainty, so consider the following:

- Make sure that the objective of the investment is clearly defined; for instance, you want to increase your hatchery's output by 200%.
- Evaluate your alternatives in terms of this objective.
- Compile a detailed technical description of the project (take into consideration potential complexity, training that may be required, and the compatibility with existing processes and technologies that are likely to continue).
- The next step is to describe the technical aspects in financial terms, considering the time factor as well as the in and out flow of capital.
- It is all good and well to listen to the many advantages that the sales consultant for the hatchery technology will list, but also consult early in the process with your auditor, financial advisor and/or financier (in some instances consultation with a legal advisor might also be relevant). They can assist with the financial and risk aspects of an investment by looking at the use of profit after tax (PAT) and average rate of return (ARR) based on conventional accounting information; or the use of repayment periods, net present value (NPV), capital budgets, internal rate of return (IRR) and profitability index as criteria. All these methods are based on cash flow and not on accounting profit.

To summarise, new technology is very likely to help you advance your hatchery operation, but it is important to incorporate it in the bigger picture of planning your farming business. Technology always needs to be fit for your individual purpose.

Nico Groenewald is the head of agribusiness at Standard Bank Group

Photograph: Shutterstock

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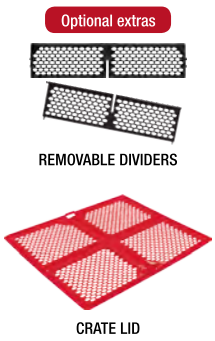

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Agritech – the future of poultry production?

The role of technology in smart farming needs constant scrutiny, says **Christoff Pienaar** of Cliffe Dekker Hofmeyr

As with other areas of our economy, the boom in technological developments and innovations has permeated the agricultural sector. This fast-developing movement, often referred to as "agritech", or "smart farming", generally refers to the use of technology to monitor and adapt the relationship between farming inputs and outputs. Recent challenges faced by the poultry industry specifically and agriculture in general, have demanded new solutions and accelerated agritech's integration, both through imported solutions and successful local innovations.

Given how fast technology is developing, careful consideration is required with regard to the direction of further integration as government and industry alike attempt to benefit from and also regulate the influence of agritech.

The poultry industry has introduced a variety of mechanisation processes and predictive analytics through various agritech solutions. The recent avian influenza outbreaks as well as the fall-out from Covid-related restrictions have accelerated an existing developmental trajectory. While neither the pandemic nor AI are permanent, it is clear that agritech is entrenched in the South African farming landscape.

The recent bird flu outbreaks and the fall-out from Covid have accelerated an existing developmental trajectory

Similar to the experience in other industries, regulators face an uphill battle to keep up with the pace of agritech developments. At present, there is no express or direct regulation of agritech in South Africa. Instead, government has sought to encourage the integration of such technologies into the agricultural sector, as is clearly evidenced by the Draft Climate Smart Agriculture Strategic Framework published by the Minister of Agriculture, Forestry and Fisheries in 2018.

In a similar vein, it is noteworthy that in the 2021 State of the Nation Address President Cyril Ramaphosa proclaimed that, over the next five years, government intends to reduce reliance on imports in the agri sector by 20%, opening space for local agritech development.

The preventative and responsive solutions offered by agritech open new doors to greater sustainability and certainty in an already resilient and innovative industry. While the specific role of agritech in 2022 remains to be seen, it is clear that it will be an area of focus for government and industry alike.

As we move into a post-pandemic world, the need to stay informed of global regulatory developments in agritech is paramount as it will play an increasingly important role in the poultry industry and broader agricultural sector.

Christoff Pienaar is the head of CDH's technology practice, which advises clients on smart farming matters from a legal perspective. Extra input by Lee Shacksnovis, associate, and Jonathan Sive, associate designate at CDH

SOUTH AFRICAN POULTRY ASSOCIATION
Founded 1904

SOUTH AFRICAN POULTRY ASSOCIATION

OFFICIAL NOTICE – CONGRESS 2022

To all members of the South African Poultry Association
Issued by: The General Manager, South African Poultry Association, PO Box 1202, Honeydew, 2040.

SAPA EGG ORGANISATION

Notice is hereby given that the 49th Annual General Meeting of the SAPA Egg Organisation will be held on Tuesday, 7 June 2022, place and time to be confirmed.

Resolutions: All members of the SAPA Egg Organisation may submit resolutions for the agenda of the organisation's Annual General Meeting, accompanied by a written motivation for consideration by the board. A board meeting will be held at the rising of the Egg Organisation Annual General Meeting.

Deadline: 2 March 2022

SAPA BROILER ORGANISATION

Notice is hereby given that the 49th Annual General Meeting of the SAPA Broiler Organisation will be held on Tuesday, 7 June 2022, place and time to be confirmed.

Resolutions: All members of the SAPA Broiler Organisation may submit resolutions for the agenda of the organisation's Annual General Meeting, accompanied by a written motivation for consideration by the board. A board meeting will be held at the rising of the Broiler Organisation Annual General Meeting.

Deadline: 2 March 2022

SAPA CONGRESS 2022

Notice is hereby given that the 116th Annual Congress of the SA Poultry Association will be held on Tuesday, 7 June 2022, place and time to be confirmed.

Resolutions: Only members of the SAPA Board, affiliates and honorary life members may submit resolutions for this agenda. A SAPA board meeting will be held at the rising of the Congress.

Deadline: 2 March 2022

REPRESENTATION – HONORARY LIFE MEMBERS

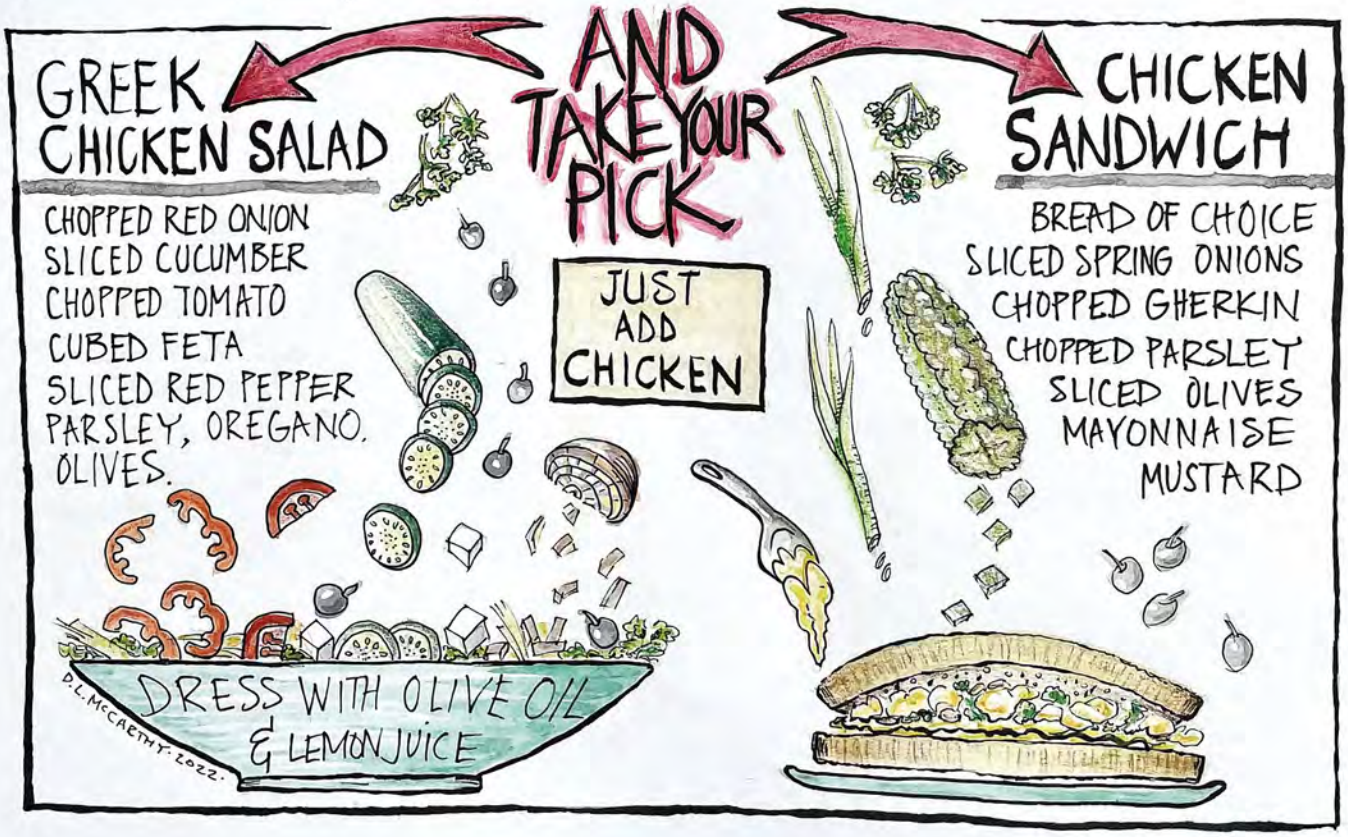
Honorary life members of SAPA, who are prepared to represent this group's interest at the 116th Annual Congress, are requested to notify the General Manager in writing: PO Box 1202, Honeydew, 2040, before 2 March 2022.

Honorary Life Members are entitled to one representative at Congress in terms of the SAPA Constitution.

Deadline: 2 March 2022

RECIPE OF THE MONTH

BRING WATER TO A ROLLING BOIL & BOIL FOR 2 MINUTES.
ADD 2 OR 3 BONELESS, SKINLESS CHICKEN BREASTS & BRING BACK TO THE BOIL. COVER TIGHTLY & REMOVE FROM HEAT.
LEAVE TO POACH IN THE HOT WATER FOR 40 MINUTES.
REMOVE CHICKEN, DRAIN, COOL & SHRED INTO BITE-SIZED PIECES.



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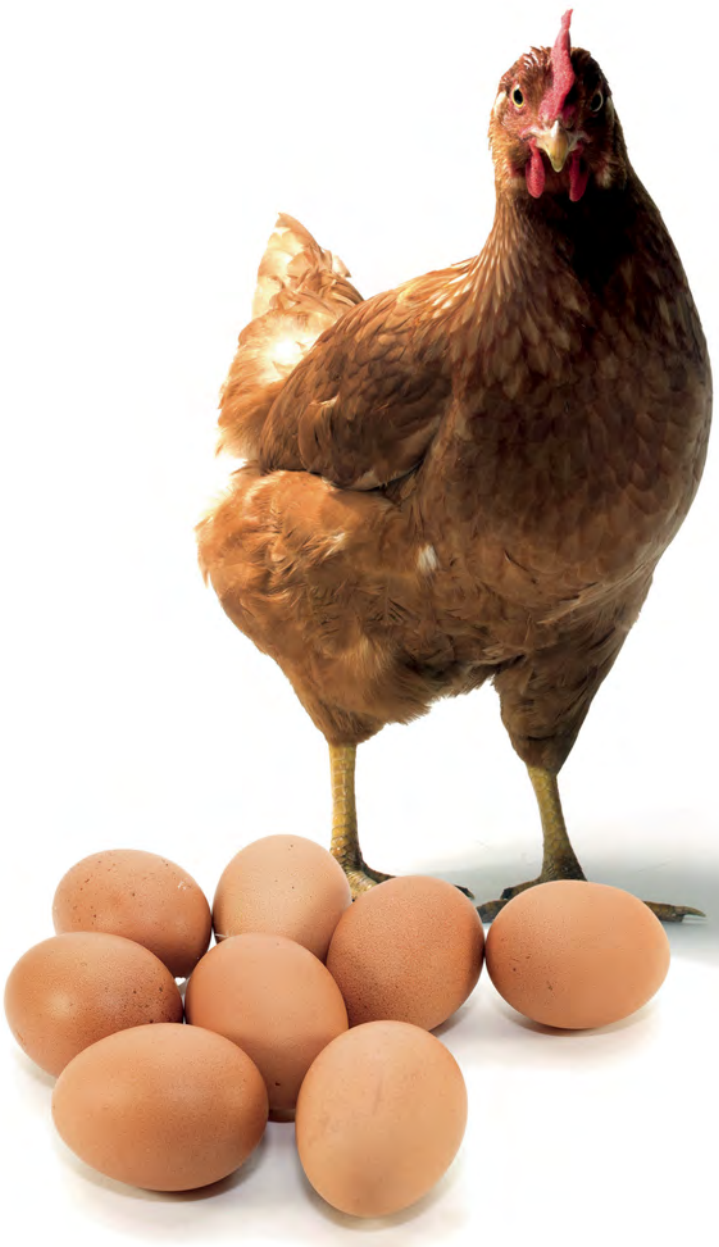

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