THEPOULTRYSITE DIGITAL.

July 2015

Australian Egg Farms Meeting Challenge of Salmonella

Strong Growth in Egg Output Recorded in Africa and Oceania

Poultry Health Basics – Planning Disease Prevention

Vaccinating to Reduce Risks from Chronic Respiratory Disease

Welcome.Editors **Note**

ThePoultrySite Digital

July 2015

Welcome to this month's edition of *ThePoultrySite Digital* which takes a look at poultry health and disease.

Attempting to eliminate salmonella on the poultry farm is virtually an impossible task.

Chris Harris
Digital Editor
ThePoultrySite.com

However, in Australia, the poultry industry has been taking steps to minimise its effects and to control the pathogen on laying farms, with the issue being discussed earlier this year at the 26th annual Australian Poultry Science Symposium in Sydney.

In this month's issue, how vaccines can be used to fight chronic respiratory disease, Mycoplasma gallisepticum, is also put under the microscope. A study from Mississippi State University examines the use of single and multi-strains of vaccine and a study from the University of Florida examines the efficacy of live and killed vaccines.

The Issue also looks at how chicken infectious anaemia has become an emerging threat to the poultry industry worldwide. There is also a useful basic health guide giving quick information to help maintain good flock health.

In the global markets, industry analyst Terry Evans looks at the egg markets in Africa and Oceania, showing how Nigeria is the major producer on the African Continent and Australia leads the way in Oceania.

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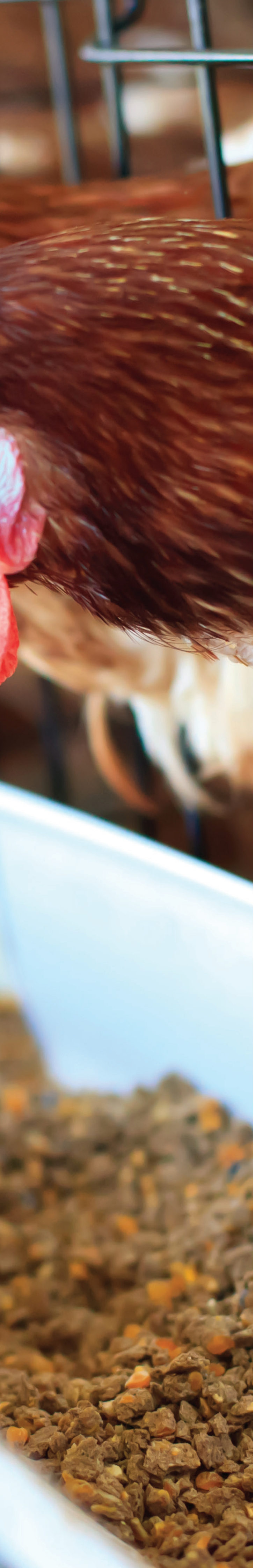


Australian Egg Farms Meeting Challenge of Salmonella

Eliminating Salmonella on egg farms is impossible, so the risk to human health needs to be thoroughly managed and controlled.

According to Kylie Hewson from the Australian Egg Corporation the presence of *Salmonella enterica* serovars (particularly some *Typhimurium* serotypes), which can cause salmonellosis in humans, throughout the supply chain has become an enduring challenge for the egg industry and has caused major issues for the sector's reputation.

Speaking at the 26th annual Australian Poultry Science Symposium in Sydney earlier this year, Ms Hewson said that the presence and spread of Salmonella depends on numerous variables, and as such, there is no single effective control measure.

Therefore, she said, the presence and control of Salmonella are complex issues that are subject to a combination of both real and perceived risks.

There is an abundance of peer-reviewed and grey-literature regarding many aspects of Salmonella, however, the type and availability of this information varies within egg production and consultancy companies.

The phrases "everything is known and we don't need to fund more work" or "we did this work 30 years ago" are heard often during industry meetings to discuss Salmonella project proposals, she said. "Yet the challenge of Salmonella remains on-farm and in the market place," said Ms Hewson.

"Therefore, there is an obvious need to collate readily available information and make it more accessible to the entire industry to provide a framework for the application of knowledge.

"Currently, the level of understanding of the issue (i.e. the cause as well as the effectiveness of various controls) is variable within industry, government regulators, the food service sector, and the consumer community.

"Recent R,D&E activity and literature reviews in preparation by the AECL Council for Sustainable Egg Farming (CSEF) are expected to provide a robust body of knowledge and a clear description of the risks and possible management options of egg related salmonellosis illness in Australia."

As elimination of Salmonella on egg farms is impossible, the risk of human illness needs to be appropriately managed.

However, as this is a technically complex issue with varying risks (and varying understandings of these risks) between on-farm and in food service, an effective management strategy will need to be a collaborative effort that relies on the development of good relationships between industry and government agents / regulators, founded on robust information and involve a system (or systems) to control highest risk Salmonella enterica serovars at various stages in the supply chain.

Ms Hewson said that key stakeholders, including state regulators/health departments, industry associations, egg producers, researchers and technical consultants (including veterinarians) are involved in the process with the aim to build relationships and guide programme development.

Coordination, review and dissemination of comprehensive, yet coherent, information regarding Salmonella is currently underway in Australia with the aim to draft a risk management plan for the control of Salmonella through the entire egg supply chain.

Ms Hewson said that this management plan needs to be robust and measurable (i.e. it relies on data and can be audited if required), able to be updated easily to include new information as it becomes available and also include options for industry uptake and development.

Outcomes will also include the development of training materials and control documents for various stages of the supply chain, which focus on key issues and support a management programme that is both applicable to, and comprehensible by, regulators and producers.

In research sponsored by Australian Egg Corporation Limited Vivek Pande, a recipient of International Postgraduate Research Scholarship, and others showed that birds infected with Salmonella are still shedding the pathogen five weeks after infection. The research findings regarding the intermittent and prolong shedding of Salmonella agreed with other research into the problem, conducted by Lister and Barrow (2008) and Gole et al. (2014).

In the Australian study, Mr Pande said: "Egg or egg product related Salmonella poisoning is a major concern for the egg industry.

"*Salmonella Typhimurium* (S. Typhimurium) is the most frequently reported serovar in egg related food poisoning outbreaks in

Australia (The OzFoodNet Working Group, 2013).

"It has been studied that Salmonella serovars such as Enteritidis have the capacity to contaminate developing eggs within the oviduct; however, the vertical transmission ability of Australian S. Typhimurium strains has not been investigated.

"Older birds are also considerably more resistant to Salmonellae than are young chicks.

"Shedding of Salmonellae in chicken faeces can be intermittent and may continue for many months."

He said that persistence of S. Typhimurium DT 9 in the poultry shed environment could cause egg shell contamination.

However, a further study that was also reported at the symposium in Sydney, showed that different pore structures, the total number of pores and the shell thickness, did not make a difference to the penetration of Salmonella into the eggs.

The research, *An Examination of Eggshell Pore Structure and Penetration by Salmonella Typhimurium by* A.Ray, J. Roberts, K.Chousalkar and R.Flavel, conducted within the Poultry CRC, established and supported under the Australian Government's Cooperative Research Centres Program, found that no significant differences in the incidence of types of pore structure or Computed Tomography measured shell thicknesses were found in penetrated and non-penetrated shell samples. All measures were very similar except for the number of internally branching pores. ■

GLOBAL POULTRY TRENDS 2014:

Strong Growth in Egg Output Recorded in Africa and Oceania

Egg production in African countries has been increasing faster than the global rate, with Nigeria leading the league table of egg producers, reports industry analyst, Terry Evans, while Australia continues to lead the field in Oceania.

Africa Increases Its Global Egg Share

Egg production in Africa expanded by 3.8 per cent per year between 2000 and 2013. As this far exceeded the global growth rate of 2.3 per cent, Africa's share of world output increased from 3.7 per cent to 4.5 per cent. In volume terms, production in Africa rose from 1.9 million tonnes to 3.1 million tonnes over this period (Table 1 and Figure 1).

Over the 13 years, the Americas recorded a growth rate of 2.2 per cent per year, while Asia returned 2.5 per cent. In stark contrast to the other regions, Europe's egg industry expanded by only a shade over one per cent per year. With world egg output likely to reach 71.5 million tonnes this year, production in Africa could amount to some 3.3 million tonnes. The individual country figures, which include hatching eggs, are presented in Tables 2 and 3. As in the other major regions, the bulk of production is accounted for by only a handful of countries.

It is evident from Table 3 that the leading seven countries – Nigeria, South Africa, Algeria, Egypt, Morocco, Tunisia and Kenya – have a combined output of 2.3 million tonnes or more than three-quarters of the regional total. Some 22 of the 53 countries in the region

Table 1. World egg production (million tonnes)										
Region	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Africa	1.9	2.2	2.3	2.5	2.6	2.5	2.8	2.9	3.0	3.1
Americas	10.5	11.7	12.3	12.3	12.5	12.9	13.1	13.5	13.2	14.0
Asia	29.0	32.6	32.9	34.5	36.2	37.0	37.5	38.1	39.2	40.0
Europe	9.5	9.9	10.1	10.1	10.2	10.3	10.5	10.7	10.6	10.9
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**	**59.6**	**61.8**	**62.9**	**64.2**	**65.4**	**66.3**	**68.3**

Totals may not add up due to rounding
Source FAO

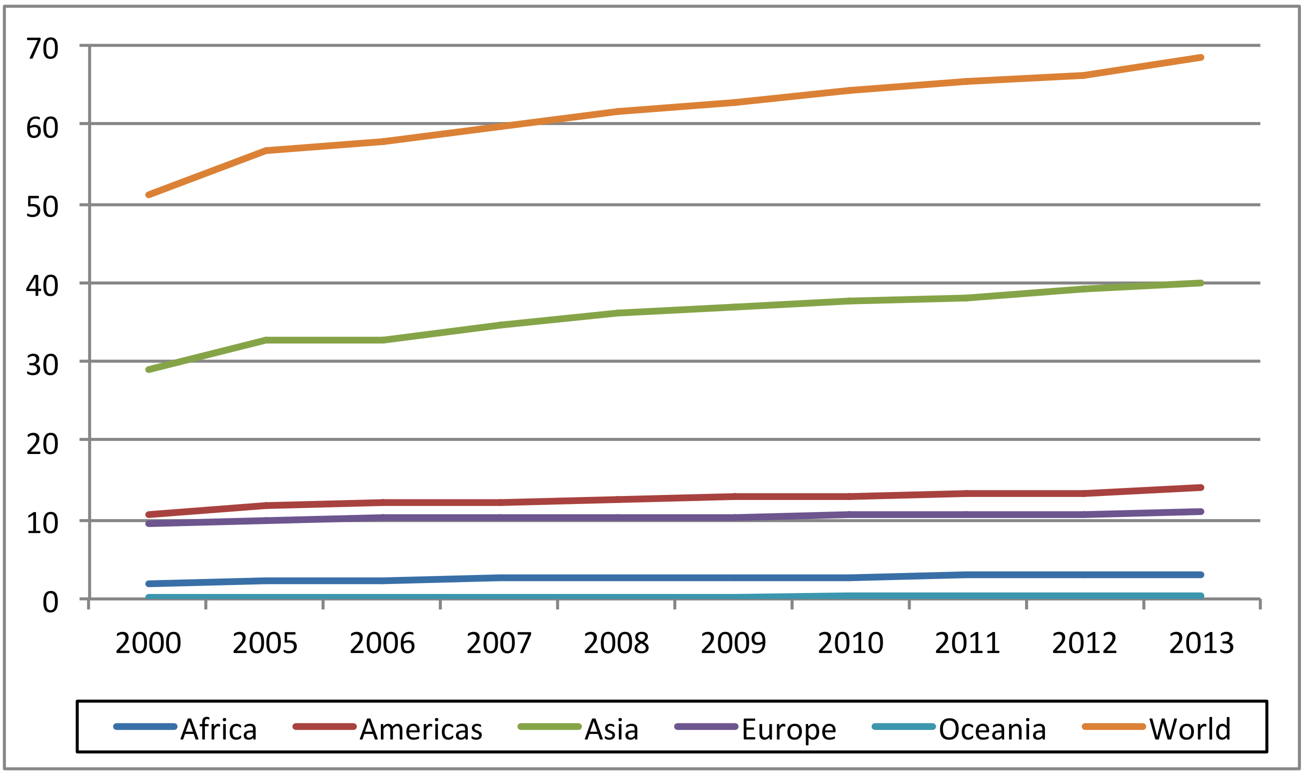


Figure 1. Upward trend in world egg production since 2000 (million tonnes)

produce less than 5,000 tonnes of eggs a year. Nevertheless, with the exceptions of Gabon, Somalia and the United Republic of Tanzania, all the industries recorded growth over the past decade or so.

Of particular note is that Uganda more than doubled its output with growth averaging above six per cent per year, while both Ghana and Guinea recorded average annual increases of more than five per cent.

Nigeria is the largest egg producer output having recorded a near four per cent per year gain to reach 650,000 tonnes in 2013 (Tables 2, 3, 4 and Figure 2) although data from another source points to an annual figure closer to 700,000 tonnes.

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

Country	2000	2005	2009	2010	2011	2012	2013
Algeria	101.0	175.0	193.6	260.5	279.7	309.0	347.3
Angola	4.3	5.2	4.9	5.0	5.0	5.0	5.1
Benin	7.2	7.2	11.1	9.9	10.7	11.6	12.5
Botswana	3.2	4.2	4.3	4.5	4.5	4.6	4.7
Burkina Faso	39.4	45.1	54.3	57.8	58.8	59.5	60.0
Burundi	3.0	3.1	3.1	3.0	3.1	3.1	3.2
Cameroon	13.0	13.4	14.9	15.0	15.0	15.5	16.0
Cabo Verde	1.9	1.8	2.1	2.2	2.2	2.2	2.3
Central African Rep.	2.1	2.2	2.7	3.1	3.2	2.5	2.6
Chad	3.6	3.7	4.0	4.0	4.0	4.0	4.0
Comoros	0.8	0.8	0.8	0.8	0.9	0.9	0.9
Congo	1.1	1.3	1.6	1.6	1.6	1.6	1.7
Cote d'Ivoire	33.0	28.7	30.0	32.0	33.0	40.4	46.0
Dem. Rep. Congo	7.0	6.9	8.7	8.9	9.0	9.0	9.0
Egypt	176.7	235.0	249.3	291.2	305.5	310.0	315.0
Equatorial Guinea	0.3	0.4	0.4	0.4	0.4	0.5	0.5
Eritrea	1.7	2.0	2.0	2.2	2.2	2.3	2.3
Ethiopia	28.6	35.0	39.0	39.0	39.6	40.0	41.0
Gabon	2.6	2.6	2.3	2.4	2.4	2.5	2.5
Gambia	0.7	0.8	0.9	0.9	0.9	1.0	1.0
Ghana	21.7	25.2	36.7	36.7	39.8	40.0	42.0
Guinea	12.2	18.6	23.5	23.6	24.5	24.5	24.5
Guinea-Bissau	1.0	1.1	1.3	1.3	1.4	1.4	1.4
Kenya	60.7	57.9	81.0	92.6	94.4	96.1	98.0
Lesotho	1.5	1.6	1.7	1.7	1.7	1.7	1.7
Liberia	4.2	4.6	5.0	5.2	5.4	5.5	5.0
Libya	60.0	63.1	62.2	62.5	63.0	63.6	60.0
Madagascar	14.9	15.1	16.2	16.1	16.6	17.0	17.0
Malawi	19.5	20.2	20.3	20.7	21.1	21.5	23.0
Mali	11.9	11.7	23.5	23.9	23.4	22.0	24.2
Mauritania	4.7	4.3	5.6	5.4	5.5	5.6	5.8
Mauritius	12.5	13.0	10.0	10.0	10.5	11.2	11.8
Morocco	235.0	232.0	200.0	244.0	265.0	272.0	278.0
Mozambique	1.7	9.8	21.9	27.1	35.0	46.9	45.0
Namibia	1.6	3.0	3.3	3.4	3.4	3.4	3.5
Niger	7.8	8.3	8.5	7.5	7.9	8.3	8.7
Nigeria	400.0	500.4	612.6	623.4	636.0	640.0	650.0
Reunion	5.1	6.0	5.9	6.7	6.7	7.0	7.0
Rwanda	2.2	2.7	2.9	2.9	2.9	3.0	3.0
Sao Tome/Principe	0.4	0.5	0.6	0.6	0.6	0.6	0.6
Senegal	10.4	20.2	26.6	27.4	28.9	27.4	26.0
Seychelles	2.2	1.2	1.3	1.1	1.3	1.4	1.4
Sierra Leone	4.6	3.7	9.9	10.8	12.0	12.0	12.0
Somalia	2.5	2.7	2.1	2.4	2.4	2.4	2.4
South Africa	318.0	365.5	450.0	473.0	511.0	535.0	540.0
Sudan (former)	34.0	30.0	32.0	35.0	38.0	38.5	38.5
Swaziland	1.1	1.3	1.1	1.2	1.2	1.2	1.2
Togo	6.3	8.0	9.3	9.3	9.3	9.5	10.0
Tunisia	82.0	84.0	88.0	92.0	92.6	97.7	98.5
Uganda	20.4	22.0	42.1	43.4	44.7	46.0	47.0
United Rep. Tanzania	33.8	36.3	31.2	32.5	32.5	33.3	33.3
Zambia	39.2	42.3	45.0	49.5	54.0	55.0	55.0
Zimbabwe	22.0	25.9	29.8	29.8	29.8	29.8	29.8
AFRICA	**1,885.9**	**2,216.1**	**2,540.4**	**2,766.7**	**2,903.9**	**3,005.2**	**3,082.4**
WORLD	**51,045.9**	**56,615.7**	**62,896.9**	**64,162.2**	**65,367.1**	**66,293.5**	**68,262.5**

P provisional, - no data, Countries producing less than 50 tonnes have been excluded
Source FAO

Table 3. Egg production ranking in Africa in 2013 ('000 tonnes)	
Country	**Production**
Nigeria	650.0
South Africa	540.0
Algeria	347.3
Egypt	315.0
Morocco	278.0
Tunisia	98.5
Kenya	98.0
Burkina Faso	60.0
Libya	60.0
Zambia	55.0
Uganda	47.0
Cote d'Ivoire	46.0
Mozambique	45.0
Ghana	42.0
Ethiopia	41.0
Sudan (former)	38.5
United Rep. Tanzania	33.3
Zimbabwe	29.8
Senegal	26.0
Guinea	24.5
Mali	24.2
Malawi	23.0
Madagascar	17.0
Cameroon	16.0
Benin	12.5
Sierra Leone	12.0
Mauritius	11.8
Togo	10.0
Dem. Rep. Congo	9.0
Niger	8.7
Reunion	7.0
Mauritania	5.8
Angola	5.1
Liberia	5.0
Botswana	4.7
Chad	4.0
Namibia	3.5
Burundi	3.2
Rwanda	3.0
Central African Rep.	2.6
Gabon	2.5
Somalia	2.4
Cabo Verde	2.3
Eritrea	2.3
Congo	1.7
Lesotho	1.7
Guinea-Bissau	1.4
Seychelles	1.4
Swaziland	1.2
Gambia	1.0
Comoros	0.9
Sao Tome/Principe	0.6
Equatorial Guinea	0.5

Source FAO

A recent research study by the Department of Agricultural Economics, Extension and Rural Development at Imo State University has recommended that there is a great need to: improve producers' access to credit; encourage producers to form co-operatives; subsidise certain inputs; improve infrastructure facilities, especially roads, which would reduce spoilage, shorten the chain of distribution and reduce transport costs.

During the review period, the egg industry in South Africa expanded by more than four per cent per year. Data provided by the South African Poultry Association, based on specific production standards and a forecasting model, indicate that, having reached a record 25 million layers in 2012, the number contracted to 24.4 million in 2013 and further to 23.5 million in 2014 as a result of the impact of higher input costs and a weaker domestic market demand. However, this year is witnessing a recovery with the latest forecast to June 2015 of 24.7 million birds.

In terms of egg output, the 2012 record average was 412,100 cases per week. Following the trend in layer numbers, this figure contracted to 387,000 cases in 2014, while the latest forecast stands at 409,000 cases per week for 2015. South Africa's representative at the International Egg Commission (IEC) considers that egg output in 2013 contracted to 428,000 tonnes from 439,000 tonnes in 2012.

Fastest growing industry among the top seven producers is Algeria, which has returned a massive near 10 per cent per year expansion as output increased from 101,000 tonnes in 2000 to 347,000 tonnes

Table 4. Leading egg producing countries in Africa ('000 tonnes)								
Country	**2000**	**2005**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Nigeria	400	500	581	613	623	636	640	650
South Africa	318	366	473	450	473	511	535	540
Algeria	101	175	184	194	261	280	309	347
Egypt	177	235	356	249	291	306	310	315
Morocco	235	232	192	200	244	265	272	278
Tunisia	82	84	89	88	92	93	98	99
Kenya	61	58	77	81	93	94	96	98

Source FAO

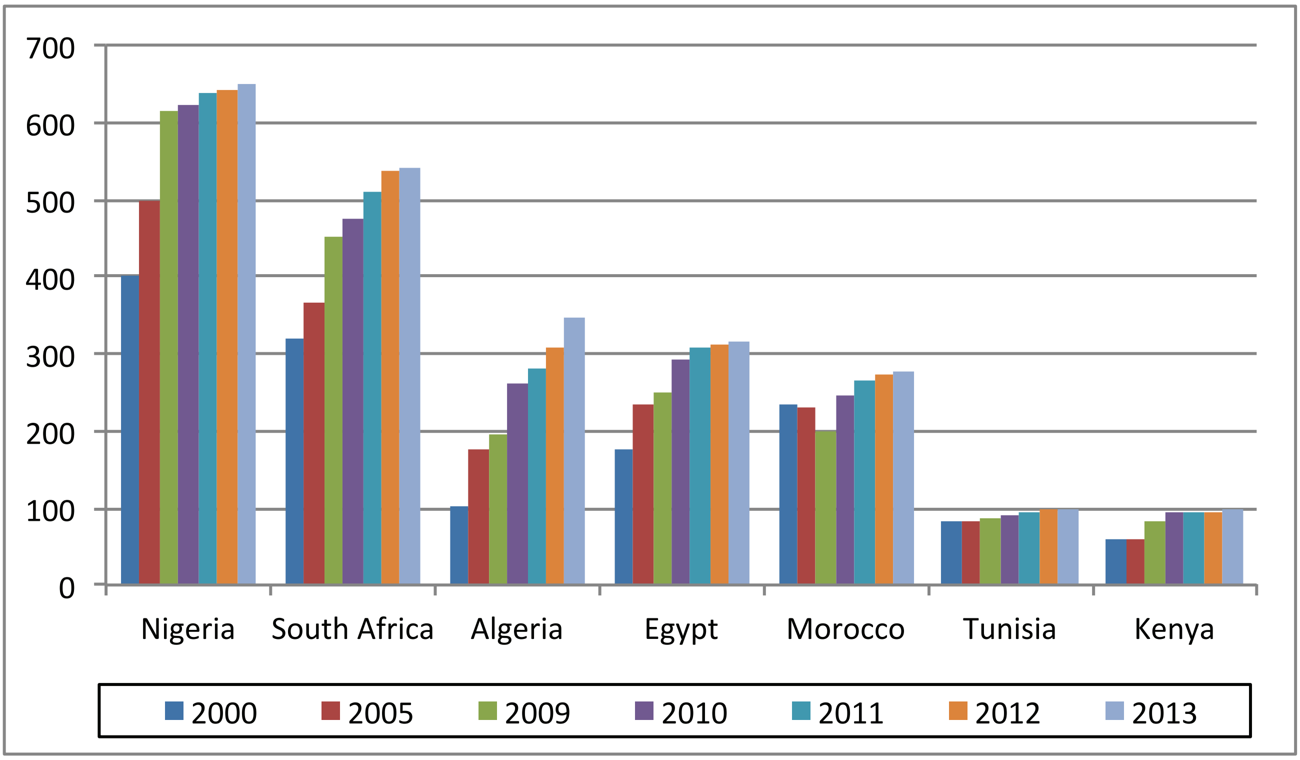


Figure 2. Egg output has grown in all the leading producing countries in Africa ('000 tonnes)

in 2013. In doing so Algeria displaced Egypt as the third largest producer.

High feed prices and the banning of the transportation of poultry between Governorates led to a cut-back in egg production in Egypt from the 2008 record of 356,000 tonnes (Table 4). However, while a good recovery has become evident since 2009 annual output has still not reached the 2008 level.

Egg production in Morocco declined between 2000 and 2009, but has since recorded rapid growth of almost 9 per cent per year to reach 278,000 tonnes in 2013.

Growth in Tunisia at 1.5 per cent per year has been much slower than the 3.7 per cent achieved by Kenya such that by now, annual production in Kenya could well have surpassed that in Tunisia.

Table 5. Hen egg production in Oceania ('000 tonnes)							
Country	**2000**	**2005**	**2009**	**2010**	**2011**	**2012**	**2013**
Australia	143.0	138.6	159.3	174.0	205.2	214.7	240.9
Fiji	3.2	3.8	3.5	5.7	5.5	6.0	6.0
French Polynesia	1.4	2.4	2.7	2.8	2.7	2.8	2.9
Guam	0.8	0.8	0.8	0.9	0.9	0.9	0.9
Kiribati	0.2	0.3	0.3	0.3	0.3	0.4	0.4
Micronesia	0.2	0.2	0.2	0.2	0.2	0.2	0.2
New Caledonia	1.5	1.7	1.7	1.8	1.7	2.1	2.0
New Zealand	43.0	50.9	51.8	52.3	51.1	53.5	54.0
Papua New Guinea	4.5	4.8	4.8	5.0	5.1	5.3	5.3
Samoa	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Solomon Isl.	0.4	0.5	0.6	0.7	0.7	0.7	0.7
Tonga	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Vanuatu	0.3	0.4	0.8	0.6	0.7	0.7	0.7
OCEANIA	**199.4**	**205.3**	**227.4**	**245.1**	**274.9**	**287.9**	**314.7**
WORLD	**51,045.9**	**56,615.7**	**62,896.9**	**64,162.2**	**65,367.1**	**66,293.5**	**68,262.5**

P = provisional; - no data, Countries producing less than 50 tonnes have been excluded
Source FAO

Rising Egg Production in Oceania

Egg production in Oceania primarily reflects developments in Australia and, to a lesser extent, New Zealand.

That output in the region as a whole grew by 3.6 per cent per year between 2000 and 2013 is hardly surprising when the picture for Australia reveals an increase of 4.1 per cent per year.

According to FAO figures, production in Australia amounted to 241,000 tonnes in 2013 (Table 5). The flock of around 16.5 million birds is found on some 270 farms. Some 68 per cent of the birds are kept in cages with 25 per cent on free range and seven per cent in barn systems.

Although the FAO data, which incidentally includes hatching eggs for both layers and broilers, points to a large increase in egg output in 2013, data provided by the Australian Egg Corporation Ltd (AECL) indicates little change in production between 2013 and 2014 at around 397 million dozen, though the value of sales in 2004 was considerably higher.

Australia's representative at the International Egg Commission reports that egg output in 2013 amounted to some 288,000 tonnes against 290,000 tonnes in 2012. The industry is considered to be mature hence future growth, at around 2.6 per cent per year to 2019-20, is not envisaged to be as large as in the recent past.

In New Zealand, the increase in production averaged less than two per cent per year to 2013, but since 2009 growth has slowed to around one per cent. There are only 120 or so flocks totalling around 3.3 million birds. Some 82 per cent are currently housed in conventional cages but these will have to be phased out by 2022 and will likely be mainly replaced by colony cages. About 15 per cent of the flock is currently on free range with three per cent in barns. ■

Poultry Health Basics – Planning Disease Prevention

Disease prevention focuses primarily on dedicated planning and sound management practices that keep infectious diseases out in the first place and stop non-infectious diseases before they start.

With this approach, the poultry owner and farmer place a higher priority on planning and expenditures for disease prevention than on short-term savings and stop-gap treatments, according to MSUCares, the Mississippi State University Extension Service.

It is essentially a mental attitude that recognises the ever-present risk of disease and the fact that disease prevention does not cost. It pays, and many times over.

Failure to concentrate on planned disease prevention often leads to personal disappointment and sometimes disastrous financial loss. A flock receiving good health security management is a delight, and a source of both pride and profit.

A good disease control programme emphasises three primary goals or areas:

- Reduce exposure to disease organisms by proper sanitation and stress management.

- Increase bird resistance to disease by using recommended immunization procedures.
- Treat disease outbreaks with specific medications that are effective against the disease being treated.

Diseases have consistently been a major limiting factor to profitable production. Some diseases result from egg transmission or organisms through the use of infected breeder flocks.

Other diseases are brought into the poultry house by vectors like wild birds, rodents, parasites, and even the poultryman.

Disease results when exposure combined with the virulence of an organism is greater than the resistance of the host.

Disinfectants reduce the exposure time and number of organisms.

Vaccines help build the natural resistance or immunity of the birds.

Medications and drugs help battle the disease organisms after they have overwhelmed the birds' natural defences.

Most diseases can be eradicated from the poultry flock by applying the basic principles of hygiene and excellent sanitation.

Other diseases are not easily eliminated, but can be controlled by proper use of disinfectants and sanitisers.

If not controlled, the potential for microbial contamination and spread of infectious diseases in the flock is always a threat to the success of any operation.

Sanitation is a rather simple word, commonly used in our daily conversations to refer to the establishment of environmental conditions that are favourable to health.

It is those management practices that actually prevent disease or contamination by disease causing organisms.

For the most part, they are simple mechanical applications.

They are not sophisticated and usually require little in capital expenditures.

These management practices do require a positive attitude, a workable programme, and proper application.

There is a practical way to clean a poultry house or hatchery.

Each time, the process involves time, labour, energy, and money, so the job must be done correctly to achieve the best results.

Disinfecting alone will not control disease, but combined with other disease control practices, will do much to reduce the incidence of many diseases.

Vaccination is one of the more effective ways to prevent specific diseases.

This is why we vaccinate poultry; so they are protected from explosive disease outbreaks. Viruses stimulate the development of better immunity than other types of microorganisms; so most poultry vaccinations are against viral diseases like Newcastle disease, infectious bronchitis, laryngotracheitis, fowl pox, and infectious bursal disease.

Disease producing microorganisms can be classified smallest to largest as viruses, bacteria, fungi, protozoa, and parasites.

All except the viruses are sensitive to drugs or antibiotics, so treatment against them is available when outbreaks occur. Because viruses are resistant to drugs and antibiotics, their control is fully dependent upon prevention through sanitation, isolation, and vaccination.

Vaccination is basically the introduction of a specific biological substance (antigen) into the bird to stimulate the formation of a resistance or immunity to a particular disease.

Usually the biological substance is some of the live disease organisms that you want to protect the bird against.

The presence of these organisms in the blood stimulates the body's defence mechanism to produce antibodies that attack the disease causing organisms when the bird is exposed to them.

Scientists have developed weakened (attenuated) forms of most disease causing viruses with little danger of causing the severe form of the disease.

Even the killed form of some disease causing viruses stimulate the production of antibodies. In these cases, the 100 per cent safely killed virus is used.

Short-term protection against a particular disease can also be given by vaccination with an antiserum that contains antibodies previously formed by animals that have been exposed to that particular disease.

So-called vaccination outbreaks do occur periodically.

The factors influencing vaccine response in poultry are many, mainly depending on the host and environment.

Seldom are all factors considered when vaccination programmes are initiated.

Ordinarily, some protective immunity is produced when poultry are vaccinated, although the vaccine in itself cannot guarantee it.

When vaccination failures occur, the total vaccination programme should be reviewed. Although vaccination offers a method of preventing many poultry diseases from establishing themselves, certain drugs and antibiotics are needed to help alleviate the symptoms of a vast number of diseases.

The drugs make up an unassociated list of chemicals, and a great many are specific for a certain disease or for a group of similar diseases.

New ones come on the market regularly and many others are in the process of experimentation.

Drugs must reach the pathogenic microscopic organisms in the bird to be effective. Most drugs kill on contact, weaken the organism, or upset its life cycle.

Drugs may be administered through the feed, in water, or by injection.

Most drugs are chemicals that disrupt the life cycle of the organism involved.

As most of the drugs are quantitative, their activity is determined by the amount administered to the bird.

Some are effective when given in a large amount over a short period; others are better if given in small daily dosages over a long period.

To be effective, the manufacturer's recommended dosage must be used.

Any dilution will not produce the results anticipated.

Some drugs produce excellent results from a disease prevention standpoint, but can have a harmful effect on the bird.

Therefore, do not administer more than the recommended amount of any drug.

When drugs are administered to a bird over a long period of time, particularly at a low level, certain species of bacteria become resistant, and finally the resistance becomes so great that the drug is ineffective.

Resistance develops primarily to drugs that are absorbed from the intestinal (systemic drugs) tract, although resistance to non-absorbed drugs like bacitracin has been documented.

Antibiotics are used for disease control.

Usually they are specific for those diseases caused by bacteria or related organisms.

They are of no value against virus infections except to reduce stress on the birds caused by secondary bacterial/fungal/parasitic infections.

The beneficial effects of antibiotics are due to their ability to disrupt various phases of cellular metabolism.

An antibiotic will prevent bacterial multiplication, provided enough is present to attack all the bacteria present.

If the amount of antibiotic is small and the number of bacteria large, the antibiotic will not produce its full effect.

Antibiotics also act by changing the intestinal flora.

Some drugs used in the poultry industry produce major effects in treating specific diseases; others are less valuable, and some are ineffective.

In some instances the birds have become resistant, producing a change in the value of the drug.

The diagnostic laboratory uses a technique known as a sensitivity test to determine which drugs are effective in treating a disease.

The test actually shows which drugs are effective and those that are ineffective for treating the disease.

Proper administration of medications requires that all precautions be followed as shown on the product label.

Be sure that the dosage, route of administration, and required withdrawal period are observed.

Use only drugs approved by the relevant authority, such as the Food and Drug Administration in the US, for treatment of the specific poultry disease involved.

Regardless of the products used, always keep an accurate record of all vaccines and medications administered to the birds.

Record the dates, product lot numbers, and all other pertinent information that can be used to monitor the flock's health status.

Remember that disease can affect all types of birds, and all types of people keep birds. Disease outbreaks never discriminate.

By practicing health control in the flock, the producer also helps insure the health status of other producers located near him.

Good neighbours are a valuable asset in the prevention and elimination of disease problems. ■

Vaccinating to Reduce Risks from Chronic Respiratory Disease

Live F-strain Mycoplasma gallisepticum (FMG) vaccines are presently being used to help control field-strain chronic respiratory disease Mycoplasma gallisepticum (MG) outbreaks.

However, they may exert some adverse effects on egg production.

Live strains of *Mycoplasma gallisepticum (MG)* of lesser virulence as well as killed vaccines have little or no effect on egg production, but afford lower levels of protection.

This has led to research investigating their use in combination with a subsequent overlay vaccination of F-strain Mycoplasma gallisepticum given later in the production cycle.

Mycoplasma gallisepticum is considered to be the most problematic of the poultry mycoplasmal diseases.

It is a slow spreading infection and often infected birds remain healthy without showing any signs of the disease.

Once other complicating factors - such as environmental issues including a rise in temperature, ammonia levels or dust or cold drafts, problems with nutrition and other infections, such as infectious bronchitis or laryngotracheitis virus - *Mycoplasma Gallisepticum* can flare up.

Mycoplasma Gallisepticum adversely affects fertility, hatchability, and survival of baby chicks and it will spread easily to other flocks on the farm, to nearby farms and to other birds including wild birds.

Infection with *Mycoplasma gallisepticum* is associated with slow onset, chronic respiratory disease in chickens, turkeys, game birds, pigeons and other wild birds.

> "Infection with *Mycoplasma gallisepticum* is associated with slow onset, chronic respiratory disease in chickens, turkeys, game birds, pigeons and other wild birds."

According to Paul McMullin in his Pocket Guide to Poultry Health and Disease, the condition occurs worldwide, though in some countries this infection is now rare in commercial poultry. In others it is actually increasing because there are more birds in extensive production systems that increase their exposure to wild birds.

In adult birds, though infection rates are high, morbidity may be minimal and mortality varies.

“The route of infection is via the conjunctiva or upper respiratory tract with an incubation period of six to 10 days.

“Transmission may be transovarian, or by direct contact with birds, exudates, aerosols, airborne dust and feathers, and to a lesser extent fomites. Spread is slow between houses and pens suggesting that aerosols are not normally a major route of transmission. Fomites appear to a significant factor in transmission between farms.

“Recovered birds remain infected for life; subsequent stress may cause recurrence of disease.

“The infectious agent survives for only a matter of days outwith birds although prolonged survival has been reported in egg yolk and allantoic fluid, and in lyophilised material. Survival seems to be improved on hair and feathers. Intercurrent infection with respiratory viruses (IB, ND, ART), virulent E. coli, Pasteurella spp. Haemophilus, and inadequate environmental conditions are predisposing factors for clinical disease,” says McMullion

Signs of the disease are:

- Coughing.
- Nasal and ocular discharge.
- Poor productivity.
- Slow growth.
- Leg problems.
- Stunting.
- Inappetance.
- Reduced hatchability and chick viability.
- Occasional encephalopathy and abnormal feathers.

Eradicating the infection has been the main goal for official poultry health programmes in most countries.

These programmes are based on buying of uninfected chicks, all-in/all-out production, biosecurity, and routine serological monitoring. In some circumstances preventative medication of known infected flocks may be of benefit.

Vaccination with live attenuated or naturally mild strains are used in some countries and according to McMullin may be helpful in gradually displacing field strains on multi-age sites.

Productivity in challenged and vaccinated birds is not as good as in Mycoplasma gallisepticum-free stock.

In a study, on the effects of different vaccine combinations against *Mycoplasma gallisepticum* on the internal egg and eggshell characteristics of commercial layer chickens, published in Poultry Science, two trials were conducted to investigate the effects of pre-lay vaccinations of live and killed MG vaccines or their combination, in conjunction with an F-strain *Mycoplasma gallisepticum* vaccine overlay after peak production, on the egg characteristics of commercial layers.
The four treatments were administered at 10 weeks of age:

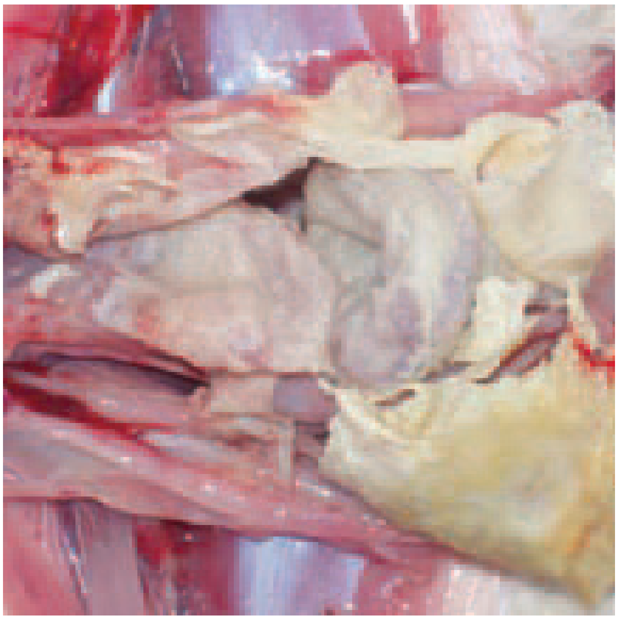
1. unvaccinated (Control),
2. MG–Bacterin (*Mycoplasma Gallisepticum Bacterin*) vaccine,
3. ts-11 strain Mycoplasma Gallisepticum (ts11 *Mycoplasma Gallisepticum)* vaccine, and
4. Mycoplasma Gallisepticum Bacterin and ts11 *Mycoplasma Gallisepticum* combination (*Mycoplasma Gallisepticum Bacterin* + ts11 *Mycoplasma Gallisepticum*).

Mycoplasma gallisepticum, Image Courtesy of Ceva, from the book *Diseases of Poultry: A Color Atlas*

At 45 weeks of age, half of the birds were overlaid with an F-strain Mycoplasma Gallisepticum vaccine.

The study's authors, R. Jacob, S. L. Branton, J. D. Evans, S. A. Leigh and E. D. Peebles, from the Department of Poultry Science, Mississippi State University, and the USDA-Agricultural Research Service said that in each trial, internal egg and eggshell parameters including egg weight (EW), Haugh unit score (HU), eggshell breaking strength (EBS), percentage yolk weight (PYW), percentage albumen weight (PAW), percentage eggshell weight (PSW), eggshell weight per unit surface area (SWUSA), percentage yolk moisture (PYM), and per cent total lipids (PYL) were determined at various time periods between 21 and 52 weeks of age.

At 28 weeks of age, SWUSA was lower in



Mycoplasma gallisepticum, Image Courtesy of Ceva, from the book *Diseases of Poultry: A Color Atlas*

the ts11 *Mycoplasma Gallisepticum* and *Mycoplasma Gallisepticum* Bacterin + ts11 *Mycoplasma Gallisepticum* groups compared to the Control group.

Conversely, at 43 weeks of age, SWUSA was higher in the ts11MG than in the *Mycoplasma Gallisepticum* Bacterin group.

Between 23 and 43 weeks of age, PYL was higher in the *Mycoplasma Gallisepticum* Bacterin and ts11 *Mycoplasma Gallisepticum* groups in comparison to the Control group.

In conclusion, the researchers said that vaccination with *Mycoplasma Gallisepticum* Bacterin alone or in combination with ts11 *Mycoplasma Gallisepticum* at 10 weeks of age with or without a Live F-strain *Mycoplasma Gallisepticum* vaccine overlay at 45 weeks of age does not adversely affect the internal egg or eggshell quality of commercial layers throughout lay.

According to Dr Gary Butcher from the University of Florida in his paper, *Mycoplasma Gallisepticum - A Continuing Problem in Commercial Poultry* the organism is similar to bacteria, but lacks a cell wall. This characteristic makes *Mycoplasma Gallisepticum* extremely fragile and they are easily killed by disinfectants, heat, sunlight, and other factors.

They only remain viable in the environment, outside the chicken, for typically up to three days.

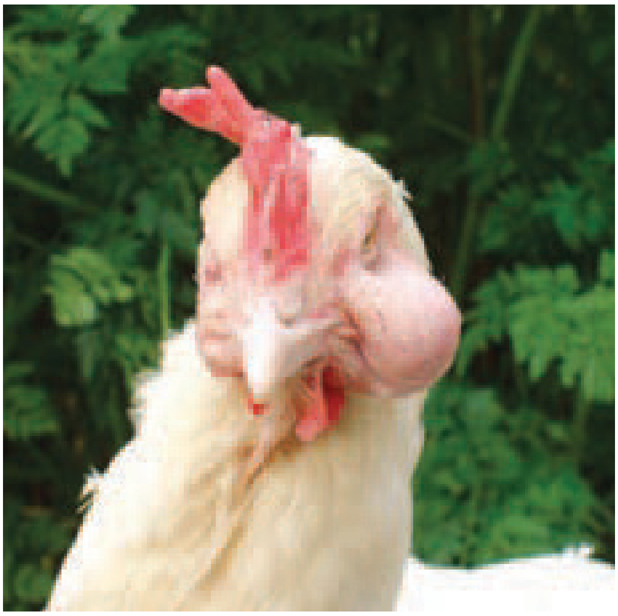
For this reason, Dr Butcher says *Mycoplasma Gallisepticum* is fairly easy to eliminate on single-age, all-in all-out poultry farms. If a laying flock is infected, complete depopulation of the farm at the end of the laying cycle and providing down-time prior to reintroducing chickens will be successful in eliminating *Mycoplasma Gallisepticum*.

However, complete depopulation must be performed to break the cycle and prevent re-infection in subsequent flocks on the premises.

When a chicken is infected with *Mycoplasma Gallisepticum*, the infection is of long duration. In the period after infection, the organism is present in the respiratory tissues in high levels and is shed into the environment and eggs.

After several weeks, the level of infection and shed of the organism decreases. However, the infection persists in the flock indefinitely and the chickens may shed the organism intermittently, especially following a period of stress.

This characteristic makes elimination of *Mycoplasma Gallisepticum* extremely difficult in multi-age breeder and laying complexes.



Mycoplasma gallisepticum, Image Courtesy of Ceva, from the book *Diseases of Poultry: A Color Atlas*

Mycoplasma gallisepticum, Image Courtesy of Ceva, from the book *Diseases of Poultry: A Color Atlas*

As *Mycoplasma Gallisepticum*-clean pullets, raised in single-age farms and in isolation, are brought onto the complex, they are often exposed to the organism at probably the worst possible time-- at the onset of production. This cycle of spread continues in a complex with new flock introductions, says Dr Butcher.

Efforts to reduce the adverse effects of the disease on breeders and egg-type layers in complexes have included use of antibiotics, killed vaccines, and live vaccines.

These efforts have been successful in reducing drops in egg production following infection, maintaining levels of egg production throughout the cycle, reducing severity of concurrent respiratory diseases, controlling excess vaccine reactions, reducing sensitivity to air quality, limiting shed level and duration into the poultry house environment, and reducing egg transmission to broiler progeny.

These efforts have not been successful, however, in eliminating infection and shed.

Dr Butcher says that live vaccines have become commercially available that do not spread from bird to bird, do not cause disease in turkeys, and cause a very mild and predictable reaction in pullets.

These, he says, offer many advantages over the live vaccines used in the past.

Most *Mycoplasma Gallisepticum*-positive breeder and egg-type layer complex managers administer these products to pullets prior to moving the *Mycoplasma Gallisepticum*-clean pullets onto infected complexes.

Use of killed vaccines is common in some farms, especially broiler breeder complexes. While live vaccines are more commonly used in egg-type commercial layers.

However, combinations of live and killed vaccines and antibiotics are used depending on local conditions.

Use of antibiotics is most practical in broilers for controlling respiratory reaction, he says.

He says that vaccination programmes for *Mycoplasma Gallisepticum* must take into account the air quality where layers will be housed.

Concurrent diseases such as coryza and infectious laryngotracheitis and the intensity of the live virus vaccination programme, especially against IBV, NDV, ILT, are also variables to take into consideration.

Mycoplasma gallisepticum, Image Courtesy of Ceva, from the book *Diseases of Poultry: A Color Atlas*

The decision to vaccinate or simply accept performance losses in commercial layers will depend on several factors, he says.

The strain of *Mycoplasma Gallisepticum* in a farm must be considered as some strains of MG are mild while others are highly virulent. House construction is a major factor in determining the severity of clinical disease.

Open-sided houses and closed houses with excellent ventilation do not experience recognisable losses in performance, while the same layers in a closed-type house with poor ventilation will experience considerable performance losses.

Mycoplasma Gallisepticum infection in heavy breeders, almost without exception, requires intervention with vaccines and antibiotics. These breeders suffer significant loses and shed the organism to the progeny.

Mycoplasma Gallisepticum vaccination has been shown to reduce shed level and duration. If the aim is to eradicate *Mycoplasma Gallisepticum* on a commercial layer or breeder farm or reduce potential spread to neighburing non-infected farms, vaccination is suggested.

Affected broiler breeder flocks should be vaccinated prior to onset of infection and broilers managed and treated to reduce adverse of effects of *Mycoplasma Gallisepticum* Dr Butcher says.

“It is unlikely *Mycoplasma Gallisepticum* will be eradicated from the commercial poultry industry in the coming years.

“However, through biosecurity programmes and effective use of vaccines, losses can be reduced,” he says.■

Finding New Methods to Detect Chicken Anaemia Virus

Chicken infectious anaemia has become an emerging threat to the poultry industry worldwide.

It is caused by a circovirus called chicken anaemia virus (CAV), and may cause clinical symptoms in young chickens.

Chicken infectious anaemia is a relatively new disease of chickens, first reported in Japan and it is a virus that may cause clinical manifestation only in young chickens free of anti- chicken anaemia virus antibody, but it can maintain subclinical infection in antibody positive commercial chickens and cause immunosuppression.

Vertical transmission of the virus is well documented, and it is also believed to transmit laterally to flockmates, presumably through the faecal-oral route.

Commercial broiler chickens are not usually vaccinated against chicken anaemia virus, but the parent stock are vaccinated to protect their progeny through passive immunity.

In the absence of clinical manifestation, a reliable method for monitoring of chicken anaemia virus infection is needed for the poultry industry.

The detection of the viral nucleic acid in various tissues using molecular techniques is commonly used.

However, the virus may not be present in all organs at all stages of infection. In addition, the tissue distribution may depend on the antibody status of the host.

Two experiments on tissue distribution and shedding profiles of chicken anaemia virus in specific pathogen-free and commercial broiler chickens were conducted, one in specific-pathogen-free-layer chickens and the other in commercial broiler chickens, to detect and quantify the viral genome in various tissues and environmental samples.

The researchers M. Alsharari, A.F.M.F. Islam, S.W. Wwalkden-Brown and K.G. Renz in their paper to the 26th Australian Poultry Science Symposium found that chicken anaemia virus was detectable in a number of tissues with a high titre in thymus and bone marrow and therefore, these two tissues were taken as samples for molecular diagnosis.

The virus was detected in dust and litter samples, although at a low level.

The monitoring of chicken anaemia virus infection using environmental samples such as dust and litter has potential, but needs further optimisation.

The study showed that the chicken anaemia virus genome can be detected in lymphoid organs and bone marrow as early as six days post-infection in maternal-antibody-free chickens but not in commercial broiler chickens.

The authors said that this is the first study to demonstrate that chicken anaemia virus can be detected in dust and litter samples in both pathogen-free and commercial chickens.

> "The study showed that the chicken anaemia virus genome can be detected in lymphoid organs and bone marrow as early as six days post-infection in maternal-antibody-free chickens but not in commercial broiler chickens."

This has implications for the poultry industry, as environmental monitoring can be used for disease screening.

“Among the four organs tested, we found that the thymus had the highest viral load,” the research team said.

“The viral copies increased up to 13 days post-infection, following which they either stayed at similar levels (bursa and bone marrow) or increased (thymus and spleen) up to 28 days post-infection in this study, whereas only a limited number of chickens were reported to be chicken anaemia virus positive in the thymus and spleen and none in the bursa and caecal tonsil following infection with a vaccinal.

The virus was detectable in the faeces, but at a very low level.

Therefore, the researchers concluded that the shedding of chicken anaemia virus through faeces and the faecal-oral route of lateral infection remain to be determined.

The most significant finding of the study was the detection of the virus in chicken dust and litter.

However, the team said that the viral load in these environmental samples was not very high (103.9–102.6 per mg).

The presence of the chicken anaemia virus genome in various tissues reached its highest level in the bone marrow and the study concluded that bone marrow should be the best sample for diagnostic purposes followed by the thymus and bursa, but not the spleen.

Dust also has potential for use in monitoring the disease, but not litter.

Although this study successfully demonstrated the ability to detect the chicken anaemia virus genome in the dust and litter both from pathogen-free and broiler chickens that had no clinical manifestation of the disease, these methods need further validation before industry recommendations can be made.

The team said that the industry would ideally like one method for the detection of all potential viral diseases from a single sample and this may be best be achieved by applying two different nucleic acid extraction methods, one for DNA viruses and one for RNA viruses. ■

Respiratory Disease and Immune Status

US - Recent university research evaluated the effects of Original XPC (XPC) on antibody titers and clinical signs of respiratory disease in poultry, Dr Stephanie Frankenbach reported in the Diamond V newsletter PoultryAdvisor.

Previous research had shown that Diamond V technologies provided support for the immune system, particularly in its response to respiratory challenges.

Newcastle Disease Virus: The effects of feeding XPC to broilers vaccinated with Newcastle disease virus (NDV) has been reported in published broiler studies since 2007.

Researchers at Texas A&M University recently evaluated feeding XPC to broiler chicks vaccinated at one day of age with B1 NDV vaccine, followed by B1, Lasota NDV vaccine at 21 days of age.

Blood and tissue samples were taken to evaluate the birds' immune-competence through flow cytometry and gene expression. Findings were presented at the International Poultry Scientific Forum (IPSF) 2015 in Atlanta, USA and discussed in PoultryAdvisor.

Infectious Bronchitis Virus: Observations from two separate trials conducted at Auburn University College of Veterinary Medicine Researchers studied the effects of Infectious Bronchitis Virus (IBV) challenge (Trial 1) and IBV vaccine + IBV challenge (Trial 2) in XPC-fed broilers. Results were presented at IPSF 2015 and discussed in PoultryAdvisor:

Infectious Laryngotracheitis: Researchers evaluated the effects of XPC-fed broilers in three separate trials - LT vaccinated (in ovo), ILT challenged; Vaccinated, ILT-challenged; and Non-vaccinated, ILT-challenged.

Contact a Diamond V representative for details and results of these studies and other poultry research (**http://www.diamondv.com/experts/sales-service/**).

To subscribe to PoultryAdvisor, visit **www.diamondv.com**.

New Circulation Fan ERD - Quality, Efficiency and Design in Unique Product

ITALY - A properly ventilated environment, without stratified heat, humidity and stagnant air helps the animal welfare increasing their productivity.

The new family of circulation fans ERD is born to create a healthy environment that prevents the spread of disease and creates the most suitable solution for the production conditions.

ERD - currently available in the models 31'' and 37''- uses a direct driven system that provides greater efficiency by reducing energy losses and also a substantial lowering of the management and maintenance costs.

Furthermore, in an environment where a good destratifier is used, greater energy savings result from improved temperature homogeneity.

The propeller has been completely redesigned, in comparison to our previous circulating fans, to ensure a higher air flow and increased efficiency.

The fan body is designed for an easy installation in any type of situation through four functional hanging rings for suspended installation.

Also this new innovative product signed TERMOTECNICA PERICOLI complies with the European directive 2009/125/EC concerning ECODESIGN.

This newcomer in the circulation fans family promises to get great results: the data obtained by the test in our internal laboratories are more than encouraging and demonstrate, once again, that our technical staff work with great dedication optimally combining the production needs of customers with the forefront technology that has always characterised all Pericoli's products.

Getting the Measure of Biosecurity

UK - How often do you measure and evaluate your biosecurity procedures? the Aviagen Global Technical Transfer Team asks.

Every farm or facility has biosecurity procedures in place but the real question is, are they the correct procedures?

Are they effective in tackling the specific biosecurity issues in your flock?

There is no point closing the windows but leaving the doors wide open!

Aviagen believes a true biosecurity programme should be:

- Robust
- Mandatory
- Practical
- Cost effective
- Part of the staff training programme
- Financially resourced
- Reviewed regularly

A clear programme of hygiene management should be in place to prevent disease from entering the farm via both humans and animals. Auditing is a key part of that programme.

Appropriate procedures for cleaning and disinfection must be in place and evaluation should highlight any deficiencies in the process.

These issues must be addressed and a second audit undertaken to capture the optimum conditions and the measures necessary to maintain the same level of biosecurity.

Good training and an understanding of the tasks involved is critical to an effective biosecurity plan.

Put simply, audit, action and evaluate on a regular basis if you want your biosecurity to measure up.

History in the Making

GLOBAL - If imagination is the fount of innovation, then is accident the mother of invention?

Certainly when Alexander Fleming accidentally discovered Penicillin in 1928, the resulting creation of antibiotic treatments changed the face of medical history.

Humans are inherently a resourceful race as evidenced by the many pioneering inventions which have shaped history.

The telephone, invented by Alexander Graham Bell in 1876, revolutionised global communication.

Edison's light bulb transformed life from 1879. More recently the creation of the internet, worldwide web and mobile communications has had a life-changing impact on just about everyone on the planet.

Most of us can't imagine life without a smartphone in hand!

Randox created its own piece of history in the 1990's when its unique biochip array technology (BAT) was developed and patented with an investment of £200m.

Biochip technology has wide and varied

diagnostics capabilities in the clinical, drug testing and food safety sectors.

It enables multiple tests to be carried out on one small sample. It is revolutionising food screening practices, raising the standards of global food safety and increasing consumer confidence in the foods they consume.

With more and more mouths to feed globally, food producers continue to seek ways to increase productivity, whilst keeping costs down and quality up.

Antibiotic treatments for disease feature as a key part of this effort which leads to an increased risk of the presence of residues.

When present in produce for human consumption these residues can present a legitimate threat to health, which the food industry works to remove.

These efforts, however, require the use of the latest technology in drug residue detection ensuring that the end produce reaching the consumer is safe for consumption and free from residues.

Randox Food Diagnostics is helping counter this through its high quality, reliable and cost-effective biochip technology for the screening of antibiotics, growth promoting hormones and drug residues in animals and food products.

Offering unrivalled limits of detection, Randox is changing the face of food safety with cutting-edge screening technology that is trusted by many of the world's biggest food producers.

Designed to work across a wide variety of matrices, including meat, seafood, honey, grains, cereals and milk, Randox biochip technology uses micro spotting techniques to create an assay that can detect and provide quantitative and semi-qualitative results for up to 22 residues from a single sample.

The biochip is made up of $9x9mm^2$ reaction wells into which samples are placed, requiring little technical expertise for preparation.

Randox's unique Investigator biochip analyser uses chemiluminescent reaction to produce multiple test results from a single food or beverage sample with easy-to-interpret results ready in less than two hours. And with less than five per cent false positives and no false negatives reported in tests, food producers can save money on costly confirmatory testing.

Just as the landmark inventions of history are an important part of who we are and the way we live today, Randox biochip technology is integral in ensuring global food safety now and in the future.

Contact enquiries@randoxfooddiganostics.com today for more information or visit **www.randoxfooddiagnostics.com**.

Biosecurity and Vaccination for Control of Avian Influenza

INDIA - Feeding 9 billion human beings by 2050 and the role of chicken and eggs in filling the gap of protein are being actively discussed, writes Dr.T.Kotaiah from Indbro.

With a shorter life cycle and improving feed efficiencies, poultry is the species of choice and the cost of protein is going to be much lower compared to other species.

Poultry production all over the world is on expansion path.

Many countries are working at increasing the production of the inputs such as grains, oil cakes and effective alternatives.

Avian Influenza is becoming a serious limitation because of the loss of huge stocks together with the trade barriers. In both ways the prices are likely to go up instead of down.

The number of outbreaks of Avian Influenza all over the world as notified to OIE, are increasing and the losses to producers are alarming, because even the healthy birds around the affected farm are also being killed. Fortunately, the number of human deaths has not being rising at an alarming rate.

OIE has directed the poultry world to control Avian Influenza through biosecurity measures without opting for vaccination, considering the mutation capability of the virus and the possibility of spreading to humans. Inactivated vaccines prepared from the locally emerging strains and homologous low pathogenic strains have been tried in some places.

The main ways of transmission for Avian Influenza were found to be through free moving wild birds from continent to continent and the movement of these birds cannot be controlled.

The discussions on the recent outbreaks of the disease suggest that there are inadequacies in the biosecurity protocols, leading to the transmission through men and material from farm to farm.
Biosecurity as a prevention tool for the entry of the disease has long been practiced and awareness of the disease in growing.

Biosecurity levels are much higher today compared to a decade ago, but there is no absolute definition for fool-proof biosecurity. Commercial broiler units have a very short cycle of 35-45 days. They are cleaned, disinfected and rested after each crop.

Many of the broiler breeder farms are also moving to “All in All Out” production with vacation after each batch.

The outbreaks of Avian Influenza are less in these units.

Egg laying flocks with longer laying cycles

> "Avian Influenza is becoming a serious limitation because of the loss of huge stocks together with the trade barriers. In both ways the prices are likely to go up instead of down."

are in multi age housing and seem to be more vulnerable for the infection.

New farms following defined biosecurity norms are also getting the disease.

The virus load on the earth is increasing with new outbreaks.

We are getting in to the next phase of “re housing” the birds in the affected production units.

The safety of the replacement flocks in an affected farm is at a greater risk compared to an unaffected farm.

When a production unit that is also a larger size is affected, the shredding of virus is much higher by the time the problem is diagnosed and the action taken.

The cleaning, disinfection and biosecurity norms should be much higher.

Vaccination through inactivated vaccines is a good tool to control the disease.

There are limitations in the use of vaccine, which are being studied at a higher level by decision makers.

While more versatile vaccines are being researched, use of ring vaccination around outbreak areas and killed inactivated vaccines prepared from the strains for the replacement flocks will be an additional useful tool to limit the shedding of the virus.

Leaving some birds unvaccinated and a differentiation of the vaccinated from the infected (DIVA) also will help reduction in shedding.

Eradicating every particle of virus from the face of earth is much greater a task than looking for a needle in the hay stack. A careful vaccination programme can be a very helpful tool.

Dr T.Kotaiah can be contacted at
drkotaiah@indbropoultry.com

Thermal Fogging with Halamid

FRANCE - There has been a resurgence of interest in thermal fogging in the poultry industry recently and of experimentation with different active products as the use of traditional chemicals such as formaldehyde has been called into question on grounds of hazard and toxicity.

ThePoultrySite spoke to Toby Heppenstall – General Manager, and Arno Schut - Technical Manager of the well-known universal disinfectant brand Halamid®, to get an idea of the exciting progress that has been made in this area.

Q: What is Thermal fogging?

TH: Thermal fogging is the generation of ultra-fine droplets in a range of 1-50 μm using thermopneumatic energy. Liquid substances are vaporised at the end of fogging barrel and form ultra-fine aerosols by condensing on contact with cool ambient air, on being ejected, to create dense visible fog-clouds.

Q: What are the benefits of thermal fogging in the poultry industry?

TH: In biosecurity in general, active substances should be uniformly distributed, even in inaccessible places, without leaving undesirable residues: Thermal fogging is ideal for this. In addition, fogging can be an economical solution for treating large spaces like poultry barns with a minimum quantity of active substance, meaning less operational work, quicker completion, and lower environmental residues.

AS: On top of that we know that Halamid® has a mild toxicity and is environmentally sound, so the efficient fogging method definitely complements our product in this respect. We also find that poultry customers like to perform a thermal fog as the final step of a biosecurity protocol, once the equipment and floor insulation (straw or wood shavings) are all back in the barn. The dryness of the fogging method makes this possible and gives extra confidence in controlling any pathogens reintroduced after equipment and dry organic matter is put back.

Q: Can fogging replace wet disinfection?

AS: We don't recommend this for a poultry barn. A high pressure spray of disinfectant is a very thorough method of controlling pathogens on all hard surfaces which is where the pathogens mainly reside and multiply. Having said this, we have some customers who successfully combine the benefits of a wet spray and a dry fog by producing an aerial mist of very fine water droplets. To be successful, however, this requires fairly high investment in suspended system of hydrofans with nozzles, integrated with pump and solution intake. More usual is a wet spray followed by a dry fog.

Q: Can any disinfectant be fogged?

TH: A number of types and brands of disinfectants can be fogged, but it is important to get the right dosage and solution, perhaps including a fog-enhancer. Leading disinfectant brands publish guidelines about fogging usage in their literature. We have carried out trials with Halamid®, so we can vouch that it works well according to the guidelines. Modern formulated disinfectants with good hazard and toxicology profiles certainly offer advantages compared to traditional products like formalin in that less dangerous fumes dissipate more quickly to safe levels and the barn is re-usable within hours instead of days. Faster turnaround between cycles is naturally attractive for poultry producers.

Q: How do you know that fogging Halamid® is effective?

AS: We have done comparative studies and found Halamid® to be particularly efficient and fast acting. The test protocol used infected dipslides suspended in the air inside the barn. The results demonstrate that modern branded disinfectant formulations can be used with confidence to replace carcinogenic

Water-based fog

and toxic formaldehyde fumigation at about one fifth of the formalin dosage. Halamid® achieves the same efficacy score as formalin even at this reduced usage rate.

Q: Do you need to use a fog promoter / fog enhancer?

AS: As Toby said, it depends on the product. Our experience is that fogging agents give a more persistent, whiter mist that will float in the air longer, however, we have not experienced better efficiency as a result. If desired we would recommend using a cost effective agent like monopropyleneglycol (MPG). From a practical point of view we also caution users that the white fog created with the use of fogging agents can look like smoke or fire from a distance, which may provoke reaction from neighbours.

Q: Would poultry farmers need to use a contractor or could they fog Halamid® by themselves?

AS: Some farmers prefer to use a contractor for the guarantee or because it fits with other services which is understandable. But using a fogging machine is really no more complicated than using a lawn mower. Manufacturers often provide basic training and support, and very quickly any operator can become proficient. Hence mechanically speaking, it is entirely possible for poultry farmers to adopt the technology for use by their own staff.

As long as they are OK with the chemicals handling - on which point of course, there is a distinct advantage in fogging Halamid® which is much less dangerous for handling and exposure-risk than formaldehyde.

Q: How much disinfectant is needed to fog a typical poultry barn?

TH: Different manufacturers recommend different amounts, typically between 0.5 and 2kg of the neat commercial disinfectant product per 1,000m3 internal volume. Dosages should really be recommended

Product	Qty AppliedKg / 1000m3	Efficacy score (CFU count)
HALAMID®	2	1(0 - 40 CFU)
Formalin (37%)	10	1 (0 - 40 CFU)
Leading Branded	29.0	32.6
Quat-Glut formulation	2	2 (40 - 120 CFU)
Oceania	0.2	0.2

per cubic volume rather than per square area, because you're talking about a method which fills 3D space.

In the trials mentioned above, where fogging was performed as the only disinfection step, we obtained great efficacy results using 2kg of product (actually 20L of a 10% solution) per 1000m3.

For a terminal fog which follows a first stage wet disinfection step – which we recommend in practise - half that amount should be sufficient, and we intend to prove in future trials that still lower application rates of Halamid® are effective.

Q: What is the standard protocol and how long does it take?

AS: It's quite simple to prepare and quick. Mix up to 10% of Halamid® in water. For example 1kg Halamid® in 10L water in a bucket. Mix the solution for a minute with the mixing unit until all Halamid® particles are dissolved and a clear solution results.

Pour the contents of the bucket into the reservoir of the thermal fogging machine. If a whiter fog is desired up to 20% of the solution can be replaced with MPG, for example 1kg Halamid® in 8L water and 2L MPG.

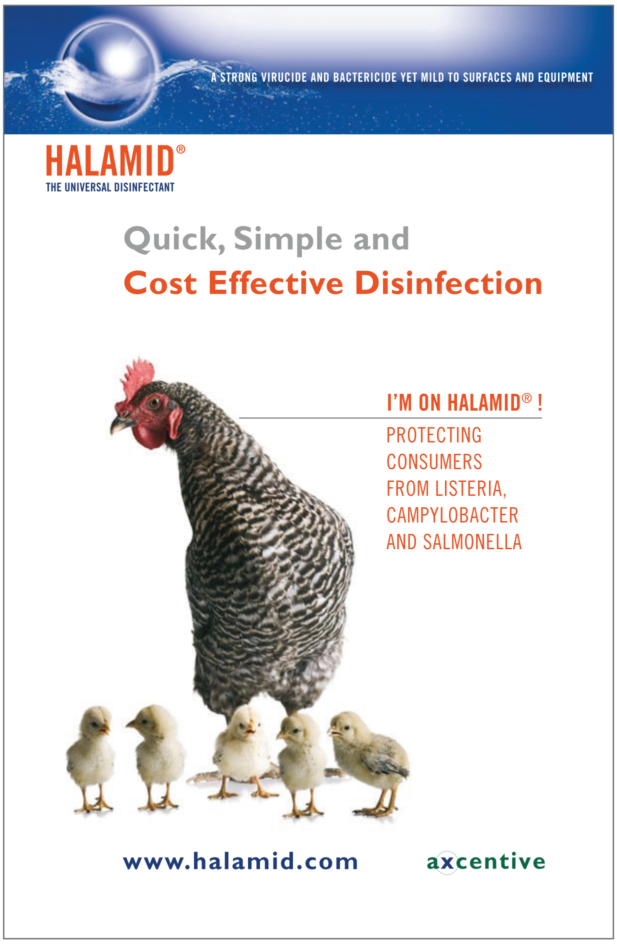
Although Halamid® is a very safe chemical, remember to always wear suitable protective equipment (safety goggles, gloves and respirator).

For the actual fogging, turn on the fogging machine and operate at a flow rate of 1L/min for at least 30 minutes. Ventilate after the elapsed exposure time for about 30 minutes until all the fog has visually disappeared.

Q: Is Halamid® really safer than formaldehyde?

AS: Yes. Of course, our guidelines also specify the need for the operator to wear protective equipment including a respirator during operation, but Halamid® is at worst labelled corrosive, whereas formaldehyde is toxic and carcinogenic.

Further information on Halamid® can be obtained from **www.axcentive.com**, by emailing **info@axcentive.com** or by calling the Axcentive sales office on +33 442 694 090.



El consumo de pollo, cada vez más fuerte en América Latina

La carne de pollo es una de las más saludables del mercado. Es un alimento con una alta densidad de nutrientes. En los últimos meses, varios países latinoamericanos han ofrecido informes con datos sobre el consumo de pollo entre su población. En el caso de Chile, un informe del pasado mes de abril, Actualización del mercado avícola, elaborado por la Oficina de Estudios y Políticas Agriaras, señalaba que en 2014 la carne de ave representó un 43 por ciento del total del consumo cárnico de los chilenos.

Por otro lado, hacia mediados de mayo, datos del Instituto Nacional de Estadística de Bolivia, indicaban que el consumo promedio de carne de pollo de cada boliviano era 25,8 kilos. En Honduras, el gerente de relaciones gubernamentales de Cargill en el país informaba de que la población del país estaba consumiendo alrededor de un cinco por ciento más de pollo. Y en Paraguay, el subsecretario Dr. Marcos Medina informó de que aumentó el consumo de pollo en el país hasta triplicarse en los últimos diez años. El dato del 2015 indica que la cifra saltó a 18,5 kilos por persona, por año.

Por último, cabe señalar que un estudio reciente de la Argentina señaló que el consumo de carne de pollo en el país ha alcanzado niveles récord. El informe de la Consultora Investigaciones Económicas Sectoriales detalló que el consumo agregado de este tipo de carne tuvo un fuerte incremento de 13,4 por ciento en los cuatro primeros meses de 2015. El consumo per cápita llegó a un récord de 42,3 kilos por habitante en el primer cuatrimestre de 2015.

JBS adquiere la europea Moy Park

El grupo cárnico brasileño, líder mundial en el sector, adquirió el grupo avícola europeo Moy Park. La transacción se ha fijado en unos 1.500 millones de dólares y está sujeta a la aprobación por parte de los órganos de defensa de competencia en Europa.

Según informó la compañía mediante comunicado de prensa el pasado 21 de junio, esta operación representa un paso importante en la estrategia de crecimiento de JBS en productos preparados y de alto valor agregado. Además, esta operación aumenta la diversificación geográfica de la compañía brasileña, con una ampliación de las operaciones en Europea de un modo relevante.

La Junta Directiva de JBS aprobó la transacción y está sujeta a las autorizaciones normativas correspondientes, que incluyen el visto bueno de los órganos de defensa de competencia de la Unión Europea.Se espera que la conclusión de esta transacción ocurra en la segunda mitad del año corriente.

Competencia aprueba venta de negocio avícola de Tyson a Pilgrim's Pride

La Comisión Federal de Competencia Económica (Cofece) aprobó la venta del negocio avícola de Tyson Foods México a Pilgrim's Pride, cuyo accionista mayoritario es JBS.

Según informa El Financiero, en un comunicado el presidente y director ejecutivo de Tyson, Donnie Smith, dijo: "Agradecemos la atención y los esfuerzos de la Comisión y ahora seguiremos adelante con Pilgrim's Pride para completar el acuerdo. No hemos fijado una fecha de cierre, pero creemos que será muy pronto".

En julio de 2014, las empresas informaron sobre un acuerdo de compra-venta de las operaciones en México y Brasil por 557 millones de dólares, aunque la transacción en México es de 400 millones de dólares. Con la compra de los negocios avícolas de Tyson en México, dijo JBS en el comunicado de julio, Pilgrim's Pride estima una generación adicional de ingresos cercana a los 650 millones de dólares al año.

Qatar quiere importar 5.000 kilos de carne de pollo paraguayo

El Ministerio de Agricultura y Ganadería a través de su Viceministerio de Ganadería fomenta la producción de pollos parrilleros con miras a exportar el producto a países árabes.

Qatar ya solicitó la remisión de 5.000 kilogramos de carne de pollo para primer envío.

En la reunión de trabajo desarrollada el 4 de junio, en la que estuvieron presentes el Viceministro de Ganadería, Marcos Medina y el Presidente del Servicio Nacional de Calidad y Salud Animal (SENACSA), Hugo Idoyaga, se informó de esta solicitud.

Participaron representantes de la Asociación Paraguaya de Productores y Exportadores de Pollos (APPEP), la Asociación de Avicultores del Paraguay (AVIPAR), técnicos y productores avícolas.

¿Por qué precalentar los huevos fértiles en sistemas de incubación multietapa?

En las incubadoras multietapa, es necesario que se produzca una transferencia eficiente de calor metabólico de los embriones que se encuentran al final de la incubación a los que justo empiezan este proceso. Escribe Ángel Salazar, especialista en producción avícola.

En una incubadora multietapa, suelen introducirse y transferirse huevos dos veces a la semana. Es importante que se introduzca en la incubadora un número similar de huevos en cada etapa del proceso de incubación, y que estas etapas se distribuyan a lo largo del proceso equitativamente.

Para aumentar la temperatura interna del huevo antes de introducirlo en las incubadoras multietapa, el método clásico en muchas plantas de incubación para pollos de engorde ha consistido en "aclimatar" estos huevos entre 8 y 10 horas en carros de incubadora que se sitúan en el vestíbulo de la sala de incubación. Pero esta forma de lograr este objetivo no permite controlar las condiciones ambientales con precisión y requiere mucho tiempo.

Además, comporta un aumento no uniforme de las temperaturas internas de los huevos y da lugar a una ventana de nacimiento de larga duración. Y por último, aunque no menos importante, llevar a cabo este proceso de aclimatación de los huevos en los vestíbulos de las salas de incubación aumenta el riesgo de condensación de humedad sobre las cáscaras de los mismos.

El conjunto de temperaturas internas de los lotes de huevos "aclimatados" carece de la uniformidad que sería necesaria para que la mayoría de los huevos empiecen la incubación a una temperatura interna similar una vez se han introducido en la incubadora para iniciar el proceso de incubación en sí.

Precalentamiento del huevo fértil

Este es el motivo por el que un precalentamiento del huevo en unas condiciones ambientales controladas acompañadas de ventilación forzada y fuentes de calor es una propuesta mucho mejor. De hecho, un precalentamiento permite que todos los huevos destinados a las incubadoras multietapa alcancen un aumento relativamente rápido y uniforme de la temperatura interna, llegando a un intervalo de entre 26 y 28 ºC antes de que sean introducidos en dichas incubadoras.

Estoy convencido de que precalentar los huevos destinados a una incubadora multietapa antes de que empiece el proceso de incubación, ya se trate de carros enteros o de estantes, es un factor muy importante y que contribuye a lograr ventanas de nacimiento uniformes y de corta duración.

En incubadoras de una sola etapa, por lo general el precalentamiento se logra durante la fase de precalentamiento de la incubadora. En cuanto al equipo de incubación multietapa, nuestro objetivo debería ser que ciertos parámetros, como la temperatura interna del huevo, empezaran con valores uniformes y similares en la gran mayoría de los embriones "reactivados".

Sin la ventaja del precalentamiento, los lotes de huevos de los equipos multietapa presentan una variación mayor de la temperatura de la cáscara incluso varias horas después de que haya empezado la incubación en el interior de la incubadora.

Además, el precalentamiento también resulta ventajoso para reducir la mortalidad embrionaria temprana, sobre todo antes de la fase del anillo de sangre y durante la misma, al tercer día del proceso de incubación.

Por norma general, se proporcionan 4000 vatios de capacidad calorífica durante 5-6 horas por cada 30 000 a 32 000 huevos que tengan que precalentarse.

Existen varios tipos de cámaras de precalentamiento, algunas de las cuales combinan la circulación de agua caliente (a 80 ºC) por un serpentín de cobre con la generación de calor eléctrico mediante elementos térmicos. Ello permite un procedimiento de precalentamiento más rápido y energéticamente más eficiente.

Es importante recordar que lo fundamental es precalentar los huevos de forma rápida y uniforme antes de iniciar el proceso de incubación. Aclimatar lotes de huevos destinados a equipos de incubación multietapa en los vestíbulos de las instalaciones es un proceso lento y no permite alcanzar, ni de lejos, un aumento tan uniforme de la temperatura interna. ■

Industry.**Events**

Poultry Science Association Annual Meeting 2015
Louisville, Kentucky, US
27th to 30th July

The Poultry Science Association (PSA) is a professional organization consisting of approximately 1,500 educators, scientists, extension specialists, industry researchers, administrators, producers, and college students who are committed to advancing the poultry industry.

SIAV International Poultry Show
Sao Paulo, Brazil
28th to 30th July

The Brazilian Association of Animal Protein (ABPA) is proud to announce the International Poultry and Pork Show – SIAVS 2015, which will be held on July 28 to 30, 2015, at Anhembi Parque, in São Paulo (SP).

Extending the great success achieved in 2013, the SIAVS 2015 will bring together representatives of all segments at the largest and most important gathering promoted by ABPA.

20th European Symposium on Poultry Nutrition
Prague, Czech Republic
24th to 27th July

More than 500 participants will be expected – among them many opinion leaders, representatives of important poultry industries and scientists, and other professionals from the entire Europe that will have a chance to witness not only interesting and useful lectures and posters but also to learn about new ideas, products, solutions and technologies.

4th International Poultry & Livestock Expo 2015
Bangalore,India
21st to 23rd July

Bringing under one roof leading poultry and Livestock players of India, specially Poultry and Dairy equipment manufacturers, breeders, food products exporters, experts & leaders from the industry , of course, along with, farmers' delegations - in fact all stakeholders.

Listings.Business **Directory**

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and Medical)
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Areas:
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Areas:
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Feed: Nutrition

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Feed: Additives
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Areas:
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Fax: +31 36 523 3110
clive.girdler@kerry.com
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Areas:
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Feed: Additives
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Feed: Nutrition

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Equipment: Hatching
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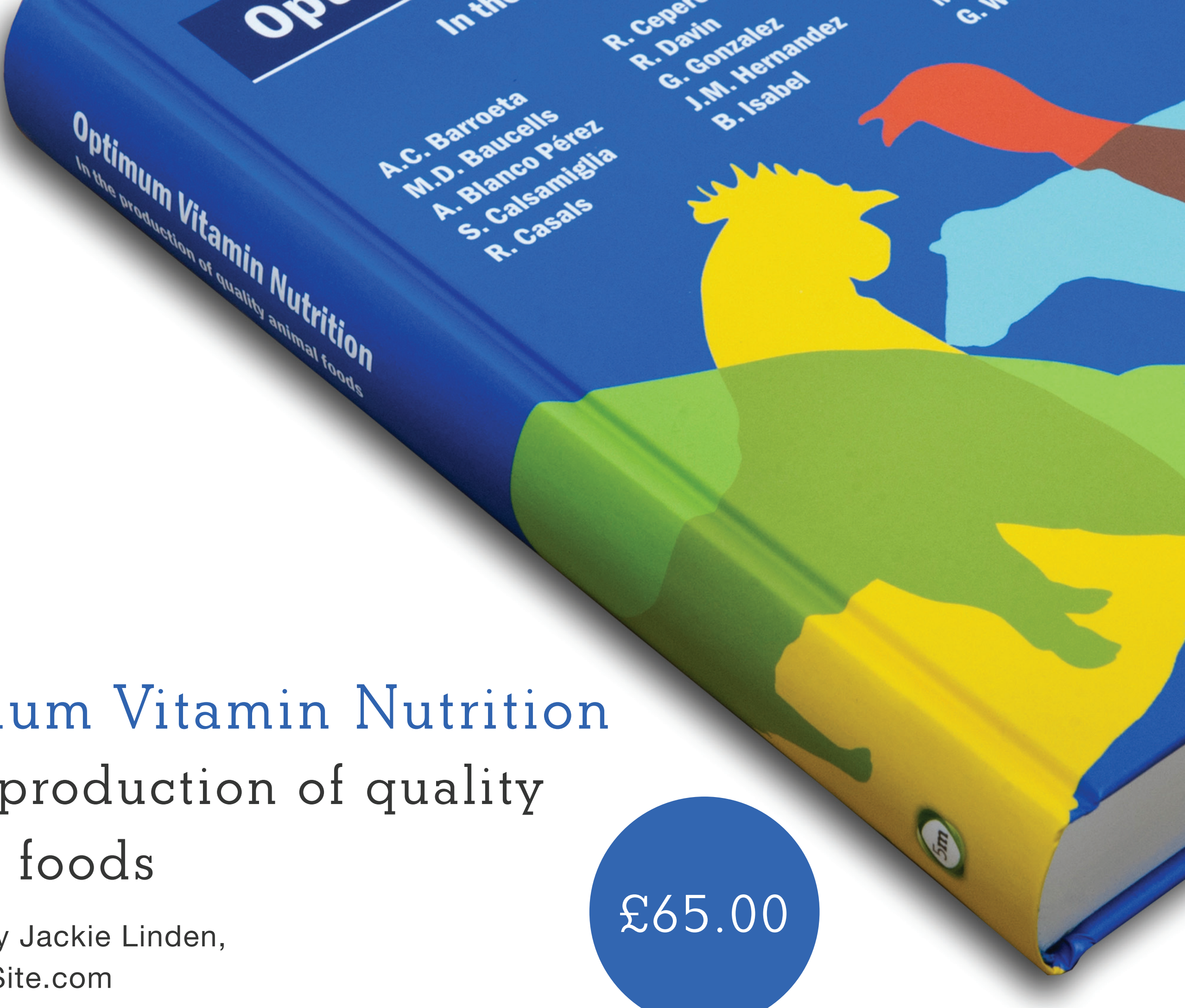

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