

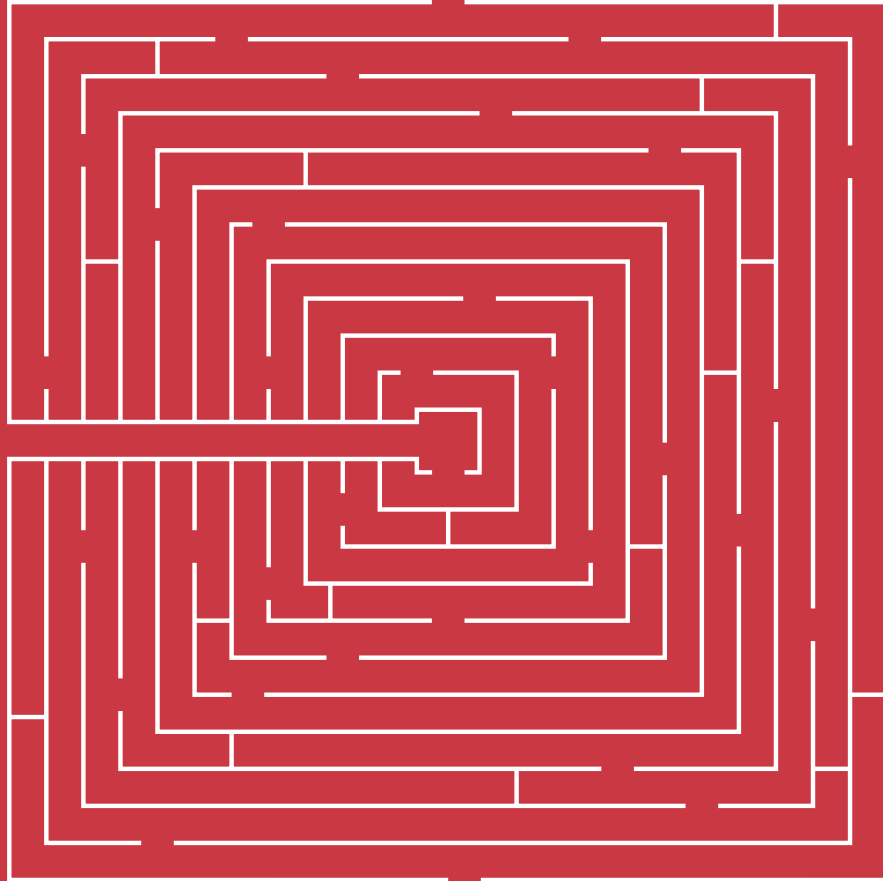
Poultry Digital

Top of the flocks

The science behind our pursuit of the perfect poultry



Inside the Breeding & Genetics issue | The heritability of feather-pecking • Can turkey researchers crack cryogenics? • Reviewing Ghana's poultry enhancement programme • Why heritage breeders should consider making a flock will • Introducing the Junglefowl • Meet a specialist avian veterinarian



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FROM THE EDITOR

“Man first started tweaking the chicken’s genes over 7,000 years ago”

Turn to page 30 in this issue and you’ll meet the red junglefowl, the square root of the modern chicken, still roosting and crowing in Southeast Asian forests today. While contemporary poultry genetics is a complicated and extraordinary thing (see ‘Can turkey researchers crack cryogenics?’ on pages 12-15), in fact man first started tweaking the species over 7,000 years ago when he first took the junglefowl in to farms in India and started its amazingly successful journey to domestication.

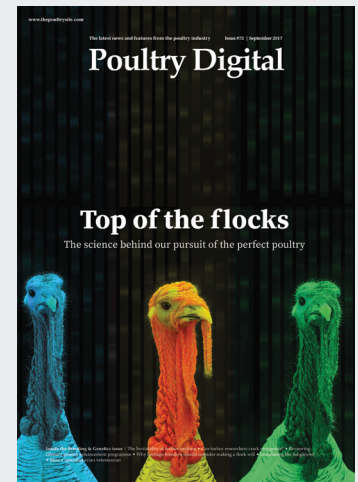


Today the industry’s breeding concerns are rather more developed, and this issue of Poultry Digital highlights just a few of them. On pages 8-11 we explore new research into the possibility that feather-pecking is an inherited trait, opening up new opportunities for improving welfare. We also consider the dilemma facing dedicated heritage breeders – what happens to their carefully constructed flocks once their owners are gone?

USDA projects in Ghana (page 20), international travel for pet chickens (page 32) and a specialist avian veterinarian (page 16) are just some of the other topics included in the issue. Then we’ll be looking forward to the final issue of 2017, when we’ll review some of the biggest stories of the year and look ahead to the opportunities and challenges of 2018.

Ellen Hardy | Managing Editor

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Dutch egg scandal spreads to 17 countries worldwide

GLOBAL 15 AUGUST 2017

Millions of eggs across Europe have been destroyed in a food scare caused by a pesticide that was sprayed on chickens in The Netherlands to treat them for ticks, flies and lice.



HARMFUL | Millions of eggs have been destroyed due to Fipronil contamination, which can be harmful to human health in cases of prolonged exposure

Since 20 July, millions of eggs have been destroyed or taken off supermarket shelves as it emerged that Fipronil, which is banned for use on animals intended for human consumption as it can be harmful to human health, was mixed in with another substance known as Dega 16 used to treat the chickens.

Tests have proven that very low levels of Fipronil, seven to ten times below the maximum limit, have been detected in eggs from the treated chickens. One test in Belgium, however, was above the European limit.

Poisoning by small doses has few

effects and requires little treatment; however, heavy and prolonged exposure can damage the kidneys and liver or cause seizures.

Neighbouring countries Belgium, The Netherlands and Germany are all blaming each other over the incident, alleging each of them knew about the problem but failed to announce it soon enough.

Understandably, it is the poultry farmers who have been hit the hardest, and are blaming the company responsible for mixing the chemicals.

[Read the original article here](#)

Chlorinated chickens overshadow US-UK trade talks

US & UK 27 JULY 2017

Talks between Britain and the US on the potential for post-Brexit trade have been overshadowed by concerns over whether Britain would be forced to lower its food standards to accommodate US demands.

The first meeting of the US-UK Trade and Investment Working Group took place in Washington D.C. The meetings cannot involve negotiations on a free trade deal, but can explore the potential of what could happen after Britain exits.

The latest controversy over food standards – and in particular US demands to allow the export of cheaper poultry washed in chlorine – highlights the difficulties of this process. The government, eager to show that it was “taking back control”, does not want to simply capitulate to demands of stronger nations just to secure trade deals.

Chlorine-washed chicken is currently banned under EU regulations, and public concern about such chicken coming to the UK remains high.

[Read the original article here](#)



FOOD STANDARDS | US demands to allow the export of cheaper poultry washed in chlorine to the UK have been met with opposition

FROM OUR SPONSORS

Managing female bodyweights in rear



Management of female broiler breeder body weight during rear (placement to point of lay) will enhance flock performance and productivity.

During the first seven to 14 days, a flock will be fed ad-lib so that optimum skeletal and cardio-vascular development is supported, and target bodyweight is reached. Feed levels are then adjusted to maintain average flock bodyweight on target until grading.

The more effort put into creating a uniform population, the easier it is to manage that population with regard to feed levels and associated weekly feed increments. This is done by grading at 28-35 days.

Once the flock has been graded, it is important that feed levels are adjusted appropriately for each graded population to ensure that target body weight is achieved.

- **Light populations** – should receive an increase in feed. Due to reduced competition, it may be beneficial to maintain pre-grading feed levels for one week post-grading. Feed levels should then be increased to allow birds to come back to target by 10 weeks of age. A simple rule of thumb is to increase the recommended weekly feed increment by 1g for every 40g of body weight the birds are under target weight.



For example – if the weekly recommended feed increment is 2g and the birds are 120g under target weight, the feed increment given, should be $2g + (120g/40g) = 5g$ of feed per bird. Subsequent weekly feed increments should be determined in the same way until target bodyweight is reached.

- **Average populations** – should continue to be fed to achieve target bodyweight.
- **Heavy populations** – feed levels should never be reduced but feed increments will need to be smaller to bring birds back on target by 10 weeks. Do not maintain feed levels at a constant for greater than two weeks.

At 10 weeks, it may be necessary to

regrade the population, following the same post-grading feeding guidelines given above to ensure all populations reach average target weight by 15 weeks of age.

From 16 weeks of age to point of lay, larger weekly feed increases are required to achieve the correct sexual maturity prior to light stimulation. It is essential that bodyweight targets are maintained during this period if subsequent flock productivity is not to be affected.

- Overweight birds will have poorer persistency and a higher probability of prolapse and associated peritonitis
- Underweight birds will have a lower peak, poorer persistency and a higher probability of prolapse and associated peritonitis

New avian influenza events for summer 2017

PHILIPPINES 17 APRIL 2017

Agriculture officials in the Philippines reported the country's first highly pathogenic H5 avian influenza outbreak, which struck a commercial poultry farm in Pampanga province on Luzon, the country's largest island.

According to the Centre for Infectious Disease Research and Policy (CIDRAP), in other avian flu developments, Laos reported its first H5N1 outbreaks of 2017 and South Africa reported more H5N8 outbreaks,

which have spread to some of its commercial ostrich farms.

A report from the World Organization for Animal Health (OIE) said the Philippine outbreak began on Jul 24, killing 36,485 of 190,000 birds. Culling was ordered as one of the outbreak response steps, which also included movement controls, quarantine, disinfection, and enhanced surveillance.

A report in the Manila Times, based on a media briefing with Emmanuel Pinol, the country's agriculture secretary, said the outbreak was confirmed in the city of San Luis and that six poultry farms were affected.

[Read the full article on the CIDRAP website here.](#)



OUTBREAK | A report from the World Organization for Animal Health (OIE) said the Philippine outbreak began on Jul 24, killing 36,485 of 190,000 birds

Mandatory CCTV in slaughterhouses ‘huge win for animal welfare’, says BVA

UK 14 AUGUST 2017

The UK government’s plan to introduce mandatory CCTV in all slaughterhouses in England is a huge win for animal health and welfare, following years of campaigning by the British Veterinary Association (BVA) and Veterinary Public Health Association (VPHA)

BVA and the Veterinary Public Health Association (VPHA) – who represent the Official Veterinarians (OVs) who oversee animal health and welfare and public health in slaughterhouses – have been campaigning for both mandatory CCTV in all areas of slaughterhouses where live animals are kept and full and unrestricted 24/7 access to CCTV footage for OVs as part of their long-standing welfare at slaughter campaign.

Both commitments are vital in order to safeguard animal welfare, assist with enforcement and instill consumer confidence. All of these asks were included under new animal welfare plans announced by Environment Secretary

Michael Gove.

British Veterinary Association President Gudrun Ravetz said: “Today’s announcement is extremely welcome. We have been campaigning on this issue for a number of years and this announcement represents a huge win for animal health and welfare in England.

“Mandatory CCTV in all areas of slaughterhouses will provide an essential tool in fostering a culture of compassion that could help safeguard animal welfare and we are particularly pleased to see a commitment to Official Veterinarians having unrestricted access to footage.

“We recognise that the cost of installing CCTV may be a burden for some very



small abattoirs, but it is important that the animals we farm for food have both a good life and a humane death and CCTV has a key role to play in ensuring these requirements are met.”

[Read the original article here](#)

FROM OUR SPONSORS

Coccidiostats: what are they and why are they important to test for in poultry?

Antibiotics have been used in the animal food industry since the early 1940s, their introduction in veterinary medicine has in many ways revolutionised the industry.

The main use of Antibiotics is normally within the treatment of infection as a means for disease prevention. Examples of this could be treating respiratory and enteric infections during the early stage of the animals’ lives or for the treatment of bacterial infections.

Poultry are susceptible to coccidiosis which is a parasitic disease of the intestinal tract. This disease can be spread by contact with infected faeces, or the ingestion of infected tissues by other animals.

In order to treat coccidiosis, potent antibiotic drugs called coccidiostats are used within veterinary practice, mainly in feed additives. Chickens are susceptible to at least 11 species

of coccidia that causes coccidiosis therefore creating a high importance around treatment.

Government bodies are setting strict regulations on the amount of drug residues within products for human consumption per country. With this in mind many food processors have now implemented rigorous screening methods for the detection of these drug residues and are taking measures to ensure that their end products are not contaminated.

This has created a need for outsourced screening solutions, one company producers are turning to is Randox Food Diagnostics, an innovative leader in drug screening.

Randox Food Diagnostics created the Evidence Investigator drug residue analyser. The Investigator uses Biochip Array Technology (BAT), a technology that was developed by Randox, to detect multiple residues

(up to 44) from a single sample (various sample types can be screened).

Randox Food Diagnostics Coccidiostats Array for Feed will quantitatively test for 12 analytes including Lasalocid, Nicarbazine, Imidocarb, simultaneously. This multiplex technology allows the user to save time on testing and on the costs of running individual tests separately.

Randox Food Diagnostics is dedicated to improving the global food safety chain. We provide remarkable tools for the screening of antimicrobials, growth promoting hormones and drugs of abuse in animals and produce, offering superb limits of detection and simple sample preparations.

For more information on our coccidiostats array please contact us at: info@randoxfooddiagnostics.com

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FOOD DIAGNOSTICS

Could genetics counteract feather pecking?

Why a ban on beak trimming won't stop the 'super peckers' going for feathers

Words Melanie Epp

Damage from feather pecking and cannibalism presents severe welfare problems and has major economic implications for poultry producers. The problem is one that will only be compounded when beak trimming is banned for welfare reasons. While farmers have been told that making adjustments to their management systems – such as providing enrichment tools and more space – will virtually eliminate the behaviour, recent research suggests that this is unlikely to be the case.

According to research conducted by Dr Werner Bessei of the University of Hohenheim, Germany, feather pecking is a genetic, not management, issue. Based on their results, Bessei and his fellow researchers believe a better understanding of poultry genetics could lead to a reduction in cannibalism and feather pecking in birds.

Most scientists believe that feather pecking is the result of misguided foraging behaviour. The strategy in the fight against feather pecking, therefore, is to provide the birds with more occupation, like scratching and foraging. Other strategies include using diluted feed to divert attention from feather pecking to prolonged eating.

"In most cases, it does not have a significant impact on feather pecking," says Bessei. "It may reduce feather pecking, but you cannot totally avoid it."

Bessei believes the urge to peck is influenced by genetics, not environment. During the course of his study, he came across a group of birds that he called 'super peckers'. While such birds accepted the occupation tools, they still went for feathers, and the researchers wanted to know why.

"Obviously, there is a special genetically-based drive to eat

"Bessei believes the urge to peck is influenced by genetics, not environment"

feathers," he said. "And that's the first difference from our theory to the theory that exists in most of the publications. It's just because these birds want to eat feathers, so feather eating is the primary motivation."

What their findings suggest is that even if farmers employed all the recommended management strategies to reduce feather pecking they would have little impact, says Bessei, who points out that the problem still exists in free-range production.

"How can you argue that feather pecking is caused on the basis of occupation?" he asks. "They have sufficient occupation."

The good news is that Bessei believes that it is possible to genetically select with aggression, feather pecking and production in mind. "They have been doing that in Scandinavia for years now," he says. "But only if you can control light intensity."

"If you're working indoors, you can still reduce light intensity," he continues. "And that is, to my knowledge, the only reliable means to reduce feather pecking and the damages of cannibalism. But in free-range you cannot do that, so you have to live with the risk that if you are getting an outbreak, you are going to lose ten to 20 percent of your birds."

Bessei believes that a ban on beak trimming is premature.



“Farmers are being told that they are doing something wrong in their management,” he says. “But they’re not.”

Bessei concedes that better management can reduce feather pecking, but not in all birds, and certainly not all the time. “In some flocks it was okay, and in some we have disaster,” he says. “So I think that it’s not fair to the farmer to say if you have good management you won’t get feather pecking. That has been shown in our experiments.”

“Whatever you do, you have a percentage of birds that will not stop feather pecking, and that can be disastrous,” he continues.

Bas Rodenburg, associate professor at Wageningen University, in the Netherlands, isn’t sure that feather pecking can be eliminated either, but he does believe that major outbreaks can be prevented through flock management. Rodenburg has also conducted studies on the heritability of feather pecking. Dutch farmers are currently preparing for a ban on beak trimming, set to begin in 2018.

In one study, where the objective was to estimate heritabilities of feather pecking and the open-field responses of laying hens at two different ages, he concluded that gentle feather pecking and open-field behaviours may be used in selection

to reduce the prevalence of pecking feathers in subsequent generations.

“Of course, not all flocks will perform as well,” he says. “There will always be some flocks with some feather damage,

I think, but a lot can be done by a combination of breeding and a good, early-life environment and a good laying environment.”

Already some farmers have switched over to raising birds with intact beaks, and so far it seems to be going well, says Rodenburg. “Probably because people have been really focused on management and doing a good job,” he suggests. “Also, the feeding companies and veterinarians

among others are keeping an eye on what’s happening.”

“Indeed, I think [weeding out feather pecking] can be done,” he adds. “But it is challenging, especially for a country that has quite large flocks, quite intensive farming, and a lot of birds without free-range access,” he says. “But I think it can be done.”

Like Bessei, Rodenburg sees genetics as part of the whole package. “I don’t think genetics is the only solution,” he says. “It’s not like we can just switch it off by breeding... But,” he concludes, “I do think it plays an important role.” **PD**

“Better management can reduce feather pecking, but not in all birds, and certainly not all the time”

Can turkey researchers crack cryogenics?

How identifying and storing the genetic marker for turkey fertility could change the industry

Words Rachel Lane



Humans have manipulated poultry genetics for thousands of years by choosing which birds will breed with which to encourage the most desired traits – it is only in the last 70 years that laboratory genetics has established itself in the industry. Some areas of focus are common to both selective breeding and genetic research, like increasing egg production, improving feed conversion and increasing the breast meat available. While that holds true for turkeys, fertility is now also a particular focus for geneticists.

The search for the golden fertility gene

Dr Julie Long, poultry physiologist researcher at the [ARS Biosciences and Biotechnology Laboratory](#), was part of the team that sequenced the entire turkey genome for the first time in 2010. Using that data, her team is now focused on trying to expand the fertility of turkeys by identifying which genes are responsible for the better breeders: the best egg producers in the females and the males with the highest mobility sperm. Turkeys are raised from chicks by farmers, and until they reach maturity, there is no way for breeders to know which bird will have high mobility sperm – the term for sperm that moves in an efficient

pattern for fertilization. High sperm mobility is more important than a high sperm count, according to Long.

If it succeeds, Long's project could have big impacts on turkey producers. Once the genes associated with fertility are identified, the less productive turkeys can be pulled from the breeding programme and put into the supply line for edible birds. It would save the breeders money, since the cost of feeding the less efficient birds would be curtailed, and lead to future generations of turkeys with higher fertility rates. Also, eggs in incubators would have a higher likelihood of hatching, meaning fewer incubators would need to be operated to get the same number of birds.

This work doesn't take place at the farm level – for individual farmers, testing every bird's fertility wouldn't make sense. Instead, the task of improving overall turkey fertility rates rests with a few genetics companies that are currently working on breeding elite specimens. If these firms and their researchers were able to obtain clearer information on the genes responsible for productive breeding, they could create a "grandparent generation" of turkeys to pass on the genetic marker for fertility to hundreds of "parent" birds. This parent-line would then be sent to growers to produce a

“It would save the breeders money feeding the less efficient birds, and enable future generations of turkeys with higher fertility rates”

more fertile breeding generation, to enter the production cycle and be sold to consumers. If these fertility genes were identified, it's estimated it would take about five years for turkey producers to alter the breeding population's genetic make-up in order to make improved fertility a prominent trait in commercial flocks across the US.

Identifying the relevant genes is only part of the challenge – researchers and companies are also looking for ways to more effectively store, transport and implant the genetic material. The primary genetic companies for turkey are [Hybrid](#) (a subsidiary of Hendrix Genetics) and [Aviagen](#), which also tracks broiler chicken genetics. The companies





are protective of their methods and the genes they are promoting in the birds. Dr John Glisson, vice president of research at the [US Poultry & Egg Association](#), says their caution is partly due to the public perception that poultry receive growth-hormone treatments, even though this didn't happen, even when it was legal. (For hormone therapy to be effective, poultry farmers would have to inject each bird every day – and this would have been inefficient.)

Cryogenics: the magic bullet for efficient turkey breeding?

Geneticist Dr Ben Wood works at Hybrid, one of the companies tracking turkey genetics. From autumn 2017, he will be working with the USDA and PhD students from the [University of Guelph](#) to try to cryogenically freeze the ovarian tissue of turkeys. The process has been achieved in chicken and quail, but so far not in turkey. In the case of quail,

ovarian tissue was frozen for a week, then implanted in chicks that had had their ovaries removed – to test whether reproduction would be possible using transplanted ovarian tissue that had first been frozen, then thawed, before being implanted. When the chicks reached sexual maturity it was found they were able to reproduce, with the function of the transplanted tissue successfully preserved. **The test** demonstrated that the function of ovarian tissue in avian species can be successfully preserved at sub-zero temperatures and recovered by transplantation.

Dr Long approaches the challenge from the other direction. She works on seminal cryogenics, i.e. preserving sperm through freezing to ensure the viability of future populations. Many other animals and plants have fertility banks around the world to protect them from disease outbreaks and other catastrophic events, but poultry semen doesn't survive the freezing and defrosting process well, so creating a semen bank has been unrealistic. Recently, however, her research has seen some success. Several of the primary (i.e. ped-

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“Several of the primary genetic lines have had 35 to 45 percent fertility rates after cryogenics, a rate that is high enough to repopulate if a primary breeder farm is impacted by avian influenza”

igree) genetic lines have fertility rates of 35 to 45 percent after frozen sperm has been thawed and implanted, a rate that would be high enough to repopulate if a primary breeder farm were to be impacted by avian influenza, for example. Unfortunately, each different genetic line responds best to a different method of cryogenics. Dr Long hopes that identifying the genes associated with fertility might make cryogenics more efficient.

“In birds, we have a lot of things working against us,” Dr Long says. In addition to the typical poor reaction to

cryogenics, the female birds may store sperm for weeks before using it on an egg. Artificially freezing, thawing and storing sperm causes between a zero and five percent fertility rate compared to a 96 percent fertility rate using fresh sperm.

In the USA, turkey breasts have become so large as a result of breeding programmes that it is more efficient to artificially inseminate birds than to allow natural breeding. However, as Dr Jack Shere, USDA’s chief veterinary officer leading [APHIS Veterinary Services](#) explains, currently the sperm used for insemination is only good for a brief period before it starts to degrade. Samples need to be fresh, which means that live breeding birds are transported around the globe to disseminate their genes. If their sperm could be handled cryogenically, fewer male turkeys would be needed, because sperm samples could be shipped in their place. Each male turkey needed for breeding increases the costs because they require feed and labour to collect and distribute sperm samples. Fewer samples would also mean they could more easily be tested for diseases before use for insemination. Similarly,

to prevent the turkeys with specific genetics from being exposed to the same diseases and potentially wiping out the line, Hendrix currently exports chicks or fertilised eggs with the same parent birds to different farms around the world, so that genetic material doesn’t get lost if a disease outbreak occurs.

So, if a uniform method can be discovered to store sperm and ovarian tissue, breeders could store the genetics with desirable traits and transport them comparatively easily. Dr Wood has worked with Dr Long on her research into cryogenically handling turkey sperm. He said the frozen sperm could be used for long-term storage if the birds had a specific trait the company wanted to save. In general, the genetic material from each generation of bird is superior for commercial use than previous generations, meaning the stored sperm wouldn’t always be the most up-to-date version in case of a disease outbreak – but it would provide a safety net. As a tool to help future-proof the poultry industry, cracking the turkey fertility gene and seminal cryogenics could make all the difference. **PD**

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Farming in focus

Meet the people driving change in their industry

Words Jennifer Parker

Neil Forbes
Avian veterinarian and founder of Great Western Exotics

What is your opinion on the [Defra](#) measures in response to the [outbreak of bird flu](#) in the UK last winter?

I think the Defra measures are proportionate to the risk. They had obviously been watching the situation in Europe very carefully and were well aware that it was inevitable that we were going to get some outbreaks.

One of the difficulties is that, whilst they should have contact details for everyone with a flock of 25 or more poultry, it took quite a long time for information to get out to individual owners of small groups of backyard poultry.

That is one area where veterinary practices and OV surgeons have an official role to play because they may well be coming face to face with those people. I think making sure that people, particularly backyard keepers who are hobbyists, really understand what biosecurity is about and are doing sensible things is incredibly important.

In terms of the overall picture, my confusion is the fact that these legislation requirements do not relate to pigeons or birds of prey. Even in a higher-risk area, there is no restriction on flying birds of prey who might catch, kill, eat a duck or a goose, and that seems a little bit of a dichotomy in terms of restrictions.

There have been a couple of bird flu cases reported in wild birds of prey in England and Scotland; what protection advice would you offer to keepers of birds of prey?

This is going to be a long-term problem. I would suggest that, if the restrictions are there from a disease-control point of view, people flying birds of prey should not be doing so in higher-risk areas.

This also relates to wildlife casualty cases. If you are running a wildlife rescue centre, so only wildlife cases are at risk every time you take a wild bird in, so be it. But many falconry centres often take in injured wildlife and every time they accept an injured bird, particularly if they are in a higher-risk area, they are putting the whole of their collection at risk. As a veterinary surgeon looking at the risk assessment, I feel very strongly that should not be happening.

What drove you to specialising in exotic birds?

My grandfather was a very famous falconer – he was one of the founding members of the [British Falconers Club](#) and his brother was a very famous waterfowl conservationist who worked with the [Wildfowl & Wetlands Trust](#) in Northern Ireland. I had





LECTURING | Neil Forbes lecturing in amsterdam

home, so I've always had an affinity with birds. I've always worked in and relaxed in the countryside and have a great interest in conservation and wildlife generally anyway, so those two things mash together nicely.

Do you own any birds yourself?

Not at the moment. I have had birds of prey that have been recovering from injury. I have kept parrots as well, but I would never have a parrot and go out to work and leave it at home by itself; I wouldn't have a single parrot in a cage either. When I had a parrot, I brought it to work so it had company 24/7 and then I actually rehomed it with a breeder client so it could be in a flock in a big aviary with 30 birds. I thought that was better for the bird. Sad for me, but better for the bird.

It's not to say that I won't have other birds in the future, but I have a very hectic life, travelling a fair bit and lecturing, doing conservation work abroad and so on.

What conservation work are you involved in abroad?

I'm involved with critically endangered and endangered vultures in South Africa. Ninety-eight percent of the vulture population has been lost in Africa in the last 30 years; they are, in many cases, as rare or more endangered than rhinoceroses, and yet everyone gets excited about rhinoceroses and African lions (which are also persecuted). The

vultures are having a really difficult time and, in many respects, solving that problem is going to be a lot more difficult.

I'm working with a conservation organisation over there called [Vulpro](#) and they work with injured, sick vultures. We're rehabilitating all those that can be rehabilitated, and those that can't are being used in captive breeding projects to breed more youngsters, which can then be released.

“I guess one of the most bizarre things I've done is to spay an Andean condor. There's not many people who do that – because why would you? It's an endangered species”

What have been some of the most bizarre cases you've had to treat?

They are always bizarre and unusual. I guess one of the most bizarre things I've done is to spay an Andean condor. There's not many people who do that – because why would you? It's an endangered species. It was an infant bird and it had several episodes of egg binding so it had to be done. Another unusual case I had recently was doing a caesarean section on a 40g lizard. From there to ostriches and other wildlife, it has been an interesting, challenging and stimulating career. [PD](#)

For more information on Neil's work, see the [Great Western Exotics website](#).

a genetic predisposition, shall we say!

My grandfather, who was amongst the first group in the world to breed merlins in captivity in breeding accommodation, knew Professor John Cooper [now Honorary Research Fellow at the University of Kent] very well. We were introduced when I was at university in London and he was great in stimulating and helping me develop my specialist interest. It was a family interest cultivated by John Cooper.

So you grew up with birds all around you?

Yes and no. My grandfather's birds weren't around me because he wasn't that close to me, but we also had poultry at

Focus on Ghana

Two years in, Ghana's five-year poultry plan is paying off

Words Efua Konyim Okai

With support from both the US government and their own national agricultural bodies, Ghana's chicken farmers are mobilising to prise the maximum benefit from an ambitious project to boost the country's poultry production. Efua Konyim Okai spoke to Kwame Awuku of Delawin Farms, one of the scheme's beneficiaries, to find out how Ghanaian producers are making the most of the opportunity

Strategically located some 20km from the harbour and industrial city of Tema, Delawin Farms is one of the medium-scale poultry enterprises that could, in a more favourable business environment, help restore Ghana's poultry industry to its former levels of prosperity.

The farm's current output of 500 trays of eggs per day and 6,000 broilers per month is, by its own standards, modest. In more than 20 years of operation, it has been named the Greater Regional Best Poultry Farmer on five occasions, and has established a reputation for providing good-quality products to a high-value clientele. Although it regards its current operations as profitable, it is hoping that government policy will significantly improve the fortunes of poultry farmers throughout the country.

Delawin is one of the many poultry enterprises that are benefiting from the US Department of Agriculture (USDA)-funded Ghana Poultry Project (GPP), a five-year initiative that is

seeking to improve poultry production across the value chain. Focusing on the country's three major poultry-producing regions – Greater Accra, Ashanti and Brong Ahafo – the \$58 million project is providing skills training to help enterprises improve product quality and increase production efficiency. It is also promoting strategic investments and private-public partnerships, working with farmers through the Ghana National Association of Poultry Farmers (GNAPF). The GNAPF is in turn being assisted in improving its communications with its members and advocacy on their behalf.

Quite a number of training workshops have been organised for farmers in the three regions, and valuable skills transferred. Kwame Awuku, Managing Director of Delawin, believes a substantial amount of new information has already been shared. Awuku says one of the most useful aspects of these workshops has been "having prominent people in the agencies that matter most all in one place," to share up-to-date information.

“Delawin Farms is one of the medium-scale poultry enterprises that could, in a more favourable business environment, help restore Ghana's poultry industry to its former levels of prosperity”





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The demonstration farm workshops, he says, have been even more useful: “Farmers have been able to ask questions and seek explanations whilst looking at situations they are facing on a daily basis, with the key veterinary, nutrition and production experts all in attendance. Even though our staff are reasonably well trained, GPP has been a great learning experience.”

The bulk of Delawin’s clientele are hotels and catering establishments with specific needs. While some require standard-size birds produced in six weeks, others prefer bigger two-kilo birds that are deboned prior to cooking. Awuku believes that the GPP’s training programmes will help raise production quality in poultry establishments, especially among the numerous small-scale farms which far outnumber the medium- and large-scale farms, but which account for less than a quarter of Ghana’s poultry production.

Awuku shares the belief of some prominent experts that the level of technical skills among Ghana’s hatchery personnel is low. “We need to produce

“Another cause of low poultry production levels among small-scale farmers is weak biosecurity and health management. Many farmers use antibiotics without completing the recommended course durations, and many do not observe withdrawal periods”

better quality day-old chicks,” he says. “Presently, Delawin uses imported day-olds in order to maintain our quality standard, which adds to our production costs.” But the main challenge facing Delawin, and most Ghanaian poultry farmers, is the cost and quality of feed. Feed costs account for 80 percent of Delawin’s production budget. These costs would be higher if the company were using commercial feed. Maize and soya meal are the main components of poultry feed in Ghana.

The challenge faced by commercial feed millers, Awuku says, is that they often use maize and wheat bran with significant levels of aflatoxins, and they

use fish meal as protein supplement. “Our production is based on a 100-percent-vegetable feed regime, which produces healthier, tastier products,” he explains. Like most medium and large poultry enterprises, Delawin produces its own feed. It buys yellow maize, soya meal and other inputs from the Ghana Agro-Food Company, an American firm also based in Tema. Many small poultry farmers try to get around the prohibitive prices of commercial feed by compounding their own feed. Low-quality feed, produced under weak hygiene standards, is a major factor behind the low productivity of small-scale poultry farmers.



Another cause of low poultry production levels among small-scale farmers is weak biosecurity and health management. Many farmers use antibiotics without completing the recommended course durations, and many do not observe withdrawal periods. This issue has been a major topic at training workshops and demonstration farms. Delawin is one of an increasing number of poultry enterprises that are opting for probiotics. Awuku believes that the use of antibiotics must be discouraged in poultry production, especially since there is a national programme dealing with antibiotic resistance. However, he believes that the switch to probiotics must be done after farmers have been adequately trained in their effective use, and assisted in improving their biosecurity practices.

Awuku shares the optimism of other beneficiaries of the Ghana Poultry Project that noticeable improvements will soon be seen in the industry. But he says that far-reaching results will be seen when the knowledge and skills which have been shared have been passed

down the line to all farmers. "The GNAPF must sustain the training workshops and mobilise the bulk of farmers to advance our interests," he says.

Like most Ghanaian poultry farmers, Awuku is concerned about the influx of cheap, imported frozen poultry. Although many Ghanaian consumers will buy fresh chicken, the rock-bottom prices of imported frozen products offer a huge disincentive. "It is unfair that local farmers are not being given any form of protection against such formidable competition," says Awuku. For two decades, poultry farmers campaigned actively but unsuccessfully for tariffs on imported poultry. The current government, which assumed office in January 2017, has declared that it will not impose import bans, but will ensure that poultry ingredients will be continually available and affordable. "We wait in hope," says Awuku. An improvement in the feed-supply situation will enhance the performance of the industry. Says Awuku: "In spite of these formidable challenges, our chicken and eggs are tastier." **PD**



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Have you written your flock will yet?

Why you owe it to your birds and posterity to sort out a plan for succession

Words Christine Heinrichs

It's not something we like to think about too often, but any farmer can be disabled or find themselves in circumstances that make keeping birds impossible. Who will take over for you if you can no longer care for your birds? Every poultry keeper should have a succession plan in place, and it's especially important for those who are keeping heritage breeding flocks. Make a plan before events create a crisis.

As a smallholder with a backyard flock of mixed breeds, you'll want to be sure they get the care you committed to providing when you acquired them. They are living beings who require human supervision. They depend on you for food, water and shelter.

Heritage and exhibition breeds that have been lovingly nurtured over many generations, meanwhile, have value beyond the meat and eggs they produce. Their genetic heritage contains both known and unknown qualities that can only be conserved in those living flocks.

Have a flock will drawn up

Californian farmer Walt Leonard has a flock will. "If you are a decent breeder and have some time in with these birds, you



“As a smallholder with a backyard flock of mixed breeds, you’ll want to be sure they get the care you committed to providing when you acquired them”

should think about what is going to happen to your birds when you are gone,” he says.

Leonard has designated a friend, who will then divide up the flock, leaving his birds to colleagues who will know how best to care for them. His current flock comprises about 500 birds, including both waterfowl and chickens. He has Call, East Indies, White Runner and Magpie ducks, and China, Sebastopol and Egyptian geese. He keeps many breeds and varieties of bantams, including two colour varieties of Modern Games, brown red Old English Games, both black and blue Sumatras, Dutch and Ko Shamos. He keeps Nankins to support kids who are involved in the US's nationwide [4-H](#) programme of



agricultural mentoring. He also keeps large fowl Rhode Island Reds, New Hampshires, Shamos and Aseels.

Heritage breeders are as rare as the birds they husband. Those who have kept their birds over the second half of the 20th century have a resource beyond dollar value. Passing on their stock of both birds and knowledge to 21st century breeders who have established their own reputations for thoughtful breeding and careful stewardship can provide a bridge to the next generation.

Suzann Chung, who breeds Shamos and Ko Shamos in California, made some decisions for her flock after witnessing the loss of carefully tended flocks due to their breeders' death or disability.

"Over the years, I have seen some very fine birds of really nice lines of Aseels, Shamos and Malays lost after the person died or couldn't care for them any more," she says. "I now have a list on my poultry folder that says who to call 'In Case Something Happens to Mom'."

Back in 2009, Ryon Carey of Kansas took on buff, black, white, dark brown and light brown Leghorns, Anconas, Andalusians and white-faced black Spanish birds from an elderly Missouri breeder. They talked about it over the birds

they were showing at the Kansas State Fair. This older breeder decided it was time to let others carry on his legacy of 50 years of breeding.

When the older breeder became incapacitated due to ill health, Carey took the birds, all Mediterranean egg breeds that lay lots of large white eggs, back to his farm. He's keeping them all, working on improving them and selling eggs. They now lay enough eggs that he can supply his restaurant customers with 50 to 150 dozen every week.

He works closely with Frank Reese of [Good Shepherd Poultry Ranch](#) in Kansas and P Allen Smith of [Moss Mountain Farm](#) in Arkansas on flock improvement. He also has farm assistants who would be able to step in and help the birds make the transition to other keepers.

"It doesn't take very long for your line to disappear," says Carey. To safeguard against this, he recommends keeping separate lines of a breed, to provide diversity within uniformity – since separate flocks, bred to develop individual lines of a breed, strengthen the breed as a whole.

The Missouri breeder, who asked not to be identified, has since recovered from his health problems and still keeps chickens and ducks. He supplied Carey with 25 dozen Leghorn

eggs – buffs, blacks, dark browns and whites – for this hatching season.

Carry on the legacy

Carey started keeping Leghorns on Frank Reese’s advice. He foresaw the day when Standard Leghorns would be replaced by industrial strains.

The white Leghorns kept by the egg industry are hugely degraded from the traditional standard: their tails may be pinched, with a severe break. Hens should weigh 4.5lb, roosters 6lb – but those sizes are not valued by industrial producers.

“These weigh a pound more than their industrial cousins,” he said.

Carey continues to work to improve size and egg production on the Leghorns. He is breeding the light brown Leghorns to make silver Leghorns. Their colour is coming along well, but they remain at about three-quarters of the size they should be.

The blue Andalusians maintain the distinct lacing on their feathers that can be lost to careless breeding. The blue colour presents problems because it doesn’t breed true. On average, only half of the offspring will have the blue colouring. A quarter will be black and the last quarter will be splash.

Carey also trades white-faced black Spanish birds with Smith, to improve both their flocks.

Carey is expanding his meat-bird operation in a newly acquired building on land a few miles down the road from his farm. He anticipates raising between 1,200 and 1,500 Barred

Rocks and New Hampshires at a time, growing them out for 16 to 18 weeks. They will be fryers for the [Siena Tuscan Steak-house](#) in Wichita, Kansas, which features his chicken, sold under Frank Reese’s Good Shepherd Ranch imprimatur.

Take care in choosing beneficiaries

Finding the right person to take on the responsibility of your flock before a crisis arises is important for poultry keepers and their families. Spouses and significant others often wouldn’t be up to the job of caring for the flock. Experts such as Leonard, Chung and Carey evaluate aspiring poultry keepers even for decisions on selling their birds.

“They have to somehow convince me that they are going to do a good job with them,” says Leonard.

That holds true especially when the entire flock is being transferred to a new keeper. Make plans for a smooth transition for all concerned.

Heritage breeds, whether recognised by the Standard of Perfection or not, are packages of genes and characteristics that have succeeded over the years. Keeping those flocks strong is the bridge to future poultry success. **PD**

Christine Heinrichs is the author of [How to Raise Chickens](#), [How to Raise Poultry](#), and [The Backyard Field Guide to Chickens](#), Voyageur Press, all of which focus on raising traditional breeds in small flocks.

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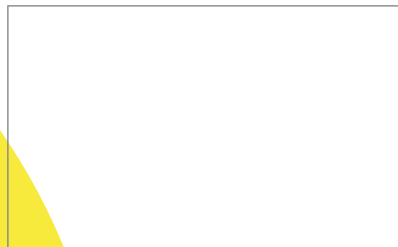
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Introducing...

Junglefowl

Words Ellen Hardy

The gorgeous junglefowl comes in red, grey, green and Sri Lankan. The red is particularly famous for being the ancestor of the domestic chicken (though the grey may have got in on the act at some point as well). These handsome tropical species all hail from the *Gallus* genus of the pheasant family Phasianidae, and are found across India, Sri Lanka (where it is the national bird) and Southeast Asia. Junglefowl were first farmed by humans around 7,000 years ago.

Largely terrestrial and strongly sexually dimorphic, there are numerous ways the junglefowl is recognisable as the square root of our modern birds, from the male's crow to their penchant for dust-bathing. Something you're unlikely to see on a commercial farm, however, is the red's mating ritual. On finding food in the presence of the female, the male repeatedly picks up and drops the morsel, while clucking, bobbing his head and twitching his neck alluringly. All this activity eventually persuades the female to mate. Mating dances can, of course, be observed in modern breeds as well.

The red junglefowl's astonishingly successful adaptation to human environments may ironically be leading to the downfall of the original gene pool. Research suggests that interbreeding with domestic fowl at the edges of the junglefowl's forest habitats are bringing the purebred form to the brink of extinction. **PD**



YOUR QUESTIONS

Poultry professional Mike Colley answers the best questions from The Poultry Site community.



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Q: I'm interested in adopting some rescue chickens. What do I need to know?

very often you are dealing with an animal that has worked very hard for over a year, perhaps laying an egg every day which is an anatomically complicated and draining process. They will often be bald due to moulting and rubbing against cage sides and companions. They may also have weakened skeletons and weak muscles due to inactivity.

What these birds need is a rest. It's great to get loads of eggs quickly from your new arrivals, but it's not true that only happy hens lay eggs – modern layers can't help it, they are super-ovulators.

There are only two ways of slowing this process down, starvation and shortened day length. I don't recommend the former but if you can get the bird's day length below 11 hours it will slow egg production down. You can get diets specifically for ex-battery hens but something like a 14 percent protein grower diet should be fine. Mix this with a layer's diet proportionately to eggs laid.

Q: Are there any heritage poultry breeds whose genetic survival is threatened?

A: There are indeed many old breeds whose survival is threatened, just as there are new breeds and new varieties of breeds being created continuously. There are very few breeds that had a recognised

such as Leghorn, Rhode Island Red and Sussex are relatively modern. We can thank the Victorians and their passion for progress and exhibitions that created many a new breed, then the 1950s poultry revolution finally saw the end of purebreds being used commercially, putting many of these new breeds into the history books. Even those breeds that survive today often look quite different to their ancestors.

Many breeds may not be as pure as they seem, with cross breeding used to

“Pure breeds are rare for a reason, i.e. they can be expensive to keep with little payback”

increase size, feather pattern and so on. Pure breeds are rare for a reason, i.e. they can be expensive to keep with little payback. You also need a descent population size to sustain that breed. Look for very ancient breeds that have a narrow following.

I recommend going to the national shows and see what is around and what you like. Derbyshire Redcaps and Pheas-

ant Fowl, as well as white faced Spanish always come to my mind.

Q: Do you have any information on moving my three chickens to France? Do they need paperwork, vaccinations. I can't find any details as these are pets and not commercial.

A: In law, production animals – poultry, pigs, cattle, sheep etc. – cannot be classed as pets.

There is no separation between these animals on a farm and one kept in the house or backyard. Numbers do apply in some cases, such as you don't have to register your poultry if you have less than 50, but that does not mean you don't have to meet the basic requirements for those birds laid out in the welfare laws. There is a reason why the export and import of animals is strictly regulated, because even one individual may be a carrier of a virulent strain of a deadly disease.

Backyard and small populations of poultry can be carriers of commercially devastating viruses and bacteria without showing any signs (ducks are particularly good at this). DEFRA will be your first port of call.

Then speak to your own vet or a poultry specialist vet. Whatever you do don't try and smuggle your birds out of the country – if caught you will be heavily fined and your birds likely destroyed.

If you do manage to get your birds across the border and there is an outbreak of bird flu near your new home, expect a knock on the door; without the right papers you could find yourself in a great deal of trouble.

Mike Colley

Mike has had an interest in all things chicken since he first asked his mum on the school bus “what colour eggs do different coloured chickens lay?” aged five. Over the next 45 years Mike developed his knowledge of poultry: in his backyard, breeding, hatching, showing and selling chickens, as well as in the commercial poultry industry as an Area Manager and, latterly, a Research Manager.



EVENTS

Poultry events from around the globe

WVPA XXth Congress 2017

Date: 4-8 September

Location: Edinburgh, UK

The Congress attracts both poultry research scientists and practitioners, and will include leading speakers from across the world. It is expected that delegate numbers will be in excess of 1200 visiting Edinburgh from over 70 countries joining together to explore the past, share the present and helping to forge the future of poultry veterinary science.

www.wvpac2017.com

IEC Global Leadership Conference Bruges 2017

Date: 10-14 September

Location: Bruges, Belgium

The IEC Global Leadership Conference gathers CEOs and leaders from the IEC's 300 member companies. These companies represent 80 countries and all business areas of the egg industry. The IEC's mission is to bring together the most influential leaders in egg production and egg processing in pursuit of efficient business practices and positive change across the industry.

www.internationalegg.com

25th Latin American Poultry Congress (Avicultura 2017)

Date: 26-29 September

Location: Guadalajara, Mexico

The 25th Latin-American Poultry Farming Congress is an extraordinary Agriculture and Veterinary Congress at the Expo Guadalajara in Guadalajara, Mexico. The biennial Congress is the principal event of the Latin-American Poultry Farming Association.

www.avicolatina.com

National Poultry Show 2017

Date: 2-3 December

Location: Telford, UK

The National Show continues to grow year on year and again this year it will be held at The International Centre in Telford. A highlight of any fancier's calendar, here you will find nearly 7000 entries, 500 sales pens and everything you need for your poultry from many trade stands.

www.farminguk.com

London Poultry Show 2018

Date: 4-5 April

Location: London, UK

As one of North America's premier poultry trade fairs, the London Poultry Show brings together the best in the poultry industry each April.

www.poultryindustryCouncil.ca/education-extension-events/london-poultry-show/

British Pig & Poultry Fair 2018

Date: 15-16 May 2018

Location: Kenilworth, UK

The UK's only dedicated pig and poultry industry event, with 350+ exhibitors and free entry for visitors. A great place to do business in 2018.

www.pigandpoultry.org.uk



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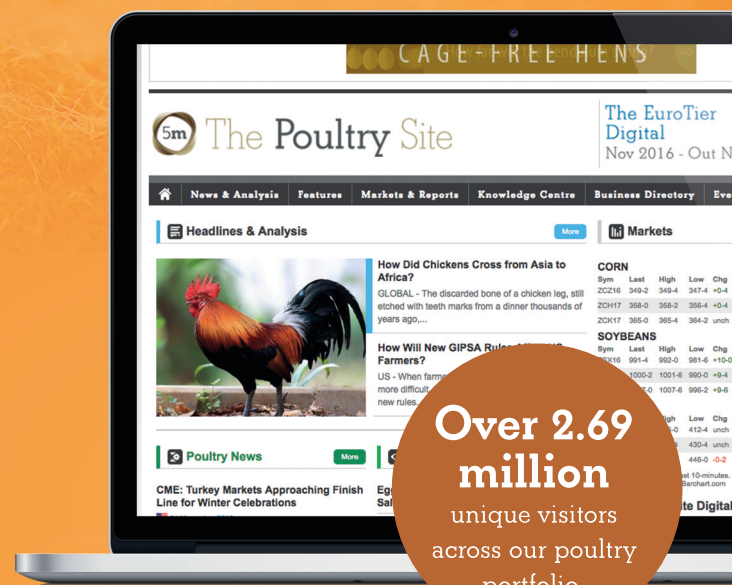
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