A healthy intestine is vital for good health and production in poultry, according to Dr Richard Bailey, poultry health scientist with Aviagen.

Speaking on the importance of the intestinal microbiota for chicken health at the joint session of the British Society of Animal Production and the UK Branch of the World’s Poultry Science Association earlier this year, Dr Bailey said that one of the key aims of producing animals for the food chain is to obtain good growth rates and performance through feed conversion efficiency while maintaining optimal animal health. To achieve this, a healthy gut is essential, he said.

Optimal intestinal health is heavily reliant upon the acquisition and maintenance of a balanced intestinal microbiota, which has become one of the key topics in the European poultry industry.

Microorganisms reside in all known habitats, therefore, animals have had to evolve in a world full of bacteria, viruses, fungi and protozoa. Part of the evolutionary process has resulted in symbiotic relationships between an animal and its microbial residents.

The intestinal microbiota of an animal is a complex population of microbes dominated by a large bacterial community. The composition of this community is highly dynamic with spatial shifts in population along each region of the intestinal tract in relation to the change in conditions of each section.

Continued on page 4...
Dietary Yeast Extracts Tested as Alternative to Antibiotics in Poultry

A dietary yeast extract could be an effective alternative to antibiotics for turkey producers, according to a US Department of Agriculture (USDA) study.

Americas Holds Share of Global Chicken Meat Production

More rapid growth in production among the leading South American countries will enable the Americas to maintain its share of global chicken meat output.

Scientific Opinion on the Public Health Risks of Drug-Resistant Bacteria

The use of antimicrobials in food-producing animals is a risk to public health and it can help to spread the bacterial strains, according to an EFSA expert panel.

Poultry Production Without Antimicrobials

A healthy intestine is vital for good health and production in poultry, according to Dr Richard Bailey, poultry health scientist with Aviagen.
Editorial

Welcome to ThePoultrySite Digital Issue 9

Alternatives to Antibiotics

A clear link has now been established between the use of antibiotics in farm livestock and the development of drug resistance in some important bacterial strains in human health.

According to a report from the European Food Safety Authority (EFSA) published a month ago, the use of antimicrobials in food-producing animals is a risk to public health and can help to spread the drug-resistant bacterial strains.

EFSA’s expert panel said it is a priority to limit the risk to public health that can arise from resistance in the food chain.

The report adds that that an effective option would be to restrict or stop the use of cephalosporins in the treatment of food-producing animals.

It would be almost impossible to rear poultry commercially without access to any antimicrobials, at least for the treatment of disease on the grounds of animal welfare, but the EFSA report has provided extra pressure to end their routine use in the EU.

In this issue, there is a summary of the EFSA report and we also examine some alternatives to antimicrobials.

The lead feature looks at the importance of establishing a healthy gut microbial population in poultry and what can go wrong if the crucial balance is disturbed. The article is based on a paper presented earlier this year by Dr Richard Bailey, poultry health specialist with Aviagen.

There is also an article on work at the USDA Agricultural Research Service on the use of yeast to maintain poultry health without the need for antimicrobial feed additives.

And last but by no means least, the new series of articles in our exclusive series, Global Poultry Trends 2011, starts in this issue with a look at the trends in broiler production in the Americas by seasoned industry watcher, Terry Evans.

Jackie Linden
ThePoultrysite.com Senior Editor
With total bacterial cells numbers outnumbering the host’s own cell number by a ratio of 10 to one, it is not surprising that the intestinal microbiota plays a vital part in the health and well-being of all animals, Dr Bailey said.

Many mechanisms have been identified by which the microbiota promotes host health. It has been found that the intestinal microbiota aids digestion, protects against pathogens, produces nutrients and plays a role in the development and maturation of the immune system.

With the advent of culture-independent DNA technologies, our knowledge of the composition of the intestinal microbiota has improved greatly, explained Dr Bailey. Using these techniques, it has been suggested that the intestinal microbiota of the chicken comprises around 640 species of bacteria from 150 different genera. The increased application of molecular methods has revealed that culture-based methods had vastly underestimated the complex community of bacteria within an animal’s microbiota.
It has been demonstrated that the composition of the intestinal microbiota is affected by factors such as sex, age, dietary intake and health status of the host. The exact relationship between the host and its resident microbiota is still an active area of research and it is becoming ever more apparent that the intestinal microbiota is highly influential in terms of host health and immunity. Culture-independent techniques combined with '-omics' technologies have allowed microbiologists to learn more about the relationship between the host and its resident microbiota.

There is a delicate balance between the host, intestinal microbiota, the intestinal environment and diet, continued Dr Bailey. If there is an imbalance in the relationship, the composition of the intestinal microbiota may alter. The shift in microbial populations can have a negative effect on the host, leading to poor growth and impaired performance. This is seen in cases of dysbacteriosis.

Dysbacteriosis is a digestive condition of poultry and has been broadly described as an overgrowth of the intestinal microbiota – especially members of the Bacteriodes, Clostridium spp. and *E. coli* – which can lead to non-specific enteritis. Onset is usually between 20 and 30 days of age and it is thought to be triggered by changes in diet, poor management and overcrowding. The condition rarely causes clinical signs but it can adversely affect bird performance.

Typically, dysbacteriosis is treated using antimicrobial therapy. However, with increasing pressure on veterinarians and poultry producers in many countries to reduce antibiotic use, there is a need to find alternatives to promote good intestinal health and prevent intestinal upsets.

The management of intestinal health without antimicrobials is a wide area of research. The use of a probiotic supplement is a popular approach, said Dr Bailey. Probiotics have been found to boost enteric health by inhibiting the growth and/or attachment of less favourable bacteria in the intestinal tract or by modulating the composition of the intestinal microbiota towards a more favourable community.

**What happens when there is an imbalance?**

**Possible consequences of an imbalance in the intestinal microbiota**

- Poor digestion and passage of undigested feed
- Poor flock uniformity
- Poor feed conversion
- Wet litter
- Susceptibility to enteric pathogens

Intestinal bacteria derive most of their energy from the host's diet so poultry feed composition has a major influence on bacterial populations and it is possible to modulate the microbiota by altering the diet and including specific components, such as essential oils, oligosaccharides (in the form of prebiotics), enzymes and specific carbohydrate sources.

Deciding on the best approach is not easy as results from intervention studies can vary. The key to the maintenance of intestinal health is to understand how the intestinal microbiota changes at key points in the bird's life and how to prepare the bird for these changes.

The combination of practical field experience from poultry producers and veterinarians with laboratory research into the relationships between the host and its microbiota is likely to re-
veal further ways by which enteric health can be improved in future.

Summing up, Dr Bailey said that intestinal health is vital for good overall health and performance in poultry, as in other animals. Disruption of the resident bacteria can have detrimental effects, leading to digestive upsets and a loss in performance. However, he said, there is a mounting body of evidence indicating that the intestinal microbiota can be successfully modulated by the use of probiotics, when the appropriate product is administered correctly and at the appropriate time.

Research into alternatives to antimicrobials remains an important area of study.

A number of research groups from across the globe have demonstrated in laboratory trials that there is a place for products such as probiotics in helping to control gut pathogens, thus reducing the need for antimicrobials. They also have potential to help establish a healthy gut microbial population early in the chick’s life and potentially prevent intestinal imbalances as the result of common stressful events, such as feed change, vaccination or thinning, added Dr Bailey.
The 2012 International Poultry Expo and International Feed Expo will be held January 24 – 26, 2012, and the week of the Expo has been officially designated as “IPE Week” with an emphasis on educational programs rounding out the week-long event.

The Expo is shifting to a TUESDAY, WEDNESDAY, THURSDAY format to increase the education programs available to attendees.

- The World’s Largest Poultry and Feed Technology Exposition
- Over 20,000 Industry Leaders from Over 100 Countries
- Over 14 Acres of Exhibits
- Exceptional Educational Programs Planned for IPE Week
  - International Poultry Scientific Forum
  - Hatchery-Breeder Clinic
  - Pet Food Conference
  - Animal Agriculture Sustainability Summit
  - Workshops on Safety and Environmental Issues
  - Symposium on Egg Production
  - Pre-Harvest and Food Safety Conference
  - Executive Poultry Outlook
Scientific Opinion on the Public Health Risks of Drug-Resistant Bacteria

The use of antimicrobials in food-producing animals is a risk to public health and it can help to spread the bacterial strains, according to an EFSA expert panel.

Following a request from the European Commission, the Panel on Biological Hazards (BIOHAZ) was asked to deliver a Scientific Opinion on the public health risks of bacterial strains producing extended-spectrum beta (β)-lactamases (ESBL) and/or AmpCβ-lactamases (AmpC) in food and food-producing animals.

In particular, the Panel was asked:

1. To propose a definition of the ESBL- and/or AmpC-producing bacterial strains and genes relevant for public health and linked to food-producing animals or food borne transmission;

2. To review the information on the epidemiology of acquired resistance to broad spectrum cephalosporins including the genes coding for such resistance in food-producing animals and food, ensuring that differentiation was made between transmission of resistant bacterial strains and/or genes to humans by consumption or handling of contaminated food; and transmission of resistant bacterial strains and/or genes to humans through the food animal production environment;

3. To perform a critical analysis of the methods (phenotypic and genotypic) and the interpretive criteria currently used for detection (isolation and identification) and characterisation of ESBL- and/or AmpC-producing bacterial strains, ESBL- and/or AmpC-encoding genes and associated mobile elements;

4. To make recommendations for a harmonised monitoring of resistance (phenotypic and genotypic) caused by ESBL- and/or AmpC in food and food-producing animals in the EU;

5. To the extent possible, to identify risk factors contributing to the occurrence, emergence and spread of ESBL- and/or AmpC-producing bacterial strains in food producing animals and food;

6. To identify and rank possible control options, taking into account the expected efficiency in reducing public health risk caused by ESBL and/or AmpC-producing bacterial strains transmitted via the food chain or via food animal production environment, and consider the advantages and disadvantages of different options.

The BIOHAZ panel concluded that ESBLs may be defined as plasmid-encoded enzymes found in the Enterobacteriaceae, frequently in Escherichia coli and Klebsiella pneumoniae, that confer resistance
to a variety of β-lactam antibiotics, including penicillins, second, third and fourth generation cephalosporins and monobactams, e.g. aztreonam, but usually not the carbapenems or the cephemycins, e.g. cefoxitin.

In contrast, AmpC β-lactamases are intrinsic cephalosporinases found on the chromosomal DNA of many Gram-negative bacteria, which confer resistance to penicillins, second and third generation cephalosporins including β-lactam/inhibitor combinations, cefamycins (cefoxitin), but usually not to fourth generation cephalosporins (cefeprine, cefquinome) and carbapenems; a growing number of these AmpC enzymes are now plasmid-borne.

The potential contribution of food-producing animals or foods to public health risks by ESBL and/or AmpC-producing bacteria is related to specific plasmid-mediated ESBL and/or AmpC genes encoded by a number of organisms.

Although there are a large number of genes which encode ESBL and AmpC enzymes not all are equally prevalent among human and animal bacteria. The predominant ESBL families encountered are CTX-M, TEM, and SHV. The predominant AmpC-family is CMY.

The bacterial species most commonly identified with these genes are Escherichia coli and non-typhoidal Salmonella. Among E. coli, the clonal lineages: B2-E. coli O25:H4-ST131, D-E. coli O25aST648 and D-E. coli-ST69, -ST393, are being increasingly detected among both humans and animals.

Among Salmonella the most common serovars are Typhimurium, Newport and Heidelberg; ESBL/AmpC transmission is mainly driven by integrons, insertion sequences, transposons and plasmids, some of which are homologous in isolates from both food-production animals and humans.

Cefotaxime is used as the drug of choice for optimum detection of blaESBL and/or blaAmpC genes in Salmonella and E. coli. From the results presented in the Community Summary Report it can be concluded that the prevalence of resistance to cefotaxime in food animals varies by country and animal species.

High levels are observed in E. coli and Salmonella from poultry in Spain, Italy, the Netherlands and Poland.

From raw meat from poultry, only limited cefotaxime resistance prevalence data are available.

Belgium and the Netherlands reported high to moderate cefotaxime resistance prevalence in Salmonella and E. coli from poultry meat. In pigs and cattle, the prevalence was low.

Since 2000, the presence of ESBL- and/or AmpC-producing Salmonella and E. coli in animals and food has been increasingly reported in both Europe and globally. Although these enzymes have been described in bacteria from all major food-producing animals, poultry and poultry products are most frequently reported to carry ESBL and/or AmpC-producing bacteria.

The most frequently reported ESBL subtypes in the EU in both Salmonella and E. coli in food-producing animals and foods are CTX-M-1, CTX-M-14, TEM-52 and SHV-12; the predominant plasmidic AmpC variant described globally to
occur in *Salmonella* and *E. coli* from food-producing animals or foods since the mid-1990s is CMY-2.

A wide range of additional CTX-M subtypes (CTX-M-1, -2, -3, -8, -9, -14, -15, -17/18, -20, -32, -53) have been detected in food-producing animals and food in European countries. A range of additional TEM (TEM-20, -52, -106, -126) and SHV (SHV-2, -5, -12) variants have similarly been detected in different European countries. Epidemic plasmids belonging to the incompatibility groups F, A/C, N, HI2, I1 and K groups carrying particular ESBL-encoding genes (*bla*TEM-52, *bla*CTX-M-1, -9, -14, -32,) or AmpC-encoding genes (*bla*CMY-2) have been detected among farm and companion animals, food products and humans.

There are few studies that describe clear evidence of direct transmission of ESBL- or AmpC-producing *E. coli* isolates from food-producing animals or food to humans.

Data does exist about common clones of ESBL- and/or AmpC-producing *E. coli* isolates from food-producing animals or food to humans.

Recent findings indicate transmission of ESBL genes, plasmids and clones from poultry to humans is most likely to occur through the food chain.

There is limited evidence for spread of ESBL/AmpC-carrying organisms via direct contact with animals or indirectly via the environment. Nevertheless people working with poultry have a higher risk for intestinal carriage of ESBL/AmpC-producing bacteria.

The preferred method for selective isolation of ESBL- and/or AmpC-producers is using cephalosporin-supplemented agar preceded by selective enrichment in a broth.

The preferred method for selective isolation of ESBL- and/or AmpC-producers is chromogenic (e.g. MacConkey agar) with one mg/L cefotaxime or ceftriaxone. Using low concentrations will result in optimum sensitivity to detect all relevant β-lactamase families.

Pre-enrichment may be performed in a general broth like Mueller-Hinton, Brain Heart Infusion or Luria-Bertani broth with one mg/L cefotaxime or ceftriaxone.

Identification is performed by determination of susceptibility to cefotaxime, ceftazidime and cefoxitin. ESBL producers are resistant to cefotaxime, variably resistant to ceftazidime and susceptible to cefoxitin.

Confirmation of ESBLs is performed by testing for synergy with clavulanic acid by combination disks, ESBL-етестs or broth micro-dilution including cefotaxime and ceftazidime as single drugs, and in combination with clavulanic acid.
Confirmation of AmpC producers is performed by determination of susceptibility to cefepime. AmpC producers are susceptible to cefepime and resistant to cefotaxime, ceftriaxone and cefoxitin. To identify ESBL and/or AmpC suspected Enterobacteriaceae by broth micro-dilution susceptibility tests, optimum breakpoints or interpretive criteria need to be used.

Although CLSI has recently redefined MIC breakpoints for third and fourth generation cephalosporins, the R-breaking points for ceftazidime, cefoxitin and cefepime are still one to two dilution steps higher than those defined by the European Committee on Antimicrobial Susceptibility Testing (EUCAST).

In order to harmonise the interpretation of susceptibility data and for optimum phenotypic detection of ESBL and/or AmpC producers, it is important to use EUCAST clinical breakpoints for interpretation of susceptibility or resistance and EUCAST epidemiological cut-off values (ECOFFs), to determine if an isolate belongs to the wild-type population or not.

All isolates confirmed phenotypically to be either ESBL or AmpC producers may be screened for \( \beta \)-lactamase gene families using micro-array or (multiplex) PCR. The ESBL and/or AmpC subtypes may be identified by dedicated PCRs and sequence analysis of the amplicons. Characterisation of plasmids on which \( \text{blaESBL} \) and/or \( \text{blaAmpC} \)-genes are located is essential to study the epidemiology of these genes and plasmids.

Since in Enterobacteriaceae several different plasmids are often present in each isolate, a structured approach is needed to identify the characteristics of the plasmid on which the \( \beta \)-lactamase genes are located.

If the presence of an ESBL and/or AmpC gene in a bacterial isolate is confirmed, plasmid isolation is performed to determine the number and sizes of plasmids present.

Subsequently, by conjugation or electroporation, transconjugants or transformants are isolated on selective agar plates with only the plasmid that harbours the \( \beta \)-lactamase gene present. The plasmid can be typed using replicon typing and sub-typed by fingerprinting or plasmid MLST.

Ultimately whole plasmid sequence analyses may replace the current typing and sub-typing techniques.

The choice of the molecular typing method to be used for isolates is determined by epidemiological relatedness of the isolates. Next to phenotypic methods such as serotyping and phage typing, PFGE or MLVA can be used to identify clusters of isolates that are related to a certain ‘outbreak’ in a restricted time frame.

MLST is generally the method of choice to identify relatedness of isolates of the same species from different backgrounds (eg. animal versus human).
The establishment of risk factors for occurrence of ESBL/AmpC-producing bacteria is particularly complicated by the data unavailability or lack of its accuracy. Few studies designed to assess risk factors for ESBL and/or AmpC occurrence in animals are available.

The use of antimicrobials is a risk factor for selection and spread of resistant clones, resistance genes and plasmids. Most ESBL- and AmpC-producing strains carry additional resistances such as to sulphonamides and other commonly used veterinary drugs. Therefore, generic antimicrobial use is a risk factor for ESBL/AmpC and it is not restricted specifically to the use of cephalosporins.

Currently, there are no pan-European data available on the use of antimicrobials. The European Surveillance of Veterinary Antimicrobial Consumption (ESVAC), coordinated by the European Medicines Agency (EMA), is collecting information.

An additional risk factor is extensive trade of animals in EU member states (MS), with few countries leading the production and the export, and with a small number of companies producing pure line breeding animals.

How widespread ESBL-carrying bacteria are in food-producing animals in the breeding/rearing/fattening sectors is generally unknown, although a few reports suggest that ESBL/AmpC are not uncommon in the top of some production pyramids (breeding).

ESBL- and/or AmpC-producing E. coli are introduced in poultry production chain through day-old grandparent chickens. Moreover, some data indicate that the occurrence of these organisms
in the different levels of the poultry production chain is the result of vertical transmission, local recirculation and selection.

There are no data on the comparative efficiency of individual control options presented in this document in reducing public health risks caused by ESBL and/or AmpC-producing bacteria related to food-producing animals.

Prioritisation is complex, and the effectiveness of measures discussed in this Opinion is based on the best available evidence and expert opinion. As such it is considered that a highly effective control option to reduce selection of ESBL/AmpC-producing bacteria at an EU level, would be to stop all uses of cephalosporins/systemically active third and fourth generation cephalosporins, or to restrict their use so they are only allowed under specific circumstances.

Measures intended to minimise off label use should focus on increased compliance with existing legislation. As co-resistance is an important issue, it is also of high priority to decrease the total antimicrobial use in animal production in the EU.

Also of importance (more so after the ESBL/AmpC-producing microorganisms have emerged) are the measures to control dissemination, for example by implementing increased farm biosecurity and controls on animal trade (of ESBL/AmpC-carriers), and by improving hygiene throughout the food chain, and implementing other general post-harvest controls for foodborne pathogens.

Because most evidence is available for high prevalence of ESBL/AmpC-producing bacteria in the poultry production pyramid, and their consequent involvement in public health, it is of high priority to reduce selection pressure imposed by the use of antimicrobials, to prevent vertical transmission from the top of the poultry production pyramid, and to prevent local recirculation within subsequent flocks.

Recommendations for the harmonised monitoring of resistance caused ESBL- and/or AmpC-producing bacteria have been provided.

**FURTHER READING**

You can view the full report by clicking here.
Dietary Yeast Extracts Tested as Alternative to Antibiotics in Poultry

A dietary yeast extract could be an effective alternative to antibiotics for turkey producers, according to a US Department of Agriculture (USDA) study.

Microbiologist Gerry Huff with USDA’s Agricultural Research Service (ARS) at Fayetteville in Arkansas, and her colleagues have been studying the effects of yeast extract as an immune stimulant and alternative to antibiotics in conventional turkeys.

Non-pharmaceutical remedies and preventatives are particularly needed for organic poultry production, according to Dr Huff, who works in the ARS Poultry Production and Product Safety Research Unit (PPPSRU) in Fayetteville.

ARS is USDA’s principal intramural scientific research agency, and this research supports the USDA goals of ensuring food safety and promoting international food security.

Initial studies suggest that dietary yeast extract has good potential as a non-antibiotic alternative for decreasing pathogens in organic turkey pro-
duction. A larger study was needed to confirm its efficiency.

But it is expensive to work with turkeys because they eat more than other birds, according to Dr Huff. So the researchers are testing yeast extract in Japanese quail to test the extract's efficacy against Salmonella and Campylobacter.

The quail serve as a model system to evaluate natural treatments that will be beneficial for chicken and turkey production. Dr Huff's current study, in collaboration with Irene Wesley at the ARS National Animal Disease Center at Ames in Iowa, involves 800 Japanese quail.

Yeast extracts help boost the immune system's ability to kill bacteria, but there is also a downside. According to Dr Huff, yeast ramps up certain aspects of the immune response but body weight may be decreased in some birds. That is because the energy normally used for growth is redirected toward the immune system. The researchers are looking for a balance between enhancing immune response and maintaining growth.

Organic poultry farms can only use compounds on the National List of allowed substances for organic production. Yeast extract is on that list.

Alternatives to antibiotics are also needed for conventional poultry production, since regulations for the usage of antibiotics are being tightened in response to the prevalence of antibiotic resistance in pathogens.

*This research was published in Poultry Science and British Poultry Science.*
More rapid growth in production among the leading South American countries will enable the Americas to maintain its share of global chicken meat output at 47 per cent in 2011, writes industry watcher, Terry Evans in this, the first part of the 2011 series of Global Poultry Trends, exclusively on ThePoultrySite.

It should be noted that our estimate of world production in 2011, at more than 87 million tonnes (table 1) assumes that production in India will amount to around 2.7 million tonnes. It is possible but unlikely, that the latter figure may be revised downwards, in which case the global total will need to be reduced, boosting the share accounted for by the Americas.

Figure 1. Chicken meat production in the US and Americas compared to the global total (million tonnes)
Table 1. Chicken meat production in the Americas ('000 tonnes eviscerated weight)

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**AMERICAS**

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**WORLD**

58,971.8 70,450.9 72,343.9 76,061.3 79,372.8 82,983.8 85,236.0 87,191.0

E=estimated, F=forecast
Sources: FAO, USDA, ThePoultrySite estimates
Global Poultry Trends 2011

Americas Holds Share of Global Chicken Meat Production

While production in the USA could reach a record high of more than 17 million tonnes in 2012, the annual rate of growth since 2000 has been less than two per cent, which contrasts markedly with the expansion of over seven per cent recorded by Brazil where output has risen from less than six million tonnes to close on 13 million tonnes.

Clearly, the USA has maintained its position as the leading chicken meat producer in the region (table 2) though its share of total output has fallen from 51 per cent in 2000 to an estimated 41 per cent in 2011, which contrasts with Brazil’s contribution which has escalated from 22 per cent to almost 32 per cent. Lower prices resulting from the recession and higher input costs have put a brake on expansion such that, for the foreseeable future, it is likely that annual increases in the USA will fall short of two per cent, pointing to production of a little over 18 million tonnes in 2015.

The cost of corn (maize) is now nearly three times as high as five years ago when the demand for corn to produce ethanol first impacted on the market. It has emerged recently is that in 2011 for the first time more corn will be used to produce fuel for cars than for animal feed.

Industry growth in Brazil since 2000 has averaged more than seven per cent a year. According to Conab, the National Supply Company of the Ministry of Agriculture, chick placings in 2011 will come close to 6.4 billion. As the average eviscerated weight has risen to around 2kg, total production should be in the region of 13 million tonnes, which will be almost double the level of 10 years ago. Despite lower profit margins as a result of higher feed costs, the industry is optimistic for increased exports and a firmer domestic demand arising from bigger disposable incomes and much higher beef prices. Continued growth in exports

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F=forecast
is vital to future expansion in production, though it is possible that currency fluctuations could play an important role here. However, even if future growth is restricted to the likely global norm of around two per cent, Brazil’s output will come close to 14 million tonnes by 2015.

Mexico is the third largest producer whose output when combined with that of the USA and Brazil represents almost 80 per cent of the regional total of nearly 41 million tonnes. Since 2000, production in Mexico has expanded by almost six per cent a year, reaching nearly 2.9 million tonnes in 2008. A cut-back of some 2.5 per cent occurred in 2009, since when industry growth has risen by just over one per cent a year, so production in 2011 at an estimated 2.85 million tonnes, will just about match the 2008 level.

High and volatile feed prices are limiting growth. According to a USDA GAIN report, some 40 per cent of feed grains are sourced domestically as 60 per cent are imported. It is considered that about 73 per cent of the total demand for feed grains is covered by risk management tools aimed at mitigating the impact of high feed prices. Some producers are hedging against such price risks using a government programme Agricultura por Contrato, under which price volatility for domestic corn and sorghum is covered. The impact of price volatility will mainly hit those small and medium-sized producers who are less inclined to adopt risk management practices. Although improved consumption of chicken is anticipated as an increase in domestic demand is envisaged among the lower income groups, there are indications that some middle-class consumers are switching from chicken to beef. Nevertheless, an increase in

![Figure 2. Chicken meat production in selected countries of the Americas (million tonnes)](image-url)
Global Poultry Trends 2011

Americas Holds Share of Global Chicken Meat Production

Imports, mainly from the USA, will act as a brake on production growth. With forecasts of continued relatively slow growth of possibly only one per cent or so a year, output in 2015 is projected to be around three million tonnes.

Argentina has one of the fastest expanding chicken industries in the region, the annual average increase exceeding 5.5 per cent as production has climbed from less than one million tonnes back in 2000 to possibly nearly 1.8 million tonnes in 2011. Looking further ahead, production is set to pass the two million tonnes a year mark over the next four years.

Three other countries in the Americas will produce more than a million tonnes of chicken meat in 2011 – Peru, Colombia and Canada. But, typical of the contrasts in growth between North and South America, Peru and Colombia have recorded production increases of well over six per cent a year since 2000, while in Canada industry growth has been little more than one per cent per year. As a result, output in both Peru and Columbia has overtaken Canada.

Production in Canada is tied to a strict supply-management system, with the business, in the main, in the hands of a relatively large number of independent operations. Output is controlled through a quota system. Decisions on the quantity to be produced are taken before each eight-week cycle, with the national total being allocated to each of the 10 provinces and subsequently further allocated to individual producers within each province. Future growth will be linked to population increases. Although the Farmers of Canada Strategic Plan for 2009-2013 has, as one of its objectives, the aim of increasing the average quantity of chicken eaten/person to 33kg, forecasts of annual output in 2015 vary from little change from the current level of around 1.1 million tonnes to a much more optimistic 1.34 million tonnes.

Two other countries featuring in the region’s Top 10 are Venezuela and Chile. While production in the former has actually declined in recent years because of increased imports from Brazil and Argentina, output in Chile has recorded steady growth and could reach a record 625,000 tonnes in 2011. Chile’s industry is highly concentrated with more than 96 per cent of production coming from just three regions – Valparaíso, Metropolitana and Libertador Bernardo O’Higgins, with nearly 60 per cent of broilers being grown in the latter. The large companies that dominate the market are fully integrated controlling growing, processing and distribution hence product traceability is high. The poultry sector is the largest meat producer in the country, accounting for nearly 46 per cent of the total.

Global Poultry Trends is a series of articles exclusively prepared by industry watcher, Terry Evans for ThePoultrySite.com

Trend Analysis of:
► Chicken Meat
► Eggs
► Turkeys-Ducks-Geese

Latest Data on:
► Production
► Trade
► Per Capita Consumption

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ThePoultrySite.com
Un nuevo sitio web de los creadores de ThePoultrySite.com
MEXICO – At the World Poultry Veterinary Association (WVPA) congress in Cancun, there has been much talk of the so-called 'protectotype concept' in vaccination, a relatively new idea, writes Chris Wright, senior editor of ThePoultrySite.

Vaccination has been one of the key topics discussed at this convention, an event that has attracted poultry veterinarians from all over the world. The protectotype concept is a fairly new idea, which is replacing the serotype vaccination concept – the standard operating procedure for the industry.

Instead of trying to protect against all the variants of the different diseases, and trying to keep up with genetic drift, the idea now is to find combinations of vaccines that will solve the problem.

If only one type of vaccine was given (one serotype) and it is found to not protect the birds very well, the latest idea is to add vaccines of different serotypes to the rotation to solve the problem.

It is the vaccine manufacturing companies which are redefining these ideas, and the protectotype concept is the new working model for them. Instead of trying to create new vaccines per serotype, the companies are looking for answers to the disease problems with their existing vaccines, and trying to find the right combinations that will resolve the problems for the producers.

Since there is no 'one solution fits all' to fighting diseases, this approach has to be done on a regional or country basis. The approach taken in Europe would probably not work in the Americas, for example. This is the new concept going into the future.

Factors Combine to Drop Poultry Exports 14 Per Cent

BRAZIL - Brazil exported 14 per cent less poultry meat in July in volume terms than in the same month last year but the value in US dollars was up almost four per cent.

Brazil exported the equivalent of US$669 million in poultry in July, a 3.8 per cent increase in comparison with the same month of last year.

Experts Help Cargill Improve Food Safety Programme

US - Cargill has assembled an expert panel on food safety, microbiology and epidemiology to review ground turkey food safety enhancements and make recommendations following the recent Salmonella outbreak linked to its product.

Cargill has asked a panel of experts in food safety, microbiology and epidemiology to review its enhanced ground...
EFSA Panel Shows Risks of Antimicrobial Use

EU - The use of antimicrobials in food producing animals is a risk to public health and it can help to spread the bacterial strains.

A study by the Panel on Biological Hazards (BIOHAZ Panel) for the European Food Safety Authority (EFSA) has called for a lowering of the overall use of antimicrobials in food producing animals in the European Union.

The panel says it is a priority to limit the risk to public health that can arise from resistance in the food chain.

And it adds that that an effective option would be to restrict or stop the use of cephalosporins in the treatment of food-producing animals.

EFSA says that resistance to antimicrobials, used in human and veterinary medicine to treat infections caused by bacteria, occurs when bacteria develop mechanisms that reduce their effectiveness or render their use ineffective.

Resistant bacteria can spread through many routes. When antimicrobial resistance occurs in zoonotic bacteria present in animals and food, it can also compromise the effective treatment of certain infectious diseases in humans.

In its assessment, the BIOHAZ Panel evaluated the risks to public health of bacterial strains producing two types of enzymes; extended-spectrum beta-lactamases (ESBL) and AmpC beta-lactamases (AmpC).

These enzymes inactivate the effects of antimicrobials such as penicillins and cephalosporins, which are defined as critically important antimicrobials for both human and veterinary medicine.

Cargill to Acquire Provimi

GLOBAL - Cargill has made a binding offer to acquire Provimi, the global animal nutrition company, for an enterprise value of €1.5 billion from Permira funds, the private equity firm which owns Provimi. Provimi has agreed, on an exclusive basis, to commence the necessary Works Council consultations and appropriate regulatory approvals.

Cargill plans to acquire Provimi's worldwide animal nutrition business...

Agricola Bacau Aims to Gain Market Share & Exports

ROMANIA - Agricola Bacau plans to sell 31,000 tons of poultry this year, 5,000 tons more than in 2010, with a significant portion of this being exported, according to the company's president.

After a tough 2010 which brought lower sale prices, higher input costs and no more subsidies, local poultry producers are hoping to wing it on a flat market this year...
Regional News

Asia

BIRD FLU: FAO Warns of New Variant

ASIA/GLOBAL - FAO has urged countries to increase their level of preparedness and surveillance against a new variant of H5N1 highly pathogenic avian influenza (HPAI).

FAO is urging heightened readiness and surveillance against a possible major resurgence of the H5N1 HPAI amid signs that a mutant strain of the deadly Bird Flu virus is spreading in Asia and beyond, with unpredictable risks to human health.

The H5N1 virus has infected 565 people since it first appeared in 2003, killing 331 of them, according to WHO figures. The latest death occurred earlier this month in Cambodia, which has registered eight cases of human infection this year – all of them fatal.

Since 2003, H5N1 has killed or forced the culling of more than 400 million domestic poultry and caused an estimated US$20 billion of economic damage across the...

Branded Egg Market Grows

INDIA - Several egg companies are achieving success with egg branding as consumers come to value freshness and food safety.

In order to cater to the organised retail and niche market, region-based poultry farms are foraying into branded eggs, reports Business Standard. According to entrepreneurs, the increasing brand-consciousness among urban consumers and points of sale available at retail stores have now provided opportunities to poultry farmers to sell branded eggs. Also, unlike unbranded eggs, these branded eggs are produced in an environment which is totally clean, hygienic and am mechanically packed.

Joining the bandwagon, and in order to cash in on the growing demands, Punjab's Rajpura-based Raja Farms Pvt Ltd has introduced branded eggs called 'Peggs'(Punjab Eggs). This is the second poultry farm from the Northern Region (excluding Delhi & NCR region) which is producing branded eggs.

Poultry Meat & Egg Output up Three Per Cent

PHILIPPINES - Agricultural output increased by 5.5 per cent, mainly due to increases in rice, corn and sugarcane production. Poultry meat and egg production was up more than three per cent, pig meat by one per cent and fishery output was down three per cent.

Agriculture Secretary Proceso J. Alcala has credited rice and corn for the expansion of the farm sector by 5.48 per cent.

Broiler Industry Approaches Crisis-Point

BANGLADESH - Hundreds of poultry farmers have closed down their farms during the last couple of months as the result of the high costs of day-old chicks and feed.

An unusual rise in the price of one-day-old chicks and poultry feed has come as a serious blow to the already limping poultry industry in eight districts of Rangpur division, according to Daily Star of Bangladesh.
Massey Researcher Wins Top International Award

NEW ZEALAND - Professor Velmurugu 'Ravi' Ravindran was awarded the Poultry Nutrition Research Award by the Poultry Science Association at its annual meeting last month.

Professor Ravindran is the first non-American researcher to receive the award, which is in recognition of his career of research.

Read More...

Producers under Pressure from High Feed Prices

UGANDA - High feed prices are driving poultry farmers out of business.

The scarcity of poultry feeds has hit the industry hard, forcing some farmers out of business, reports The Monitor. The key ingredients in the production of chicken feeds include maize bran, rice bran, cotton seed cake, wheat bran, palm kernel cake, groundnut cake and fish and mukene (silver fish).

Esther Genza, an employee at Kagodo Feeds, says the industry's biggest challenge has been the scarcity of maize and maize bran.

She said: "Towards the end of last..." Read More...

Signs of Bird Flu Virus Found at Another Ostrich Farm

SOUTH AFRICA - Evidence of the H5 subtype of the highly pathogenic avian influenza (HPAI) virus was found at another ostrich farm in the Western Cape last month, according to a serology test.

The veterinary authority sent Follow Up report No. 6 dated 26 August to the World Organisation for Animal Health (OIE).

Read More...

Local Producers Struggle in Face of Imported Poultry

GHANA - Local poultry farmers are battling for survival as the country imports frozen chicken to the value of US$200 million.

Ghana's poultry farmers are struggling to survive crippling competition from their counterparts in developed countries as the country imports $200 million worth of chicken every year, according to Ghana Business News.

The major factors behind the declining state of Ghana's poultry industry are varied and complex but the most significant is government policy towards the sector's growth.

Read More...

Namib Poultry Aims to Double Chicken Consumption

NAMIBIA - One company's new investment in hatching, broiler growing and feed production aims to meet the country's demand for chicken meat and double per-capita consumption.

A multi-million Namibian chicken project, which began construction in April this year, should be completed and in full production by July 2012, reports Namibian.
Global Events

Keep up to date with what’s happening in the global poultry industry

**Poultry Meat Conference 2011**
Stoneleigh, UK
September 7th

Building on the considerable success of previous conferences Poultry Meat Conference 2011 will once again be held at Stoneleigh Park on the 7th of September.

With all costs of staging the conference being met by Aviagen, BOCM PAULS, Cobb Europe, IntervetSP, and PD Hooks, the event is once again free to all members of the Poultry Industry who wish to attend.

Embracing the traditional theme of this conference the vastly experience line up of speakers will once again address the practicalities of producing high quality poultry meat.

**SPACE 2011**
Rennes, France
September 13th to 15th

One of Europe’s largest trade shows on animal production this year.

This will the the 25th SPACE event.
XXIII International Poultry Symposium
Poznan, Poland
September 13th to 15th

The Symposium will cover all problems connected with the nutrition, breeding and rearing, product quality as well as prophylaxis and pathology of poultry.

ANUGA 2011
Cologne, Germany
September 8th to 12th

The world’s leading food fair for the retail trade and the food service and catering market. Over 6,500 exhibitors and around 150,000 trade visitors. Almost 300,000 square metres of inspiration, ideas and innovations. Anuga is not only the largest food and beverage fair in the world; it is also the sector’s most important fair for new markets and target groups. It is the perfect venue for all the latest trends and themes – and a great place to make first-rate contacts and business deals.
CABLEVEY OFFERS FREE REGISTRATION TO PACK EXPO

US - Cablevey Conveyors is exhibiting at booth number S-6520 at Pack Expo Las Vegas 2011.

More...

FIRST AVIAGEN POULTRY PRODUCTION COURSE FOR LATIN AMERICA

BRAZIL - The first poultry production management school offered by Aviagen America Latina, called ‘Chicken Production’, was conducted between 31 July and 15 August 2011 in Embu das Artes, Sao Paulo.

More...

DELUCA APPOINTED PRESIDENT OF MERCK ANIMAL HEALTH


More...

COBB APPOINTS NEW DIRECTOR OF WORLD MARKETING

US - Roger Vessell, who has over 26 years of sales and marketing experience, has been appointed director of world marketing for Cobb-Vantress.

More...

TIPS AND TRICKS FOR COST-EFFECTIVE PRODUCTION

IRAN - Big Dutchman has held a series of conferences on cost-effective poultry production.

More...

HY-LINE SUDANESE DISTRIBUTOR HELD TECHNICAL SEMINAR

SUDAN - Recently, Al-Shaeed (Hy-Line International distributor in Khartoum-Sudan) conducted a successful seminar focused on food and egg production in Khartoum.

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EARN MONEY BY BATTLING SUBCLINICAL COCCIDIOSIS

BELGIUM - Biosecurity advice from CID Lines to prevent subclinical coccidiosis.

More...

MERCK SUPPORTS RECOVERY OF JAPANESE ANIMAL SECTOR

NETHERLANDS & JAPAN - Merck Animal Health has donated about US$30,000 (¥2.3 million) to three veterinary and farmer associations in Japan to support recovery of the country’s animal sector following the earthquake and tsunami.

More...
OREGO-STIM GAINS ORGANIC CERTIFICATION

AUSTRALIA - Orego-Stim, the natural feed additive from Meriden Animal Health, has been certified for use in organic systems in Australia by the Bio-Dynamic Research Institute.

BIG DUTCHMAN EXPANDS SALES FORCE IN CHINA

CHINA - Big Dutchman has appointed Richard Armstrong as Technical & Sales Director for the Poultry Division. He will be based in the Beijing Sales Office.

COBB SEMINAR UNITES LATIN AMERICAN CUSTOMERS

BRAZIL - The 5th seminar for grandparent farmers, organised by Cobb-Vantress Brazil for Brazilian and international customers at São Jose do Rio Preto, was given a vision into the future of poultry breeding.

FEED MILL TAKES ROSS GP PROJECT IN IRAQ TO NEXT LEVEL

CHINA - Big Dutchman has appointed Richard Armstrong as Technical & Sales Director for the Poultry Division. He will be based in the Beijing Sales Office.

NOVUS'S SUSTAINABILITY REPORT AWARDED B-CHECK

US - Novus International, Inc. announces publication of its 2010 Sustainability Report, which documents and measures the company’s comprehensive social, environmental and economic sustainability programme globally.

NEW WEB SITE FROM MERIDEN PHILIPPINES