

THEPOULTRYSITE

DIGITAL.

February 2014

Characterisation of
Eimeria in Australia

Collaborative Studies
on Cyanosis in
Broiler Breeders

Also in this Issue:

Americas Account for 20 Per
Cent of Global Egg Output

Vocalisation Study Provides
Insight into the Well-Being of
Birds in Growout Houses



Welcome.Editors Note

ThePoultrySite
Digital

February 2014



Our focus in this month's issue of *ThePoultrySite Digital* is on health and disease, starting with an assessment of coccidiosis and its impacts on the Australian industry.

The disease is estimated to cost the global poultry sector US\$2.4 billion and in Australia, there has been concern recently that outbreaks are occurring on farms even after vaccination.

As a result of a survey of the *Eimeria* strain on farms, researchers are now able to distinguish between field and vaccine strains, offering the prospect of better control of this costly disease in future.

In another study – this time in the United States – scientists have been looking into the causes of cyanosis. The condition, causing blue or purple discolouration of the skin of broiler breeders, appears to have a genetic link but can be managed by proper nutrition and feed management. Egg production trends in the countries of the Americas are examined by industry analyst, Terry Evans, in the latest in our series, 'Global Poultry Trends'.

And finally, sensors are being developed to monitor the noises made by broilers as a management tool for poultry farm managers, alerting them to possible problems with their birds' health or welfare 24 hours a day, seven days a week.

Jackie Linden

Senior Editor

ThePoultrySite.com



Jackie Linden

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Characterisation of Eimeria in Australia

Coccidiosis in Australia is widespread, species are ubiquitous, dynamic and genetically diverse, and this diversity does not appear to be geographically structured, according to new research from the University of Queensland reported by Poultry CRC.

Coccidiosis, caused by parasites of the genus *Eimeria*, is a worldwide disease of chickens estimated to result in global annual losses of over US\$2.4 billion.

Ten species of *Eimeria* have been identified in Australia and species, as well as strains within a species, can vary greatly in their pathogenicity. Recent outbreaks on vaccinated farms have highlighted concerns that the vaccine strains may not be protecting birds sufficiently. Additionally (in Australia), it is not currently possible to distinguish vaccine strains from wild infections.

To assess the nationwide status of coccidiosis, Dr Jess Morgan from the University of Queensland has led a CRC project entitled 'Characterising population structure and diversity of Australian *Eimeria*'.

The project, which has recently been completed, sampled species and strains of *Eimeria* from every Australian state and territory. Different regions of DNA were sequenced to identify variable genetic markers in order to differentiate species and strains of the 10 *Eimeria* species.

Dr Morgan explained: "Accurate disease diagnosis is important to the poultry industry where coccidiosis is a costly and virtually ubiquitous problem.

"The aim of my project was to identify new genetic markers to differentiate among Australian strains of *Eimeria*. Live *Eimeria* vaccines have been developed as a means of countering the increasing emergence of drug resistant strains, and although species can be diagnosed using their DNA, there was a need for genetic markers to differentiate among strains of *Eimeria*."

During the three-year project, five nationwide chicken faecal sampling surveys were conducted. Samples were screened visually and genetically for infective *Eimeria* oocysts. The high prevalence of uncharacterised *Eimeria* species in the samples led to the development of a new species-diagnostic genetic assay, targeting a region of mitochondrial DNA. Nationwide samples were screened using the assay comparing backyard and commercial broiler flocks.

A subset of strains was passed through laboratory birds to obtain sufficient numbers of oocysts to cryopreserve in a live *Eimeria* collection.

Dr Morgan continued: "DNA regions of the mitochondrial and apicoplast genomes were sequenced from pure *Eimeria* strains of eight species to identify single nucleotide polymor-



Dr Jess Morgan

phisms (SNPs), in order to differentiate among strains. Then, species-specific assays targeting these SNPs were developed so that DNA extracted from mixed species infections could be screened.”

Publicly available nuclear genome sequences for *E. tenella* and *E. maxima* were mined for highly repetitive DNA sequences, called microsatellites. During DNA replication, 'slippage' of the repeat elements produces differences which can be used to characterise strains.

Genetic assays targeting variable microsatellite loci were developed for *E. maxima*, *E. acervulina*, *E. tenella* and *E. necatrix*.

Australian species and strains were screened using the new strain diagnostic assays in the first nationwide assessment of *Eimeria* genetic diversity. Strains were genotyped and assigned a genetic barcode. Vaccine strains were also included in the comparison and assigned a barcode.

The project's outcomes included:

- development of a new assay for species diagnostics that is more comprehensive than any available assay and cheaper than many.
- development of 15 new strain diagnostic assays targeting SNPs in the mitochondrial genome.
- development of 38 new strain diagnostic assays targeting microsatellites in the nuclear genome of Australian *Eimeria* species. It is now possible to differentiate vaccine strains from wild strains for four *Eimeria* species. These assays will reduce the cost of managing outbreaks by providing accurate diagnosis of disease down to the strain level.
- expansion of the existing library of cryopreserved *Eimeria* species and strains with the addition of 42 new stabilates containing 123 infections.

The overall conclusion that can be drawn from Dr Morgan's study is that coccidiosis in Australia is widespread, species are ubiquitous, dynamic and genetically diverse, and this diversity does not appear to be geographically structured. Thus national measures to control the spread of coccidiosis do not appear to be necessary.

She added that she would like to see future study concentrate on characterising the impact on industry of the three poorly understood operational taxonomic units, measuring the true prevalence of *E. tenella* in commercial flocks by screening caecal samples, and further testing to optimise vaccine strain diagnostics (with assay development). ■





Collaborative Studies on Cyanosis in Broiler Breeders

New research at Mississippi State University has increased understanding on cyanosis, a blue or purple colour of the skin in broiler breeders. They found differences in heart function between the three genetic lines they studied and a lower incidence of cyanosis in the heavier and fleshier individuals than lighter ones.

Cyanosis refers to a dark bluish or purplish colouration of the skin and mucous membranes in chickens, according to Danny L. Magee and colleagues at Mississippi State University. Dr Magee is Clinical Professor at the Department of Pathobiology and Population Medicine and Director of the Poultry Research and Diagnostic Laboratory.

Cyanotic meat-type broiler breeder males have been seen for years in the commercial poultry industry. It has been hypothesised that this condition may be initiated by some underlying cardiovascular defect or dysfunction, which is then exacerbated later in life due to risk factors such as male feeding programmes, demand for reproductive performance, and/or environmental stressors.

Professor Magee and co-authors explain that the objective of this research project - supported by the US Poultry & Egg Association, was to determine the primary cause of cyanosis in adult male broiler breeders.

This project was primarily designed to evaluate the cardiac function of these broiler breeder males.

Some preliminary tests had indicated that echocardiography may be helpful in this process. Males of three different breed strains from multiple production companies were evaluated over the course of the project. After echocardiography, the males were necropsied and the hearts collected for further histopathological evaluation. Information gathered included body weights; breast fleshing scores; blood parameters such as cholesterol, haematocrits, nitrates; and heart function analysis of the left side of the heart.



A wide variety of quantitative and subjective as well as gross and microscopic evaluations was performed on hearts obtained from normal roosters and roosters manifesting with transitory skin cyanosis or echocardiogram abnormalities.

A number of suggestive but mostly not statistically significant differences were observed between the echocardiogram- ('echo') normal and echo-abnormal groups.

A striking breed difference was noted in the occurrence of left ventricular area dilation as reflected in gross measurements for the ratio of ventricle chamber to total ventricle area. While no hearts in the Breed A group demonstrated a ventricle area ratio above nine per cent, the Breed B and Breed C groups exhibited an incidence in this parameter of 25 per cent or greater.

Conversely, the number of hearts in the Breed

A group below a ratio of four per cent was much greater than the other breeds.

The combined evidence of increased left ventricular wall width and an increase in the incidence of left ventricle ratios below four per cent argue for the possible presence of a constrictive form of cardiomyopathy in some birds in this group. Magee and co-authors stress that the clinical or pathological importance - if any - of these breed findings is not known and they may simply reflect breed differences of no major importance.

At the microscopic level, no major differences in routine subjective histopathology were observed between the echo abnormal and normal groups; nor were any remarkable microscopic pathology present.

The initial concerns with cyanosis were that these males may have had a respiratory and/or a circulatory problem. It was found, in



evaluation of birds on the farm that higher average body weights and higher average fleshing scores were both associated with lower incidences of cyanosis. Also, higher haematocrits correlated with an increased incidence of cyanosis.

On first impression, the body weight and fleshing data suggest that proper nutrition and feeding management in broiler breeder males is important in the prevention of cyanosis on the farm. Proper feeding management should also reduce the need for males to eat manure.

The researchers say they can only speculate at this point as to whether those preventative practices may actually be improving cardiac function.


But without a change in the management practices of feeding these birds, we may continue to see an increase in haematocrits as a

response to decreased oxygen carrying capacity of the blood, which compounds the circulatory problems.

Since the project was designed to work with mature broiler breeder males, it is easy to draw conclusions focused on the mature bird. However, the authors cannot exclude the possibility that the body weight and fleshing data are the result of a heart abnormality that was present in these males at a young age rather than the cause of a heart abnormality later in life.

If this were to be the correct conclusion, feeding practices beginning at day one could still help lessen the impact of the abnormality but would be unlikely to correct it.

As with other species, added Professor Magee and colleagues, heart health is vitally important for the overall health and well-being of the breeder male. ■



Global Poultry Trends.2013

Americas Account for 20 Per Cent of Global Egg Output

Global egg output is heading towards 68 million tonnes, with the Americas producing one-fifth of the total, reports poultry industry analyst, Terry Evans, in his latest look at egg production in that region.

World hen egg production (table and hatching) expanded by 14.1 million tonnes or 2.3 per cent per year from 51.1 million tonnes in 2000 to 65.2 million tonnes in 2011. After a disappointing 2012, growth appears to be well under way again such that in 2013 output could have come close to 67 million tonnes (Table 1 and Figure 1), while it will likely exceed 68 million tonnes in 2014. Hatching eggs are estimated to account for about five per cent of the total.

Africa was the fastest growing region over the

review period to 2011, recording a 3.5 per cent annual increase, followed by Oceania (3.0 per cent), Asia (2.6 per cent) and the Americas (2.1 per cent), while Europe returned the least rapid growth of just one per cent per year.

As a proportion of the global total, the share contributed by the Americas slipped a shade over the period from 20.5 to 20.3 per cent.

Back in 2000, the total number of layers was assessed by the Food and Agriculture Organ-



isation (FAO) at some 5,004 million, this figure rising to 6,617 million in 2011, of which 64 per cent were in Asia, 16 per cent in the Americas, nearly 12 per cent in Europe, eight per cent in Africa and 0.3 per cent in Oceania. The corresponding figures for 2000 were 61 per cent, 17 per cent, 14 per cent, 7.5 per cent and 0.4 per cent, respectively.

A closer look at the situation in the Americas (Tables 2 and 3) reveals that the largest three egg-producing countries - the US, Mexico and Brazil - accounted for some 9.9 million

tonnes in 2011 or three-quarters of the regional total of 13.2 million tonnes.

The next four in the production ranking table - namely Columbia, Argentina, Canada and Peru - produced a further nearly 1.9 million tonnes or a little over 14 per cent. Thus, almost 90 per cent of the region's production came from just seven countries.

The **United States** is the number one producer in the region, though growth between 2000 and 2011 averaged less than one per

Table 1. World egg production (million tonnes)

Region	2000	2005	2006	2007	2008	2009	2010	2011	2012E	2013E
Africa	1.9	2.2	2.3	2.5	2.6	2.6	2.7	2.8	2.9	3.0
Americas	10.5	11.7	12.3	12.3	12.5	12.6	13.0	13.2	13.4	13.6
Asia	29.0	32.6	33.0	34.5	36.2	37.2	37.7	38.3	38.3	39.0
Europe	9.5	9.9	10.1	10.0	10.1	10.3	10.5	10.6	10.6	10.8
Oceania	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
WORLD	51.1	56.6	57.9	59.5	61.7	62.8	64.1	65.2	65.5	66.7

Sources: FAO to 2011; 2012 and 2013 author's estimates

cent per year. The data presented in Table 4 includes hatching eggs, which represent around 12 per cent of the US total. According to data published by the International Egg Commission (IEC), table egg production (which excludes hatching eggs) in the US amounted to 4.82 million tonnes in 2012.

The USDA World Agricultural Supply and Demand (WASDE) estimates are given in number of eggs rather than tonnage. This organisation estimated table egg output in 2012 at 6816.4 million dozen, which would

equate with a tonnage yield of around 4.9 million tonnes (based on an average egg weight of 60g). WASDE projected an increase of some 2.4 per cent for 2013 and a further 1.6 per cent in 2014 when table egg output is forecast to total 7,085 million dozen eggs.

The egg industry in **Mexico** appears to have expanded by almost three per cent per year during the review period as output rose to 2.46 million tonnes.

However, data published by the IEC points to

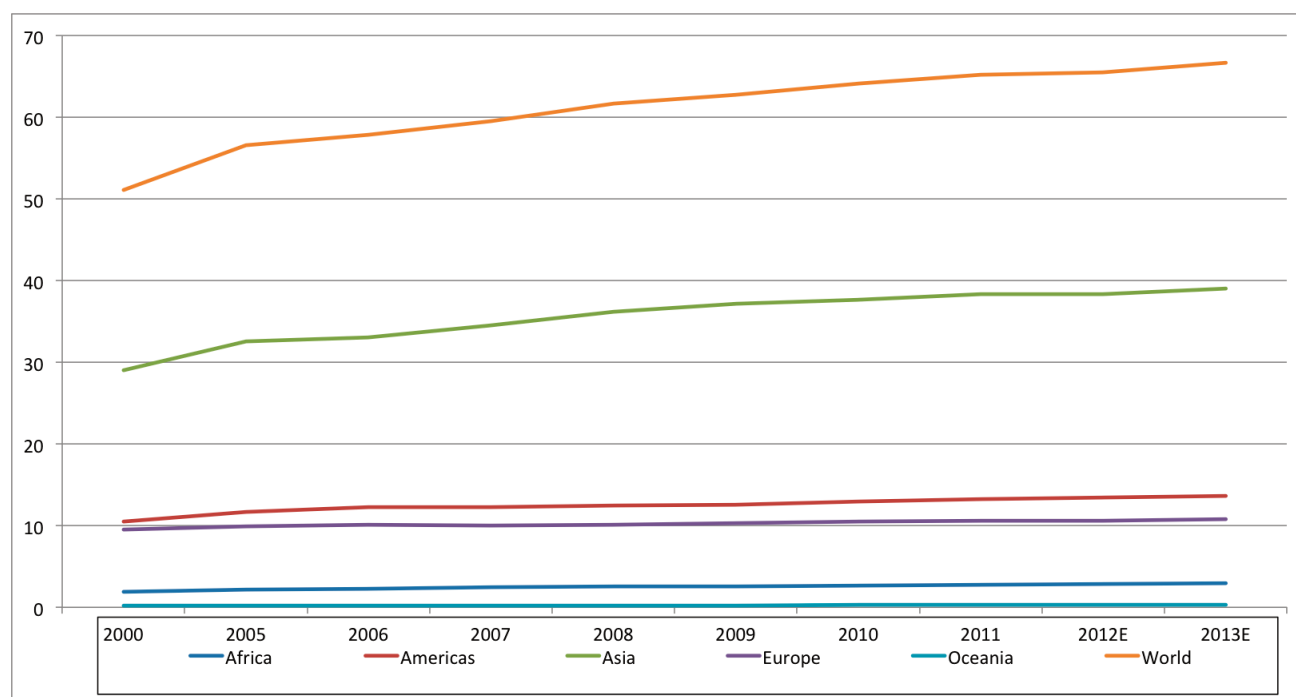


Figure 1. World hen egg production (million tonnes)

Table 2. Hen egg production in the Americas ('000 tonnes)

Country	2000	2005	2007	2008	2009	2010	2011
Antigua/Barbuda	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Argentina	326.9	403.0	468.0	494.6	507.3	505.0	505.0
Bahamas	0.8	1.1	1.2	1.2	1.3	1.3	1.3
Barbados	1.3	1.4	2.3	1.9	2.0	2.2	2.1
Belize	1.7	1.5	1.8	2.1	2.1	2.5	2.2
Bermuda	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Bolivia	38.9	56.1	62.6	65.4	68.6	68.5	68.5
Brazil	1,510.0	1,674.9	1,779.2	1,844.7	1,921.9	1,948.0	2,036.5
Canada	372.4	399.3	398.4	419.0	422.0	433.0	436.8
Chile	109.8	126.4	137.2	142.6	190.0	190.9	198.4
Colombia	386.4	492.0	497.6	542.3	580.9	585.0	639.7
Costa Rica	41.0	48.2	41.9	52.2	51.7	53.6	50.8
Cuba	75.8	90.9	103.5	102.4	106.8	106.9	115.3
Dominica	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Dominican Rep.	58.7	80.2	87.0	87.2	91.9	105.7	105.7
Ecuador	72.2	75.0	88.0	91.0	93.6	179.0	94.0
El Salvador	61.3	67.4	70.0	66.3	64.3	64.7	59.7
French Guiana	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Grenada	0.9	1.1	1.2	1.2	1.3	1.4	1.4
Guadeloupe	1.8	2.2	1.7	1.7	1.7	2.0	2.0
Guatemala	81.0	191.6	203.9	209.0	214.0	219.8	224.6
Guyana	1.5	1.2	0.5	1.0	1.0	0.7	0.7
Haiti	4.1	4.4	4.5	4.5	4.7	5.0	5.0
Honduras	41.2	40.9	50.6	49.7	47.4	44.2	44.2
Jamaica	5.8	5.1	6.3	6.7	7.1	6.0	6.0
Martinique	1.5	1.9	2.7	2.5	2.5	2.7	2.7
Mexico	1,787.9	2,024.7	2,290.8	2,337.2	2,360.3	2,381.4	2,458.7
Montserrat	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Netherlands Antilles	0.4	0.6	0.6	0.6	0.6	0.6	0.6
Nicaragua	19.7	20.4	21.5	21.6	23.2	24.5	26.2
Panama	12.4	28.1	28.2	24.3	23.9	24.6	25.3
Paraguay	67.6	107.0	120.0	124.2	127.6	128.0	128.0
Peru	162.3	182.3	257.6	266.5	268.7	285.1	317.7
Puerto Rico	8.9	11.2	11.5	11.4	12.0	11.7	11.7
Saint Kitts/Nevis	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Saint Lucia	0.5	1.1	1.1	1.2	1.2	1.2	1.2
Saint Vincent/Grenadines	0.5	0.8	0.7	0.7	0.7	0.8	0.8
Suriname	3.0	2.7	2.2	1.8	2.3	2.3	1.3
Trinidad/Tobago	3.4	3.8	3.9	3.9	4.0	4.3	4.3
US	4,998.3	5,333.4	5,386.8	5,325.7	5,349.1	5,411.6	5,415.6
US Virgin Isl.	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Uruguay	37.0	41.6	47.6	58.3	52.5	52.5	52.5
Venezuela Bol. Rep.	174.6	173.6	153.7	157.6	160.0	159.8	159.8
AMERICAS	10,472.4	11,698.8	12,337.9	12,525.9	12,772.2	13,018.3	13,207.6
WORLD	51,048.6	56,569.6	59,518.2	61,655.5	62,751.1	64,085.5	65,181.3

Source: FAO

Table 3. Americas egg production ranking in 2011 ('000 tonnes)

Country	Production
US	5,415.6
Mexico	2,458.7
Brazil	2,036.5
Colombia	639.7
Argentina	505.0
Canada	436.8
Peru	317.7
Guatemala	224.6
Chile	198.4
Venezuela Bol. Rep.	159.8
Paraguay	128.0
Cuba	115.3
Dominican Rep.	105.7
Ecuador	94.0
Bolivia	68.5
El Salvador	59.7
Uruguay	52.5
Costa Rica	50.8
Honduras	44.2
Nicaragua	26.2
Panama	25.3
Puerto Rico	11.7
Jamaica	6.0
Haiti	5.0
Trinidad/Tobago	4.3
Martinique	2.7
Belize	2.2
Barbados	2.1
Guadeloupe	2.0
Grenada	1.4
Bahamas	1.3
Suriname	1.3
Saint Lucia	1.2
Saint Vincent/Grenadines	0.8
Guyana	0.7
French Guiana	0.6
Netherlands Antilles	0.6
Bermuda	0.4
Antigua/Barbuda	0.3
Saint Kitts/Nevis	0.3
Dominica	0.2
US Virgin Isl.	0.2
Montserrat	0.1

Source FAO

a slightly higher figure for that year of 2.54 million tonnes, which was followed by a cut-back of around six per cent to 2.39 million tonnes as a consequence of the outbreaks of highly pathogenic H7N3 avian influenza, principally in the Jalisco state in the summer of 2012. This was countered by a vaccination programme accompanied by depopulation of some 25 million birds out of a total laying flock of possibly 150 million.

By the spring of 2013, re-population of farms had been completed and output for that year is currently estimated at 2.3 million tonnes.

Egg production in **Brazil** has exhibited a near three per cent annual increase since 2000, having topped two million tonnes in 2011, though hatching eggs for the broiler sector could account for around 16 per cent of the FAO total.

National statistics frequently differ depending on the source. Figure 2 shows that FAO data for **Argentina** since 2008 have been amended to tie in with the figures published by the IEC. These point to higher production levels than the FAO, such that the 2011 figure of 721,000 tonnes, if correct, would put Argentina into fourth place in the production league table ahead of Columbia. For 2012 Argentina's production is assessed at 733,000 tonnes.

Among the leading egg-producing countries in the region, with the exception of Peru, the industry in **Columbia** recorded the fastest growth of 4.7 per cent per year over the review period. Production in 2012 is considered to show little change over the previous year at around 640,000 tonnes.

Of the top seven countries, egg output in

Table 4. Leading egg producers in the Americas (million tonnes)

	2000	2005	2007	2008	2009	2010	2011	2012E
US	5.00	5.33	5.39	5.33	5.35	5.41	5.42	5.43
Mexico	1.79	2.03	2.29	2.34	2.36	2.38	2.46	2.31
Brazil	1.51	1.68	1.78	1.85	1.92	1.95	2.04	2.01
Colombia	0.39	0.49	0.50	0.54	0.58	0.59	0.64	0.64
Argentina	0.33	0.40	0.47	0.50	0.51	0.51	0.51	0.72
Canada	0.37	0.40	0.40	0.42	0.42	0.43	0.44	0.44
Peru	0.16	0.18	0.26	0.27	0.27	0.29	0.32	0.32

Source FAO to 2011; 2012 author's estimates

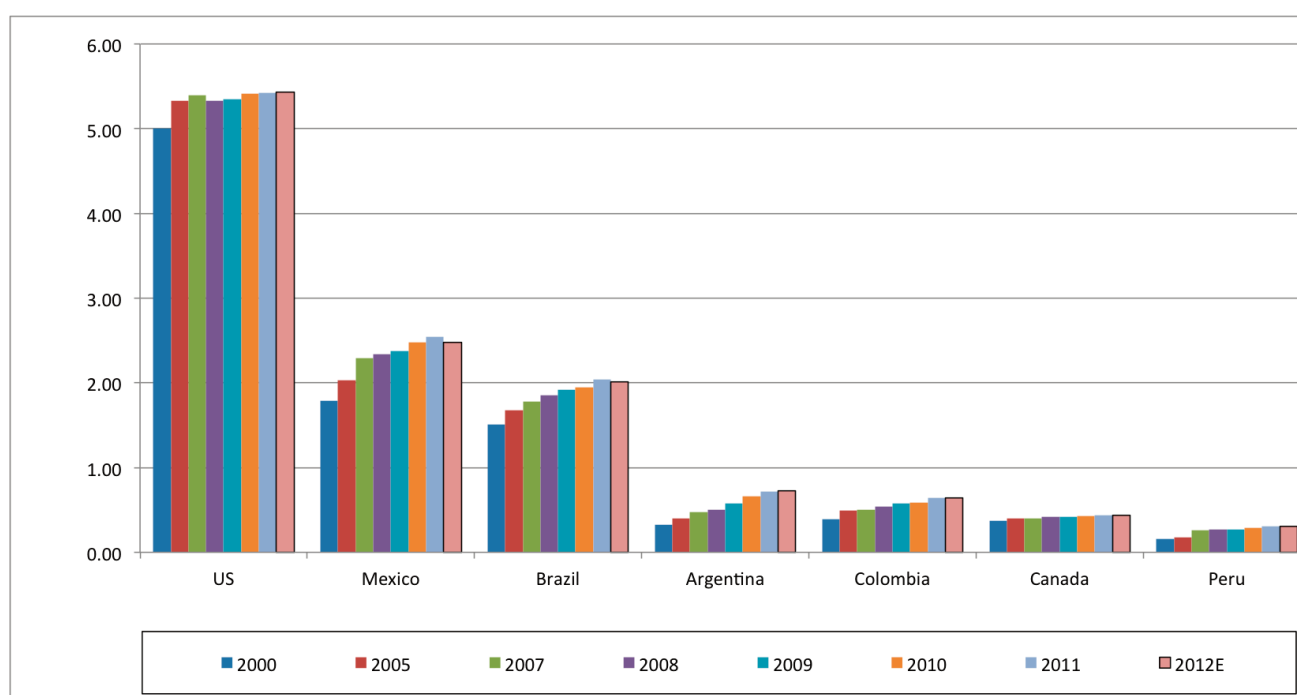


Figure 2. Leading egg producers in the Americas (million tonnes)

Canada recorded the slowest growth, with an annual average of just 1.5 per cent per year. As production is controlled under a supply-management system, any future growth is likely to be slow in order to maintain a sustainable profitable industry.

was **Peru**, where production expanded by more than six per cent per year to 2011.

However, since then, annual output appears to have stabilised somewhat at around 314,000 tonnes. ■

Fastest growing industry among this group

Vocalisation Study Provides Insight into the Well-Being of Birds in Growout Houses

Sensors capable of reliably monitoring the well-being of birds reared in confined housing currently do not exist but researchers from Georgia Tech Research Institute are making progress on using the noises made by broilers to indicate health or welfare issues in the flock.

Two years ago, engineers with the Georgia Tech Research Institute (GTRI) and poultry scientists at the University of Georgia set out to investigate whether the birds themselves could be the answer. Anecdotal evidence and previous research at the University of Connecticut indicated that this might be a possibility. So, to help the poultry industry assess grow-out house conditions and thus flock health and performance, the team built an experimental monitoring system.

The Growout Monitoring System collects and then analyses bird vocalisations to determine if the birds are behaving in an unusual manner due to environmental conditions, disease or other stressors.

“The well-being of animals is of significant concern to the poultry industry. Currently, there are no quantitative techniques for measuring the state of animals in confined environments. The objective of our research is to determine vocalisation features that can be extracted and used as a measure of animal well-being,” explained Dr Wayne Daley, associate division chief of GTRI’s Food Processing Technology Division and project director.

Researchers start by isolating bird vocalisations that are of interest. They then select features that might help with identifying those vocalisations and differentiate them from background noises. Such features could be the sound levels of the audio at various frequencies. For example, bird-calls, sneezes and coughs are made up of different frequencies or tones, so those are characteristics of the sound that can be used to identify them. Thus, a sneeze would consist of higher frequencies, while a cough would have lower frequencies.

Next, researchers use machine learning techniques to evaluate the important features along with corresponding algorithms to identify the vocalisations. The machine learning system is taught to differentiate the isolated bird vocalisation sounds from the background noise and other sounds by processing different examples of a particular bird vocalisation as well as examples of sounds that are not the vocalisation.

The anticipated result is that features can be found that represent unique 'syrinxprints' (the syrinx is the equivalent in a bird of the voice box or larynx in a human) of the vocalisations as well as algorithms to identify the vocalisations matching those features.

The team can then use those features and algorithms to identify automatically vocalisations that are made by the birds when they are sick or under stress due to environmental conditions within the grow-out house.



The Growout Monitoring System collects and then analyses bird vocalisations to determine if the birds are behaving in an unusual manner due to environmental conditions, disease, or other stressors. To view a video of the project, scan the QR code below.



Recent studies conducted at University of Georgia's Poultry Science research farm and its Poultry Diagnostic and Research Center (PDRC) supported the use of this approach. The team studied environmental effects such as temperature, ammonia, and crowding in the farm's grow-out house.

Results showed that features extracted from bird vocalisations correlated with higher ambient room temperatures and the presence of ammonia. However, the correlations for crowding were not as conclusive. Experiments conducted at the PDRC explored the effects of two broiler diseases, Infectious Bronchitis and Laryngotracheitis (LT). In both experiments, algorithms identified vocalisations that correlate with the progress of both diseases.

Researchers are now attempting to replicate these results and investigate applicability in a commercial setting. They are also seeking to identify other features of interest that correlate with animal and grow-out house conditions.

“Our ultimate goal is to develop techniques that allow us to extract features that provide a more quantitative measure of animal well-being that could lead to more effective management practices. For example, if we are able to detect diseases early in the grow-out cycle, it provides managers with more options to keep the flock healthy,” said Dr Daley.

The team hopes to define a path for future commercial application of the research results. ■

February.Industry News



Indian Agricultural Food Exports Rise Sharply

INDIA - The Indian agricultural food products have seen a dramatic rise in exports over the last two years – rising by 55 per cent two years ago and 13 per cent last year, writes Chris Harris.

Last year's figures from the Ministry of Food Processing show that wheat and rice products led the way.

In 2011-12 wheat exports rose to more than \$202 million and then soared to more than \$1.9 billion – a growth of 857.2 per cent. However the export sales of wheat were just 5.36 per cent of the total agrifoods' export market.

Close behind the rise in exports of wheat were the rises in export sales of basmati and other rice products.

Basmati rice exports rose by 29 per cent two years ago and then last year by 10.7 per cent to reach \$3.56 billion, which other rice sales rose by 53.6 per cent last year to reach \$2.65 billion.

Production of food grains during 2012-13 was around 255.36 million tonnes compared to 259.29 million tonnes in 2011-12.

Meat and meat preparations, largely bolstered by the sales of buffalo beef, have risen by 48.2 per cent two years ago followed by a 12.7 per cent rise last year to £3.3 billion and taking 9.13 per cent of the total export market.

Poultry product sales also saw a sharp rise in 2011-12, going up by 28.7 per cent followed by a 5.7 per cent rise last year to \$84.79 million.

Two years ago, export sales of dairy products took a severe hit, dropping by 31.3 per cent.

However, over the last year they rose sharply by 153.4 per cent to reach \$326 million.

Fish and marine product exports rose sharply two years ago and remained fairly static last year according to the official figures with sales reaching nearly \$3.5 billion.

Overall, agrifood exports for India were worth more than \$36 billion and have been showing continual growth over the last three years with rises of 38 per cent three years ago, more than 55 per cent two years ago and 12 per cent last year.

Biosecurity: Is There a 'Wolf' at Your Poultry House Door?

GLOBAL - We all know the tail of the three little pigs, whilst things went badly for two out

of three of them; they at least knew not to open the door. In Red Riding Hood on the other hand, says Aviagen, Grandma not only opens the door to the wolf but gets eaten! The wolf then disguises itself as Grandma, so when Red Riding Hood knocks on the door, the immediate threat is not obvious.

As an analogy, this is very close to one of the main ways biosecurity is breached on farms – visitors who bring health challenges that are not always obvious!

There are simple ways to stop the 'wolf' getting amongst your chickens.

The first is clear: minimise the number of people who have access to the farm. This can be done, for example, by positioning reception and administration areas well away from the poultry houses.



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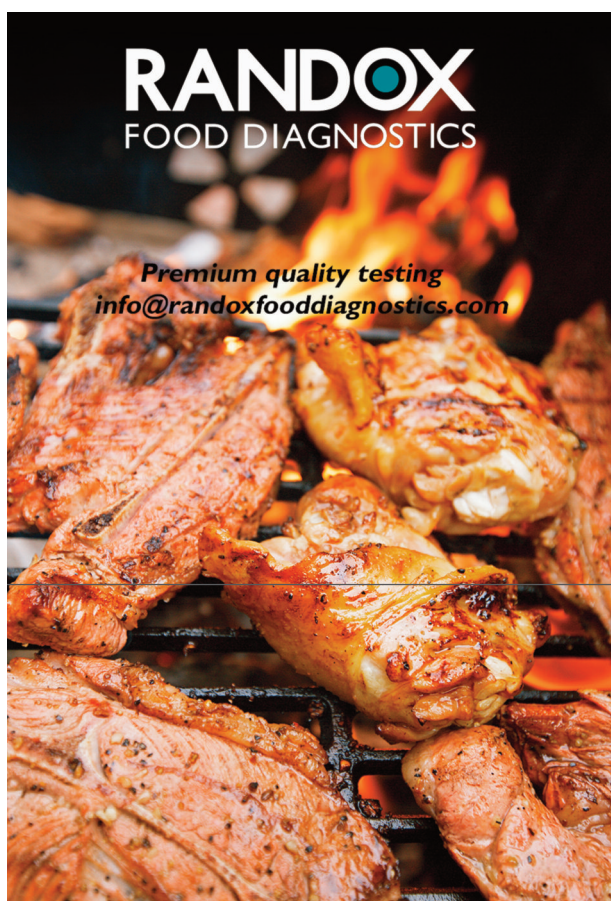
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Lock gates, post no entry signs and, unless someone absolutely has to be on the farm, then there is no need to take the risk and invite them in. If someone does have to come on to the farm, be sure they have not been in recent contact with other poultry or wild birds, if possible.

Other checks include:

- All people visiting the farm should read and follow the biosecurity procedure
- Maintain a record of visitors
- Workers and visitors should wash their hands and sanitise boots whenever they enter/leave a poultry house
- Clean and disinfect tools used in the poultry houses
- It is recommended only one farm visit per day.



For further info, refer to:

www.aviagen.com

http://en.aviagen.com/assets/Tech_Center/Ross_PS/Ross_PS_Handbook_2013_i-r1.pdf

http://en.aviagen.com/assets/Tech_Center/BB_Resources_Tools/Pocket_Guides/Ross-PS-Pocket-Guide2013EN.pdf

New Poultry Meat Inspection Rules to Improve Safety, Save Money

US - New moves by the USDA to change the system of poultry meat inspection will place more inspectors at the sharp end of detecting food safety issues rather than quality issues, writes Chris Harris.

Dr Richard Raymond, the former USDA Undersecretary for Food Safety speaking at a seminar on pathogen reduction during the International Production & Processing Expo (IPPE) in Atlanta said that the new regulations will also help to save money while improving the service. He said that a modernisation rule on inspection is expected shortly.

Dr Raymond said that, at present, too many inspectors are based on the line looking for blemishes in the poultry meat, broken legs and other quality issues rather than testing for pathogens and other food safety issues.

Typically, he said, four inspectors are on the line looking at quality issues and just one at the end of the line is testing for food safety problems.

He said that the changes could free up 1,500 inspectors looking to pathogens and other similar problems, which employees of the processing companies should be searching for quality defects.

The new proposals, however, had run into opposition from the unions because they could mean a potential loss of 800 positions.

Dr Raymond said that new measures could save the US tax-payer up to \$100 million over three years and prevent at least 5,000 food-borne illness cases a year.

He told the seminar that improvements in food safety and hygiene in poultry plants is already improving.

In the second quarter of last year, just 2.6 per cent of the broiler carcasses passing through poultry plants tested positive for Salmonella and in the third quarter, it was 4.5 per cent.

A total of 73.7 per cent of all poultry processing plants are classed as Category 1 or good and only six per cent are Category 3 – bad-where their details are published on the FDA website.

More than 82 per cent of turkey processing plants are classed as Category 1.

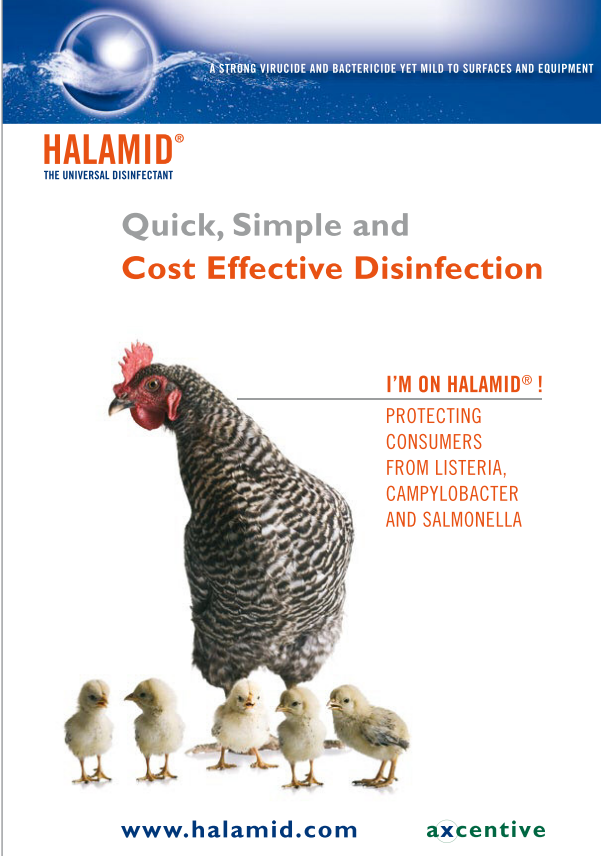
Dr Raymond added that contrary to popular opinion, larger plants are more successful in countering Salmonella than smaller plants, with just 0.7 per cent of large plants testing positive for Salmonella.

A total of 8.1 per cent of small plants were found to have Salmonella contamination and 22 per cent of very small plants.

However, Dr Raymond warned that among comminuted chicken products, mechanically separated chicken meat was found to be 81.5 per cent positive for Salmonella contamination while ground chicken was 40.3 per cent positive and other comminuted products were 36.5 per cent positive.

“Chicken carcasses are going in the right direction but comminuted chicken parts are going in the wrong direction,” Dr Raymond said.

He said that the Food Safety and Inspection Service (FSIS) can be expected to produce new standards for comminuted chicken but he warned that he did not believe that mechanically recovered chicken meat should not be sold to be cooked commercially and should not enter the market as a near ready-to-eat product.



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MEPs Call for Tighter Country of Origin Labelling for Poultry

EU - A European Commission proposal that would allow pork to be labelled as 'reared' in an EU country even if the pig had spent only four months there was rejected by Parliament on 6 February.

Members of the European Parliament (MEPs) argued that origin labelling rules for fresh, chilled and frozen meat of swine, sheep, goats and poultry should be modelled on the stricter ones already in place for beef, so as not to mislead consumers.

Under the proposed scheme, labels would state only the countries of rearing and slaughter. Pork could be labelled as 'reared' in a member state if the pig had lived there for just four months, or for just one month in the case of poultry. The European Commission did not propose mandatory labelling of the place of birth, even though Parliament has repeatedly requested it.

"Consumers want the full picture of the meat supply chain, which is why I am calling for the place of birth, rearing and slaughter to be labelled. Many people want to know whether animals have come from places with good welfare standards, and how far they have been transported, for ethical and environmental reasons," said MEP Glenis Willmott (S&D, UK), who drafted the resolution, which was adopted with 368 votes to 207 and 20 abstentions.

"We already have these rules in place for beef and I don't see why we shouldn't have the same for pigs, chickens, sheep and other meat animals," she added.

MEPs point out that the origin of meat is of prime concern to consumers. Recent food scandals, including the fraudulent substitution of horse meat for beef, have shown that consumers both want and need stricter rules for traceability and consumer information, they say.

They therefore call on the Commission to withdraw the regulation and to draw up a revised version which includes a mandatory place of birth, rearing and slaughter labelling for those meats, in line with the existing beef origin labelling legislation.

MEPs also call on the Commission to delete any exceptions from the implementing rules for minced meat and trimmings.

Original XPC's Impact on Salmonella Typhimurium

US - Commercial broilers challenged with Salmonella typhimurium show reduced load and prevalence of the bacterium, along with improved feed conversion, reports Jonathan Broomhead, PhD, manager of global poultry research and technical support with Diamond V.

Colorado Quality Research recently tested effects of Original XPC™ in broilers challenged with Salmonella typhimurium at seven days of age.

Birds fed XPC had a numerically reduced prevalence and statistically reduced load of S. typhimurium at 14 days of age. By 35 days of age, the Salmonella prevalence and load was low but XPC-fed birds showed continued reduction in Salmonella load.



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The researchers also found that feed conversion was statistically improved in XPC-fed birds through 14 and 35 days of age.

Diamond V offers an extensive portfolio of research on a range of Salmonella serotypes in poultry with published reports on Original XPC effects shown through in-vitro testing, in-vivo challenges, controlled pen studies and paired house field trials.

Research covers commercial broilers and turkeys, caged layers and breeding stock.

Details of Diamond V's research on Original XPC fed to broilers are available on-line.

For updates on ongoing poultry research, subscribe to Poultry Advisor at

www.diamondv.com

Sanitary Practices for Food, Feed Transport Proposed

US - The US Food and Drug Administration has put forward proposals for sanitary practices for people shipping and transporting food and animal feed.

The new regulations are a requirement of the Food Safety Modernization Act.

The new sanitary transportation practices are designed to ensure that food is not transported under conditions that may cause the food to become adulterated.

The FDA said that isolated incidents of insanitary transportation practices for human and animal food and outbreaks and illnesses caused by contamination of foods during transport have resulted in concerns over the past decades about the potential that food



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can become contaminated during transportation.

The goal of the proposed rule is to ensure that transportation practices do not create food safety risks.

The FDA proposals say that practices that create such risk include failure to properly refrigerate food, inadequate cleaning of vehicles between loads, and failure to properly protect food during transportation.

The proposed rule builds on current safe food transport practices and is focused on ensuring that people engaged in the transportation of food that is at the greatest risk of contamination during transportation follow appropriate sanitary transportation practices.

Best practices concerning cleaning, inspection, maintenance, loading and unloading, and the operation of vehicles and transportation equipment that have already been developed will continue to be used.

The proposed rule does not cover shippers, receivers or carriers that have less than \$500,000 in total annual sales.

The requirements also do not apply to fully packaged shelf-stable foods, live food animals and raw agricultural commodities (RACs) when RACs are transported by farms.

The proposed rule will establish requirements for:

- Vehicles and transportation equipment;
- Transportation operations;
- Training;
- Records; and
- Waivers.

The new rule is estimated to cover 83,609 firms.

The total first year cost is estimated to be \$149.1 million (with an average of \$1,784 per firm), and total annual cost is estimated to be \$30.08 million (with an average of \$360 per firm). The FDA said that it does not have sufficient data to quantify the potential benefits of the proposed rule.

Comments on the proposals can be submitted by 31 May.

ALIS: Latest in State-of-the-art Poultry Lighting

GLOBAL - The AgriLamp Induction System (ALIS) is the very latest in poultry lighting solutions launched by AgriLamp, a leading global manufacturer of innovative agricultural LED lighting solutions.

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Benefits to poultry

- Lower mortality rates and lower aggression
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African Countries on H7N9 Bird Flu Alert

AFRICA - The need has been recognised to update surveillance and contingency measures for influenza A(H7N9) in African countries that have close ties with China, many poultry and a history of H5N1 infections.

Following the emergence of the novel influenza A(H7N9) virus in China, countries in Africa have been encouraged to increase their preparedness for the new low pathogenic strain of avian influenza. The Food and Agriculture Organization of the United Nations (FAO) and the African Union's Interafrican Bureau for Animal Resources (AU-IBAR) identified the need to invest in a project that would assist selected African countries to:

- conduct regular risk assessment on H7N9
- implement risk-based surveillance and
- update their contingency plans.

These countries were selected according to the following criteria:

- trade with China
- high density of poultry and
- a history of infection with H5N1.

Most of these countries had already established surveillance systems and contingency plans to combat the spread of highly pathogenic avian influenza H5N1, which hit Africa in 2006. However, with the advent of low pathogenic A(H7N9), these surveillance and contingency measures need to be updated. The main difference between the two virus manifestations is that birds that have contracted A(H7N9) do not show clinical signs unlike those infected with the H5N1 virus.



A risk-based approach is necessary to identify critical points of entry where surveillance should be targeted and risk management measures enhanced. Such measures include cleaning and disinfection of live bird markets and introducing market rest days with no poultry, among others.

Unlike with H5N1, migratory birds and ducks

do not seem to play a role in spreading the A(H7N9) virus. The highest risk of spread is associated with legal or illegal trade of live birds through humans, and the avian species most implicated so far are chickens, quail and pigeons.

Until additional donor support can be mobilized to further assist African countries at risk, FAO and AU-IBAR recommend that countries use their own resources to:

- conduct risk analysis
- identify possible points of entry for the virus in order to target their surveillance
- enhance biosecurity in live bird markets
- strengthen their laboratory capacities on Influenza A diagnosis and
- adapt contingency plans developed for H5N1 to the challenges represented by the different epidemiology of the A(H7N9) virus.



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These measures will better prepare countries for a potential A(H7N9) incursion.

The launch of this project took place in Nairobi, Kenya from 21 to 22 January 2014 with the participation of Chief Veterinary Officers from 11 of the selected African countries and representatives from AU-IBAR, the Centers for Disease Control and Prevention (CDC), the Economic Community of Central African States (ECCAS), FAO, the World Organisation for Animal Health (OIE) and the World Health Organization (WHO).

The objectives of the workshop were two-fold. The first was to agree on an agenda for the activities that would take place under the project. The second was to reflect on the new challenges the countries face with the potential introduction of the A(H7N9) virus and the required mitigation measures.

The Nairobi workshop was an occasion to revise the workplan for 2014. Among the many discussions which took place, participants placed greater emphasis on good risk communication practices and the need to explore potential sources of additional funding in order to implement the necessary actions identified through risk analysis.

As part of capacity building on potential introduction and spread of A(H7N9), FAO and AU-IBAR are now planning a regional workshop for professionals from the selected countries' epidemiology units in the first half of 2014 in order to assist with the implementation of value chain and risk analyses.

Original source: FAO report

http://www.fao.org/ag/againfo/programmes/en/empres/news_030214.html.

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Fast-track Poultry Production Planned in Uttar Pradesh

INDIA - The country's largest state, Uttar Pradesh, has been making big strides to in-poultry production in recent years, according to Indbro.

Uttar Pradesh, the largest state of the Indian Republic, has a population of 207 million people. The state has been receiving all sorts of poultry inputs such as table eggs from South India and broiler chicken and chicks from the neighbouring states of Madhya Pradesh in the south, West Bengal in the east and Haryana in the North.

However, Uttar Pradesh has decided to boost its poultry production under the active encouragement of the chief minister and active administration in the department of animal husbandry over the last three years.

It has initiated schemes to attract poultry production entrepreneurs from other states, which are leading in poultry production and the others interested with in the state.

The government has offered 10 per cent interest subvention to new entrepreneurs who start layer units of 30,000 birds and broiler breeding units of 10,000 birds.

They also offered faster clearances on land acquisition and power supplies to the new units. The state government has advised the banks to lend more money to the new poultry units.

The result is that the daily egg production has already gone up by one million eggs per day, and production of broiler chicks within the state will commence by the second half of the year 2014.

The state government has implemented the rural backyard poultry scheme sponsored by the central government with lot of diligence and three million dual-purpose, multi-coloured, low-input 'Rainbow Rooster' chicks were distributed in 77 districts at 40,000 chicks per district.

These three million chicks must have added at least 1,500 tonnes of chicken and another 1.5 million layer birds on the way to produce eggs in rural households to augmenting the nutritional status of the low-income groups in the state.

Inspired by the progress, neighbouring states like Bihar have also focused their efforts to take advantage of centrally sponsored schemes in poultry production.

The production figures for chicken and eggs

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Recapture the Dignity of Raising Animals, Farmers Urged

CANADA - Activists are using religion and children as two powerful tools to wage war against the livestock industry, and producers and their industry need to recapture the moral high ground in raising livestock, according to Dr Nelson Kloosterman.

To do that they need to think stewardship, Dr Kloosterman told the 2014 Banff Pork Seminar, reports Meristem Land and Science.

Nelson Kloosterman NBanff Prok Symposium 2014 Dr Kloosterman is executive director and ethics consultant for Worldview Resources International, a service organization with a mission to provide resources designed to assist in understanding and applying a religious worldview to responsible living.

First step, he said, is to understand what he calls the ideology of food tyranny, the 'political groupthink', characterised by manipulation, coercion and violence.

Religion is a powerful tool of propaganda, he said. There is a tremendous ignorance in the public about religion and a tremendous ignorance about animal stewardship. Anti-livestock groups deliberately use religious terms to their advantage.

For example, a bumper sticker 'Thou shalt not kill. Go vegetarian' uses the sixth commandment to make a point about livestock production. Another says 'He died for your sins. Go vegetarian'. referring to Jesus Christ showing an image of him on the cross.

"If you think these slogans are innocuous or benign you need to realise that many people are coming under the influence of this use of religion in service to animal rights, in service to what they call animal welfare, in direct opposition to the very vocation you are practicing," said Dr Kloosterman.

The use of children to sell the message is another tactic. Targeting children to identify farm animals as pets, or to portray young people as having the solutions and older generations to be set in their ways is a deliberate tactic.

Language is another tool. Bumper stickers

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such as 'Eating meat stops a beating heart' makes a direct connection with the practice of legalised abortion.

That effort goes well beyond the boundaries of moral discourse, continued Dr Kloosterman.

Three recommendations

Dr Kloosterman has three recommendations for the livestock industry all based around recalling a position of stewardship.

First, practise comprehensive transparency. "Be confident enough about what you are doing, why you are doing it and how you are doing it to let other people in the barn to watch you work," he said.

Second, move beyond advocacy to public service. Advocacy is important but organizations should move beyond simply serving producers to serving the public, he added.

Third, partner with animal science educators. Part of the advantage the other side enjoys is that with their terms, language, manipulation and coercion they have been able to capture the moral high ground because they are assisted by academics and others who know how to craft the message.

The livestock industry needs message-makers and communicators who meet the opposition on their turf, he said.

"This will cost money. I'm suggesting if the animal industry in North America wishes to survive, it will have to allocate a significant part of its budget to precisely this kind of thing," concluded Dr Kloosterman.

New Video Series Explains Commercial Poultry Production

US - The US Poultry and Egg Association (USPoultry) has released a series of videos on Concentrated Animal Feeding Operations (CAFOs) in the poultry industry.

To help provide answers as to why Concentrated Animal Feeding Operations (CAFOs) are an important part of the poultry industry, USPoultry has created a series of six short videos. The series is called Poultry Insight, and the videos are a discussion with Paul Bredwell, vice president of environmental programs for USPoultry.

The video series explains what a CAFO is, who owns CAFOs, potential impact of CAFOs on the environment, how producers manage their operations to avoid adverse environmental impacts, the benefits of CAFOs, and who regulates CAFOs.

"USPoultry and our members recognise consumers have questions about Concentrated Animal Feeding Operations, or CAFOs.

This series of videos is designed to provide a general overview about CAFOs in the poultry industry, and we welcome any feedback from consumers who have additional questions," remarked USPoultry president, John Starkey. "It is through funds generated by the International Poultry Expo (IPE) that USPoultry is able to create educational information of this type. This video series is only one example of the IPE funds that have been funneled back into the industry over the years.

We sincerely appreciate the support of our members and exhibitors that has allowed USPoultry to create and distribute this informa-

tion,” said James Adams, Wenger Feeds, Rheems, Pennsylvania, and USPoultry chairman.

The videos can be viewed on USPoultry’s web site, www.uspoultry.org.

They can also be viewed on YouTube by [clicking here](#).

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If you would like further information about this topic or to schedule an interview with Mauro Pericoli, please call Giorgia Castagna at + 39 0182 589006 or e-mail Giorgia at gcastagna@pericoli.com

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Orka Instruments Gain Recognition in South America

SOUTH AMERICA - Instruments manufactured by ORKA Food Technology ("EggTester.Com") are gaining strong recognition in South American market based on their versatility, cost and reliability.

During January 28-30, 2014, ORKA participated in IPPE 2014 at Atlanta and attracted huge number of potential buyers from South American countries.

Until now this region was not the main market for ORKA but we are feeling that the time has changed.

ORKA may be looking for local partners and/or distributors to penetrate into local markets more extensively. Should you be interested, please do not hesitate to contact us.

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The Egg Shell Thickness Gauge; this instrument uses ultrasound to measure the thickness of shells for quality control and research applications.

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NAFTA a los 20 años: pasado, presente y futuro

Veinte años después de la firma histórica del Tratado de Libre Comercio de Norteamérica (TLCNA o NAFTA) entre Estados Unidos, México y Canadá, realmente no existe consenso sobre si ha sido un gran éxito o un gran fracaso. Escribe Chris Wright, editor principal de El Sitio Avícola

Según un comunicado de USAPEEC, el Consejo de Exportación de Pollo y Huevo de EUA, en las dos décadas de NAFTA, México ha llegado a convertirse en el primer mercado de exportación de pollo, pavo, pato y huevo de EUA en 2013, con ventas anuales que superan los US\$ 1.3 mil millones, según datos del Gobierno de EUA.

Durante los 20 años de NAFTA, las exportaciones totales de aves de corral de EUA a México han crecido en un 358% en volumen y 415% en valor. México también importa una cantidad significativa de productos de huevos procesados y, en 2012, México comenzó a importar huevo de mesa de los EUA para impulsar los suministros que fueron afectados por el brote de la influenza aviar H7N3.

A pesar de que México todavía no logra que EUA acepte sus productos de pollo crudo, su industria tiene acceso sin restricciones a los cereales forrajeros de EUA, junto con genética de aves y otros insumos.

No cabe duda de que las industrias avícolas de estos dos países se acercan más y más cada día, algo que ha quedado claro, durante los últimos dos años.

Colombia: aumentará el consumo de huevo

Las estimaciones sobre la producción de huevo en Colombia son muy positivas: el país se acerca a producir 12.000 millones de huevos en 2014, a pesar de que el ritmo de producción será moderado

Esta es la previsión para la producción de huevo en Colombia hecha por Andrés Valencia, presidente de la Federación Nacional de Avicultores de Colombia (Fenavi).

Así, la expectativa para el subsector huevo es crecer un 8 por ciento, algo menos del doble (4,9 por ciento) frente al crecimiento reportado entre 2012 y 2013. También se esperaría un incremento de casi 7 por ciento para el consumo per cápita, que pasaría de 236 unidades a 252 por persona; es decir, cada colombiano comería este año 16 huevos más que en el 2013.

Veda avícola se eliminará progresivamente

República Dominicana y Haití avanzaron en el diálogo binacional y llegaron a seis acuerdos importantes en distintas materias, entre ellas, agricultura.

Gustavo Montalvo, ministro de la Presidencia, dijo que también el acuerdo relacionado a agricultura permitirá levantar la veda a la exportación de pollos y huevos hacia Haití.

La eliminación de la veda, sin embargo, se hará de forma progresiva y condicionada a un protocolo que incluye las granjas debidamente certificadas. Se trata del acuerdo fi-

tosanitario que se viene definiendo desde hace varios meses.

Avicultura chilena, abierta al mercado mundial

A 10 años de la firma del Tratado de Libre Comercio (TLC) entre Chile-Estados Unidos la industria avícola nacional ha sido capaz de aprovechar las oportunidades en un escenario adverso para el sector.

“Hoy, Chile es el mercado avícola más abierto del mundo y el TLC con EUA fue uno de los componentes más importantes en este proceso de apertura que implicó la decisión del sector de transformar una amenaza en oportunidad”, manifestó Juan Miguel Ovalle, presidente de la Asociación de Productores Avícolas de Chile (APA).

Según reporta la APA en un comunicado en su sitio web, el representante gremial señaló que el inicio de las negociaciones con Estados Unidos se dieron en un contexto desfavorable para el sector, ya que se trataba de un país con una producción avícola 30 veces mayor que la chilena y uno de los mayores exportadores de carne de ave en el mundo, que, además, estaba cerrado a las importaciones y con un patrón de consumo distinto.

En síntesis, el TLC ha sido beneficioso para Chile y la industria avícola. Hoy Estados Unidos es el principal mercado de exportación para el sector y el 57% de los cortes enviados el 2013 correspondieron a pechugas de pollo, que tiene un valor mucho más alto que los productos avícolas estadounidenses que ingresan al país.



Control orgánico de escarabajos en galpones avícolas

Se resumen las opciones para controlar estas plagas en los galpones de pollos a través del uso de métodos aceptados como orgánicos en los EUA. Información del programa ATTRA del Servicio de Información Agrícola Sostenible Nacional.

Larvas del escarabajo de la cama

Los escarabajos de la cama (o escarabajo negro), *Alphitobius diaperinus*, de la familia de los tenebriónidos, se asocian a la cama de las aves y a las acumulaciones de estiércol.

Pueden causar daños importantes a través de la perforación de materiales estructurales y también sirven como vectores de varias enfermedades avícolas

Los adultos tienen una longitud de media pul-

gada (13 mm), un color entre marrón oscuro y negro y las larvas, entre amarillo claro y marrón; y tienen entre un cuarto y media pulgada de longitud (6 a 13 mm).

Tanto los ejemplares adultos como las larvas viven en la cama de las aves, donde se alimentan tanto de los alimentos de las aves como de las heces secas.

La humedad de los bebederos u otras fuentes es necesaria para su supervivencia. Normalmente se encuentran donde hay humedad o donde la cama está más suelta y es más profunda.

Las larvas y los ejemplares adultos tienden a acumularse bajo cualquier cosa en posición horizontal o justo debajo de la superficie de la cama. Los comederos de piso suministran



lugares excelentes para que se escondan. Si no hay nada, se quedan por los bordes de la cama embarrada.

Manejo de la cama

Un buen manejo de la cama puede reducir mucho el número de estos escarabajos. Mantenga la cama tan seca como sea posible, apretuje la cama suelta y donde sea posible utilice comederos y bebederos que no se apoyen en la cama sino que se adhieran a los lados del galpón. Se aconsejan la limpieza y eliminación completas de la cama, que deben de efectuarse con regularidad, sobre todo con temperaturas muy frías que matan a los escarabajos.

Es prácticamente imposible eliminar a estos insectos de un galpón con insecticidas. Se protegen bajo la cama y la cama misma puede combinar los productos y reducir su eficacia. Sin embargo, la tierra de diatomeas (TD) puede ayudar. El galpón y la cama, los nidos y las áreas donde las aves toman baños de polvo pueden empolvarse con TD. Las versiones sin calentar de TD se permiten

sin restricciones en los sistemas orgánicos. Asegúrese de que utiliza la TD apropiada para alimentos -no aquella que se vende para usar en piscinas y otros filtros- con contenido de sílice cristalina a un uno por ciento o inferior. Aquellas TD con contenido de sílice cristalina del tres por ciento o superior son peligrosas y debe evitarse a toda costa.

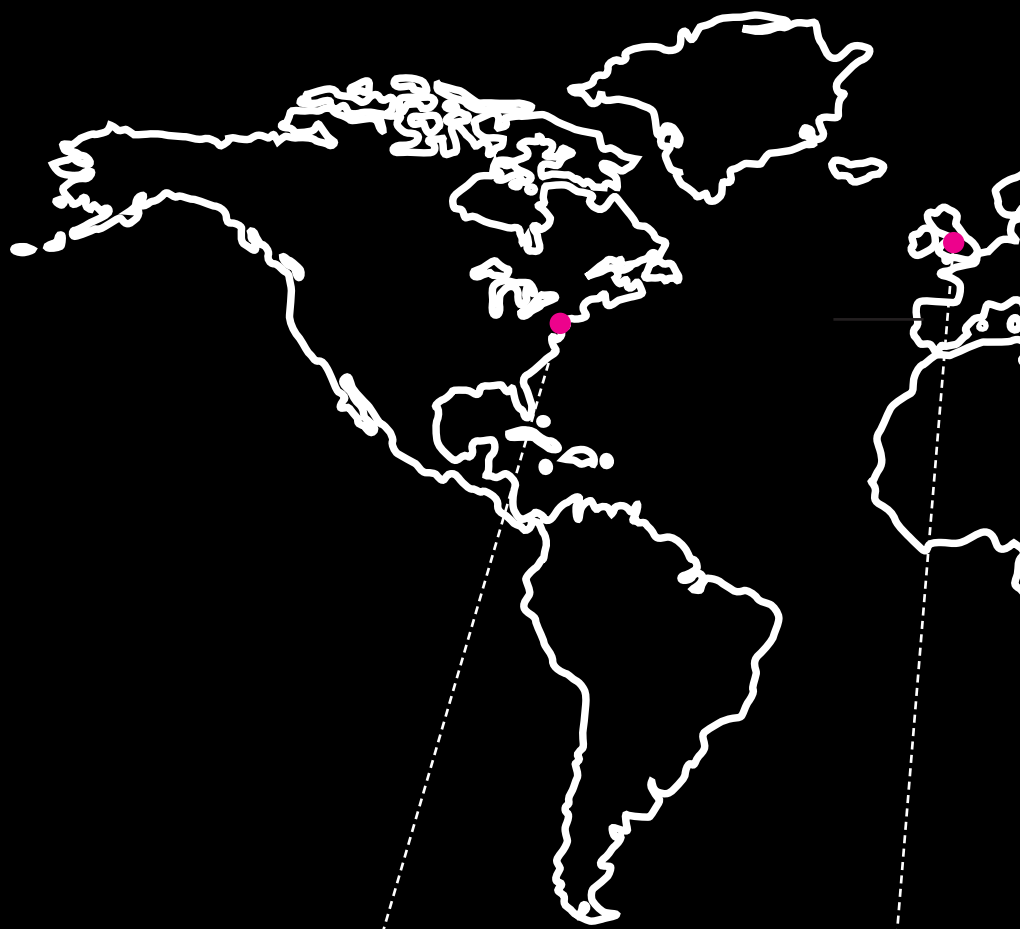
Cuando estos métodos no bastan, el pelitre se puede usar en los sistemas de producción orgánicos. El pelitre es un medio eficaz, aunque caro, para el control externo de parásitos. Tanto el pelitre puro como la combinación de pelitre y TD están disponibles. El polvo de pelitre se puede usar en los galpones avícolas y se puede aplicar sobre las propias aves.

Un comentario en la lista de Materiales Genéricos del Instituto de Análisis de Materiales Orgánicos especifica que el pelitre puede usarse como parasiticida externo. Los pelitres sintéticos y los productos de pelitre formulados con butóxido de piperonilo no se permiten.

Los productores tienen que cumplir con las instrucciones de la etiqueta para administrar correctamente los parasiticidas con pelitre a los animales, además de cumplir con las normas específicas que sean pertinentes para los sistemas de producción orgánica.

Los productores también tienen que documentar los intentos anteriores para controlar los parásitos con medios alternativos, como los descritos aquí antes. ■

Industry.Events



**2014 USDA Agricultural Outlook
Conference**
Arlington, Virginia, USA
20 - 21 February

USDA's Agricultural Outlook Forum brings together the agricultural community to discuss policy, trade, science, rural development, and the economic outlook for the coming year. The Forum also focuses on forestry, health and nutrition issues, and the changing dynamics and face of rural America.

Northern Broiler Conference
Manchester, UK, 25 February

The purpose of the conference is to support broiler growers in the North of England.

The program will cover specific broiler technical subjects along with feed and veterinary updates.



IAI Expo 2014 ●
New Delhi, India, 20 - 22 February

IAI Expo 2014 is focused on development of complete livestock industry in India. It will be witnessed by few of the global innovations in livestock industry, technical seminars, product launches and B2B meet. IAI Expo is event of events IAI Poultry, IAI aquaculture, IAI Swine, IAI Dairy, IAI Goat expos.

25th Australian Poultry Science Symposium ●
Sydney, Australia, 16 - 19 February

The Australian Poultry Science Symposium is the premier avian science conference in Australia and attracts delegates from Asia, Australasia, the Americas and Europe.

Listings.Business Directory

Health & Welfare



Ceva Animal Health

Tel: +33 (0) 557 554 040
Fax: +33 (0) 557 554 198
info@ceva.com
www.ceva.com

Areas:

Pharmaceuticals
Vaccines
Equipment: Vaccination
and Medical)
Feed: Additives

CEVA Santé Animale is a global veterinary health company focused on the research, development, production and marketing of pharmaceutical products and vaccines for pets, livestock, swine and poultry.



Merck Animal Health

animal-health-communications@merck.com
www.merck-animal-health.com

Areas:

Feed: Safety Products
Feed: Additives
Feed
Cleaning/Disinfectants
Pharmaceuticals

Merck Animal Health offers veterinarians, farmers, pet owners and governments the widest range of veterinary pharmaceuticals, vaccines and health management solutions and services



Zoetis

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GP.Marketing@zoetis.com
www.zoetis.com

Areas:

Vaccines
Biodevices
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Zoetis strives to support those who raise and care for farm animals by providing a range of products and services that offer tangible solutions to the many challenges veterinarians and livestock producers face every day.

Breeding & Genetics



Aviagen

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www.aviagen.com

Areas:

Breeding
Genetics

The Aviagen Group is the global market leader in poultry genetics. As the world's premier poultry breeding company, Aviagen develops pedigree lines for the production of commercial broilers and turkeys.



Cobb Vantress

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Areas:

Breeding
Genetics

Cobb broiler breeding stock has the sustained advantage of the most efficient feed conversion and highest potential for profitability for the company's global customers.



Grimaud Frères Sélection

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Areas:

Breeding
Genetics

Grimaud Frères are a multi-species selection and breeding operator in the service of the waterfowls and festive poultry field.



Hubbard

Tel: +33 296 79 63 70
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Areas:

Breeding
Genetics

Hubbard provides solutions that focus on the economic performance, health and well-being of breeding stock. Hubbard specializes in state-of-the-art selection programs to improve the performance of their pure lines.



Hy-Line

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Areas:

Breeding
Genetics

Hy-Line International is a world leader in poultry layer genetics with a rich history of innovation. Hy-Line was the first poultry breeding company to apply the principles of hybridization to commercial layerbreeding.



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contact.novogen@novogen-layers
www.novogen-layers.com

Areas:

Breeding
Genetics

NOVOGEN offers a new alternative giving the egg producers more choice and possibilities to fit their specific market requirements.



Indbro Poultry

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drkotaiah@indbropoultry.com
www.indbro.com

Areas:

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Biosecurity & Hygiene



CID LINES

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Fax: +32 5721 7879
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Areas:

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Cleaning
Feed: Additives
Health and Safety
Pest Control
Welfare

CID LINES offers VIROCID, the most powerful disinfectant, which is part of a hygiene program for poultry, written by hygiene specialists. VIROCID has a proven record in preventing and fighting disease outbreaks for many years.



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Areas:

Biosecurity
Hygiene
Cleaning Services
Pest Control

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AB Vista

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www.abvista.com

Areas:

Feed
Feed: Additives
Feed: Nutrition

AB Vista is an integrated international supplier of new generation micro-ingredients for animal feeds providing visionary solutions for your agribusiness.



Biomim

Tel: +43 2782 803 0
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Areas:

Feed
Feed: Additives
Feed: Nutrition

BIOMIN offers sustainable animal nutrition products such as quality feed additives and premixes, which include solutions for mycotoxin risk management, a groundbreaking natural growth promoting concept as well as other specific solutions



Danisco Animal Nutrition

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Fax: +44 (0) 1672 517778
info.animalnutrition@dupont.com
www.animalnutrition.dupont.com

Areas:

Feed: Additives

Danisco Animal Nutrition (part of DuPont) is a leading global supplier of enzymes, natural feed betaine, probiotics and essential oils to improve the nutrition of poultry, pig, ruminant and some aquaculture species. Our mission is to develop sustainable solutions that further decrease feed costs, increase animal productivity and reduce environmental impact.



Global Bio-Chem

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contact@globalbiochem.com
www.globalbiochem.com

Areas:

Feed
Feed: Additives

Global Bio-Chem is the largest producer of Lysine worldwide and pioneers of corn refined and corn based products. Our products are utilized in feed products, food, beverage, cosmetics, textiles, pharmaceuticals and chemicals industry worldwide.



Kerry Ingredients & Flavours EMEA

Tel: +31 36 523 3100
Fax: +31 36 523 3110
clive.girdler@kerry.com
www.kerry.com

Areas:

Feed
Feed: Additives
Feed: Safety

Kerry Ingredients & Flavours is a leader in developing, manufacturing and delivering technology-based ingredients and integrated solutions. Our products are designed specifically to optimize the nutritional value and maximize the energy of feed ingredients in poultry diets.



Novus International

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www.novusint.com

Areas:

Feed
Feed: Additives
Feed: Nutrition

Novus International is a global leader of animal health and nutrition programs for the poultry, pork, beef, dairy aquaculture and companion animal industries.

Housing & Equipment



AgriLamp

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Areas:

Equipment: Lighting & Electrical

AgriLamp™ is a leading LED manufacturer with years of experience in designing and manufacturing the world's most innovative LED (light-emitting diode) lighting solutions for the agricultural industry.



Big Dutchman

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Areas:

Equipment: Breeding
Equipment: Drinking
Equipment: Egg
Equipment: Feeding
Equipment: Weighing

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Termotecnica Pericoli

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Fax: +39 0182 589005
termotecnica@pericoli.com
www.pericoli.com

Areas:

Climate Control
Climate Management
Heating, Cooling and Ventilation

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Vencomatic

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www.vencomatic.com

Areas:

Equipment: Breeding
Equipment: Drinking
Equipment: Egg
handling and grading
Equipment: Nesting

Vencomatic is a global supplier of innovative and welfare friendly housing solutions for the poultry sector. The flexible and turn key solutions of Vencomatic offer large possibilities for a wide range of poultry production concepts.

Incubation & Hatching



Orka Food Technology

Tel: +852 8120 9245
Fax: +852 2802 7112
info@orkatech.com
www.eggtester.com

Areas:

Equipment: Egg
Equipment: Hatching
Equipment: Incubation

EggTester.com (officially known as "Orka Food Technology") is a leading worldwide manufacturer of egg-quality testing equipment to be used extensively in QC laboratories operated by egg producers, packers, universities, regulatory authorities, and primary breeders.



Pas Reform

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Fax: +31 314 652 572
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www.pasreform.com

Areas:

Equipment: Incubation
Equipment: Egg
Equipment: Environment
Equipment: Hatching
Waste Handling

Pas Reform is an international company, which has specialized in the development of innovative hatchery technologies for the poultry sector since 1919. Products and Services: Incubators, Hatchery Automation Systems, Hatchery Climate Control Systems and Hatchery Management Training.



Petersime

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Areas:

Equipment: Hatching
Equipment: Incubation

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Events & Exhibitions



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Events & Exhibitions

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