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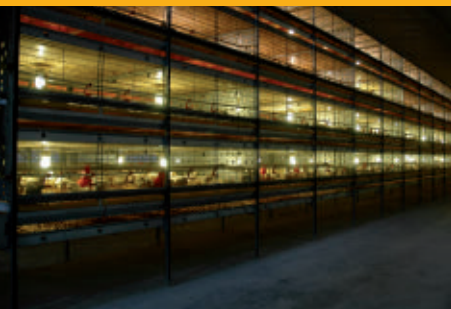




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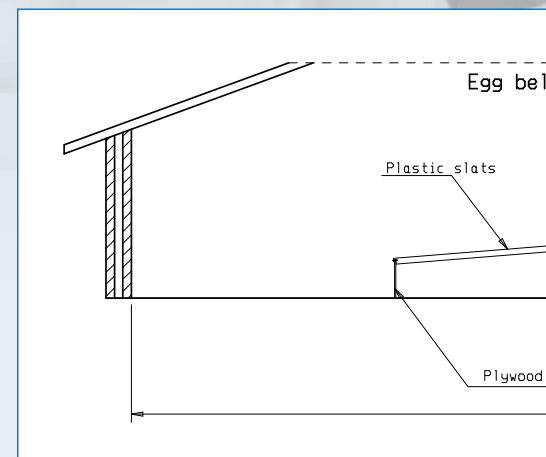
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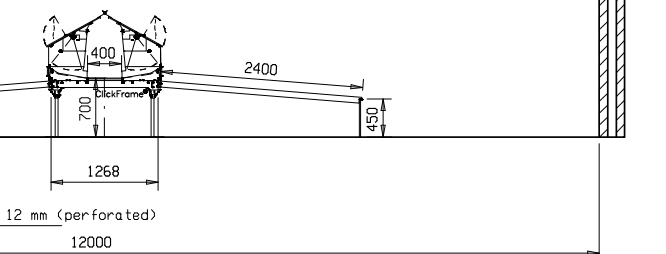
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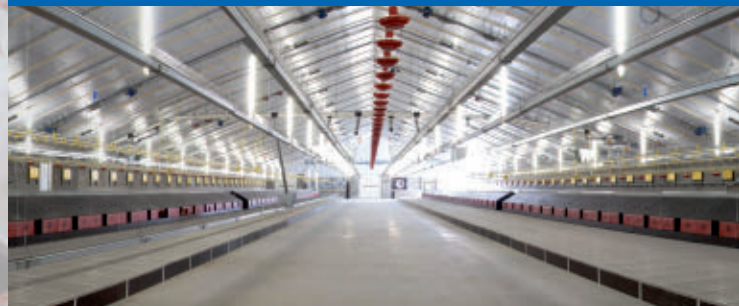
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Poultry International

Production, Processing and Marketing Worldwide



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CELEBRATING



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* This third and final presentation in the webinar series "Successfully managing the intestinal health of poultry flocks: Coccidiosis control" will take place September 18, 2012, at 9:00 a.m. CST.

* Register today at:
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Webinar: USDA August Crop Report: Analysis and implications

* Tim Brusnahan, Richard A. Brock & Associates, and Chris Hurt, Purdue University, analyze and discuss the USDA's August crop report in light of the drought that has ravaged a large portion of the U.S.

* Access the webinar at:
www.WATTAgNet.com/ondemandwebinars.aspx

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Editor's Comment

Mark Clements



Poultry International reaches 50!

The last half-century has certainly seen the industry change and grow. In this issue, along with our regular content, we have taken a look back over what has made the pages of *Poultry International*.

The last five decades have been examined, and we've included a selection of magazine covers for each period. For those readers reading online, there are links to articles from as recently as last year and stretching right back to 1962.

Way back in 1962, the very first edition of *Poultry International* carried features on ventilation, debeaking, Israel, molting and disposal pits, and the World's Poultry Congress, amongst other areas.

No industry exists in isolation, and our timeline demonstrates how the sector is part of something much bigger. We highlight not only technical breakthroughs and market development but the need for cost controls and political developments too.

With the passage of time, what seemed truly innovative in one decade may have become standard

practice by the next, trends have come and gone, records have been beaten, new markets and companies have emerged, while old names have disappeared. Practices that now seem indispensable were, once upon a time only dreamt of.

Our anniversary edition truly demonstrates that over the last 50 years the poultry industry is a dynamic industry. It is always risky to predict the future, but a couple of elements can be predicted with certainty.

The demand for poultry meat will continue growing, as well as pressure on costs. These two aspects alone are enough to stimulate innovation and new ways of producing.

While we may now feel that we are engaging the most modern of practices,

by the time *Poultry International* celebrates its centenary, our current methods will seem positively old-fashioned. Between then and now, *Poultry International* will continue to bring you the latest developments in the sector, helping business to grow and aiding in feeding the world. □

So here it is – our special anniversary

issue.

Enjoy looking back over the last half century!

EDITOR'S FOCUS - a regular look at industry key players

ZAG – The Austrian poultry and egg association

ZAG is a nationwide umbrella organization representing the interests of broiler, turkey and egg producers in Austria and is dedicated to working in partnership with its members to help the industry grow responsibly and profitably.

Located in Vienna, among the association's various activities, its main field of work is improving the production of its members and the marketing of their products.

The association is in regular contact with political, economic and scientific bodies relevant to its members' interests as well as with the country's media. In addition, it maintains contacts along the production chain from feed producers to consumer groups. Internationally, it is a member of the International Egg Commission and is in contact with AVEC.



ZAG not only disseminates information about the industry externally but also keeps its members abreast of developments, organizes conferences and publishes a journal.

Among members of ZAG are the individual poultry industry associations of the Austrian states of Burgenland, Lower Austria, Upper Austria, Salzburg, Styria, Tyrol and Vorarlberg. Those egg producers that have their own price quotations are also members, as is EZG Frischei, which represents 160 member companies with 1.1 million laying hens.

The GGO broiler cooperative, which acts as a link between 300 broiler producers and slaughter plants, and the poultry health service, the QGV, are also members. For more information visit: www.zag-online.at □



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Around the World

UK poultry farmers call for 20 percent price increases

UK poultry farmers are calling for

supermarkets to raise the prices of eggs and poultry by as much as 20 percent, in order to offset the increase in chicken feed prices caused by the ongoing U.S. drought that has

damaged corn and soybean crops, according to reports.

The cost of producing a chicken has grown by up to 25 percent since the beginning of 2012, said Peter Bradnock, chief executive of the British Poultry Council. "We need to pass the price increase on," he said. Feed makes up roughly 60 percent the cost of producing chicken. "There are more people [in the poultry industry] making losses than making profits at the moment," said Bradnock.

Feed increases are hurting farmers and making it difficult to profit, according to Duncan Priestner, chairman of the National Farmers' Union. "What the supermarkets are hoping is that the price of feed will come down again and that farmers will just have to grit their teeth and take this on the chin until prices come down," said Priestner. "The

Liberia gets US\$1 million grant for poultry farming

Liberia has received a US\$1 million grant from Nigeria to begin a poultry farming project, according to Liberia's Minister of Agriculture Florence Chenoweth, that will produce consumable poultry products and bring an end to imports.

"We want to bring to an end the importation of poultry products, specifically eggs, by the end of this year," said Chenoweth. "We'll have at our site in Grand Cape Mount County over 70,000 day-old chicks. Some of these will be given to other farmers who have an interest in poultry farming." The project, known as Obasanjo Farm after the Nigerian President Olusengun Obasanjo, is meant to help reduce the incidence of bird flu that comes from imported products and raise the quality of local production.

The Liberia ministry is also working on a corn production program to produce local feed for the chickens. Chenoweth said the poultry farming project and its corn feeding program will create job opportunities for Liberians, especially young people who want to engage in poultry farming.



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problem is if these prices don't come down then the supermarkets are going to have to react to that, otherwise farmers won't be able to put the next stock of chickens in because they can't afford it."

Chicken price to not exceed RD\$46 in Dominican Republic

On July 23, the Committee on Agriculture of the House of Deputies, representatives of the white meat industry and Pro Consumidor set a limit of RD\$46 (US\$1.18) per pound of chicken sold in stores in the Dominican Republic.

According to a source, the agreed-upon system establishes the following prices:

- * Chicken producers will sell chicken at RD\$28.50 (US\$0.73) per pound
- * Distributors 1 (individuals or companies

IN BRIEF

Jamesway appoints area sales manager for Russia:

Jamesway has appointed Daniel Ferrari as area sales manager for Russia.

HJ Baker partners with Mexico animal nutrition company:

H.J. Baker & Bro. Inc. has agreed with Vimifos S.A. de C.V., a Mexican animal nutrition company, to sell H.J. Baker Pro-Plus and Pro-Pak products to the poultry feed industry throughout Mexico.

that sell live and buy it directly from the farms) will sell chicken at RD\$31.50 (US\$0.81) per pound

- * Distributors 2 (retailers) will sell chicken at RD\$42.00 (US\$1.07) per pound
- * Distributors 3 (which includes grocery

CTB celebrates 60th anniversary:

CTB Inc., formerly known as Chore-Time, celebrated its 60th anniversary on July 17 with more than 600 employees, past and present, in Milford, Ind.

Ufac-UK appoints customer services assistant:

Sarah Sleight has been appointed customer services assistant by specialists feed manufacturer, Ufac-UK.

stores) will sell chicken at RD\$46.00 (US\$1.18) per pound

- * Slaughterhouses will sell chicken at RD\$50.50 (US\$1.29) per pound
- * Supermarkets will sell chicken at RD\$55.60 (US\$1.42) per pound



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Philippine poultry production increases 7 percent in first quarter 2012

January–March 2012 poultry production in the Philippines continued its upward trend, growing over 7 percent compared to the same period in 2011, according to the U.S. Department of Agriculture Agricultural Marketing Service's latest report.

Chicken production increased 7.38 percent and duck production rose 1.82 percent; chicken and duck egg production increased by 6.92 percent and 1.18 percent, respectively. In calendar year 2011 chicken production totaled 1.41 million metric tons live weight, up 4.52 percent from 135 million metric tons in 2010. Growth was due to the expansion of commercial broiler farms and the higher number of broilers dressed, according to the USDA. Duck production was 33,153 metric tons, up 0.53 percent from 32,970 metric tons in 2010. Chicken egg production grew 6.92 percent in 2011 and duck egg production increased by 1.18 percent.

The value of U.S. poultry meat exports to the Philippines totaled \$70 million in 2011, an increase of over 39 percent when compared to 2010 (\$50.3 million). The value of eggs and egg products exports totaled to \$1.9 million in 2011, up almost 133 percent compared to 2011 numbers (\$825,000). The growth rate for 2006–2011 was 389.8 percent for poultry meats and 230.9 percent for eggs and egg products. In volume, poultry meat exports grew 47.8 percent to reach 72,689 metric tons in 2011. Eggs and egg products exports totaled 612 metric tons, up 187.1 percent from 2010. The five-year growth rate (2006–2011) was 249 percent for poultry meats and 173.4 percent for eggs and egg products, according to USDA data.

For more U.S. egg and poultry information and statistics, see www.WATTAgNet.com/marketdata.html.



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Around the World

Italy's FierAvicola poultry event adopts international outlook

A restyled FierAvicola, the international poultry event, will take place in Forli, Italy, on April 10-11, 2013.

The organizers note that the 48th edition will have a far greater international presence as they have been collaborating with institutions and businesses, trade associations and professionals in the industry at national and international level, as well as establishing partnerships with the main trade fairs abroad.

The internationalization project includes a FierAvicola road show with some 20 events around the world. Of the 300 exhibitors expected at the trade fair next year, over 30 percent will come from outside Italy.

US poultry, egg industries support Mexico efforts against bird flu

The U.S. poultry and egg industries have expressed their support for Mexican poultry producers as Mexico continues to deal with its H7N3 avian influenza outbreak, and pledges their support to help the producers any way necessary.

The USA Poultry & Egg Export Council and Mexico's Unión Nacional de Avicultores have established a working group on avian influenza to identify issues and projects on which the two industries can coordinate to help Mexico deal with this outbreak. This working group is supported

by various U.S. organizations, including the American Egg Board, the National Chicken Council, the National Turkey Federation, the U.S. Poultry and Egg Association, United Egg Producers, and the USAPEEC International Poultry Development Program, as well as the International Egg Commission and the International Poultry Council.

There are also internationally recognized standards established by the World Organization for Animal Health that identify strategies and protocols for controlling and eliminating the disease. These procedures include containment, management of poultry movement, zoning and compartmentalization, humane stamping out, and vaccination when appropriate. The strategies, when fully and properly implemented, will provide an effective path for handling this crisis. With depopulation of affected flocks as the primary focus, Mexico is incorporating the World Organization for Animal Health strategies and the U.S. industry stands ready to help Mexico in its efforts.

Pakistan poultry sector needs biosecurity investment to expand

Pakistan's poultry sector, which has become the second-largest industry (after textile) in the country, could expand further with the proper investment, according to Vice Chancellor of the University of Veterinary and Animal Sciences Professor Dr. Talat Naseer Pasha.

The industry has a local investment of Rs 300 billion (US\$3.16 billion) and has been growing at a rate of 8 percent to 10 percent, well above the 3.5 percent of agriculture or 4 percent of livestock. If biosecurity

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Vietnam poultry slaughterhouses receive committee support

Vietnam's Ha Noi People's Committee will financially support poultry and cattle slaughterhouses that are located in parts of the capital city specifically set aside for these businesses, according to reports.

The committee said it will support 50 percent of expenses for the slaughter of poultry or cattle in the

first year, 40 percent in the second year and 30 percent in the third year. Encouraging slaughterhouses to relocate to areas zoned for these businesses is expected to help wind down Ha Noi's small-scale slaughterhouses and ensure better control over outbreaks of diseases such as bird flu.

measure were invested in, said Pasha, the industry could expand further still. According to typical biosecurity standards, farm-to-farm distance should be at least one kilometer and vans engaged for picking up flocks should be under a prescribed protocol. There are currently no such regulations in existence in Pakistan, according to Pasha, who has called for the setting up of combine laboratories to ensure the quality of food and feed of livestock. He said the government should make a combine system to gauge the quality of food and animal feed as well as meat.



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Around the World

Brazil poultry exports up, revenue down in 2012

Brazilian exports of chicken meat totaled 1.987 million tons between January and June, 3.07 percent higher than the cumulative total (1.928 million tons) in the same period of 2011, according to a survey conducted by the Brazilian Poultry Union, UBABEF. With this result, the export projections of UBABEF for all of 2012 sit at over 4 million tons, but the generated revenue is at US\$3.819 billion, 4.51 percent lower than 2011's US\$3.999 billion.

In the monthly comparison, there was a decline in exports. In volume, 307,100 tons shipped in June, 7.28 percent lower compared to the same period in 2011. The reduction in revenue was more pronounced, with a 21.25 percent decrease to US\$551.8 million in the first sixth months of 2012. "Some countries imported large volumes in May — the same month Brazilian exports reached a historical record with 374,000 tons," said Francisco Turra, the executive president of UBABEF. "These purchases have influenced the outcome of June, since small stocks formed on the passage of months." Despite the sharp drop in monthly revenue, Turra said that thanks to the exchange rate, growth was 1.6 percent in export revenue. For 2012 overall, this result is even greater, with an increase of 9.4 percent.

According to UBABEF data, Brazil produced 50.04 million broilers in 2011. In terms of egg production, the country produced 632,813 heads of hens of white eggs and 295,421 heads of hens of brown eggs.

US turkey production expected up in second half 2012

U.S. turkey meat production in the second half of 2012 is expected to be higher than in 2011 (up 3 percent), at 3 billion pounds, according to the U.S. Department of Agriculture's latest report.

Over the first five months of 2012, net poult placements totaled 121.3 million, up 4.8 percent from the same period in 2011. Turkey meat

Ghana poultry association receives US\$179,000 to boost industry

The Ghana National Association of Poultry Farmers will receive GH 350,000 (US\$179,391) to boost the operations of its members and to vitalize the industry, according to reports.

The money will come from Liberty Commodities Limited, an international trading group and will be used to help support the association's broiler project, under which farmers will be supplied with breeding equipment and day-old chicks, and will be exposed to feeding techniques that will make their birds ready for market in six weeks. Ghana's poultry sector can play an important role in the nation's socio-economic development if given the proper aid, said Kwandwo Asante, national president. The country currently imports roughly 200,000 metric tons of poultry products per year.

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production is expected to remain above 2011 numbers through the rest of 2012 but is expected to decline slightly in 2013.

With higher turkey production so far in 2012, stocks of whole birds have risen to well over their year-earlier levels. The growth in whole bird stocks, however, has not impacted prices yet. National prices for whole hen turkeys averaged \$1.07 per pound in the second quarter of 2012, up just over 7 cents per pound from 2011 numbers. Whole turkey prices are expected to remain above year-earlier levels through the remainder of 2012, according to the USDA.

For more poultry information and statistics, see www.WATTAgNet.com/marketdata.html.

Taiwan builds Asia's first EU-style chicken house

Shi'an Farm in Kaoshiung City, Taiwan, is importing new equipment to construct the first Asian egg chicken house that will fit European Union standards.

Every mother hen must have at least 750 square centimeters of living space and the rooms must be at least 45 centimeters high. The width of the walking area and the length of the feed bunks also meet European Union standards. There are also egg-laying rooms, claw-rubbing rooms and a designated sleeping area in place of cages.

Manager of Shi'an Farm, Wenfeng Xie, said that the new chicken house will start off holding 120,000 chickens and producing 100,000 eggs per day, but will eventually rise to 500,000 chickens and 400,000 eggs per day.



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Around the World

At that rate, said Xie, the facility can produce 140 million or more eggs per year.

The price of the eggs is high, however; a single package can cost around NTD 10–12 (US\$0.33–\$0.40), which is three to four times as much as the price of normal eggs.

Bangladesh still struggling to recover from 2007 bird flu outbreak

Bangladesh's poultry industry is still struggling to recover from a 2007 outbreak of bird flu that closed two-thirds of the country's 150,000 related businesses and left half of the 5 million people who earned their income from it unemployed, according to reports.

Roughly 2.3 million chickens have been culled as a result of 550 avian influenza outbreaks since 2007. There were 171 outbreaks in 2011, and 21 so far in 2012. The most deadly year was 2008, with 226 outbreaks, according to the government's

Department of Livestock Services. Since 2008, farmers forced to kill their birds due to suspected H5N1 infections have been paid anywhere from US\$0.49 for baby chicks to more than US\$2 for older birds, but they say it's not enough. "Farmers often do not get the compensation, or get it [late] and face hassles to get it, resulting [in them] often selling the sick chicken in the markets, which is spreading the disease...and also threatening the public health," said Syed Abu Siddique, president of Bangladesh Poultry Industries Association.

Prices are going up, say industry experts, and the country may need to rely on imports soon.

Study determines energy available to broilers from corn distillers grains

Researchers at Purdue University have determined the amount of metabolizable energy available to young broiler chickens from dried corn distillers grains and dried corn distillers grains with solubles.

Currently, more than 35 percent of the annual U.S. corn crop is being used for ethanol production, resulting in less and more expensive corn for use in diets for poultry and other livestock. As a result, poultry growers have turned to DDG and, more often, DDGS, both byproducts of the ethanol production process, to provide an economically affordable substitute. The challenge, say researchers, has been to accurately determine the energy content of these fermentation byproducts.

"The energy and nutrients of different components of the feed are extracted at different parts of the bird's digestive tract, and not all of the energy in the feed is actually available to the bird," said Dr. Layi Adeola, the final article's lead author and a professor in Purdue's Department of Animal Sciences.

The DDG and DDGS were incorporated into a corn-soybean meal-based reference diet at three levels (0, 300 or 600 g/kg) by replacing the energy-yielding ingredients. The five diets were fed to 120 male Ross 308 broilers. □

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CELEBRATING



Special Interactive Report:

50 years of *Poultry International*

In celebration of the 50th anniversary of *Poultry International*, we looked at every issue of the magazine since 1962 to see how the worldwide poultry industry has changed and how *Poultry International* has influenced—and been influenced by—those changes.

On the following pages you will see a short summary of each year, along with a few headlines of key articles in that year, and a cover from one of the year's issues.

At the bottom of each year is a link that will take you to our interactive timeline at www.WATTAgNet.com/poultryinternational50.aspx. This interactive page provides more details on the year. Click on each headline to download a full copy of the article in PDF format.

We've also added some high points of world history, details on the growth of the magazine and a history of staffing changes to the online timeline. We hope you enjoy this trip through the history of *Poultry International*, which mirrors the international growth of the poultry industry and the exciting changes in the poultry industry in the last 50 years.

1962
The first year of *Poultry International* in 1962 offered global coverage of the poultry industries in England, Israel and Australia. Click on links to read articles:

- January 1962: "England's agribusiness"
- January 1962: "Israel: Rural country with a big poultry industry"
- April 1962: "Australia's large, commercial flocks lead poultry modernization"

Four issues were published in 1962.
Other topics covered included Ostrich Poultry House Design, Abing the Best Patterns of Low Cost, and How the Producer Can Benefit from Integration.
J.H. Flores was editorial director and Gerry Elyser editor.



The online timeline contains further details on each year, with links to download the featured articles.

Articles from each year of *Poultry International's* history are available as a downloadable PDF.

Australia
Large, Commercial Flocks Lead Poultry Modernization



Reports on Poultry Research

Sponsored by:





The beginning

Poultry International had incredible growth in its first decade, taking a unique place in the rapidly expanding worldwide poultry industry. The magazine quickly grew from being published quarterly to a monthly magazine by 1967.

You can read more details and the mentioned articles by following the link below each year.



1962

The very first year of *Poultry International* in 1962 offered global coverage of the poultry industries in England, Israel and Australia.

- * "England's agribusiness"
- * "Israel: Small country with a big poultry industry"
- * "Australia's large, commercial flocks lead poultry modernization"

www.WATTAgNet.com/1962.html



1965

In 1965, *Poultry International* reviewed the poultry industry's continued globalization.

- * "16 nations join Egg Commission"
- * "Review of the world poultry situation"
- * "How 8 experts view the poultry business"

www.WATTAgNet.com/1965.html



1966

Poultry International focused on the control of diseases, especially Leukosis, in 1966.

- * "Leukosis can be controlled"
- * "New findings on Leukosis may alter control methods"
- * "Isolation or exposure: Disease control controversy develops among British poultrymen"

www.WATTAgNet.com/1966.html



1969

Increasing performance while decreasing costs was the focus in 1969 in *Poultry International*.

- * "When do layers hit peak production?"
- * "How to cut cost of layer replacements"
- * "Rearing methods build foundation for layer performance"

www.WATTAgNet.com/1969.html



1970

Marek's disease took a toll on the poultry industry in 1970, and *Poultry International* addressed multiple ways to combat the disease.

- * "How much does Marek's cost in your flock?"
- * "Vaccine will be answer to Marek's"
- * "Is genetics the answer to Marek's control?"

www.WATTAgNet.com/1970.html

Research: Kayla Kling and Tara Leitner

1962 Cuban missile crisis >>
First person killed trying to cross Berlin Wall



1963 John F. Kennedy assassinated

1964 Nelson Mandela sentenced to life in prison

1965 Japan's Bullet Train begins service

1966 Mao Zedong launches the Cultural Revolution >>





1963

In 1963, *Poultry International* looked at how eggs were being produced around the world.

- * "How a big egg producer operates"
- * "How the British automate laying cage operations"
- * "Where eggs are produced in the US and why"

www.WATTAgNet.com/1963.html



1964

Poultry International examined the best environment for poultry in 1964.

- * "Wire floors: The system that failed?"
- * "What light is right?"
- * "How to keep chick-to-layer loss under 2%"

www.WATTAgNet.com/1964.html



1967

In 1967, the removal and disposal of cage manure was the center of attention in *Poultry International*.

- * "Deep pit cage system cuts manure removal costs"
- * "Part 1: The problem of cage manure disposal"
- * "Part 2: The problem of cage manure disposal"

www.WATTAgNet.com/1967.html



1968

Poultry International covered the Pleuro-Pneumonia Like Organisms-free program in 1968.

- * "Why go Pleuro-Pneumonia Like Organisms free?"
- * "How to go Pleuro-Pneumonia Like Organisms free"
- * "How to monitor Pleuro-Pneumonia Like Organisms free-programs"

www.WATTAgNet.com/1968.html



1971

In 1971, the *Poultry International* German edition offered several articles on broiler feeding, including how to formulate animal feed based on weather conditions.

- * "Low-protein diets may be used in broiler breeding"
- * "Energy content in broiler feed under hot weather conditions"
- * "Facts and errors in phase feeding"

www.WATTAgNet.com/1971.html

Be sure to visit

www.WATTAgNet.com/PoultryInternational50.html



to see the entire timeline, read more details of the magazine's history and to read all of the articles mentioned in this section.

1967

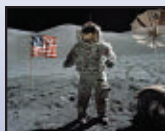
Six-Day War in the Middle East

1968

Prague Spring Tet Offensive in Vietnam War

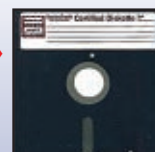
1969

Neil Armstrong first man on the moon >>



1970

Computer floppy disks introduced >>



1971

VCRs introduced



50 YEARS 1962-2012

Poultry International

Publication: Processing and Marketing: Poultry

Russian government to aid egg producers

Plus:

Panama's poultry industry to face new challenges

Namibian broiler integrator to become fully operational in 2012

Poultry processing—attention to detail and cost control

50 YEARS 1962 - 2012

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CONGRATS AND THANK YOU!

Poultry International - Always insightful!

If two young partners join forces in their early years, maintain a solid partnership for five decades and grow stronger together in the process, it is more than justified to call them a strong team.

This is certainly true for Poultry International and Big Dutchman. Together from the start, we have both grown steadily, expanding into new dimensions as we advance into the future.

We say Thank You for half a century of success and are proud, together with Poultry International, to be recognised as international market leader.



Big Dutchman



1972 to 1981

In its second decade, *Poultry International* continued its growth curve, along with the poultry industry. The expansion of the integrated business model played a big part in this, and was covered extensively in the '70s.

Read more details and the mentioned articles by following the link below each year.

1972

Poultry International focused on the European Economic Community and the UK's entrance into the commission in 1972.

- * "Fact finding tour of the EEC"
- * "Britain and the EEC"
- * "Britain in the EEC"

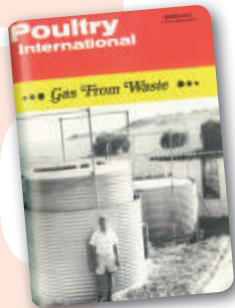


www.WATTAgNet.com/1972.html

1975

Using animal waste as a viable source of energy was a big trend in *Poultry International* in 1975.

- * "Turning droppings into gas"
- * "This Indian poultry farm runs on methane"
- * "Processed animal waste problems and opportunities"



www.WATTAgNet.com/1975.html

1976

Poultry International covered the growth of India's poultry industry in 1976.

- * "Indian poultry industry is growing up"
- * "Developing countries"
- * "Indian poultry industry on the progress march"

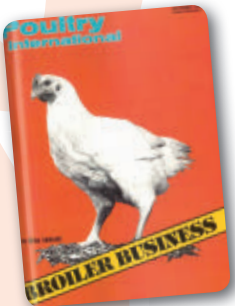


www.WATTAgNet.com/1976.html

1979

In 1979, artificial insemination was presented by *Poultry International* as an additional tool for poultry breeders.

- * "Aid to artificial insemination"
- * "Is there a future for artificial insemination with broiler breeders?"
- * "Artificial insemination: A tool for poultry breeders"

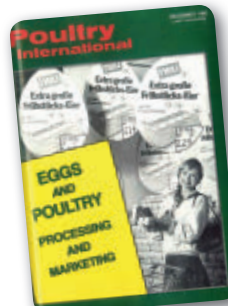


www.WATTAgNet.com/1979.html

1980

Poultry International reviewed how to cater to consumers' preferences in order to advance sales numbers in 1980.

- * "Consumer attitudes toward poultry"
- * "Yoke color in demand"
- * "Egg and poultry promotion"



www.WATTAgNet.com/1980.html

1972 Pocket calculators introduced >>



1973 OPEC hikes oil prices

1974 U.S. President Nixon resigns >>



1975 Microsoft founded

1976 North and South Vietnam join

1977 Elvis found dead >>





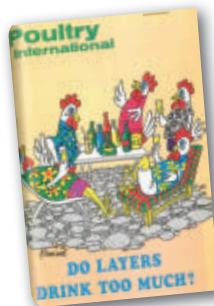
1973

In 1973, the poultry industry was mainly concerned with the hygiene of eggs, which *Poultry International* addressed in several articles.

- * "Egg washing in the ECC: The outlook is hopeful"
- * "Part 1: Hatching egg hygiene"

* "Part 2: Hatching egg hygiene"

www.WATTAgNet.com/1973.html



1974

Poultry International offered ways to trim feed and water consumption in 1974.

- * "Less feed for layers?"
- * "Limited feeding lowers costs"
- * "Cage layers may be drinking too much"

www.WATTAgNet.com/1974.html



1977

Poultry International focused on vaccinating against diseases found in hens and broilers in 1977.

- * "Mycosis and mycotoxicosis prevention"
- * "Newcastle disease vaccination in the hatchery"

* "Vaccination against infectious bronchitis in broilers"

www.WATTAgNet.com/1977.html



1978

Increasing the nutritional value of feed was on the minds of poultry producers in *Poultry International* 1978.

- * "Amino acids and protein"
- * "Iron requirement for hens established"
- * "Brewers dried grains in poultry feed"

www.WATTAgNet.com/1978.html



1981

In 1981, *Poultry International* attempted to take a look far into the future of the poultry industry, predicting what would happen in 2000.

- * "Facts and figures: Eggs in the year 2000"
- * "The next 10 years in broiler breeding"

* "Technical services in the future"

www.WATTAgNet.com/1981.html

Be sure to visit

www.WATTAgNet/PoultryInternational50.html

to see the entire timeline, read more details of the magazine's history and to read all of the articles mentioned in this section.



1978 John Paul II becomes Pope >>



1979 Sony introduces the Walkman >>



1980 CNN established >>



1981 Personal computers launched by IBM >>



1980



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2006



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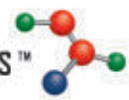


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2012



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WHAT'S NEXT?

It's a great question — and one we constantly ask ourselves at Kemin. Since our founding in 1961, Kemin has used breakthroughs in molecular science to help make the poultry industry increasingly safe, healthy and efficient.

As the poultry industry continues to change, Kemin will always ask "what's next" as we evolve our products and customer service capabilities. Finding science-based solutions to help producers feed the world has inspired us for more than half a century — and we're more excited than ever about our breakthroughs on the horizon.

WWW.KEMIN.COM

**Congratulations Poultry International
on 50 years of serving the industry!**



1982 to 1993

In the '80s, the magazine's two editors, Terry Evans and David Martin, travelled extensively around the world. The Middle East was seen as an area of rapid growth, with Asia seeing more and more coverage.

The link below each year's summary will lead you to more information and the articles listed for that year.

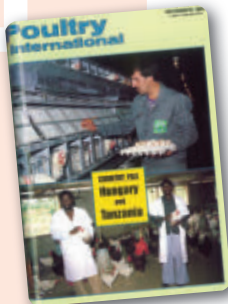


1982

Vaccines and their aid to chicken health were the hot topic in *Poultry International* in 1982.

- * "Birth of a vaccine"
- * "Chicken's immunity to disease"
- * "Vaccines and vaccination"

www.WATTAgNet.com/1982.html



1985

Poultry International returned to its truly international roots in 1985 with monthly profiles on the growing poultry industry in certain countries.

- * "Kenya: Kenchic go for fast food"
- * "Hungary: International cooperation plays an important role in industry development"

* "Tanzania: Education's vital role"

www.WATTAgNet.com/1985.html



1986

In 1986, *Poultry International* dissected the Middle East's growing poultry industry.

- * "Induced-molting: A new trend in Middle East"
- * "Training in the Middle East"
- * "Middle East breeder market review"

www.WATTAgNet.com/1986.html



1989

In 1989, self-selection feeding for pullets and layers was a trend for poultry farmers and was featured in *Poultry International*.

- * "Self-selection feeding layers"
- * "Part 1: Self-selection feeding for pullets"

* "Part 2: Self-selection feeding for pullets"

www.WATTAgNet.com/1989.html



1990

Poultry International covered the Middle East and Asia extensively in 1990.

- * "How India's industry has developed"
- * "Improving local chicken in Taiwan"
- * "Quails in Saudi Arabia"

www.WATTAgNet.com/1990.html

1982

Falkland Islands invaded by Argentina

1983

Soviets shoot down Korean airliner

1984

Indira Gandhi killed by two bodyguards

1985

Mikhail Gorbachev calls for Glasnost >>



1986

Ferdinand Marcos flees the Philippines

1987

New York Stock Exchange suffers huge drop >>



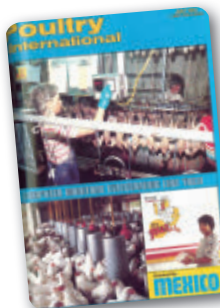


1983

In 1983, *Poultry International* offered ways to get the most out of feed, and in particular, feed for broilers.

- * "Putting an energy value on feed"
- * "Alternative vegetable protein sources in broiler rations"
- * "Impact of diet on broiler problems"

www.WATTAgNet.com/1983.html



1984

The use of computers throughout the poultry industry was highlighted in *Poultry International* in 1984.

- * "Computer control extends from farm to shop"
- * "Computer-controlled broiler growing"
- * "Monitoring eviscerating line yield"

www.WATTAgNet.com/1984.html



1987

Poultry International celebrated its 25th anniversary in 1987 and took the opportunity to reflect and also look forward to the next 25 years.

- * "Output to double in the next quarter century"
- * "Broiler industry in 25 years"
- * "Your place in tomorrow's egg industry"

www.WATTAgNet.com/1987.html



1988

Poultry International covered the use of the latest technology to ensure poultry quality in 1988.

- * "Machine vision: Poultry quality control by computer"
- * "Implementing a quality assurance scheme"
- * "Quality of genetically lean chickens"

www.WATTAgNet.com/1988.html



1991

In 1991, *Poultry International* offered practical tips for poultry producers and several articles about controlling various pathogens.

- * "Eating quality of poultry meat"
- * "Training tomorrow's managers"
- * "Salmonella: Perception versus reality"

www.WATTAgNet.com/1991.html

Be sure to visit

www.WATTAgNet/PoultryInternational50.html

to see the entire timeline, read more details of the magazine's history and to read all of the articles mentioned in this section.



1988 Pan Am flight 103 bombed over Scotland >>



1989 Berlin Wall falls >>



1990 Nelson Mandela freed

1991 Collapse of Soviet Union >>



1976

Poultry processors! Just a minute please.

You all know what it means: a precise processing system. You realize that the quality of your final product may depend on the precise functioning of all equipment.

It influences your profit and determines the hygiene of your processing plant.

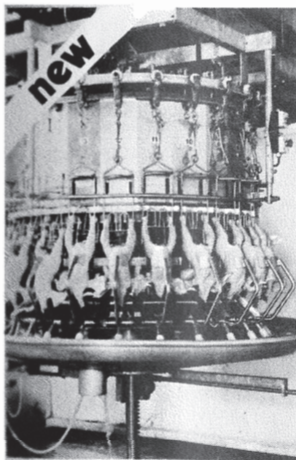
All kinds of . . . yells . . . which struck you every day, but in practise you can't deny them.

Neither do we, Stork PMT, manufacturers of poultry processing systems. With all modesty we feel that we can assist you with our advanced technique, our know-how in the field of industry and process, as well as with our international experience.

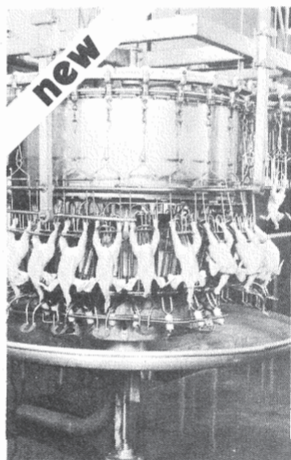
Big words too you will say? Then we can only recall the fact that Stork PMT have by far the greatest market share in the poultry processing industry throughout the world.

At any time we would like to have a talk with you.

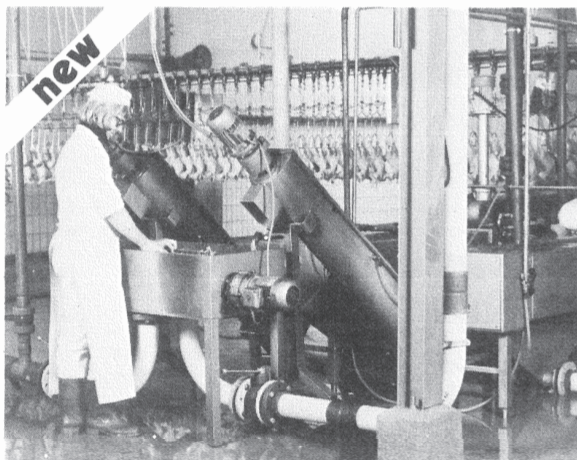
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We congratulate Poultry International on their 50th anniversary. It's a great achievement to stimulate the development of the poultry industry for decades!

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Over the years, many of our products have become benchmarks for the industry. At Eurotier 2012 we present 10 innovative products which offer benefits in important areas such as sustainability, process control, food safety and even higher yield.

We will continue to develop more fantastic products and solutions for the poultry industry. With Poultry International as the respected stage to promote them, you have a golden team!

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1992 to 2001

The '90s saw the continued rise of integration, consolidation of suppliers to the industry and computers playing a larger role in all businesses. The '90s also saw the launch of something called the Internet and the World Wide Web.

The Internet allowed the poultry industry to expand beyond the pages in the magazine.

The link below each year's summary will lead you to more information and the articles listed for that year.



1992

Poultry International's 30-year anniversary saw frequent articles on eggs as pertaining to marketing, production, processing and more.

- * "Update on China: The largest egg industry"
- * "Eggshell quality and microbial penetration"

* "Protecting the egg and the environment"

www.WATTAgNet.com/1992.html



1995

Growth and expansion in individual markets and the international landscape were detailed in Poultry International 1995.

- * "Growth in all sectors for 1995"
- * "India moving into the fast lane"
- * "Is the Asian market for you?"

www.WATTAgNet.com/1995.html



1996

Poultry International 1996 saw a breadth of coverage relating to biotechnology and genetic engineering as it applies to poultry production.

- * "Biotechnology in poultry breeding: From discovering heredity to the use of gene markers"

* "New genetics approach to breeding layers"

* "Feed the bird of tomorrow, today – Genetics: Nutrition interaction"

www.WATTAgNet.com/1996.html



1999

Throughout Poultry International 1999, the topic of poultry feed was extensively covered, including formulation and nutrition.

- * "Feeding the broiler of tomorrow"
- * "Feed additives in Europe"
- * "Improving the nutritional quality of feed"

www.WATTAgNet.com/1999.html



2000

As the debate over layer cages heated up in 2000, Poultry International covered several angles of the debate.

- * "Trade, welfare and food safety"
- * "Layer cages in Europe – to be or not to be?"

* "The future role of the EU poultry industry"

www.WATTAgNet.com/2000.html

1992 The Maastricht Treaty is signed, founding the European Union

1993 Use of Internet grows exponentially

1994 Channel Tunnel opens

1995 Digital cameras introduced

1996 Mad Cow disease hits Britain



1993

Technological advancements, particularly those utilizing computers, shaped *Poultry International* articles throughout 1993.

- * "Computers in production systems"
- * "Computerized vision grading system"
- * "Egg production complexes"

www.WATTAgNet.com/1993.html



1994

In *Poultry International* 1994 issues, several articles detailed how to improve production through poultry housing.

- * "Lighting program for broilers"
- * "Optimum housing design and management"
- * "Breeder house profitability"

www.WATTAgNet.com/1994.html



1997

The field of biotechnology continued to dominate *Poultry International* articles in 1997, as more was learned about its application and effects.

- * "Biotechnology revolution"
- * "Genetic selection: Strategies for the future – II"
- * "Breeding for 'label' production"

www.WATTAgNet.com/1997.html



1998

Eggs made a statement throughout issues of 1998 *Poultry International*, from nutrition to consumption trends to production.

- * "Eat eggs or die"
- * "'Golden' eggs: Nutraceuticals or antibody rich value-added egg products"
- * "How to improve egg production profits"

www.WATTAgNet.com/1998.html



2001

Springboarding off the layer cage debate in Europe, 2001 *Poultry International* further detailed welfare and housing for broilers.

- * "Broiler breeders: Balancing production and welfare"
- * "Labor saving hygienic broiler housing"
- * "EU welfare directive 'Draconian'"

www.WATTAgNet.com/2001.html

Be sure to visit

www.WATTAgNet/PoultryInternational50.html

to see the entire timeline, read more details of the magazine's history and to read all of the articles mentioned in this section.



1997

Hong Kong returned to China

1998

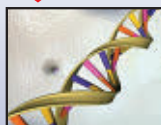
Russia averts financial collapse

1999

Euro the new European currency

2000

Human genome mapped



2001

September 11 terrorist attacks



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POULTRY INTERNATIONAL - FEBRUARY, 1978 - 53

april 1978

Archived Salmet advertisement from *Poultry International*, 1978

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*The deadline for submissions is 31 October 2012.



2002 to 2011

While remaining a print magazine, *Poultry International* offered digital editions readable on computers, and later on smart phones and tablets.

Welfare and housing for poultry became central issues in Europe while avian flu outbreaks in Asia raised poultry and human health concerns.

For more details on these stories and others, follow the link below any year.

2002



Poultry International celebrated its 40th anniversary in 2002 by reviewing the past 40 years and predicting where the poultry industry will be in a decade.

- * "What lies ahead in commercial broiler production?"
- * "Half a century of egg production – the industry's development from 1962-2012"

* "The future of poultry nutrition"

www.WATTAgNet.com/2002.html

2005



Poultry International focused on biosecurity to prevent disease outbreaks in 2005.

- * "Biosecurity doesn't cost – it pays!"
- * "Break the cycle of infection: Effective rodent control helps protect flocks from disease"

* "Planning – a vital first step in disease prevention"

www.WATTAgNet.com/2005.html

2006



Poultry International reported the financial impact of avian influenza on the poultry market in 2006.

- * "Avian influenza casts a shadow over poultry growth prospects in Asia"
- * "H5N1 hits Africa head on – but all eyes are looking elsewhere"

* "A challenging year for Europe's top 10 poultry companies"

www.WATTAgNet.com/2006.html

2009



Poultry International reported on the growth in the Asian poultry industry in 2009.

- * "Asia's eggs processors set for growth"
- * "China's poultry to gain from higher exports"

* "VIV Asia showcases Far East's success"

www.WATTAgNet.com/2009.html

2010



Articles in *Poultry International* 2010 indicated global outlook for the poultry industry was positive.

- * "2010 positive for global poultry production"
- * "Decade of growth ahead for global broiler industry"

* "Poultry producer survey reveals positive outlook"

www.WATTAgNet.com/2010.html

2
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2 North Korea develops nuclear arms

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3 Blackberry smart phone introduced >>



2
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4 Tsunami devastates Asia >>



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5 Pope John Paul II dies

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6 Saddam Hussein executed



2003

With poultry welfare being the focus in Europe in 2003, *Poultry International* dissected what it meant for producers around the world.

- * "Trying to make sense of poultry welfare issues in the EU"
- * "Measuring and auditing broiler welfare"
- * "Layer welfare symposium – some questions answered but plenty of problems still to solve"

www.WATTAgNet.com/2003.html



2004

In 2004, *Poultry International* examined the effects of the 2002 avian influenza outbreak in Chile and the 2003 outbreak in Asia.

- * "Avian influenza: Lessons for the future"
- * "The ripples from avian influenza – the future of the world poultry industry"
- * "Learning to live with avian influenza"

www.WATTAgNet.com/2004.html



2007

In 2007, *Poultry International* investigated the trend of using green and sustainable practices in the production of poultry.

- * "Powering the poultry industry of the future"
- * "Introducing the world's first 'green' supermarket eggs"
- * "Turn eggshell waste into a valuable resource"

www.WATTAgNet.com/2007.html



2008

As demand for eggs was growing, *Poultry International* covered the production and marketing of eggs in 2008.

- * "Free-range eggs with a boost of omega-3"
- * "Egg quality affected by management factors"
- * "Global egg uptake to grow by 12mt by 2015"

www.WATTAgNet.com/2008.html



2011

Poultry International 2011 offered articles to improve poultry yield and quality.

- * "Managing poultry cooking for yield, quality"
- * "Improving yield and quality in fried poultry"
- * "UK broiler producer continues to raise output and quality"

www.WATTAgNet.com/2011.html

Be sure to visit

www.WATTAgNet/PoultryInternational50.html

to see the entire timeline, read more details of the magazine's history and to read all of the articles mentioned in this section.

We hope you enjoyed this look back at the first 50 years of Poultry International.

Research: Kayla Kling and Tara Leitner

2007

Romania and Bulgaria join the EU

2008

U.S. financial crisis starts great recession

2009

Barack Obama first black U.S. President

2010

Apple releases iPad



2011

Poultry International launches app for iPhone and iPad





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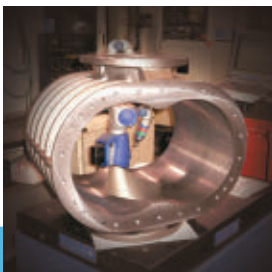
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Growth ahead for German broiler and egg industries

There is still plenty of room for expansion in this major European market.

EuroTier returns to Hanover, Germany, this year in November, and 2012 will also host the World Poultry Show. Germany, home to Europe's largest economy, is also home to significant poultry and egg industries.

The country has a population of some 81 million. Among Europeans, German consumers have some of the highest levels of disposable income.

Broiler production

While poultry meat consumption levels are relatively low in the country, poultry meat production has risen in Germany over the last decade, accompanied by the necessary expansion in processing facilities. The growth in the poultry sector has been primarily in chicken production, with turkey meat and duck consumption appearing to have reached their upper limits at 6.0 kg and 1.0 kg, respectively.

As in many other countries, poultry meat production in Germany is forecast to continue expanding. Apart from aquaculture, poultry meat

production is the only sector of farm animal production that continues to grow at a significant rate, according to Klaus Damme, writing in *Lohmann Information*.

Perhaps surprisingly, per capita poultry meat consumption is lower in

Read this article in your language:



Portuguese:

www.WATTAgNet.com/151974/1046.html



Spanish:

www.WATTAgNet.com/151974/1034.html



French:

www.WATTAgNet.com/151974/1036.html

This article has been translated from English using Google Translate.

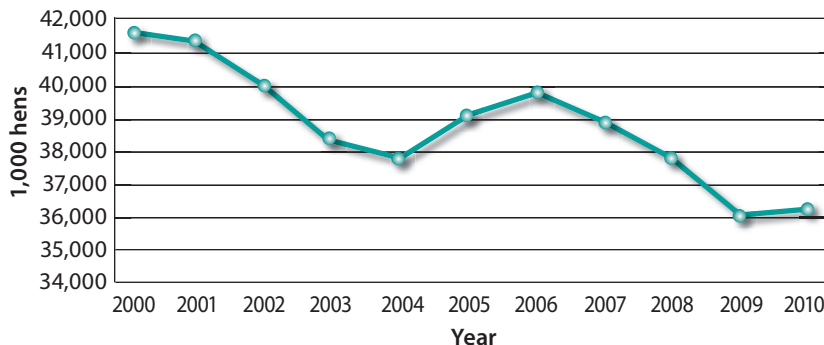
EuroTier and the World Poultry Show adopt increasingly international outlook



With 30 percent more exhibition space, this year's EuroTier will host some 2,100 exhibitors and have a more international outlook than ever before. A survey carried out earlier this year revealed that European farmers are in a confident mood. Some 3,000 farmers were surveyed. Of particular note, the survey found that producers were keen to invest in animal husbandry, with expectations more favorable in Germany, France and the UK in particular.

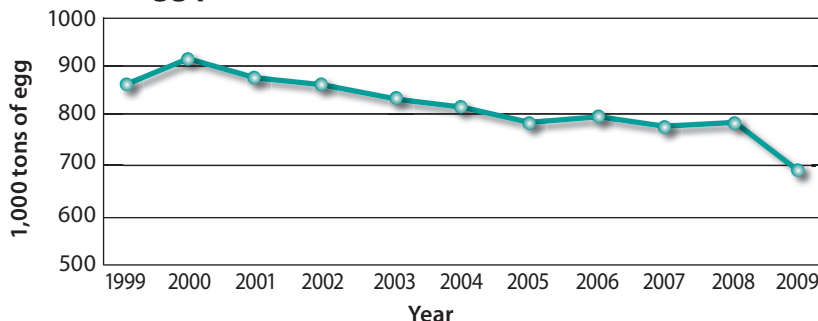
Animal production trade show EuroTier will return to its regular venue of the Exhibition Grounds, in Hannover, Germany, on November 13th-16th 2012. The event's organizers

Number of layers in Germany



The number of laying hens kept in Germany has declined by over 10 percent since the start of the century.

German egg production



German egg production during 2000-2009 declined by 22.5 percent.

say that this year's show will play host to all the leading suppliers of machinery and equipment for animal production, farm inputs and animal breeding and will offer a full program covering all aspects of modern poultry and livestock farming.

To date, more than 2,100 exhibitors from 50 countries have booked stands at EuroTier and, according to the most recently available figures, the international contingent will boast more than 1,000 exhibitors—a 25 percent increase on the last show.

The Netherlands again leads the field of overseas exhibitors with 176 companies present, while strong exhibitor participation is also already

evident from France (134 companies), Italy (84), China (75), Denmark (69), Spain (63), and the UK (55).

EuroTier will be bigger than ever this year—some 30 percent bigger—with 250,000 m² of exhibition space.

EuroTier project manager, Dr Karl Schlosser, comments: "This booking level is well above the figures at a comparable time for the last event two years ago. EuroTier is thus growing into a new dimension."

There will be a unique program at Hannover's Exhibition Grounds in November addressing the pig and cattle sectors and the poultry sector with the "World Poultry Show," the latter, the organizers

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Growth ahead

Germany than across the 27 European Union Member States as a whole. In 2009, per capita consumption of poultry meat stood at 18.6 kg, while across Europe the figure stood at 23.1 kg, and in the U.S. it was more than double—48.8 kg. This suggests that there is still room for demand for poultry meat to rise in the country.

Egg production

German egg production is also forecast to expand over the coming years; however, the sector has been through a difficult period.

In 1990, Germany was thought to be the eighth largest egg producer in the world. Yet, by 2010, it had fallen back to 15th position, losing ground to other European and Middle Eastern countries.

Unlike in most other European countries, the German government does not allow producers to use enriched cages, and in the time up to the January 1, 2012, conventional cage ban, the sector had to comply with even more stringent requirements than its competitors in other European countries. Barn systems are now the predominant means of housing laying hens in Germany, with some two-thirds of the laying flock being kept this way.

Despite an investment of Euro 200 million, the change has resulted in a decline in the national flock and a notable contraction in output.

Data from Professor Hans-Wilhelm Windhorst, University of Wechta, reveal that in 2005, there were 43.5 million laying hens in Germany, but by 2010, this number had fallen by 15.5 percent to 36.7 million birds. Over the same period, the number of farms with fewer than 3,000 birds fell by 6.8 percent as smaller farms and older farmers exited the market.

In 2002, the country was able to satisfy 74 percent of local demand for eggs. By 2010, this figure had fallen to only 55 percent. In the 12 months prior to June 2010, egg production

EuroTier/*continued*

say, will be the highlight of the year for the world's poultry industry. Outstanding exhibitor interest has already been reported in the field of bioenergy and EuroTier will again play host to "Bioenergy Decentral."

Feed Gallery

Amongst new features at the event this year will be the "Feed Gallery."

Milk, meat and egg production require large quantities of high-grade feedstuffs and, for the first time, visitors will be able to see the variety and broad base of raw materials for themselves. The most important of the 600 feed materials listed under European Union feed law and the German positive list will be presented in the Feed Gallery.

Animal Welfare Info Gallery

The DLG, the German Agricultural Society, will, for the first time, offer open discussion sessions on the theme of animal welfare.

Two discussion panels will be held daily following the round table principle. These sessions will be chaired professionally and feature experts representing opposite positions on the various topics.

The events will be supplemented by "information islands" on the subject of animal welfare in animal husbandry and management, allowing visitors to become fully up to date on all aspects of animal welfare.



EuroTier 2012

Alongside the commercial exhibition at EuroTier 2012, there will be an extensive technical program offered by exhibitors, associations and other experts. There will be forums and discussion panels, Bioenergy Decentral and the Association of Veterinary Practitioners will be holding its annual congress. 2012 sees the return of the World Poultry Show.

- * **Where:** Exhibition Grounds, Hanover, Germany
- * **When:** November 13-16, 2012
9:00-18:00
- * **Telephone:** +49.69.24788.265
- * **Email:** expo@DLG.org
- * **Website:** www.eurotier.com

declined by 800 million.

Unsurprisingly, the number of eggs and egg products imported to the country has risen greatly. This, along with the need to invest to upgrade farms, has not been the only challenge that the sector has had to face; there has also been dramatic price volatility.

For those poultry meat and egg producers looking to tap into the potential that the German market still offers, a first port of call at this year's EuroTier could be the World Poultry Show. The event's organizer, the DLG, says its return will make EuroTier the

highlight for the entire international poultry industry. The organizer adds there will be high levels of synergy for poultry producers given the cross-species exhibition sectors at the event, such as feed and feed storage; animal health and heating; and ventilation and air conditioning for animal housing.

The DLG notes EuroTier 2010 achieved a record high of 1,900 exhibitors and 145,000 visitors. This year, more than 2,000 suppliers to the agricultural industry can be expected, 200 of which will be there for the first time. □



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UK pullet producer sees business benefits of careful planning



Family-run pullet farm reaps benefits from planning for the future and keeping in with the neighbors.

John Jewson, a poultry farmer in East Anglia, UK, has a farm surrounded by houses on three sides and has had to tread a careful line between running his business and keeping his neighbors happy. While the family farm has reared various species over its history, Jewson has found that poultry farming is now the answer.

At Poplars Farm, near Wisbech in Cambridgeshire, Jewson has three sheds and approximately four acres, from which he runs a commercial pullet replacement operation, taking in free-range chicks and rearing them to point of lay.

"It is a very niche operation," said Jewson. "This is realistically the only kind of farming that can fit onto a site like this."

Changing circumstances

It hasn't always been like this, though. Jewson, aged 57, is the third generation of his family to work the farm.

It was set up 110 years ago by his grandfather, Jacob Jewson, who was a wheelwright and coffin maker before branching out into farming.

"He actually bought the land for someone else, but then decided he liked the look of it and began to farm it himself," said Jewson.

His father then developed the farm after World War II, when it was mainly a pig farm, keeping approximately 100 breeding sows. Twenty years ago, the farm began to see the potential for free-range chickens. By then, much of the land surrounding the house had been developed for residential use.

"It's just as well we moved into chickens because I think running a pig farm would be very hard here now," laughed Jewson.

"But we are able to keep a very tidy operation with the chickens, and we have never actually had a complaint from our neighbors."

He rears the chicks for Country

John Jewson raises birds for Country Fresh Pullets. Typically, he may have 30,000 birds on his farm at any one time.

Read about how a U.S. producer is using solar power: Solar power to heat water for turkey processor

www.WATTAgNet.com/147516.html

Fresh Pullets, keeping them for 16 weeks before passing them on. The type of breed reared varies greatly depending on what kind of stock needs to be replaced. At the moment, John has 10,000 Hy-Line Brown and 20,000 Lohmann Brown in his sheds.

"It's a very tight operation; my wife does the book-keeping, and I do just about everything else. I don't like to count the hours I do in a day," he said.

"When the chicks first come in, you are walking round every six hours, night and day, to check everything is OK and dealing with



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Careful planning

any problems that have arisen.”

However, he has found modern improvements in farming methods have made running the farm easier.

“It’s all automatic feed lines now. One great development in the last few years has been the increasing use of modules for moving the chickens round,” Jewson said. “That’s been an investment that has really paid off. It’s very welfare friendly for the chickens and makes life a lot easier for the catchers.”

Jewson said so far, his business has not been badly hit by the recession, although he has a worried eye on future developments in the market.

“At present, the economic climate is not making a big difference to our business, but if the egg price dropped, we would feel it,” Jewson said. “A lot of that is down to the producers getting their figures right, if there are too many chickens on the



Jewson installed solar panels on the ground rather than on top of pullet houses, thus avoiding potential weight and dust issues. The installation has received support from nearby residents.

floor around the country we could have oversupply. For now, however, they seem to be getting it right.”

Investments should be recognized

Jewson is also proud of the independence of poultry farmers but

feels the government could do more to help the industry.

“We always stand on our own feet; we don’t ask for help in the way of grants or subsidies. Poultry farmers have made big investments in the last few years in improving welfare conditions. I would like

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the government to make sure that imports stick to the same standards.”

Despite the long family history at the farm, Jewson does not think his sons will be going into the business.

“They see the long hours I work, and the holidays I don’t take, and they think there has to be a better way of making a living,” he said.

The poultry side of the farm has a turnover of approximately £50,000 a year, and Jewson has had to diversify. He has discovered a talent for renovating property and now has his own building company, developing properties to rent in the area.

Eye on the future

His most recent investment on the farm has been a solar power system, which cut his electricity bills by 50 percent. The 50 kilowatt ground-mounted system occupies a small parcel of land next to the chicken sheds and in daylight conditions turns the

farm into a completely green operation with power left over to export to the grid. The panels were installed by EvoEnergy, one of the country’s largest solar power companies.

“They are actually doing better than we expected, producing approximately 20 percent more electricity than anticipated,” said Jewson. “On a typical day, we are using approximately 12 kilowatts of power, and the panels are producing approximately 40 to 48 kilowatts.”

Under the feed-in tariff scheme, designed to encourage businesses and homeowners to produce more green electricity, Jewson is paid for the electricity he produces. He is also paid for exporting power to the national grid. “The scheme lasts for 25 years, and I often joke that this is my pension, because it will be generating money as well as electricity long after I’ve retired,” said Jewson.

Jewson decided to go for a

ground-mounted system rather than put the panels on the roofs of his sheds, because he was worried about adding extra loads onto the roofs. He also felt the dust from the ventilation system might settle on the panels.

The panels are close to the houses around the farm, and Jewson feared that there might be objections.

“In fact, we didn’t have any objections, and one neighbor wrote in a letter of support,” said Jewson.

Working surrounded by houses, he has built a successful poultry farm. Jewson uses the latest developments to run a more efficient business and be a better neighbor. □

› *Rob Pittam is a freelance writer and broadcaster. A former BBC business correspondent and presenter on the Working Lunch program, he now specializes in agriculture and renewable energy issues.*

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Disinfection of poultry housing is essential to performance.

Following a few simple steps can ensure the producer reaps the maximum benefit.

Tighter controls around the world on in-feed antibiotics have increased the importance of disease prevention through vaccination and biosecurity. The change in legislation has resulted in new challenges for producers including the increased incidence of necrotic enteritis in broilers, previously controlled by using ionophore feed additives.

The poultry farmer is constantly under pressure to drive down other diseases such as *Salmonella*, with the specter of legislation against new diseases such as *Campylobacter* always on the regulatory authority's radar.

Biosecurity, at its best, offers poultry good protection against a wide range of diseases through exclusion of diseases from the housing. A visit to any great grandparent poultry housing will demonstrate the recognition of the need for good biosecurity. On the other hand, there is always a cost attached to this type of high-level biosecurity and so the layer and broiler farm have to combine good biosecurity practices with cost control.

At the heart of biosecurity are disinfectants and sanitizers. Used correctly, these products can make the difference between healthy,

How to properly disinfect poultry production sites

productive birds and a poorly performing farm.

There is no best disinfectant

This shift in emphasis toward disease prevention has pushed the use of disinfectants and biosecurity products to the fore. It has also raised the question of which is the best type of disinfectant. The answer is simple: there is no best disinfectant!

Each product has its own benefits and shortcomings. When choosing a disinfectant, the key is to understand the needs of the farm in question and the properties of the disinfectants available.

In order to work out which disinfectant provides the optimum solution, there are a few questions that need to be answered:

- ★ **Which type of disease organism needs to be controlled?** e.g. bacteria, viruses (enveloped or non-enveloped), fungi
- ★ **What has to be disinfected?** e.g. buildings, equipment, water, transport, personnel

★ **How can the efficiency of footbaths be improved?** e.g. coping with extremes in temperature, high organic matter, etc.

In order to make a comparison between the various disinfectant types, it is important to find an unbiased source of information upon which to base a judgment.

Many countries have independent sources of information. In Europe, one of the best is provided by the German veterinary association's website www.dvg.de, where a comparison can be made across various disease groups.

The tables show the range of dilutions approved by the DVG for products of each type of microorganism. It is interesting to note that these concentrations do not agree with most of the manufacturer's recommended concentrations. This is probably connected to the manufacturer's wish to be more cost-effective than competitors. Recommendations are based on the product's efficacy when used in ideal conditions. Note that the DVG tests

Independent bodies often recommend greater disinfection concentrations than those recommended by manufacturers

ENVELOPED VIRUS (Influenza) - dilutions recommended by various disinfectant testing bodies

AOAC (USA)	FAO/OIE test	DEFRA (UK)	DVG (Germany)
1:400 / (0.25%)	1:400 (0.25%)	1:150 (0.66%)	1:200 (0.5%)

BACTERIA (*Salmonella*) - dilutions recommended by various disinfectant testing bodies

AOAC (USA)	DEFRA (UK)	DVG (Germany)
1:400 / (0.25%)	1:49 (2%)	1:33 (3%)

It is easy to see which dilution would be recommended by the manufacturer, but which dilution would be better for disease control?

Range of disinfectant dilutions approved by the DVG for each type of microorganism

Table 1: Non-enveloped viruses
i.e. Gumboro (IBD), Egg Drop Syndrome (EDS)

Range of dilutions for each type	Concentrations of disinfectants approved				
	0.5%	1.0%	2.0%	3.0%	4.0%+
Glutaraldehydes + Formaldehyde		✓	✓		
Glutaraldehyde		✓	✓		
Glutaraldehyde + Quaternary Ammonium salts		✓	✓	✓	✓
Oxidising disinfectants*	✓	✓	✓	✓	
Chlorocresol			✓		

*This group includes peroxygen-type products

Table 2: Enveloped viruses
i.e. Newcastle Disease Virus (NDV), Avian Influenza Virus (AI)

Range of dilutions for each type	Concentrations of disinfectants approved				
	0.5%	1.0%	2.0%	3.0%	4.0%+
Glutaraldehydes + Formaldehyde	✓	✓			
Glutaraldehyde	✓	✓			
Glutaraldehyde + Quaternary Ammonium salts	✓	✓			
Oxidising disinfectants*	✓	✓			
Chlorocresol		✓			

*This group includes peroxygen-type products

Table 3: Bacteria
i.e. Salmonella enteritidis (SE), Salmonella typhimurium (STM)

Range of dilutions for each type	Concentrations of disinfectants approved				
	0.5%	1.0%	2.0%	3.0%	4.0%+
Glutaraldehydes + Formaldehyde		✓			
Glutaraldehyde		✓	✓		
Glutaraldehyde + Quaternary Ammonium salts		✓	✓	✓	
Oxidising disinfectants*		✓	✓		
Chlorocresol			✓		
Quaternary Ammonium Salts	✓	✓	✓	✓	

*This group includes peroxygen-type products

Table 4: Fungi i.e. aspergillus

Range of dilutions for each type	Concentrations of disinfectants approved				
	0.5%	1.0%	2.0%	3.0%	4.0%+
Glutaraldehydes + Formaldehyde		✓			
Glutaraldehyde		✓	✓		
Glutaraldehyde + Quaternary Ammonium salts		✓	✓	✓	✓
Oxidising disinfectants*	✓	✓	✓	✓	✓
Chlorocresol			✓		
Quaternary Ammonium Salts	✓	✓	✓		

*This group includes peroxygen-type products

■ = mode of the data i.e. the most commonly occurring dilution.

Table 5: Effective concentration of product to be used as a general building disinfectant

	0.5%	1.0%	2.0%	3.0%	4.0%+
Glutaraldehydes + Formaldehyde		✓			
Glutaraldehyde			✓		
Glutaraldehyde + Quat. Ammonium salts					✓
Oxidising disinfectants*			✓		
Chlorocresol			✓		
Quaternary Ammonium Salts			✓		

Tables 1-4 show that typical products from the various groups would be effective as general building disinfectants if used at the dilutions given in Table 5.

Properly disinfect

The types of disinfectants, which are commonly used on poultry farms and the applications for which they are suitable, are listed here. This undermines the fact that a range of products may be needed to give complete disinfection of different elements around the farm.

are conducted at low temperatures and with a high organic matter loading. They therefore represent the worst possible environment in which a disinfectant can be effective.

Another problem for the farmer is how to compare products when they are all tested under different conditions. In general, the European tests are more demanding than the equivalent U.S. testing procedures. This is clearly demonstrated by comparing the approval rates by different authorities of one of the leading glutaraldehyde and quaternary

Suitability of product to be used in various instances/situations

	Animal Housing	Equipment	Vehicles	Foot dips	parasites	Food preparation	Water	Personnel
Glutaraldehydes + Formaldehyde	✓	✓	✓	✓				
Glutaraldehyde	✓	✓	✓	✓				
Glutaraldehyde + Quat. Ammonium salts	✓	✓	✓	✓				
Oxidising disinfectants*	✓			✓			✓	
Chlorocresol	✓	✓	✓	✓	✓			
Quaternary Ammonium Salts	✓	✓	✓	✓		✓	✓	✓
Organic acids							✓	

This group includes peroxygen-type products

ammonium salt disinfectants.

The failure of manufacturers to recommend the optimum concentration for their products could well be responsible for the common

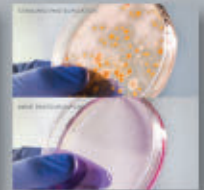
belief that resistance builds up against disinfectants and so changing the type of disinfectant is required. From our own experience, if the product is used at the "correct" concentration, i.e.

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Different active ingredients have different abilities to withstand the presence of organic matter before the footbath solution should be renewed. The table is headed "a rough guide" because the build-up of organic matter in the footbath can vary widely, and the ability of the disinfectant to withstand its presence also depends upon the concentration of the disinfectant solution.

as recommended by an independent organization (such as the Department for Environment, Food and Rural Affairs in the UK and DVG in Germany), we have never seen resistance build up against a disinfectant.

No single disinfectant is suitable for every use

In a perfect world, all disinfectants would kill all bacteria, viruses and fungi on all surfaces without being dangerous in any way to humans, wildlife, equipment and

A rough guide – how often to change your footbath disinfectant per week

	Light soiling	Heavy soiling
Glutaraldehydes + Formaldehyde	1	2
Glutaraldehyde	2	3
Glutaraldehyde + Quat. Ammonium salts	2	3
Oxidising disinfectants*	2 - 4	3 - 7
Chlorocresol	1	2
Quaternary Ammonium Salts	2	3
Iodophores	2	3

This group includes peroxygen-type products

vehicles. They would be active at all temperatures and not be affected by the presence of organic matter. However, we do not live in an ideal world, and no single disinfectant is suitable for every use! Regional variations in climate, farm-building materials, animal genetics and

management all impact on efficacy.

One of the most testing environments in which to farm is Asia, where the climatic conditions are perfect for bacterial and fungal growth. In addition, large numbers of insects mean diseases can be spread quickly from farm to farm, increasing

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Properly disinfect

the disease challenge.

These conditions, and the extensive use of organic-based building materials, mean disinfectants with higher glutaraldehyde contents are highly suitable for this region.

Different countries and regions may also prefer different methods of application, whether spray, foam or fogging. The farmer must match the disinfectant with the particular needs of the farm and not just buy on price!

There is one thing all disinfectants have in common: they will not work

if they do not come into contact with target organisms. Success depends on thorough cleaning. Time spent cleaning surfaces for disinfection is never wasted.

Choosing the most appropriate product can be confusing as manufacturers tend to claim that their products work in all situations. At best, some disinfectants are suitable in most applications, providing the correct concentration is used. The table can be used as a guide to the correct choice of disinfectants, but it is a generalization and therefore it is recommended that the supplier's instruction be referred to.

The overriding rule is to clean first, then to disinfect. A suitable regime would comprise the following:

- * **Dry-clean**—remove organic matter and dirt (mechanically/by hand)
- * **Wet-clean**—apply a suitable detergent (alkaline- or acid-based) to remove the grime without damaging the object
- * **Clean down** and rinse with water using suitable pressure washer equipment as appropriate
- * **Surfaces** can be tested at this stage for presence of protein; re-clean if tests show the surfaces are still dirty.
- * **Rinse with water**
- * **Dry** (if the surfaces are still wet the dilution of the disinfectant will increase)
- * **Disinfect**—preferably dry surfaces to avoid diluting the disinfectant
- * **Rinse when necessary**, or allow to dry

Recommended application rates and exposure times are important. Disinfectants need time in contact with the organisms they are to destroy if they are to be effective.

Your footbath disinfectant is probably not ideal

A footbath presents a unique disinfection problem. The disinfectant has to work in an environment where the temperature may change day to day, the organic matter continually increases and rain can dilute the disinfectant solution. In these situations one would expect that manufacturers would advise on "best practice," but

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that is sometimes far from the truth. It is, therefore, likely that a footbath disinfectant is far from ideal. It may be ineffective because of high organic matter loading, or too dilute because of rain. Alternatively, it may be too concentrated, so wasting money!

The modern footbath allows the user to measure the amount of disinfectant and water to produce the recommended concentration. It will have a lid to stop rain diluting the disinfectant solution and will be simple to incorporate into the farm's standard operating procedure. It will also facilitate auditing by having a removable label with the date of fill, type of disinfectant batch number and concentration, etc.

Some general rules and tips about footbaths and disinfectants:

- ✱ In general, a disinfectant should be used in a footbath at twice the concentration used for buildings.
- ✱ Glutaraldehydes will see their activity drop in low temperatures. However, the Department for Environment, Food and Rural Affairs and DVG tests are conducted at 4C so all disinfectants will work sufficiently down to this temperature and lower. At higher temperatures glutaraldehydes are even more effective.
- ✱ All disinfectants are affected by high levels of organic matter, but oxidizing disinfectants are more affected and need to be made up in higher concentrations. They should also be changed more regularly (daily) to ensure they are working effectively.
- ✱ If a footbath is allowed to freeze, some disinfectants will be denatured and should be changed.
- ✱ It is advisable to make sure the footbath is covered to prevent rain diluting the disinfectant.
- ✱ A pH test on the footbath's

➤ *Jim Bigmore is managing director of Hysolv Ltd., a company that specializes in biosecurity products, and provides products and consultancy services.*

disinfectant only tells the footbath's pH and does not indicate whether the disinfectant is still effective.

Some manufacturers recommend pH testing to see whether the solution needs changing, but have not tested their product with differing amounts of organic matter and at various pHs

using an independent test protocol. Without this type of test, the pH of a disinfectant containing organic matter is meaningless.

Understanding the properties of disinfectants can be a precursor to thorough disease-prevention protocol on any farm. □



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Modest growth forecast for Mexico's poultry and feed industries

Expansion in the poultry industry should help to keep Mexico's feed industry in positive territory.

Mexico's compound feed production is expected to record a slight increase this year, driven by demand from the poultry industry.

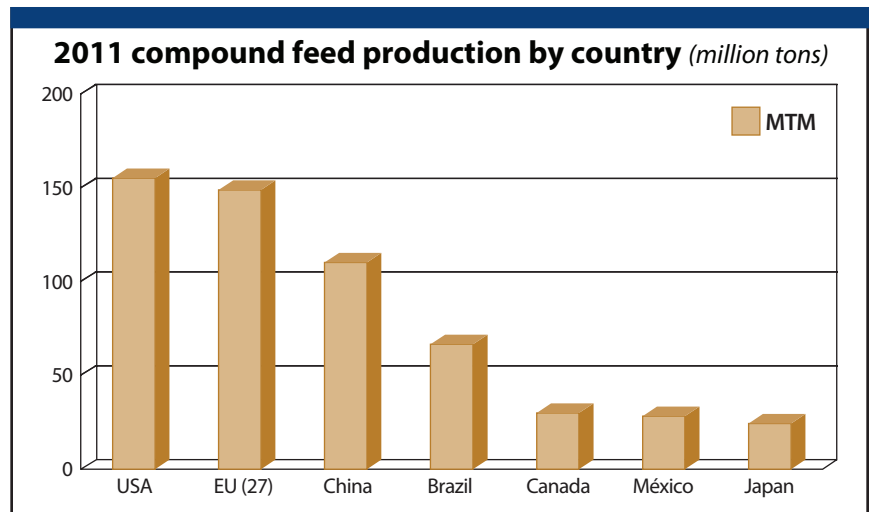
In 2011, compound feed production in the country expanded by 0.7 percent, reaching 28.3 million tons. In 2012, this figure is expected to reach 28.8 million tons, an increase of 1.7 percent.

Poultry remains the largest consumer of feed in Mexico, followed by the dairy and pig sectors. By the end of the year, egg production is forecast to have grown by 1.5 percent to reach 2.56 million tons, while broiler production is expanded to 2.95 million tons, an increase of 1.3 percent.

These increases will result in the sector consuming some 14.9 million tons of compound feed, or 51.8 percent of the total feed produced in the country.

More of the same

The forecasts come from Mexico's council of compound feed manufacturers and animal nutrition, CONAFAB, which notes that Mexican feed manufacturers, like their counterparts in other countries, had



One of the 10 largest feed producers in the world, Mexico would be ranked within the top five if the EU 27 were considered as individual countries.

Read this article in your language:



Portuguese:

www.WATTAgNet.com/152092/1046.html



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This article has been translated from English using Google Translate.

to cope with high levels of volatility in agricultural and financial markets last year.

This resulted in high prices for raw materials—particularly grains and oil seeds, transport, and electricity—pushing up the price of feed production.

The Mexican animal feed industry imports large quantities of raw materials, making it particularly vulnerable to fluctuations in

exchange rates.

For example, at the end of 2010, a ton of sorghum and corn in Mexico cost Mex\$2,800, while the average for 2011 was Mex\$4,400—an increase of 65 percent. A similar situation occurred for other raw materials.

This was not the only difficulty faced by the agricultural sector in 2011, which was also affected

by adverse climatic conditions. Some parts of the country are continuing to experience drought conditions while others have experienced frost.

Animal production as a whole in 2011 was stagnant, due to the factors mentioned above.

However, in addition to this, demand for products of animal origin on the home market was weak, and there was greater competition from

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* **Where:** Expo Guadalajara – Halls Jalisco A & B, Guadalajara

* **Web:** www.vivamericalatina.nl

imports, which are often seen as entering the market with an unfair advantage. Despite these problems, poultry production was slightly higher last year.

Poor harvest, weak economy

The outlook for 2012 is broadly similar to the situation recorded for 2011, in that the factors that acted as a drag on growth last year will continue their negative influence through the remainder of this year.

The continuing lack of rainfall means that there will be no upturn in nationally produced grains, and a weak economy and high levels of unemployment in Mexico mean that demand for products of animal origin is unlikely to increase in the short-term.

In addition, changes in the political arena and the election of a new government could result in a period of uncertainty as the new administration finds its feet. □

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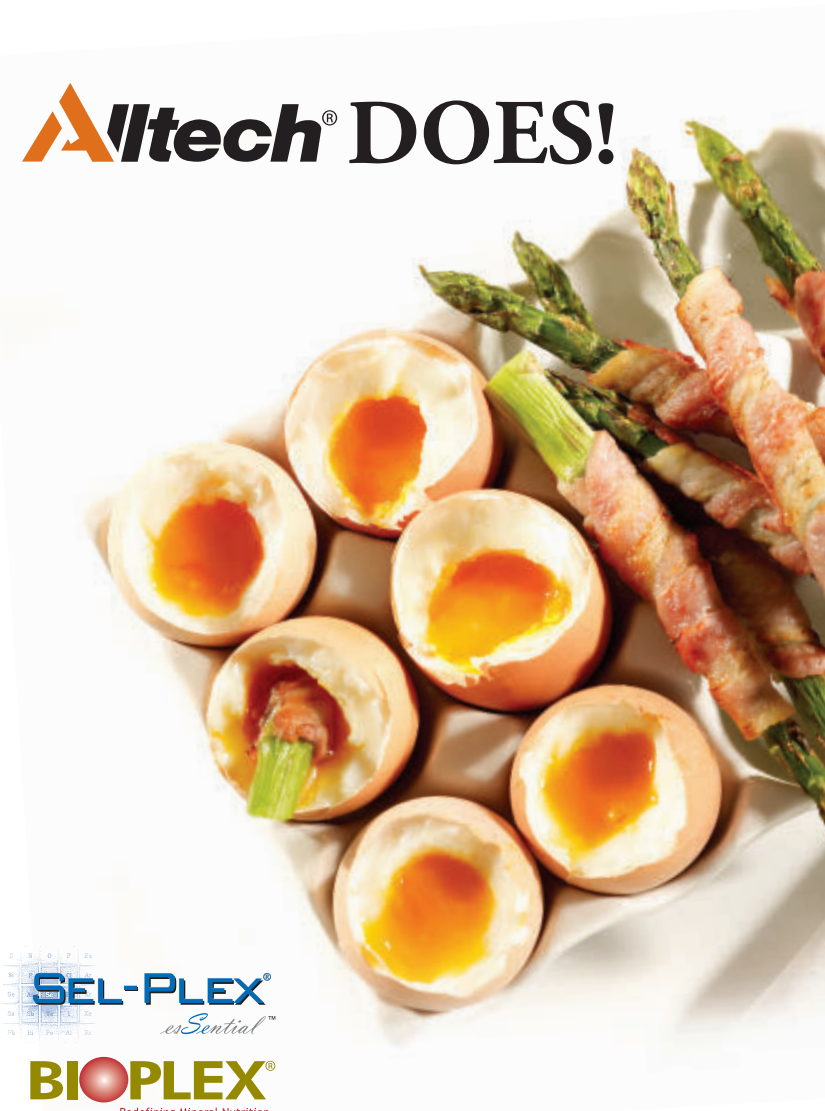
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Lowering poultry feed formulation costs with phytochemicals

Formulating poultry diets with phytochemicals can lower costs for feed producers without sacrificing feed performance.

For decades, broiler producers have tended to use high-density diets to feed their stocks and seek the highest possible profitability. But, with increasing feed prices, the entire production process is searching for alternatives to conventional feeding programs based on high-nutrient poultry diets to increase profitability.

With conventional nutrition, producers tend to make use of least-cost feed formulations, which have served for a long time as powerful solutions to optimize high feed prices. But, formulating broiler diets by the least-cost tool is not as easy as in ruminants because of the differences in the availability of raw materials for poultry and ruminants.

There are some programs that can target lower feed cost in an effective way, but unfortunately most of these programs fail to keep the balance between lower feed cost and acceptable performance. One solution may be found in phytochemicals.

Nutrient digestibility

The power of a feed additive is judged by its potential to improve the utilization of protein, amino acids and energy. Unfortunately, there is no linearity between digestibility and the

Table 1: Standard diet vs. diet with phytochemical product

Treatment	Description	Energy/nutrient** density	Phytochemical product
T1	Standard specification diet (SD)	100%	-
T2	SD + phytochemical product	100%	+
T3	Re-formulated diet (RD)	98.5%	-
T4	RD + phytochemical product	98.5%	+

**Metabolizable energy and amino acids

Novi Sad University's study began with placing broilers in four groups. Two groups had phytochemical product in their diets and two groups did not.

Read: Getting more value from poultry feed ingredients,

www.WATTAgNet.com/148771.html

density of the feed, which means that we may offer a very rich diet but with low digestibility. Nutrient digestibility or utilization depends on many factors. For example, the microbial status of the gastrointestinal tract or existence of bacterial challenge, and the nutrients' source and their accessibility to the animal for absorption.

By controlling gut microflora, phytochemical feed additives have great potential to improve nutrient digestibility. With the addition of phytochemicals, essential oils can limit the growth of the pathogenic bacteria in the gut, lowering the competition for nutrients between bacteria and host.

Phytochemicals are environmentally friendly

It is a big challenge to supply the market with safe products (natural or

antibiotic-free) that meet customer satisfaction, are beneficial for animal health, environmentally friendly and of good economic value. In terms of the environment, animal production is accused of being a culprit of greenhouse gases emissions. Some aberrant views have called for limiting animal production while ignoring the increasing demand for animal products, which is set to double by 2050.

Nutrient sparing could be a solution to limit emissions—decreasing one unit of protein may decrease greenhouse gases by 10 percent. As natural compounds extracted from plants, phytochemicals are safe for animal and human consumption. Phytochemical feed additives have proven beneficial effects in terms of improved performance through better feed conversion. Phytochemicals work to decrease ammonia emissions through improving protein utilization, decreasing the loss of nitrogen in the manure.

Positive health impact

Due to the high genetic potential of modern broiler strains, birds tend to be susceptible to any decrease in protein and energy levels. In addition

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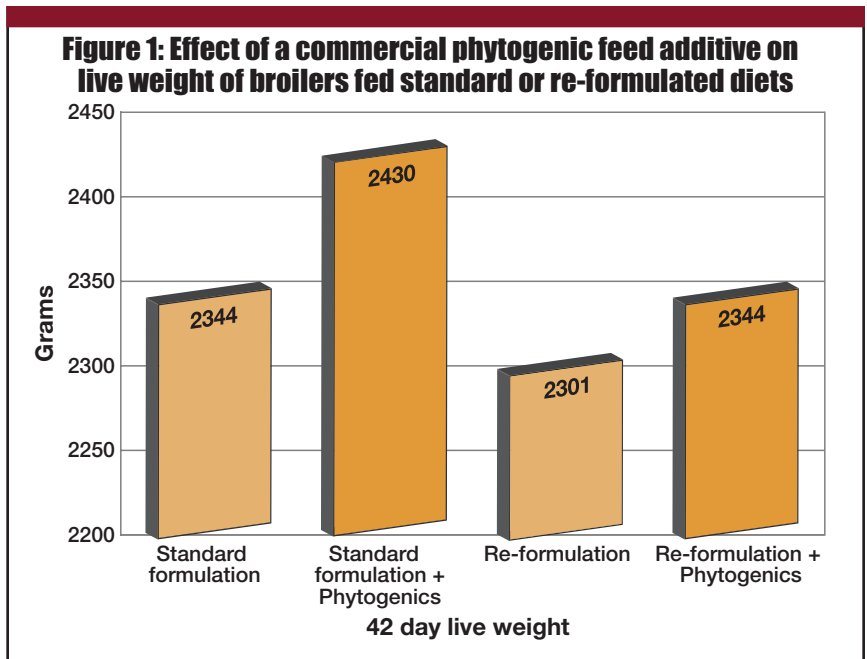
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Phylogenics

The low-density diet resulted in about a 2 percent reduction in live body weight, while the phylogenics product showed a clear compensation effect.

to improving productive performance, phylogenics can be used to decrease the risk in feed formulation due to improper mixing, variation in nutrient composition or inadequate ingredients. This is significant because manufacturing errors are difficult to observe and can cause severe loss in productivity and profitability.

Studies have proven that phylogenics have positive impacts on different health parameters, where feeding birds such compounds has led to lower microbial content in the digestive tract, lower levels of toxins and ammonia production, improved immunity and lower mortality.



Problems with high-density feeds

There is a positive correlation between metabolic diseases and high-density feed. It has been shown

that sudden death syndrome and ascites can be controlled via feed optimization. Furthermore, chronic stress can be induced by high nutrient feed that increases birds'

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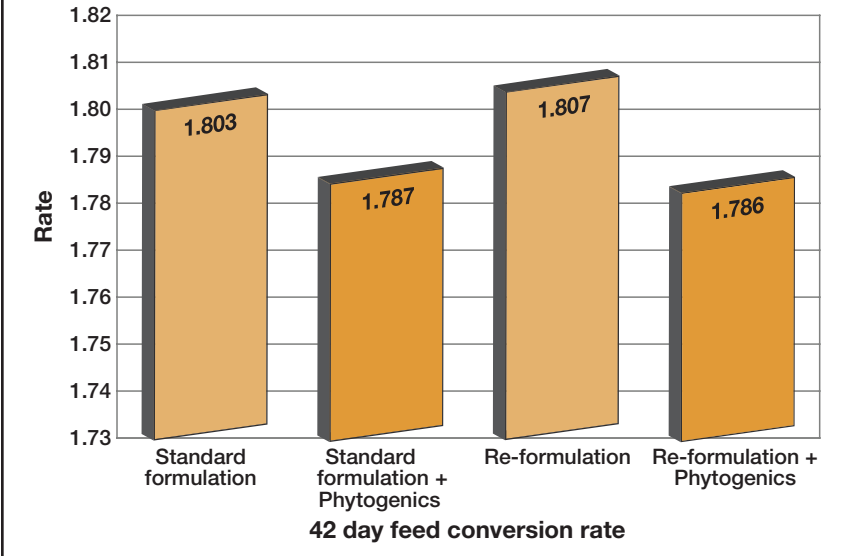
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Figure 2: Effect of a commercial phytogetic feed additive on feed conversion ratio of broilers fed standard or re-formulated diets



The feed conversion ratio of the fourth group was the lowest among all groups, which proves the efficacy of phytoGENICS as digestibility enhancers.

PhytoGENICS in the diet

To investigate the growth compensating effect of phytoGENICS and also the impact of down specification of diets with or without a commercial phytogetic product, an experiment at Novi Sad University was performed where birds were assigned into four treatment groups as shown in Table 1.

Figure 1 shows that offering the low-density diet resulted in about 2 percent reduction in live body weight, while the phytogetic product showed a clear compensation effect as group four had exactly the same live body weight as the control group. The feed conversion ratio of the fourth group (re-formulated with the feed additive) was the lowest among all groups

metabolic rate. This can be avoided by offering low-density diets.

The target behind the combination of nutrient-sparing and phytogetic feed additives is to pool

their advantages with a modern feeding program that can meet modern broiler performance and, at the same time, limit the effects of high feed prices.



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Phytogenics

(Figure 2), which proves the efficacy of phyto

genics as digestibility enhancers. The results obtained revealed that lowering nutrients in the feed had a negative impact on body weight and feed conversion ratio,

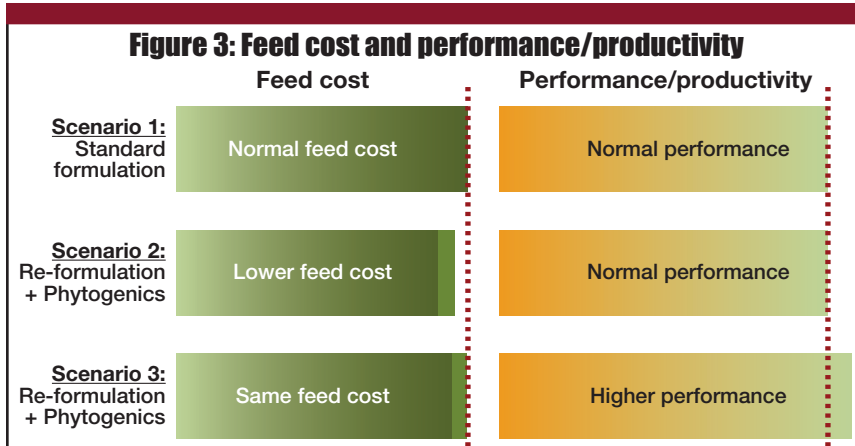
which seems logical because of the high nutritional requirements of broiler chickens. On the other hand, the nutrient-sparing effect of the phyto

genenic feed additive was clearly shown to recover live body weight and lower the feed conversion ratio.

The first scenario is the standard feeding program with standard performance. In the second, the same performance is achieved by reformulating the diet using phyto

genenic additives. According to the third scenario, re-formulation with phyto

genenic additives provides an increased level of performance while maintaining feed cost (Figure 3). Choosing the right scenario depends on the aims of producers. The fundamental question is, "Do conventional feeding programs serve modern broiler production?" The combination of nutrient-sparing tools, together with phyto




Selecting the right formulation scenario depends on the actual targets of producers.



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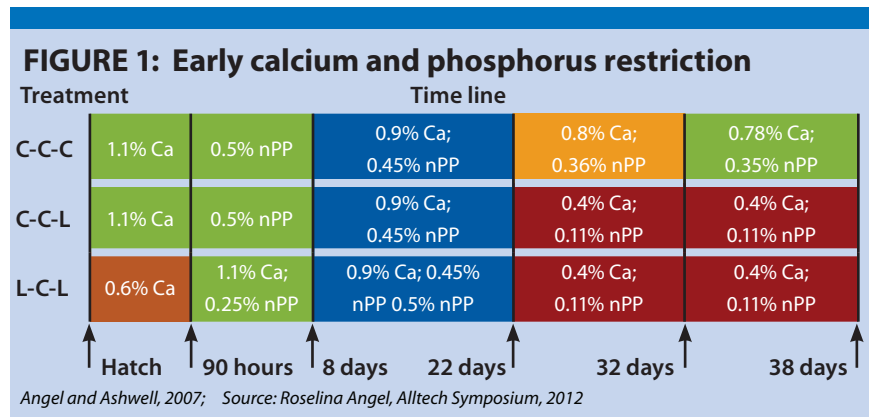
Perinatal imprinting in poultry benefits performance

Mounting evidence shows that what chicks are fed around the time of hatching influences a bird's performance and its nutrient requirement in later life.

The emerging science of epigenetics and nutrigenomics could rewrite the book on the nutritional requirements of broilers, according to scientists speaking at the Alltech 28th annual international symposium.

Manipulating gene expression around the time of hatching—or even earlier at the breeder stage—can condition birds for specific tissue development and nutritional requirements later in life. This can avoid overfeeding of certain nutrients and bring economic savings.

Dr. Peter Ferket, professor and extension poultry nutritionist at North Carolina State University, has spent 12 years studying the effect of *in ovo* feeding. He said the new science will allow animals to be programmed for specific desired traits and tissue development. Nutrition during the perinatal stage (three days before and three days after hatching) can program how and when genes are



Early phosphorus and calcium restriction: Gene expression of the sodium phosphate co-transporter, which is responsible for phosphorous absorption at 90 hours, indicated a three-fold increase in conditioned birds.

expressed and thereby influence performance.

"We are now starting to understand how genes can be switched on and off," he said. By exposing tissue during this critical stage of development to an adverse stimulus, it is possible to change the way a gene is expressed without changing the underlying DNA. The gene is then programmed and becomes an imprint for later life.

"If we can target and supplement the very first meal, the amnion fluid, we can manipulate gene expression and leave a nutritional signal that can influence the development of that animal," he said.

"We already know that *in ovo* feeding can enhance tolerance to immunological stress, environment stress,

Table 1: Effect of in ovo feeding on body and breast muscle weights in grams of Ross broilers

	Day of hatch		Day 10		Day 25	
	Control	In ovo	Control	In ovo	Control	In ovo
Body weight, grams	45.3	47*	243	254*	943	997*
Body weight difference (%)		3.7		4.2		5.7
Breast muscle % of BW	1.93	2.05*	11.4	12.3*	13*	
Difference (%) in breast muscle		6.2		5.2		8.3

>1 ml of primary IOF solution given at 17 E, >Age of breeding flock: 35 weeks; Source: Peter Ferket, Alltech Symposium, 2012

Effect of in ovo feeding: Breast muscle as a percentage of body weight at 25 days of age was 8.3 percent higher.

Table 2: Effects of early Phosphorus restriction on NaPcoT gene expression

Dietary treatment	Tissue	n-Fold
90 hour control	Duodenum	1
	Jejunum	1
	Ileum	1
Low Phosphorus	Duodenum	3.1
	Jejunum	2.9
	Ileum	2.5
38 day control	Duodenum	1
	Jejunum	1
	Ileum	1
Low Phosphorus	Duodenum	2.5
	Jejunum	2.7
	Ileum	1.8

Angel and Ashwell, 2007; Source: Roselina Angel, Alltech Symposium, 2012

Effects of early phosphorus restriction: At the end of the trial there was no significant difference in body weight between trial and control groups, although bone ash, a measurement of skeletal strength, was less.

oxidative stress, and bring about improved energy utilization. We can even change feeding patterns and how an animal eats," he said.

Benefits of *in ovo* feeding:

- ✓ Improved chick quality
- ✓ Increased glycogen reserves
- ✓ Advanced gut development
- ✓ Improved skeletal health
- ✓ Advanced muscle growth
- ✓ Increased body weight gain (2 percent to 3 percent)
- ✓ Improved feed conversion
- ✓ Enhanced immune function

Higher poultry liveweight

Ferket has also shown that feeding a nutritionally programmed diet for the first 90 hours after hatching conditions, or imprints, the birds, which leads to better feed conversion and liveweight gain.

"We fed a typical corn-soy diet which was conditioned in key nutrients for the first 96 hours after hatching. Even after five days there is an improvement in liveweight. This carries through to 21 days, 42 days and 60 days. We also see that the feed conversion of broilers improves by programmed nutrition."

Less shrinkage

Targeting metabolic keys to economically important traits such as efficacy of nutrient utilization or muscle development is the goal.

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Perinatal imprinting

For example, "If we time *in ovo* feeding to myoplast development we can influence the development of muscle fibers," said Ferket. He has been able to time *in ovo* feeding to boost the second and third wave of satellite cell development, resulting in heavier muscle development (see Table 1).

Significant reductions in cooking losses have been demonstrated with programmed feeding. Also, diets programmed to enhance anti-oxidative properties had a significant improvement on shelf-life and led to better flavor characteristics.

Saving nutrients with epigenetics

Nutritional requirements can also be programmed by epigenetics and thereby avoid wasteful overfeeding of nutrients later.

Dr. Roselina Angel, associate professor at Maryland University, department of animal and avian sciences, has already shown that neonatal conditioning can elicit a change in an animal's ability to utilize specific nutrients. Her work on phosphorous clearly demonstrates the potential of nutrigenomics and the epigenetic changes around hatching, which allows birds to better utilize nutrients in later life.

Timing is critical

Angel presented details of her research in which birds were challenged to a diet deficient in phosphorous (0.25 percent) and calcium (0.6 percent) for the first 90 hours. They were then fed a diet that exceeded nutritional requirements until 22 days of age. From 22 to 38 days of age, the diet was also deficient in phosphorous (0.11 percent) and calcium (0.4 percent). At the end of the trial, there was no significant difference in body weight between trial and control groups although, unfortunately, bone ash, a measurement of skeletal strength, was less.

"If we look at gene expression of

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the sodium phosphate co-transporter, which is responsible for phosphorous absorption at 90 hours, we see a three-fold increase in the conditioned birds. At 38 days we saw a 2.5- to 2.7-fold increase in gene expression.

"However, we don't want to see this negative impact on bone ash so we need to accurately determine the optimum timing of the challenge. We felt we started on the deficient diet too early," she said.

Angel and her team will perform more experiments to find the critical point for conditioning to make the timing of the challenge as short as possible before the theory can be commercially implemented.

"This is not just an improvement in how we feed animals, this is a leap."

Savings on phosphorous

"There is clearly potential for genetic changes in terms of phosphorous. Based on our experiments I calculate I can reduce available phosphorous by 28 percent for each bird (just by changing the diet for 90 hours at early stage of life). This equates to 3.9 grams per bird (for a

2.2 kg/5.5 lb bird), which, in addition to significant cost savings, has a positive impact on the environment," she said.

"This is not just an improvement in how we feed animals, this is a leap. Nutrigenomics is one of the tools with the most promise.

"We have seen in humans that gene expression can be transferred from one generation to another. This has not yet been explored in poultry, but the greatest potential is if we can imprint at the breeding stage so that chicks will be already conditioned for the future." □

› *Helen Armstrong is a freelance writer based in the UK.*

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Poultry Processing Worldwide

Key checks to optimize poultry processing

Even when the right processes are in place, they must be thoroughly and completely applied to ensure the highest yield from the plant.

Processing operations can be broken down into specific areas, and procedures applied to each to maximize efficiency and speed workflow. But are processes implemented as they should be?

It is all very well to have procedures in place, but they must be properly applied. The following areas in particular are worth thorough examination.

Harvesting

Birds should be harvested with care so as not to damage them, but if they are then put into damaged or defective cages, problems can occur.

It is worth checking to ensure that cages are not broken. They may not have doors because they have been removed by the harvesters, as opening and closing the cage door can slow down the speed of work. Many companies turn a blind eye to this.

Even when transport cages do have doors, often they are ill-fitting and fall down into the cage itself, or it could be the case that the size of the cage is not adequate for the size of the bird. Any of these factors can harm birds or result in suffocation.



Allowing bottlenecks to occur can reduce the quality of the final product.



If light levels are too high, birds will become stressed. Excessive movement can result in birds injuring themselves.

Preparation for transport

Even when birds are handled with utmost care at harvest and placed into the best possible cages, risks remain. As trucks are piled ever-higher with bird-filled cages, inevitably those birds toward the bottom and the middle of the stack will have a reduced air supply, and this can result in suffocation.

Transport

When trucks leave the farm, it should always be remembered that what they are carrying is the investment of the company. If they

are not properly equipped with air conditioning, birds will die, reducing the amount of meat available for processing. The lower the amount of meat processed, the higher the cost per kilo, and the lower the profit.

Waiting at the plant

If there is no proper receiving area at the processing plant, birds will stay on the trucks, which could be in full sunlight, and mortality rises.

Birds awaiting slaughter will remain in relative comfort if specific conditions are met: There must be adequate ventilation, suitable space around the stacks of cages to ensure the free-flow of air, and darkness.

Yet, even when the above conditions are met, if when birds reach the hanging area there is a high light level, their stress levels will rise prior to stunning.

Hanging the live birds

The route to the stunner should have reduced levels of lighting; however, in some plants this area is completely open. Once birds



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have been hung on the overhead conveyor they will start to flap, and if their wings hit against metal surfaces, they can be damaged. This situation is exacerbated when no breast comforter has been installed.

Incidentally, should the time between hanging and entering the stunner exceed 30 seconds, blood will accumulate in the wings and neck. Should bleeding time be insufficient then, following plucking, the wings will have some blood at their tips, affecting this area of the processed birds.

Stunning

Should the access ramp to the stunner be wet, and if there is electricity flowing through this water, then chickens will suffer a pre-shock. When this occurs, birds lift their heads and flap as they pass through the water bath, leaving them totally conscious.



Bottlenecks at chilling can affect the appearance of finished product.

They must then be taken down and returned to the hanging area.

Prewash before scalding

When chickens are slaughtered, there is fecal material on their feathers and skin, which is not acceptable from a sanitary perspective. Because of this, they should be washed to remove the maximum amount of fecal material. While this practice does occur, it is often performed with insufficient volumes of water, resulting in the water becoming

dirty, and the level of potentially contaminating bacteria rising.

Scalding

The reason for scalding is to raise the body temperature to such a degree that the skin follicles dilate and the feathers are loosened. Yet the efficiency of this process can be reduced if the time spent moving birds from the scalding to the plucking machine is too long, allowing cooling to occur. This can affect the quality of plucking.

Plucking

Chickens should enter the plucking machine at a high enough temperature to keep the follicles open. If the water used for scalding is not hot enough, birds will reach the plucker at lower than ideal temperatures for feather removal. When this occurs, it may be necessary to shut down the machines. At the moment this occurs, the pressure of the fingers on

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Optimize poultry processing

the skin increases, aiding the entry of fecal material into the follicles, and raising the risk of cross-contamination. Additionally, some fat from the skin may be removed, reducing yield.

Evisceration

Evisceration is carried out to gather the organs and other parts fit for human consumption at the speed of the overhead conveyor. If, for whatever reason, these parts are not sent immediately to the chillers, then bacterial growth may occur, which reduces shelf-life.

Chilling carcasses and giblets

Plant managers must keep water temperatures as close as possible to 0C to ensure that these products leave the chiller with an average temperature of 2C. However, when bottlenecks occur, there is the

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possibility that with an increase in temperature, there will be a loss of moisture from the meat.

Packaging

Once carcasses have been drained and selected by weight, they need to be placed into their respective bins, but if this process is not carried out fluidly, then bottlenecks can occur. Once this happens, and temperatures start to

rise, there is again the possibility that moisture will be lost, affecting yield.

Coolers

The ideal would be that carcasses and giblets enter the coolers at a maximum temperature of 4C. Should this temperature rise as result of, for example, accumulation of product at the chiller entrance, the time needed for chilling will also increase. This can lead to a darkening of the skin due to greater exposure to cold air.

Much can be gained by considering the details along the production line, ensuring the highest quality and safety, helping to reach maximum yield. □

› *Eduardo Cervantes Lopez is an international consultant based in Colombia. He can be contacted at: icproave@hotmail.com or via www.icproave.com*



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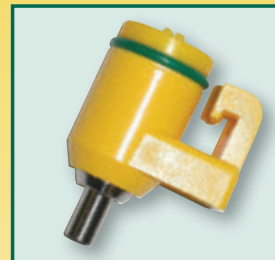
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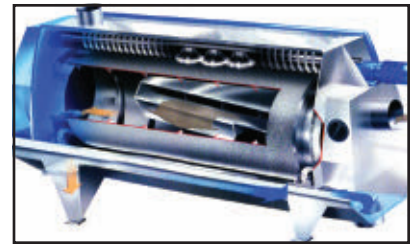
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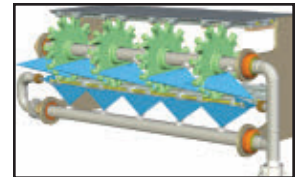


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